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

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IT MUST BE PROMPTLY FORWARDED TO THE PURCHASER

NOTICE OF PUBLIC HEARING
TILLAMOOK COUNTY PLANNING COMMISSION
RIVERVIEW MEADOWS PHASE 2
Notice Date: May 14, 2026

A public hearing will be held by the Tillamook County Planning Commission at 7:00p.m. on Thursday, June 11, 2026, in the Port of Tillamook Bay Conference Center, 4000 Blimp Boulevard, Tillamook, OR 97141 to consider the following:

#851-26-000055-PLNG: Request for consolidated review and approval of a tentative subdivision plat for "Riverview Meadows Phase 2", a subdivision development comprised of 74 residential lots and three tracts (Tracts D-F) for construction of a water reservoir, designated private open space and a private road system, respectively, together with Geologic Hazard Report review request #851-26-000056-PNG and Conditional Use request #851-26-000139-PLNG, a request to allow for a road encroachment into the 15-foot riparian buffer along Bob's Creek. Located within the City of Nehalem Urban Growth Boundary, the subject property is zoned Nehalem Mixed Density Residential (NH_RM) and is accessed via Riverview Meadows Lane, a private road. The subject property is designated as Tax Lot 3600 of Section 23B, Township 3 North, Range 10 West of the Willamette Meridian, Tillamook County, Oregon. Applicant and property owner is Carey Sheldon. *The proposed Riverview Meadows Phase 2 was previously approved as Riverview Meadows Phases 2 & 3. These land use decisions expired prior to final plat approval.*

Notice of public hearing, a map of the request area, applicable specific request review criteria and a general explanation of the requirements for submission of testimony and the procedures for conduct of hearing has been mailed to all property owners within 250 feet of the exterior boundary of the subject property for which application has been made at least 28 days prior to the date of the hearing.

The applicable criteria are contained within City of Nehalem Development Ordinance, Chapter 157: Subdivisions, Section 157.510.05, Conditional Use Permits Section 157.507.05 and the standards for development contained in Geological Hazards Section 157.440. Only comments relevant to the approval criteria are considered relevant evidence.

The hearing will take place at the Port of Tillamook Bay Conference Center with an option for virtual participation. For instructions on how to provide oral testimony at the June 11, 2026, hearing, please visit the Tillamook County Department of Community Development (DCD) website at https://www.tillamookcounty.gov/bc-pc for instructions and protocol or email Sarah Thompson, Office Specialist 2, at Sarah.thompson@tillamookcounty.gov. A virtual meeting link will be provided at the bottom of the DCD homepage address as well as a dial in number for those who wish to participate via teleconference but are unable to participate virtually prior to the evening of the hearing.

Written testimony may be submitted to the Tillamook County Department of Community Development, 1510-B Third Street, Tillamook, Oregon, 97141 prior to 4:00 p.m. on the date of the June 11, 2026, Planning Commission hearing. If submitted by 4:00 p.m. on June 2, 2026, the testimony will be included in the packet mailed to the Planning Commission the week prior to the June 11, 2026, hearing. Failure of an issue to be raised in a hearing, in person or by letter, or failure to provide sufficient specificity to afford the decision-maker an opportunity to respond to the issue precludes appeal to the Land Use Board of Appeals on that issue. Please contact Sarah Thompson, Office Specialist 2, Tillamook County Department of Community Development, Sarah.thompson@tillamookcounty.gov as soon as possible if you wish to have your comments included in the staff report that will be presented to the Planning Commission.

The documents and submitted applications are also available on the Tillamook County Department of Community Development website (https://www.tillamookcounty.gov/commdev/landuseapps) or at the Department of Community Development office located at 1510-B Third Street, Tillamook, Oregon 97141. A copy of the application and related materials may be purchased from the Department of Community Development at a cost of 25 cents per page. The staff report will be available for public inspection seven days prior to the hearing. Please contact Sarah Thompson for additional information https://www.tillamookcounty.gov/commdev/landuseapps or call 503-842-3408.

In addition to the specific applicable review criteria, the City of Nehalem Development Ordinance, City of Nehalem Comprehensive Plan, and Statewide Planning Goals which may contain additional regulations, policies, zones and standards that may apply to the request are also available for review at the Department of Community Development.

The Port of Tillamook Bay Conference Center is handicapped accessible. If special accommodations are needed for persons with hearing, visual, or manual impairments who wish to participate in the hearing, please contact the Department at 503-842-3408, at least 24 hours prior to the hearing in order that appropriate communications assistance can be arranged.

If you need additional information, please contact Sarah Thompson, DCD Office Specialist, at 503-842-3408 or email Sarah.thompson@tillamookcounty.gov.

Sincerely,

Sarah Absher

Sarah Absher, CFM, Director

Enc. Applicable City of Nehalem Development Ordinance Criteria
Location Maps

REVIEW CRITERIA

CITY OF NEHALEM SUBDIVISION ORDINANCE CRITERIA

https://www.nehalem.gov/media/5576

CHAPTER 157.510.05 SUBDIVISION DECISION CRITERIA

(A) Each parcel shall satisfy the dimensional standards of the applicable zone, unless a variance from these standards is approved or the request is part of a Planned Development or Cottage Cluster Development.

(B) The parcels shall meet the Development Standards for Land Division of Section 157.404; or, specific requirements of a Planned Development or Cottage Cluster Development.

(C) Existing buildings shall comply with the setback requirements of the applicable zone, unless a variance from the requirements is approved. Nehalem Development Ordinance Article V-32

(D) Adequate public facilities, including access, shall be available to serve the existing and newly created parcels. The applicant shall design and install a water system to serve all lots or parcels within a development in accordance with Nehalem City Code Section 51.09 and shall connect those lots or parcels to the city's water system. Applicants are responsible for extending the city's water system to the development site and through the applicant's property to allow for the future connection of neighboring undeveloped properties that are suitably zoned for future development. If adjacent properties are undeveloped or landlocked, consideration will be given to extending appropriate access to those properties in accordance with adopted City policy.

CHAPTER 157.507.05 CONDITIONAL USE DECISION CRITERIA

A Conditional Use shall be approved if the applicant provides supporting evidence that all the requirements of this Ordinance relative to the proposed use are satisfied, and demonstrates that the proposed use also satisfies the following criteria:

(A) The use is listed as a conditional use in the underlying district and complies with the development requirements of the underlying zone.

(B) The characteristics of the site are suitable for the proposed use considering size, shape, location, topography, and location of improvements and natural features.

(C) The proposed development is timely, considering the adequacy of transportation systems, public facilities and services, existing or planned for the area affected by the use.

(D) The proposed use will not alter the character of the surrounding area in a manner which substantially limits, impairs, or precludes the use of surrounding properties for the primary uses listed in the underlying zone.

(E) Decision criteria for special buffers are found in Section 157.442.

NEHALEM DEVELOPMENT ORDINANCE RELEVANT CHAPTERS & SECTIONS:

CHAPTER 157.510 SUBDIVISIONS & PLANNED DEVELOPMENTS

CHAPTER 157.507 CONDITIONAL USE PERMITS

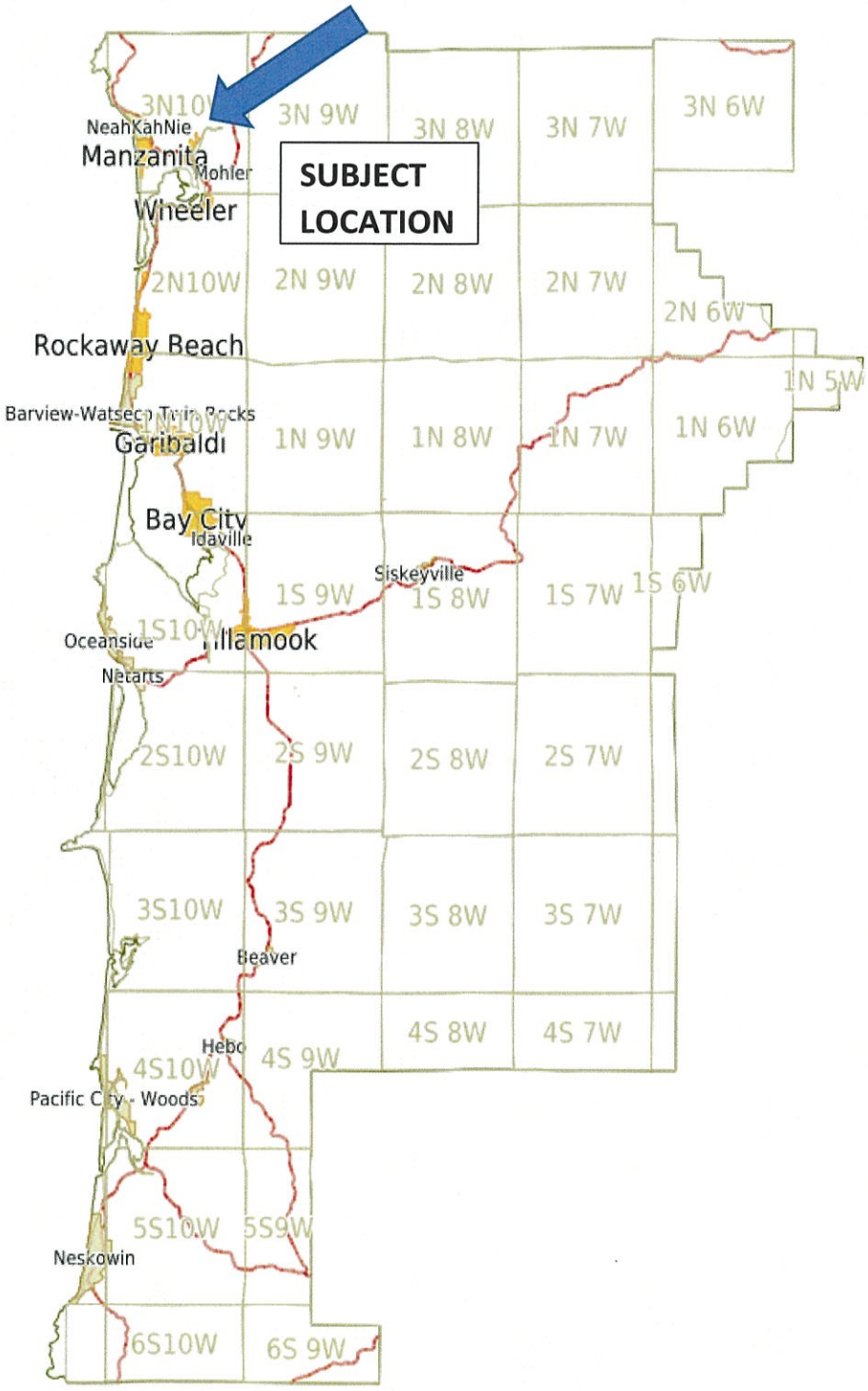
SECTION 157.205 MIXED DENSITY RESIDENTIAL (RM ZONE)

SECTION 157.404.06 IMPROVEMENT REQUIREMENTS SUBDIVISION

SECTION 157.440 GEOLOGIC HAZARDS

SECTION 157.442 SPECIAL BUFFERS & SETBACKS

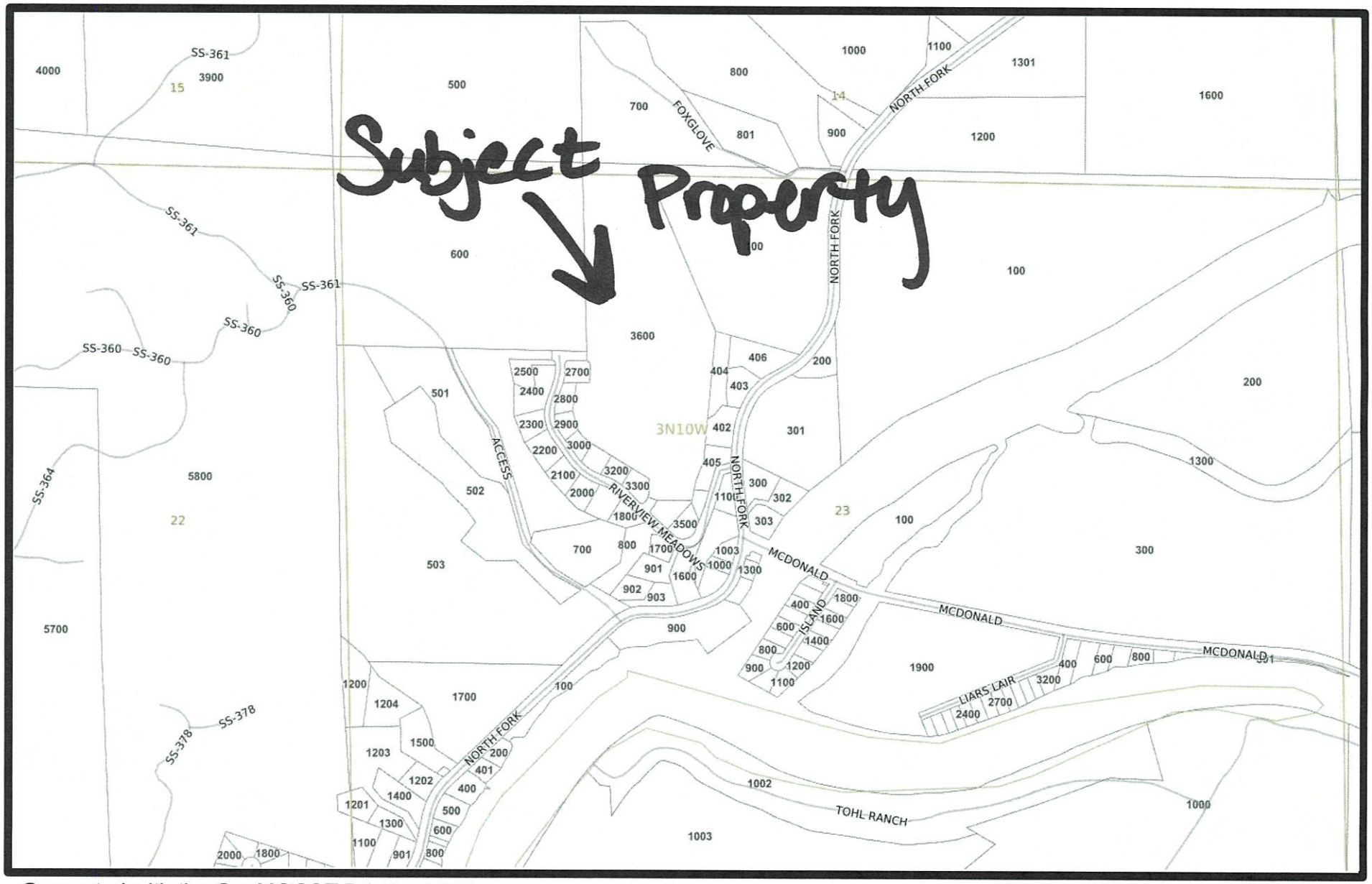
VICINITY MAP



#851-26-000055-PLNG:

RIVERVIEW MEADOWS PHASE 2

Map



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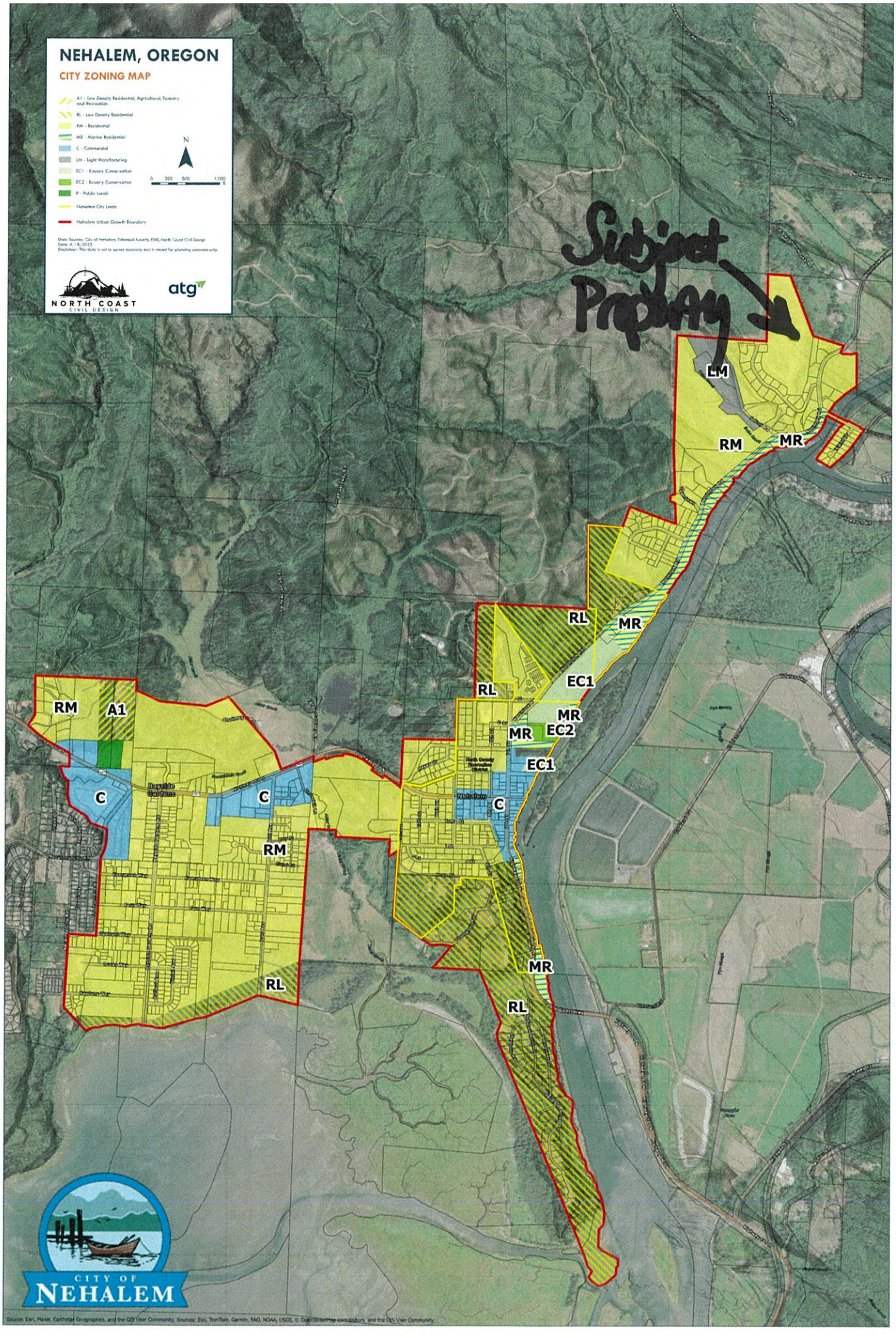

NEHALEM, OREGON
CITY ZONING MAP
A1 - Low Density Residential, Agricultural, Forestry and Recreation
RL - Low Density Residential
RM - Residential
MR - Marine Residential
C - Commercial
LM - Light Manufacturing
EC1 - Estuary Conservation
EC2 - Estuary Conservation
P - Public Lands
Nehalem City Limits
Nehalem Urban Growth Boundary
N
0 250 500 1,000 ft
NORTH COAST CIVIL DESIGN
atg
Subject Property
LM
RM
MR
RL
MR
EC1
RL
MR
EC2
MR
EC1
C
C
C
RM
RM
A1
C
RL
MR
RL
CITY OF NEHALEM

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: RECEIVED FEB 04 2026 BY: CounterApt-SS
☐Approved ☐Denied
Received by: SS
Receipt #: 90836
Fees: 1,207.50
Permit No: 851-26-000056-PLNG

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

Name: River View Meadows Phone: 503-805-8741
Address: 23765 SE Hwy 212
City: Damascus State: OR Zip: 97089
Email: CareySheldon17@YAHOO.com

Property Owner

Name: SAME Phone:
Address:
City: State: Zip:
Email:

Request: River View Subdivision phase 2

Type I

- ☐ Beach and Dune Hazard Report Review
- ☐ Extension of Time Review
- ☐ Final Plat Approval
- ☒ Geologic Hazard Report Review
- ☐ Land Use Compatibility Statement
- ☐ Land Use Verification Letter
- ☐ Preliminary Plat Time Extension
- ☐ Replacement Dwelling in Resource Zone
- ☐ Review for Dwelling in Resource Zone

Location:

Site Address:
Map Number: 3N (Township) 10 West (Range) 23 B (Section) 3600 (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.

Carey Allen — Feb 4-2026
Property Owner Signature (Required) Date

Applicant Signature Date

Business Registry Business Name Search

New Search

Business Entity Data

02-04-2026
13:20

Registry Nbr	Entity Type	Entity Status	Jurisdiction	Registry Date	Next Renewal Date	Renewal Due?
202163-88	DBC	ACT	OREGON	05-11-1990	05-11-2026	
Entity Name	SHELDON DEVELOPMENT INC.					
Foreign Name						

New Search

Associated Names

Type	PPB	PRINCIPAL PLACE OF BUSINESS				
Addr 1	23765 SE HWY 212					
Addr 2						
CSZ	DAMASCUS	OR	97089		**Country**	UNITED STATES OF AMERICA

Please click here for general information about registered agents and service of process.

Type	AGT	REGISTERED AGENT			**Start Date**	08-02-2010	**Resign Date**	
Name	CAREY		M	SHELDON				
Addr 1	23765 SE HWY 212							
Addr 2								
CSZ	DAMASCUS	OR	97089		**Country**	UNITED STATES OF AMERICA		

Type	MAL	MAILING ADDRESS				
Addr 1	PO BOX 883					
Addr 2						
CSZ	FAIRVIEW	OR	97024		**Country**	UNITED STATES OF AMERICA

Type	PRE	PRESIDENT					**Resign Date**	
Name	CAREY		M	SHELDON				
Addr 1	23765 SE HWY 212							
Addr 2								
CSZ	DAMASCUS	OR	97089		**Country**	UNITED STATES OF AMERICA		

Type	SEC	SECRETARY					**Resign Date**	
Name	BLAKE			SHELDON				
Addr 1	278 SW LILLYBEN AVE							
Addr 2								
CSZ	GRESHAM	OR	97080		**Country**	UNITED STATES OF AMERICA		

New Search

Name History

MORGAN CIVIL ENGINEERING, INC.

PO Box 358, Manzanita, OR 97130
ph: 503-801-6016
www.morgancivil.com

Drainage Calculations for

Riverview Meadows Phase 2
Tax Lot 3600, Map 3N 10W 23B
Nehalem, Tillamook County, Oregon
Project #19-10-Riv

January 14, 2026

Table of Contents

Design Criteria

Drainage Run-off – Rational Method

Intensity

Rainfall Intensity-Duration-Recurrence Interval Curves
ODOT Hydraulics Manual, Zone 2

Rational Method - Run-off Coefficients

Meadow	0.25
Residential (Normal – 4.8 units/acre)	0.50

Manning's Equation - Coefficients

n – (HDPE pipe)	0.012
n – (rock lined ditch, jagged)	0.035

Narrative of Engineering Analysis

These calculations have been prepared to address the stormwater run-off from the proposed development on the subject property. This property slopes gently to the southeast and has been developed for home construction. Phase 1 of the development has been developed and most of the twenty lots are developed with homes. The roadway improvements for Phase 2 have been constructed, including paving and drainage culverts.

These calculations determine the rate of stormwater run-off from the site. The collected water will combine with water from Phase 1. Water run-off from Phase 1 currently flows through culverts and a settlement pond, and then into Bob's Creek, at the base of the slope to the southwest. Bob's Creek flows into the Nehalem River to the southeast.

The proposed development will consist of 74 new single-family homes. The utilities and roadways to serve the lots have been constructed. The property slopes down to the southeast at roughly 2 percent. The calculations show that the planned drainage system can safely convey the run-off from a 100-year storm event.

The property consists of a layer of organic topsoil over dense silty clay. Prior to construction, there were currently vegetated ditches on the property that direct water to the south and east, off the property. The attached drawings show the previous drainage routes.

Phase 1 Drainage

Phase 1 of Riverview Meadows as constructed in 2010. The collected stormwater from Phase 1 flows into a roadside ditch and southward to a culvert system which runs behind Lot 3. Water from the homes on the east side of the roadway is discharged into the roadside. Most use a drywell system with an overflow to the ditch in order to slow water run-off.

The water runs in the culverts to the base of the hill to the southwest. At that point, record show that there is an energy dissipater and a sediment pond. The water then flows through culverts under the gravel roadway and Tax Lot 502, and into Bob's Creek.

Phase 2 Drainage Area

The roads and culverts in Phase 2 were constructed in 2025. Prior to construction, most of the water on the property flowed eastward in ditches and through private property down to the North Fork Road. There is also water entering the property from the northeast through Tax Lot 600. There were two defined channels that went down the slope to the east. They were located at what is proposed as Lot 51 and Lot 46.

Phase 2 incorporates about 22 acres of meadows and roadways. There were trees in the northern portion of the property. The eastern edge of the site continues to drain to the east, down the slope. This area is to the east of the new roadway referred to as Coltlee Drive, and is an extension of Vern's Place. This area is shown as Lots 43-52 and Lot 59.

The drainage area to the northeast that directs water through Tax Lot 600 into the property consists of roughly 42 acres of forested land. This water is collected in a ditch located at the western edge of the property which is north of Phase 1.

The stormwater from the property is now directed with ditches and culverts to Vern's Place (Coltlee Drive) in order to combine with the run-off from Phase 1 and be piped to Bob's Creek. The ditches and culverts have been installed.

The roadside ditches are typically V-shaped ditches that are 4 feet wide and 2 feet deep.

Entrance (Riverview Drive) – Off-site

The high point of Riverview Drive is located near the center of the existing asphalt hammerhead known as Sunnyview Drive (Riverview Drive). The water to the east of the high point flows eastward into the property through the ditches down to Vern's Place (Coltlee Drive) and to Bob's Creek with run-off from the property.

The area to the west of the high point flows down the entrance roadway to the west. The roadway is pitched to drain to the east to a vegetated roadside ditch. An old culvert directs water across the roadway just north of Tax Lot 502, below Lot 7.

Water run-off from the lower portion of the roadway is collected in catch basins on the east side of the road and the piped under the roadway near Tax Lot 800 to the wetlands adjacent to Bob's Creek.

Before the recent construction, the roadway was gravel and about 16 feet wide. The only water on the newly paved road will be from the roadway. The ditch will also collect any water run-off from the slope in Tract A of Riverview Meadows.

Calculations

The attached calculations show the run-off from the planned development and Phase 1, and the capacities of the pipes down to Bob's Creek. The Manning Equation was used to verify that the existing pipes are adequate for the total proposed flow.

The attached calculations show the expected rate of flow and the capacity of the ditch. As shown, a ditch with a 2 percent slope is generally adequate for the run-off. Larger ditches have been constructed for conveying the water which enters the property at the northwest edge. The existing gravel roadway in the easement west of Lot 3 has a slope of about 15 percent, so the culvert is adequate to handle the increased run-off.

A feeder ditch system with water from sections of the developed area feeding into a main drainage route which includes off-site drainage. The smaller areas include the northern portion of the property and the western portion of the southern half of the property.

Due to varying area and cover, each section has a different time of concentration for run-off. The sections are Phase 1, Phase 2 and off-site run-off. The storm event for each of these times were each checked to determine the maximum flows.

- Run-off from Phase 1 and a Portion of Phase 2.
  5-minute time of concentration.
- Runoff from Phase 1, all of Phase 2, and a portion of the off-site drainage area.
  10-minute time of concentration.
- Runoff from Phase 1, all of Phase 2, and all of the off-site drainage area.
  over 30-minute time of concentration.

The 10-minute storm was determined to produce the highest flows leaving Phase 2, and flowing to that detention pond that drains to Bob's Creek. The 5-minute storm produced the highest flows on-the site.

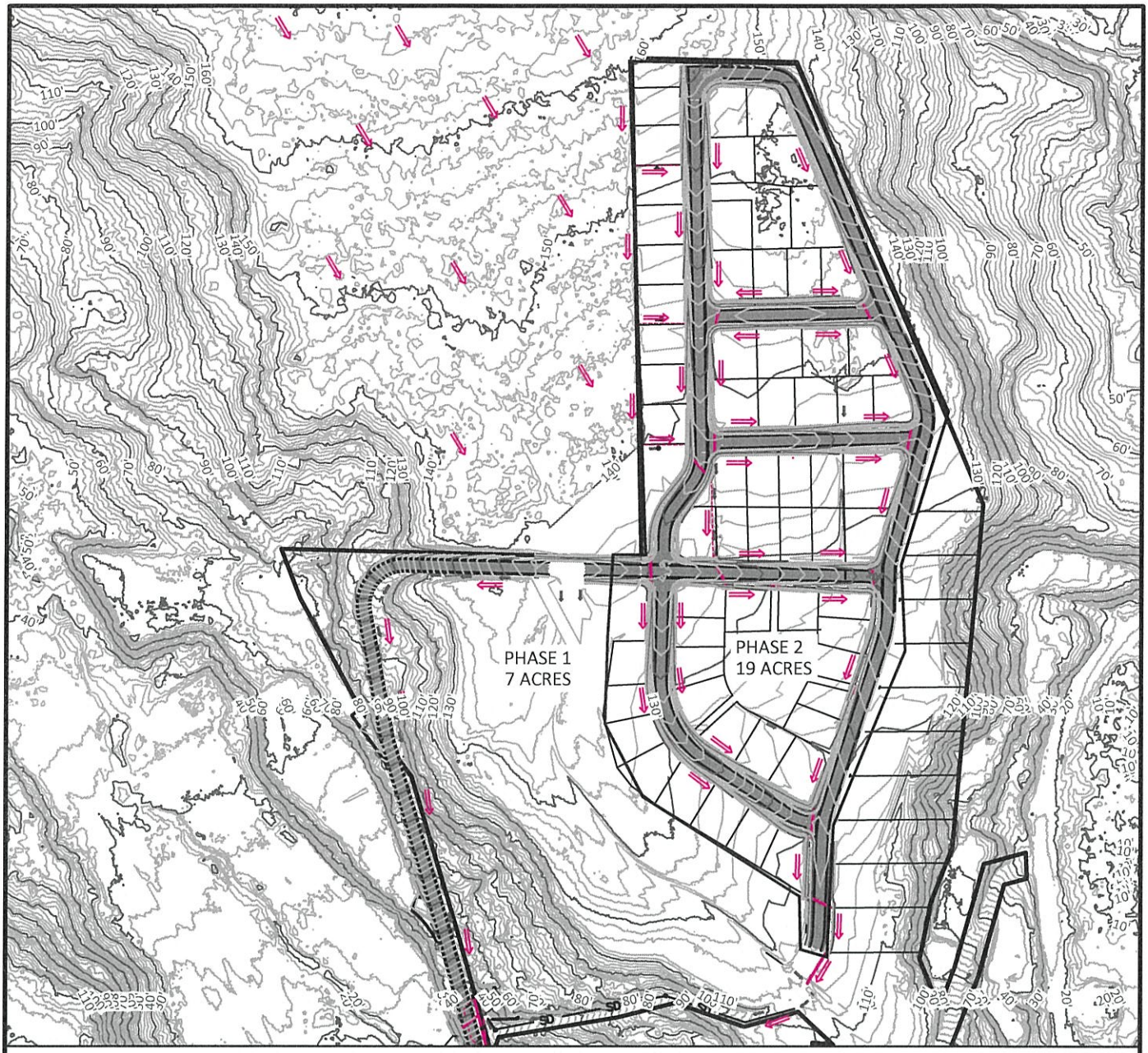
Onsite- there are 18-inch culverts that collect water locally. Rough, each quarter of the property drains to the main channel. The main drainage channel that conveys the water run-off from the off-site forested area to the northwest includes 24-inch culverts. The pipes down the hill behind Lot 3 are two 18-inch culverts.

Stormwater Treatment

The water that flows through the culvert at Lot 3 flows through an existing energy dissipater and sedimentation pond before entering Bob's Creek.

Water that flows down the entrance road will continue to follow the roadway. To direct the flow, the roadway will be pitched to a vegetated ditch on the east side. The upper portion will continue to discharge through a culvert near the north end of Tax Lot 502.

<V:\19-10-Riv\Reports\Riverview Stormwater - 2026.docx>



SCALE

0 125 250 500

1 inch = 250 ft.

N

S

DRAINAGE FLOW

CULVERTS

JAN. 2026

RIVERVIEW MEADOWS

PHASE 2

SITE LAYOUT

DRAINAGE ROUTES

NEHALEM/MAP 3N 10W 23

MORGAN CIVIL ENGINEERING, INC.

PO BOX 358
MANZANITA, OR 97130
(503) 801-6016
www.morgancivil.com

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- INSPECTION
- PLANNING

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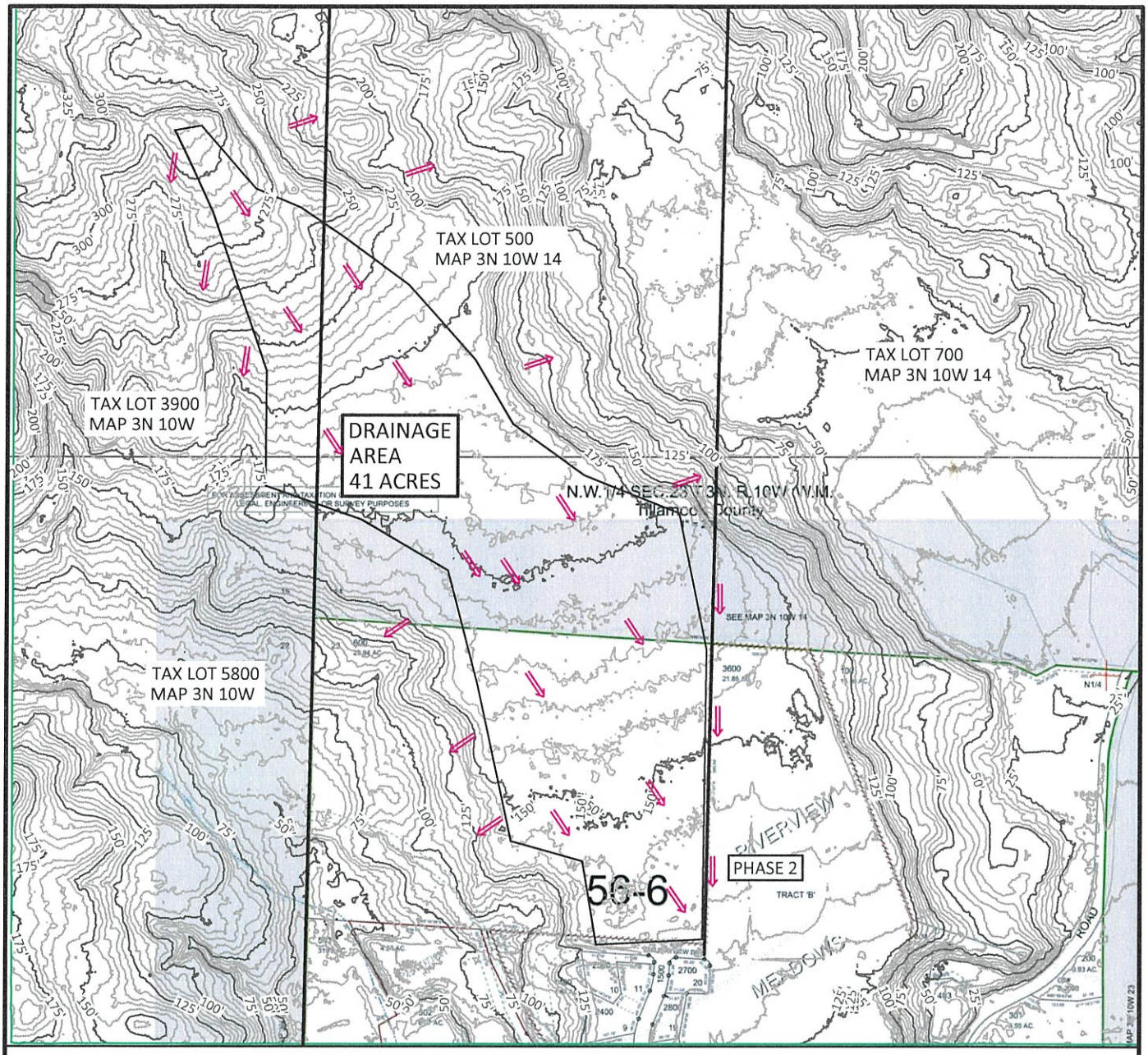

SCALE

0 25 500 1000

1 inch = 500 ft.

N

S

DRAINAGE FLOW

JAN. 2026

RIVERVIEW MEADOWS

PHASE 2

OFF-SITE AREA

DRAINAGE AREA

NEHALEM/MAP 3N 10W 23

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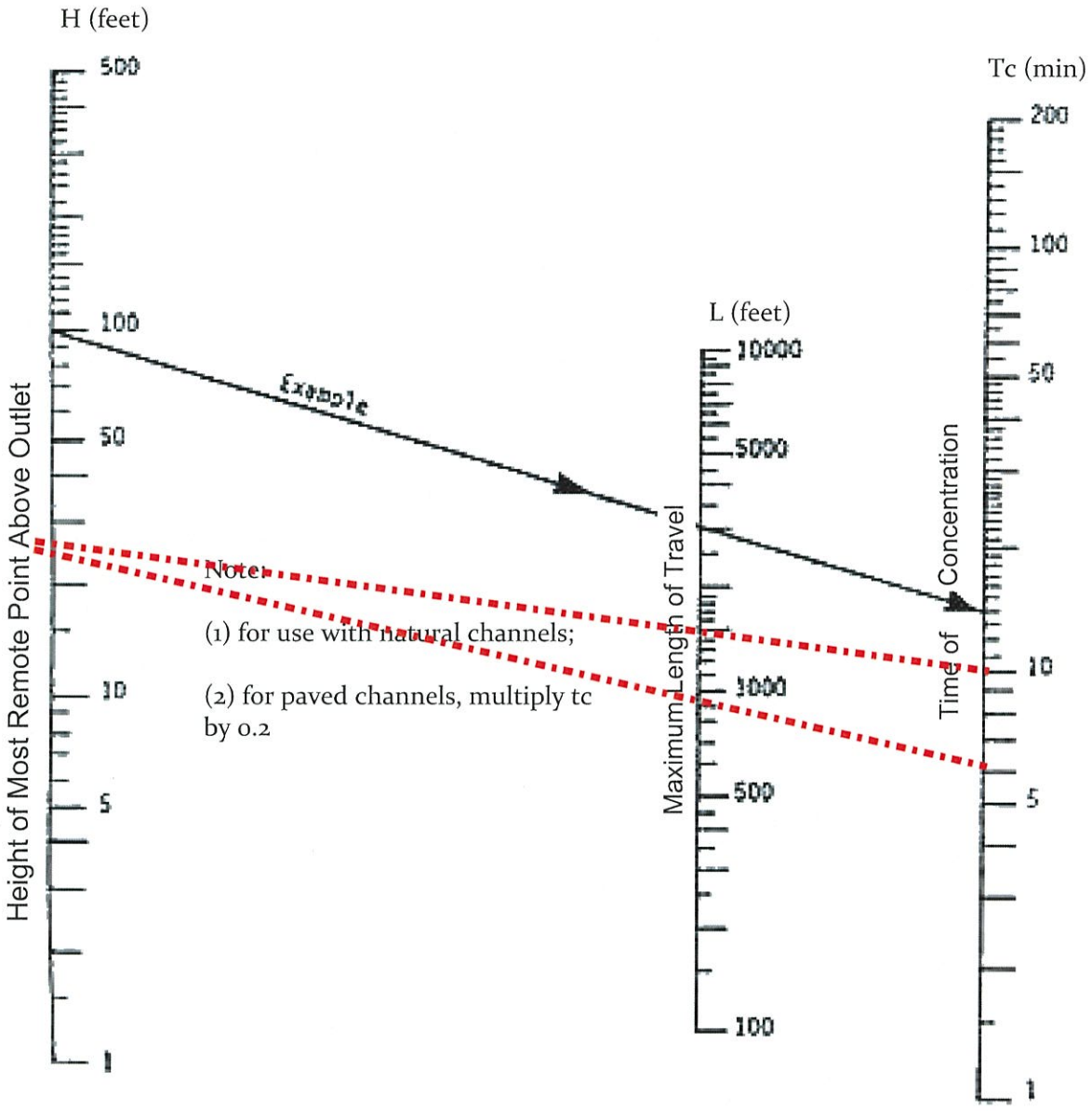
RIVERVIEW MEADOWS - PHASE 2						
STORMWATER RUN-OFF CALCULATIONS						
RUN-OFF COEFFICIENTS	FLAT ROLLING HILLY					
Normal Residential: 3 to 6 units/acre 0.50 0.55 0.60						
Cultivated Land, Clay & Loam 0.50 0.55 0.60						
Cultivated Land, Sand & Gravel 0.25 0.30 0.35						
Woodland & Forests 0.10 0.15 0.20						
Meadows & Pasture Land 0.25 0.30 0.35						
		Portion of	All of 2			
Area	Phase 1	Phase 2	Phase 2	Off-site		
Flow method	ditch	ditch	ditch	over land		
Distance	900	600	2000	3100	ft	
Fall	25	15	36	175	ft	
Slope	2.78%	2.50%	1.80%	5.6%		
Time of concentration	6	5	10	30	min	
Chart Method	kirpich	kirpich	kirpich	seelye		
					TOTAL	
Total area	300,000	220,000	830,000	1,800,000	2,930,000	sf
A=	6.89	5.05	19.05	41.32	67.26	acre
C=	0.50	0.50	0.50	0.15		
		flat residendial		rolling forest		
From Rainfall Intensity Curves	100-year storm (Zone 2)					
t=5 min	3.85	in/hr				
t=10 min	3.00	in/hr				
t=30 min	1.86	in/hr				
Run-off from Phase 1 and a portion of Phase 2						
Time of Concentration	**5**	**minutes**				
Rainfall Intensity (100 year)	3.85	in/hr				
			Portion of			
	Phase 1		Phase 2			
Area	300,000		415,000			
A=	6.89		9.53			
C=	0.5		0.5			
Q=CiA	**13.3**		**18.3**			
					Flow	
				Water from Portion of Phase 2.	18.3	CFS
		Water from Phase 1 and Portion of Phase 2.			31.6	CFS

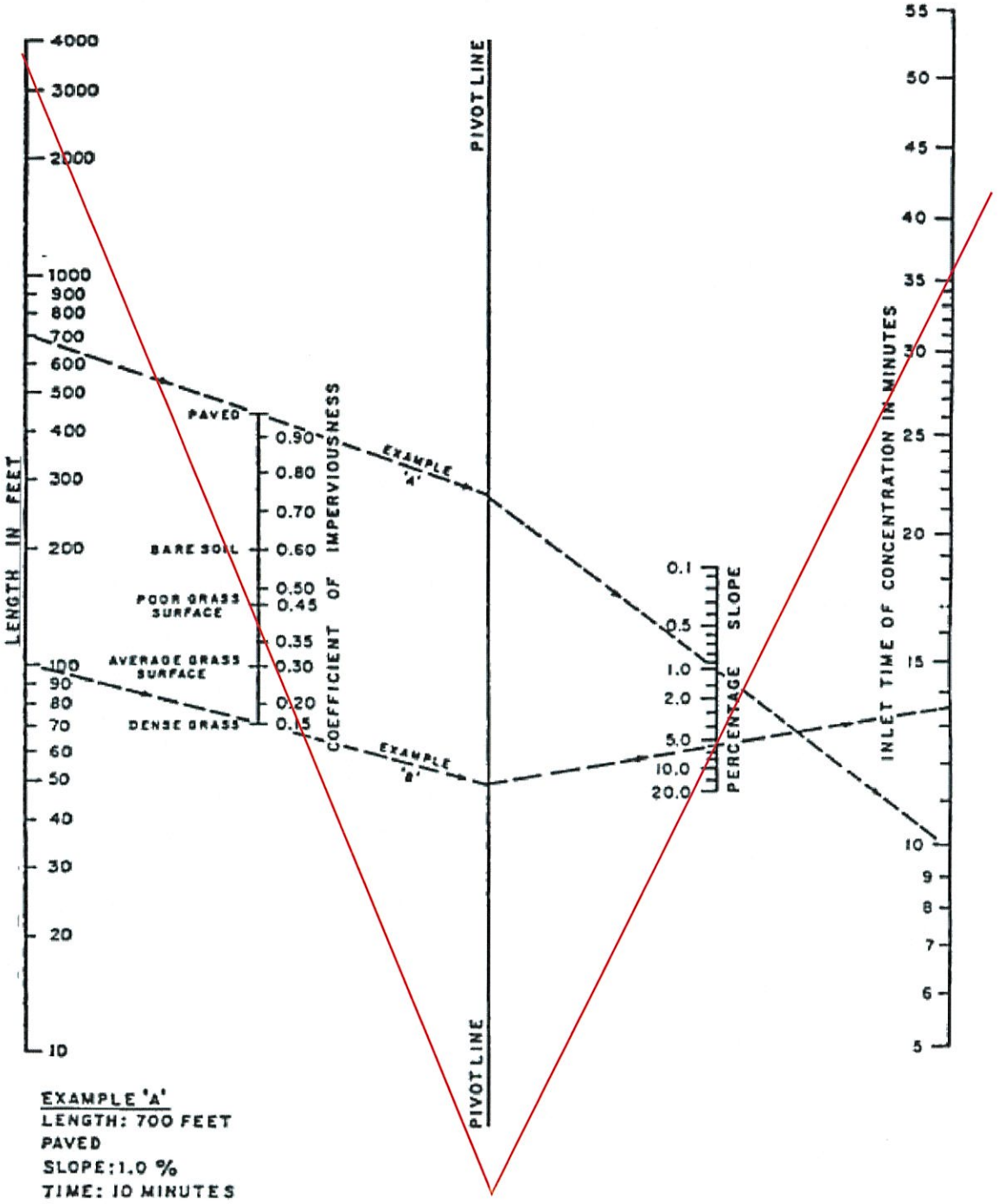
Run-off from Phase 1, Phase 2, and a portion of Off-site Area						
Time of Concentration	**10**	**minutes**				
Rainfall Intensity (100 year)	3.00	in/hr				
	Phase 1		Phase 2	Off-site		
Area	300,000		830,000	600,000		
A=	6.89		19.05	13.77		
C=	0.50		0.50	0.14		
Q=CiA	**10.3**		**28.6**	**5.8**		
					Flow	
		Water from Phase 2 and Portion of off-site.			34.4	CFS
		Water from Phase 1, Phase 2, and portion of off-site			44.7	CFS
Run-off from Phase 1, Phase 2, and Off-site Area						
Time of Concentration	**30**	**minutes**				
Rainfall Intensity (100 year)	1.86	in/hr				
	Phase 1		Phase 2	Off-site		
Total area	300,000		830,000	1,800,000		
A=	6.89		19.05	41.32		
C=	0.50		0.50	0.15		
Q=CiA	**6.4**		**17.7**	**11.5**		
					Flow	
		Water from Phase 2 and off-site.			29.2	CFS
		Water from Phase 1, Phase 2, and off-site			35.7	CFS
Peak Flows	Time of concentration	On-site	Main Channel	Off-site		
	5	18.3		31.6	cfs	
	9		34.4	44.7	cfs	
	30		29.2	35.7	cfs	
	MAX	18.3	34.4	44.7	cfs	
Pipe Capacity						
Pipe Size		18	24	18	IN	
Pipe Diameter		1.5	2	1.5	FT	
Slope		15.0%	2.0%	15.0%		
Number of pipes		1	1	2	EACH	
n, HDPE		0.012	0.012	0.012		
hydraulic radius, Rh		0.375	0.5	0.375	FT	
V		**25.17**	**11.11**	**25.17**	**FPS**	
Pipe Area		**1.77**	**3.14**	**3.53**	**SF**	
Capacity - Q		**44.5**	**34.9**	**89.0**	**CFS**	
Calculated Run-off (Max)		18.3	34.4	44.7	CFS	

TRAVEL TIME FOR CHANNEL FLOW
(Kirpich Chart)



Time of Concentration of Small Drainage Basins

Seelye Chart



EXAMPLE 'A'
LENGTH: 700 FEET
PAVED
SLOPE: 1.0 %
TIME: 10 MINUTES

EXAMPLE 'B'
LENGTH: 100 FEET
DENSE GRASS
SLOPE: 6.0 %
TIME: 13 ½ MINUTES

SEELYE CHART

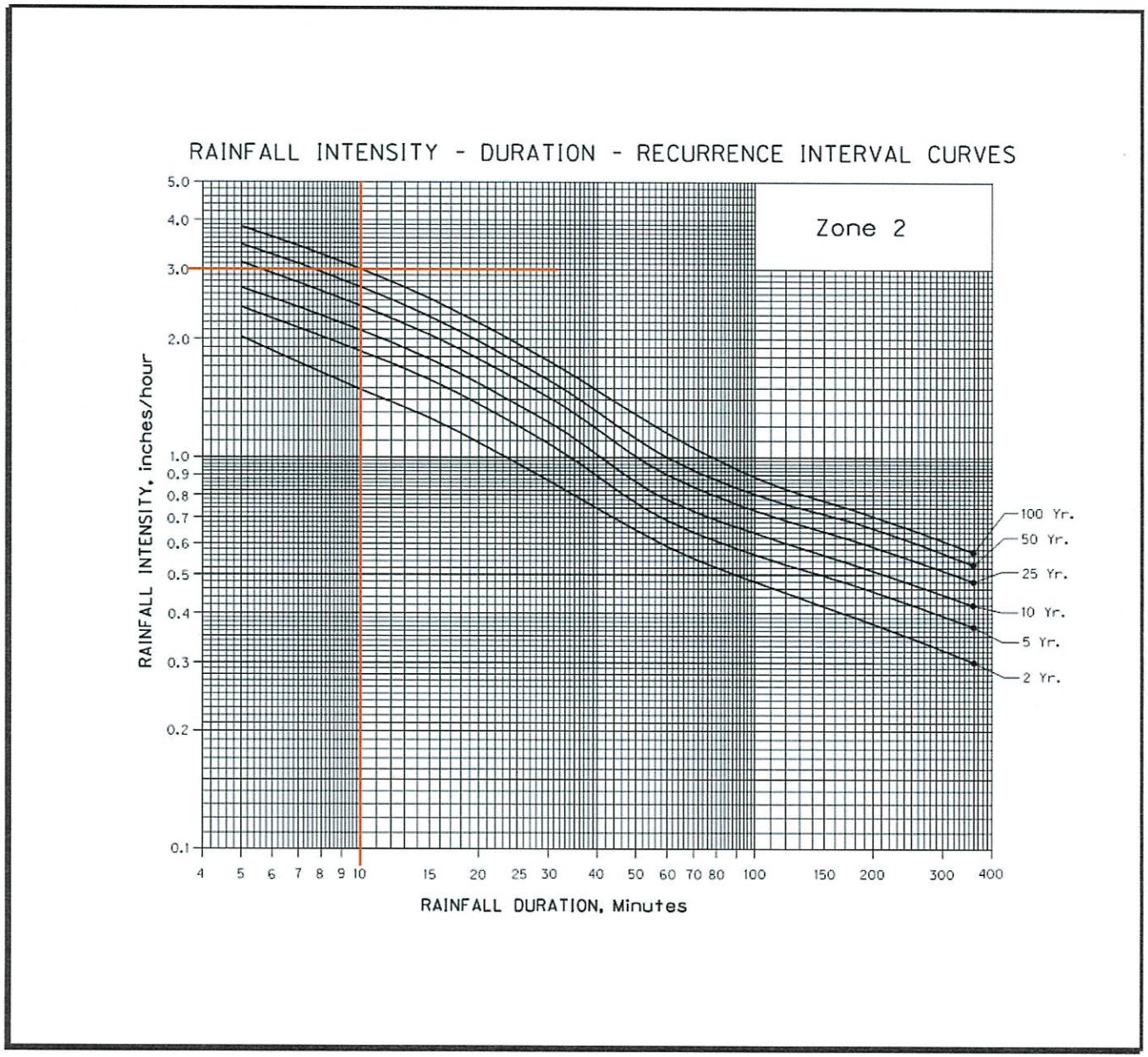
TIME OF CONCENTRATION

Table 1 Runoff Coefficients for the Rational Method

	FLAT	ROLLING	HILLY
Pavement & Roofs	**0.90**	**0.90**	**0.90**
Earth Shoulders	0.50	0.50	0.50
Drives & Walks	0.75	0.80	**0.85**
Gravel Pavement	**0.85**	**0.85**	**0.85**
City Business Areas	0.80	**0.85**	**0.85**
Apartment Dwelling Areas	0.50	0.60	0.70
Light Residential: 1 to 3 units/acre	0.35	0.40	0.45
Normal Residential: 3 to 6 units/acre	0.50	0.55	0.60
Dense Residential: 6 to 15 units/acre	0.70	0.75	0.80
Lawns	0.17	0.22	0.35
Grass Shoulders	0.25	0.25	0.25
Side Slopes, Earth	0.60	0.60	0.60
Side Slopes, Turf	0.30	0.30	0.30
Median Areas, Turf	0.25	0.30	0.30
Cultivated Land, Clay & Loam	0.50	0.55	0.60
Cultivated Land, Sand & Gravel	0.25	0.30	0.35
Industrial Areas, Light	0.50	0.70	0.80
Industrial Areas, Heavy	0.60	0.80	**0.90**
Parks & Cemeteries	0.10	0.15	0.25
Playgrounds	0.20	0.25	0.30
Woodland & Forests	0.10	0.15	0.20
Meadows & Pasture Land	0.25	0.30	0.35
Unimproved Areas	0.10	0.20	0.30

Note:

- ***Impervious surfaces in bold***
- *Rolling = ground slope between 2 percent to 10 percent*
- *Hilly = ground slope greater than 10 percent*


RAINFALL INTENSITY - DURATION - RECURRENCE INTERVAL CURVES
Zone 2
RAINFALL INTENSITY, inches/hour
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
100 Yr.
50 Yr.
25 Yr.
10 Yr.
5 Yr.
2 Yr.
4 5 6 7 8 9 10 15 20 25 30 40 50 60 70 80 100 150 200 300 400
RAINFALL DURATION, Minutes

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

December 19, 2025

Cary Sheldon, Riverview Meadows Development LLC
in care of:
Jason R. Morgan, PE,
Morgan Civil Engineering, Inc.

Subject: **Engineering Geologic Hazard Report Update and Supplement Letter**
Tax Lot 3600 Map 3N 10W 23B
Riverview Meadows Subdivision, Phase 2, 3 Combined
Tillamook County, Oregon

Dear Mr. Sheldon and Mr. Morgan,

As requested, I am pleased to submit this engineering geologic hazard report update and supplement letter for the combined Phase 2 and Phase 3 of the Riverview Meadows Subdivision, of Tax Lot 3600 on map 3N 10W 23B of Tillamook County. I conducted my initial geologic hazards reconnaissance site visit for Phase 2 of the subject residential subdivision on February 14, 2020, with Jason Morgan, P.E. of Morgan Civil Engineering, Inc. My engineering geologic hazards report for Phase 2 of this land division is dated February 25, 2020. I visited the Phase 3 portion of the subject property on November 17, 2022, again with Mr. Morgan, PE, the project Civil Engineer. We walked over and observed proposed roadway and building lot areas of the Phase 3 subdivision site. My engineering geologic hazards report for Phase 3 of the Riverview Meadows subdivision is dated November 21, 2022.

During our site reconnaissance visits, the Phase 2 portion of the property was a nearly level upland grassy meadow with an existing shallow drainage ditch presumably dug by a former property owner for drainage purposes for agricultural or grazing land use. The Phase 3 portion of the subject property had similar nearly level natural topography that was vegetated by grass covered meadow, and a grove of young to moderate age spruce trees, shown below in Photo 1.

Photo 1- November 17, 2022 north northwest facing photograph showing combined area of Phase 2, in foreground, and partially tree covered Phase 3 of Riverview Meadows Subdivision.

Mr. Morgan, PE and I visited the nearly completed combined Phase 2 and Phase 3 Riverview Meadows residential subdivision site again on Friday, December 12, 2025. During this site visit I noted that the grove of trees and their stumps and roots had been removed from the Phase 3 portion of the site. I observed that the project interior roadways and been graded and paved, road side ditches had been excavated, check dams had been installed in ditches, and underpass culverts had been installed below roadways and a drainage easement between building lots. Final site drainage connections and outlet discharge to Bob's Creek had been completed and were observed to be functioning satisfactorily following a week of heavy rain. No site erosion was observed.

In my engineering geologic hazards report for Riverview Meadows subdivision Phase 2 dated, February 25, 2020, I recommended that residential foundation excavations on individual building lots 39 through 47 that lie east of the 110 foot above mean sea level elevation contour be reviewed by an Engineering Geologist, Civil Engineer, or Geotechnical Engineer for slope stability concerns. In addition, I recommend that any portions of foundations on Lots 43 through 47 that extend east of the existing 120-foot above mean sea level elevation contour be similarly reviewed for slope stability concerns. Based on revised lot numbering for the combined Phase 2 and Phase 3 of the Riverview Meadows residential subdivision, the current lots that contain steep slopes and potential slope stability concerns for residential foundations are lots 43, 44, 45, 46, 47, 49, 50, 51 and 52, as shown in Figure 1, below.

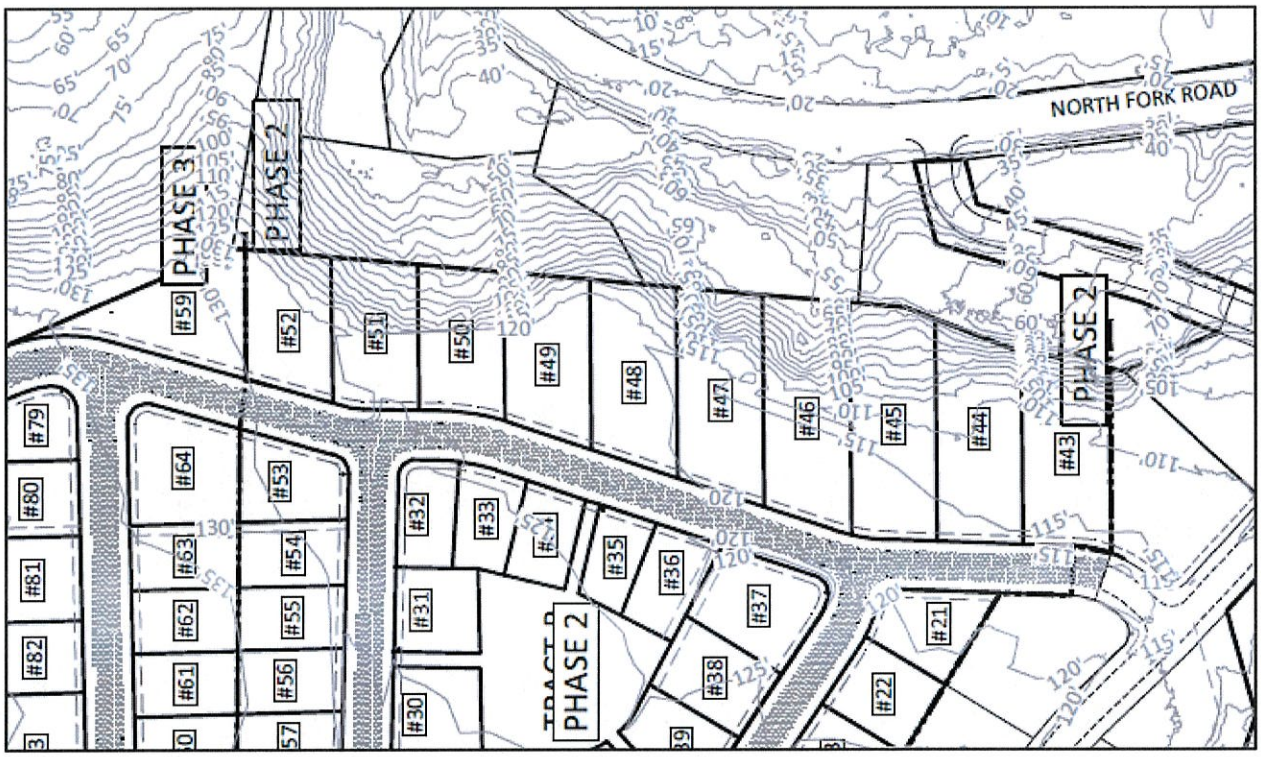


Figure 1- Topographic Site Plan, Riverview Meadows combined Phase 2, Phase 3.

The revised lot numbers vary slightly from my 2020 report for Phase 2. However, I consider the proposed building site plan shown in Figure 1, above, to be in conformance with my understanding

of the proposed building areas adjacent to steep slopes at the time of preparation of my 2020 engineering geologic hazards report for Phase 2.

I recommend that any portions of residential foundations on Lots 43, 44, 45, 46, and 47 that lie east of the 110 foot above mean sea level elevation contour be reviewed by an Engineering Geologist, Civil Engineer, or Geotechnical Engineer for slope stability concerns. I further recommend that any portions of foundations on Lots 49, 50, 51 and 52 that lie east of the 120-foot above mean sea level elevation contour be reviewed for slope stability concerns by the Engineering Geologist, Civil Engineer, or Geotechnical Engineer.

Once the individual building lot site and foundation plans noted above are reviewed and approved by the Engineering Geologist, Civil Engineer, or Geotechnical Engineer, I recommend that individual home owners or builders contact the Engineering Geologist, Civil Engineer, or Geotechnical Engineer at the time of foundation excavation to request observation and approval of the completed foundation bearing surface preparation, or installation of piers or piles, if used, before foundation construction commences.

In my opinion, other than the lot numbers noted above with steep slopes, the remaining lots on the combined Phase 2 and Phase 3 Riverview Meadows residential subdivision do not contain steep slopes, have relatively shallow undisturbed native soil and shallow weathered sedimentary bedrock, and are suitable for conventional shallow residential foundation design and construction in accordance with the adopted edition of the Oregon Structural Specialty Code. Under these conditions, any structure foundation should completely penetrate fill, topsoil or disturbed native soil to bear on firm inorganic soil or weathered sedimentary bedrock.

With the exception of the lots noted above recommended for individual slope stability review by qualified geologic or engineering design professionals, it is my opinion that minor site grading for drainage away from structures, foundation and home construction on the individual lots as allowed, will not influence or increase geologic hazard to the subject lots, adjacent lots or street or drainage infrastructure within public right of way.

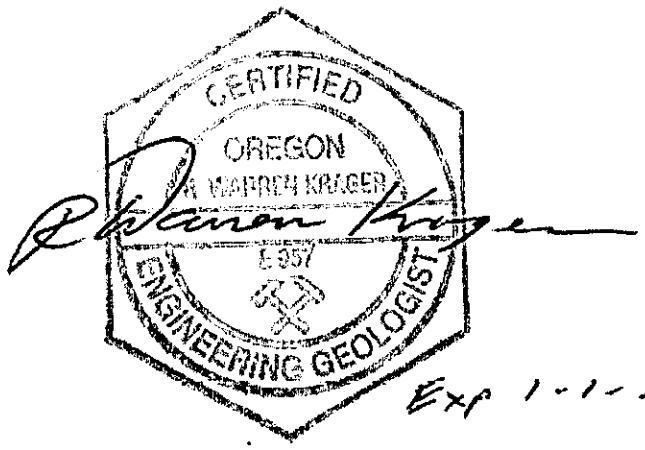
This Engineering Geologic Hazards Update and Supplement Letter should be submitted with, and used in conjunction with, my complete engineering geologic hazards report for Phase 2 of this land division dated February 25, 2020, and for Phase 3 dated November 21, 2022.

If unexpected subsurface conditions are encountered during any residential foundation construction, I or the project Civil or Geotechnical Engineer should be contacted to observe and advise if additional design or construction recommendations are warranted. If there is any question concerning differentiation of fill or disturbed ground from firm undisturbed native soil or weathered bedrock suitable for foundation support, I recommend that Mr. Morgan, P.E., or I be contacted and requested to observe and approve final excavated foundation bearing surfaces prior to foundation construction.

Limitations

The engineering geologic reconnaissance and geologic hazard review 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, time, and work scope constraints. This update and supplement letter (and my referenced engineering geologic hazard reports for Phase 2 of this land division dated February 25, 2020, and for Phase 3 dated November 21, 2022) may be used only by the client and their authorized agents for an additional three years from this letter date. If the project is further delayed, I would be happy to review site and design conditions and revise or update the reports 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

MORGAN CIVIL ENGINEERING, INC.

PO Box 358, Manzanita, OR 97130
ph: 503-801-6016
www.morgancivil.com

December 15, 2022

Riverview Meadows, LLC
Carey Sheldon careysheldon17@yahoo.com

RE: Engineering Portion of Geologic Hazard Report for Road and Utility Development of the northern portion of Tax Lot 3600, Map 03N 10W 23B, Nehalem, Tillamook County, Oregon (Riverview Meadows, Phase 3)
Project #19-10-Riv

Dear Mr. Sheldon:

At your request, we have completed the investigation for construction on the subject property, referenced above. Available maps and previous reports of nearby properties were utilized in this investigation. This investigation also included an inspection of the property. Warren Krager, Certified Engineering Geologist, has investigated the site and addressed the geologic conditions of the site in his report. Morgan Civil Engineering, Inc. (MCE) has then developed the engineering recommendations related to construction on the site. These recommendations are prepared for use in the construction of the roadways and underground utilities on the property. The standards set forth herein should be incorporated into the development plans for that project.

These reports are intended to address the overall adequacy of the site for residential development, as well as the construction of the required infrastructure (i.e., roads, utilities, etc.). The standards set forth herein should be incorporated into the final road and utility development plans. Recommendations for construction on the individual lots are also included.

Site elevations noted in this report are based on the topographic information obtained from the Oregon Department of Geology and Mineral Industries (DOGAMI) LiDAR project. The LiDAR elevations are based on the NAVD88 datum, which is roughly sea level.

Plans

Preliminary parcel and road layout plans have been completed for this site. The preliminary site grading and lot layout plans have been reviewed as part of this report.

At the time of individual lot construction, a Plot Plan and Foundation Plan should be developed for each property. The plans should be reviewed for compliance with this report and current construction requirements. For construction within 30 feet of a steep slope (over 20 percent), an individual site-specific geologic hazard report should be prepared.

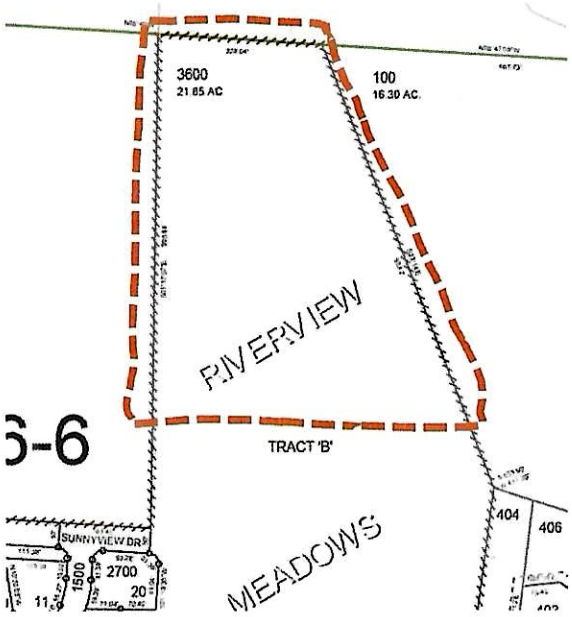
Recommendations for the development of individual lots are included in this report.

SITE CONDITIONS

The site and its geologic conditions are generally as described by the geologist in his report. Mr. Krager's 8-page report, dated November 21, 2022, is attached for your use.

The approximately 33-acre parcel is located on a plateau to the east of the incorporated City of Nehalem, but inside of the Urban Growth Boundary. Phase 3 will incorporate the northern portion of the property. The property is located to the north of the North Fork Road. The area to be developed borders residential properties to the east, and undeveloped land to the south (Phase 2). The property to the west is classified as forestry land. The area to the north is zoned as farm land.

The overall area to be developed is trapezoidal in shape, narrowing to the north, and measures about 300 feet east to west, and 400 feet north to south. See the attached portion of the assessor's map for property orientation and dimensions.



The property will be accessed from two new roads in Phase 2: Coltee Drive and Kinlee Drive. These are served from the existing roadways Sunnyview Drive and Vern's Place. (These roads are to be renamed.) Utilities are to be installed in each of the new roadways also.

Elevations in the building area vary from about 130 feet above sea level, at the southeastern corner, to about 160 feet, near the northwestern corner of the parcel. The property slopes gently to the southeast, with slopes varying from nearly flat to about 5 percent. Ditches have been constructed in order to direct drainage off the site to the east. The eastern edge of the development slopes down steeply to the east, at roughly 50 percent.

Vegetation on the property is generally grass that is regularly maintained. Evergreen trees are located along the east edge of the property and in the northeastern section. The eastern slope is heavily vegetated with blackberries, ferns, trees, and other species typical of a coastal forest.

The site is in a 135 miles per hour basic wind gust speed zone, setback from the ocean and bay winds (Exposure 'C' as per the 2021 State of Oregon Residential Specialty Code (ORSC)). Therefore, all buildings must be designed in order to withstand the minimum required lateral wind gust loads. In general, one- and two-story wood frame construction designed in order to withstand 135 miles per hour Exposure 'C' wind loading also will withstand even moderate earthquake loads.

FINDINGS AND HAZARDS ANALYSIS

The primary relevant geologic hazards on this site relate to: 1) steep eastern bank; 2) drainage control; 3) compressible surface soils, and; 4) regional seismicity.

Mitigation of these hazards is discussed in the Development Standards, addressed herein.

The North Oregon Coast is defined by the 2021 ORSC as lying within a D_2 Seismic Design Category. As such, structures built in this area must, at a minimum, comply with the structural requirements for the D_2 Seismic Design Category. Strong seismic acceleration will likely result in widespread landsliding. No slope can be considered immune from failure during these conditions.

LOCALIZED SLOPE INSTABILITY

The slope down to the east of the property will be subject to continued erosion. Construction should be avoided near this slope. The moderate and steep slopes in these areas will be subject to ongoing soil creep. Extra consideration should be taken when constructing in these areas.

In Phase 3, this will likely only affect one lot, Lot 59. Otherwise, the roadway is closest to the slope.

SITE GRADING PLAN

The plans call for the final grading and construction of the existing roadways on the property. The flat property requires minimal grading for road construction or homes.

COMPRESSIBLE SOILS

The topsoil on the property consists of 1 to 2 feet of dark gray to black humic soils. This topsoil is compressible and should not be built upon. This organic topsoil is not acceptable for backfill in engineered fills for the roadways nor is it acceptable for backfill behind retaining walls. This topsoil should be disposed of by hauling it off the site or using it on other portions of the property. The topsoil may be stockpiled temporarily and used for future landscaping.

Similarly, when constructing buildings on the individual parcels, this topsoil should be removed. The building footprint and driveway should have all organic soils excavated and removed before the foundation or road construction begins. Each homesite should be inspected by an engineer, or geologist, in order to ensure that adequate bearing soil is exposed for construction. Documentation of the inspection should be provided to the building official.

MANDATORY DEVELOPMENT STANDARDS

In addition to the required standards of Section 4.130 (2) of the Tillamook County Land Use Ordinance, the following site-specific standards should also be required:

A. Development Density – This property should be developed for uses consistent with current zoning (outright or conditional uses). All development should take place in conformance with all other requirements of the Tillamook County Land Use Ordinance or approved variances, as applicable.

The property is zoned as NH-RT, Residential Trailer. See Section 157.110 of the City Zoning Ordinance for more information.

B. Road Location and Road Base Support - Site access is proposed to take place from Sunnyview Drive (to be called Riverview Drive), and through Phase 2. This is an acceptable layout.

The roadbed should rest on firm, silty clay soil. Any soft soils or clays will need to be excavated from the road or building area, and be replaced with engineered fill material. Use a loaded dump truck to conduct a proof-roll of the soil during road construction. Remove all soft soil that is found.

C. Land Grading Practices - All excavations for road and utility construction should be done during reasonably dry weather (while it is not actually raining). All cut slopes should be retained using permanent means of stabilization. All excess excavated material should be used as non-structural fill by using it on flat areas, or disposed of by hauling it off the site. Native material will not be acceptable for use in engineered fills.

The site is flat so minimal grading for roads and homes is expected. Retaining walls will not be needed. No grading of the site, beyond that required for construction, should take place.

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

November 21, 2022

Riverview Meadows Development LLC
In care of Morgan Civil Engineering, Inc.
Phone: 503-801-6016
Email: jason@morgancivil.com

Subject: **Engineering Geologic Hazard Report**
Tax Lot 3600 Map 3N 10 23B
Proposed Riverview Meadows Phase 3- 36 Lot Subdivision
Tillamook County, Oregon

Dear Mr. Reverman and Mr. Morgan:

As requested, I am pleased to submit my geologic hazard report for the proposed Riverview Meadows Phase 3 36-lot residential subdivision. This report has been prepared in general accordance with the Tillamook County Land Use Ordinance (TCLUO) Section 4.130, Development Requirements for Geologic Hazard Areas. The property is mapped in ancient landslide topography by the Oregon Department of Geology and Mineral Industries (DOGAMI).

R. Warren Krager, R.G., C.E.G. (Oregon Licensed Engineering Geologist E-957) conducted the initial site visit with Jason Morgan, P.E. on Friday February 14, 2020. I visited the property again on November 17, 2022. I walked over proposed roadway portions of the Phase 3 site. Approximately 1 hour was spent observing site conditions. It should be noted that geotechnical subsurface exploration was not conducted in proposed roadway or building lot locations.

In preparing this report, available geologic hazard maps and reports, tax lot maps, design concept sketches and available topographic date and aerial photographic images were reviewed for detailed information pertinent to the subject property and vicinity. The following geologic reports, maps, aerial photographs, and other information were reviewed and used in preparation this report:

- Tillamook County Land Use Ordinance, Article 4, Section 4.130 Development Requirements for Geologic Hazard Areas, adopted May 11, 2022.
- DOGAMI Open File Report O-20-13, Landslide Hazard and Risk Study of Tillamook County, Oregon.
- DOGAMI IMS 22, GIS Overview Map of Potential Rapidly Moving Landslide Hazards in Western Oregon, 2002.
- Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon, Oregon Department of Geology and Mineral Industries (DOGAMI), Bulletin 74, 1972.
- Online research of DOGAMI Statewide Landslide Inventory Database of Oregon, Interactive SLIDO maps, accessed online November 18, 2022.

- Geologic Map of the Tillamook Highlands Northwest Oregon Coast Range Tillamook 15 Minute Quadrangle, United States Geological Survey (USGS) Open File Report 94-21,1994.
- Oregon Department of Geology and Mineral Industries, DOGAMI LIDAR Viewer http://www.oregongeology.org/lidar/dataviewer/, accessed online November 18, 2022
- Google Earth Aerial photographs of the Nehalem area, photo dates: September 3, 1994, July 29, 2000, June 15, 2003, June 29, 2005, December 12, 2005, August 1, 2011, July 6, 2012, July 30, 2014, August 23, 2016, June 22, 2017, April 15, 2021.
- Topographic plan and Tentative Lot Plan, Riverview Meadows Phase 3 36 lot subdivision, Map 3N 10W 23B, prepared by Morgan Civil Engineering, Inc. for Riverview Meadows Development LLC, dated November 9, 2022.

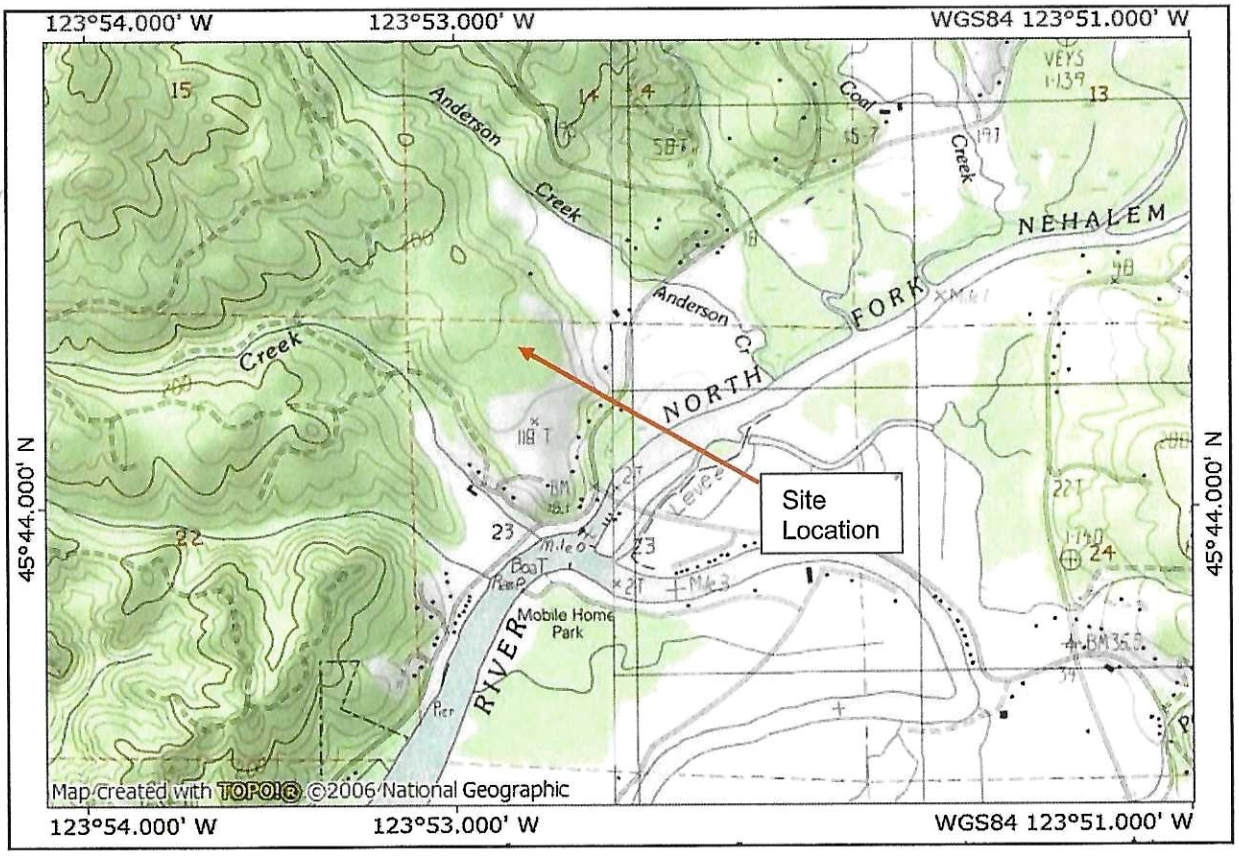


Figure 1- Site Location map.

Photo 1 – Google Earth aerial image dated April 15, 2021. The approximate area of Riverview Meadows Phase 3 Subdivision is outlined in red.

Site Location and Project Description

The general location of the subject property is north of the confluence of main stem of the Nehalem River and the North Fork of the Nehalem River, east of the town of Nehalem, in Tillamook County, Oregon. The general project location is shown in Figure 1. Photo 1 shows existing conditions and approximate outline of the proposed Riverview Meadows Phase 3 Subdivision. The subject property consists of a portion of Lot 3600, Tract B, of Tillamook County Tax Map 3N 10W 23B. Current site conditions consist of a nearly level foothill terrace vegetated with grass pastureland and timber. It is my understanding that the vacant, undeveloped parcel will be subdivided into 36 new single-family residential building lots ranging in size from 6,953 to 12,434 square feet in area, as shown in Figure 2. The proposed subdivision will include construction of new paved streets and underground utilities. Grading and earthwork are expected to be relatively minor, with most of the earthwork consisting of tree stump and root removal, underground utility installation and roadway grading.

Slope and Topography

The proposed Riverview Meadows Phase 3 subdivision parcel lies on a relatively level natural terrace at about 160 feet to 130 feet above mean sea level. The proposed development area slopes down to the south at less than 5 percent gradient. None of the proposed building lots or streets lie on steeply sloping ground. One of the proposed streets, Coltee Drive, along the eastern margin of the Phase 3 parcel, lies within a few feet of a break in slope, inclined down to the east. The adjacent property to the east of the Phase 3 parcel slopes downward to the east at approximately 30 percent to 40 percent, based on the DOGAMI light detection and ranging (Lidar) topography, shown in Figure 2. DOGAMI maps portions of the descending slope on the adjacent eastern property as landslide terrain. There are no landslide or debris flow prone slopes on the proposed Phase 3 parcel.

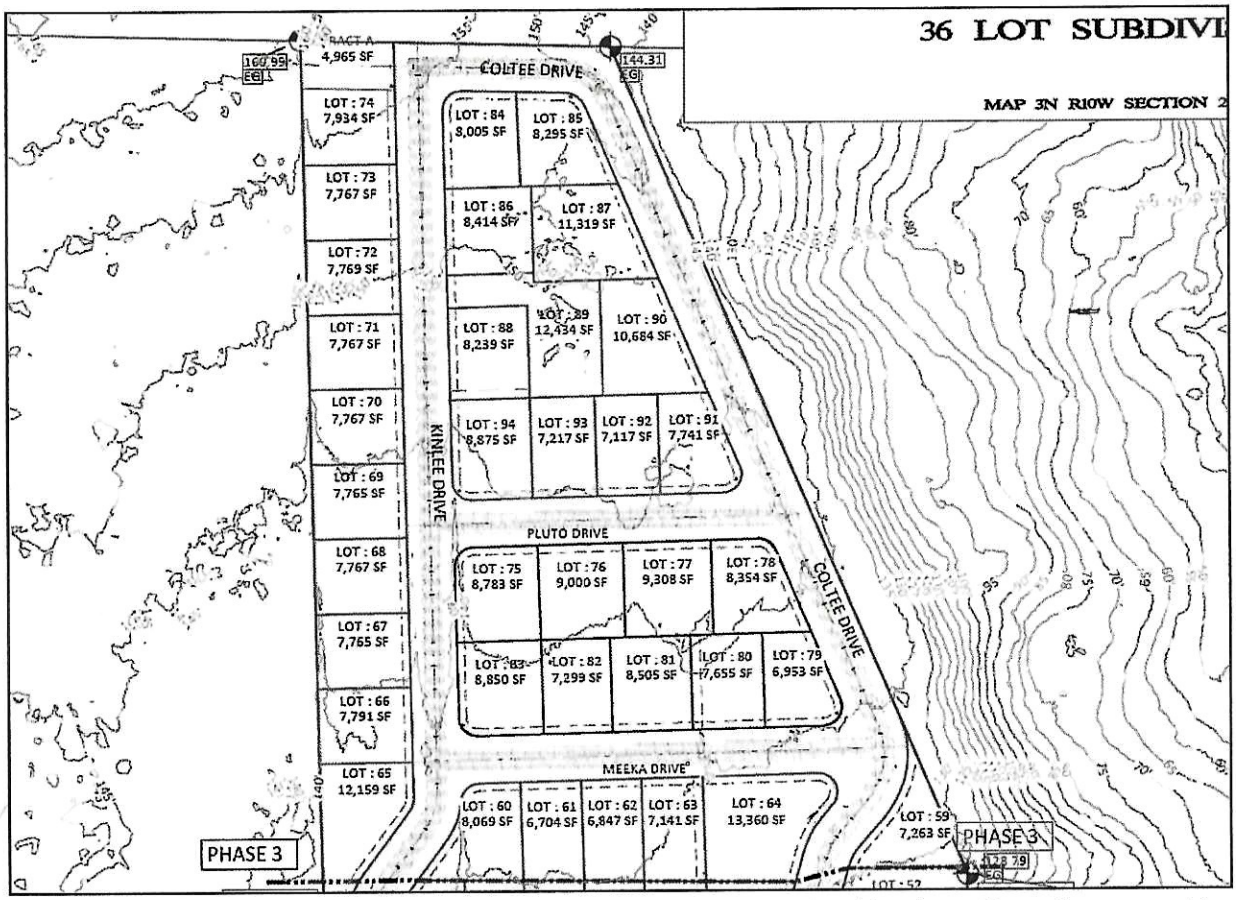


Figure 2- Portion of topographic plan and tentative lot plan, Riverview Meadows Phase 3, prepared by Morgan Civil Engineering, Inc.

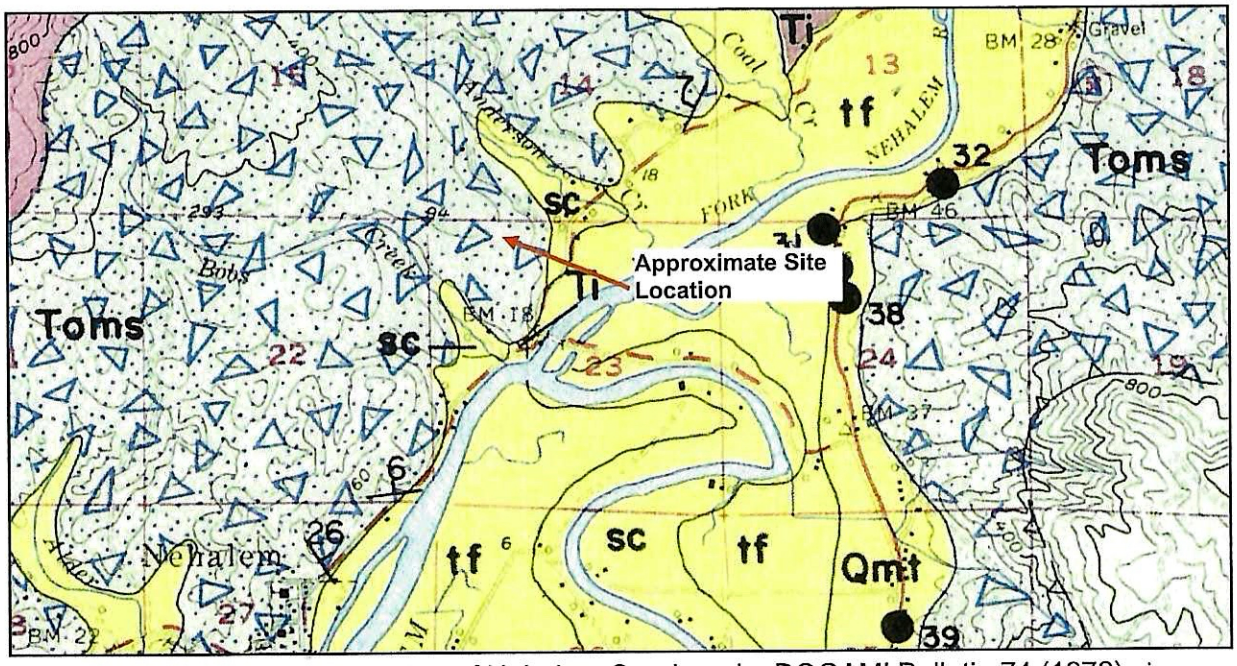


Figure 3- Portion of Geologic Map of Nehalem Quadrangle, DOGAMI Bulletin 74 (1972).

Soils and Geology

Surface soils in the project area are mapped by the USDA NRCS Web Soil Survey of Tillamook County, Oregon as Chitwood-Hebo complex, 0 to 5 percent slopes. This soil is derived from mixed alluvium and/or fluvio-marine deposits derived from sedimentary rock. The USDA describes the contact with underlaying bedrock at a depth of about 5 feet below the ground surface. Soil on the slope to the east of the subject property is mapped as Templeton-Ecola medial silt loams, 30 to 60 percent slopes. This soil is derived from slope colluvium and residuum of sedimentary rock.

DOGAMI geologic mapping in the 1970s, Figure 3, shows the subject property is located on uplands composed of Tertiary age sedimentary deposits of Tertiary, Oligocene to Miocene age siltstone, geologic map symbol **Toms**. The blue triangle and stippled overprint pattern on the **Toms** geologic map unit indicates ancient landslide topography. The **Toms** tuffaceous siltstone is typically highly weathered to completely decomposed. It has closely spaced joints and fractures from tectonic forces. Intact sedimentary bedding or bedrock dip angles are rarely observed. In the landslide terrain, it is unlikely that sedimentary bedding would be intact for any significant areal extent. Younger Quaternary fluvial silt and clay deposits (**SC**) are mapped in stream courses eroded in the older sedimentary rock at Bob's Creek, Anderson Creek, and other drainages in the lower Nehalem Valley.

USGS geologic mapping, Figure 4, the project site lies in an area of Tertiary Alsea Formation (**Tal**) tuffaceous siltstone of Lower Miocene to Oligocene age. The upper part of this unit is generally massive but has thin feldspathic sandstone interbeds. The USGS does not map the project area as landslide terrain, but the sedimentary strike and dip symbols shown on the geologic map vary substantially in orientation and dip angles, suggesting disturbance of the bedded marine sedimentary layers. As with the DOGAMI mapping, Nehalem River valley and tributary creeks are covered by younger Quaternary fluvial and estuarine (Qf) fine-grained sedimentary deposits.

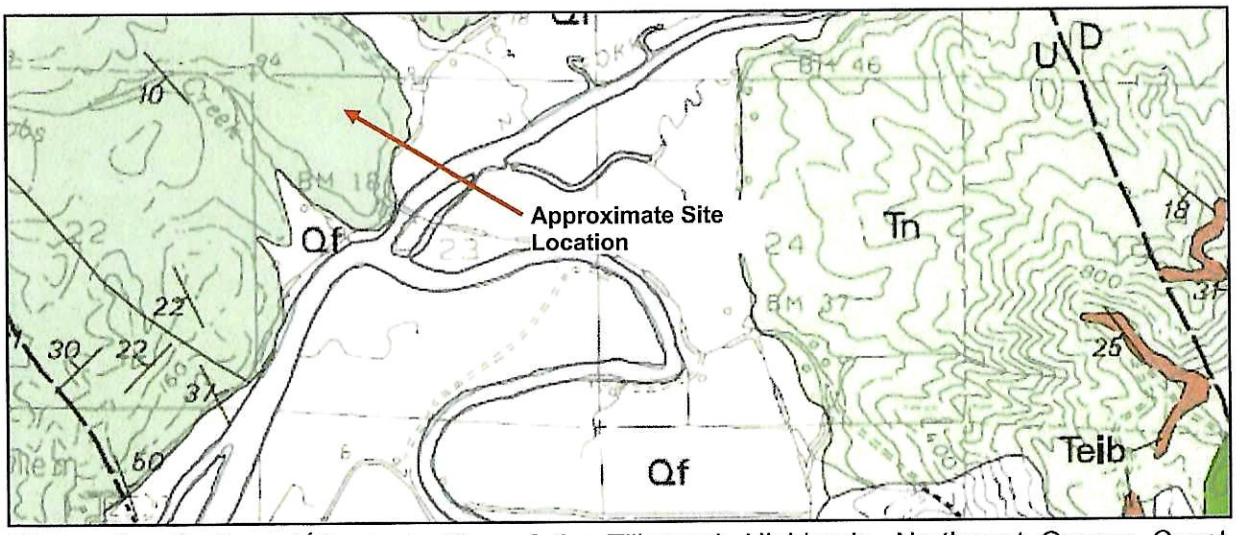


Figure 4 - Portion of Geologic Map of the Tillamook Highlands, Northwest Oregon Coast Range, USGS, Open File Report 94-21, 1994.

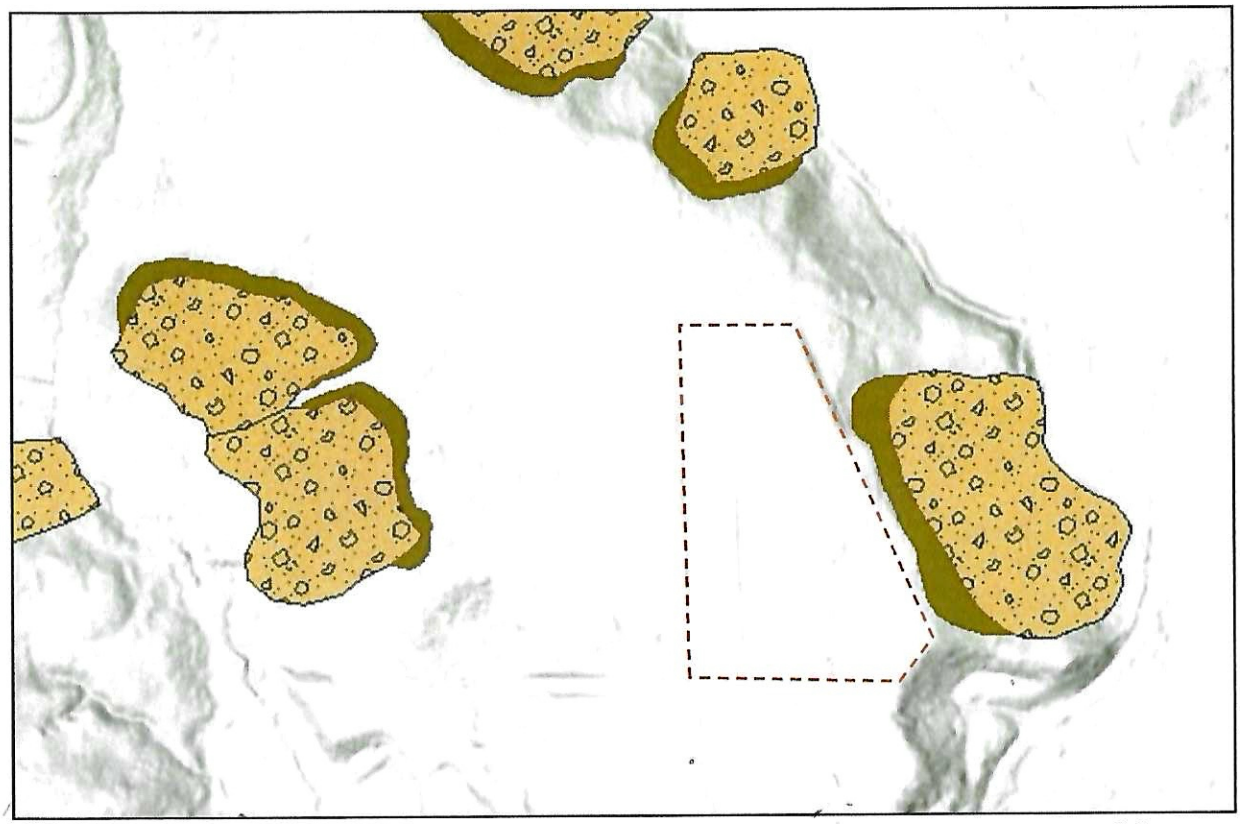


Figure 5 – Landslides mapped in DOGAMI Statewide Landslide Inventory Database of Oregon. Riverview Meadows Phase 3 approximate project boundary shown in dashed red outline.

Recent landslide mapping by DOGAMI in Figure 5 shows distinct landslides on the steep slope of the eastern adjacent property, and elsewhere on the margins of the Bobs Creek and Anderson Creek drainages.

Seismic Setting

The Cascadia Subduction Zone (CSZ) is an active tectonic plate boundary fault zone located approximately 50 miles to 60 miles off the Oregon coast. This active offshore thrust fault system has potential for earthquakes large enough to cause significant ground shaking throughout the Pacific Northwest region. Geologic research has shown that the CSZ fault system has repeatedly produced large earthquakes in the geologic past. CSZ earthquake recurrence intervals vary from about 200 to 700 years. Historic Japanese tsunami records along with dendrochronology (tree ring dating techniques) have established that the most recent strong CSZ earthquake occurred in January of 1700 AD. Based on the geologic record of CSZ earthquakes, the next CSZ earthquake is potentially overdue and may occur within future decades. In 2008 the United States Geologic Survey (USGS) estimated a 10% probability of occurrence that a magnitude 8-9 Cascadia Subduction Zone earthquake may occur within 30 years. Although scientists and engineers do not agree on the likely magnitude of the next CSZ earthquake, it is widely believed that earthquakes of moment magnitude (M_w) 8.5 to 9.5 are possible. The duration of strong ground shaking is estimated at greater than 4 to 5 minutes,

with minor shaking lasting several minutes longer. Possible aftershocks of magnitude 7 or greater may follow for hours or days after a major Cascadia Subduction Zone seismic rupture.

Other potential earthquake sources in this region include fault ruptures deep within the subducting oceanic plates and within the overlying continental crustal tectonic plate. However, the CSZ earthquake is considered the greatest seismic hazard to the region, and the seismic source that dictates building code design requirements for permitted structures.

Conclusions and Recommendations

The principal geologic hazard concern throughout western Oregon is an earthquake on the Cascadia Subduction Zone, CSZ. During a CSZ earthquake, the local area would experience a few minutes of very intense ground shaking. Steeper slopes on the eastern margin of the Phase 3 parcel may experience slope instability or landslide reactivation under seismic conditions. Static or seismically induced landslide risk to the Riverview Meadows Phase 3 parcel is considered low because of the mild slope. It is our interpretation that the landslide topography mapped by DOGAMI in Figure 3 likely formed many millennia ago. In my opinion, the Riverview Meadows Phase 3 subdivision site has no landslide or rapidly moving debris flow hazards.

Release of storm water runoff from impermeable surface should be carefully managed such that concentrated stormwater does not flow over the steep slope east of the Phase 3 parcel.

In my opinion, firm, undisturbed native soil or decomposed sedimentary bedrock is considered satisfactory for support of shallow spread foundations. Structure design according to prescriptive building code methods outlined in the adopted edition of the Oregon Structural Specialty Code (OSSC), Chapter 18 - Soils and Foundations is considered appropriate for homes on the Phase 3 building lots. Any organic debris, topsoil or manmade fill should be removed from foundation areas.

Grading recommendations in OSSC Appendix J- Grading are considered generally appropriate for excavation and earthwork construction on the Phase 3 lots building lots and roadways.

It is recommended that the Civil Engineer or Engineering Geologist be requested to observe and document roadway soil subgrade and aggregate base fill placement and compaction, structure foundation subgrade, and installation of drainage improvements.

Limitations

The engineering geologic reconnaissance and geologic hazard review performed for the proposed residential subdivision 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.

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 our findings. Therefore, 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, I would be happy to review site conditions and project design plans and revise this report if 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

MORGAN CIVIL ENGINEERING, INC.

PO Box 358, Manzanita, OR 97130
ph: 503-801-6016
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May 12, 2022

Riverview Meadows Development, LLC
Alex Reverman areverman@gmail.com

RE: Addendum No. 1 to Geologic Hazard Report for Road and Utility Development of a portion of Tax Lot 3600, Map 03N 10W 23B, Nehalem, Tillamook County, Oregon (Riverview Meadows, Phase 2)
Project #19-10-Riv

Dear Mr. Reverman:

At your request, I have prepared this addendum report in order to update the Geologic Hazard Report for this project, referenced above. The original report was completed by Morgan Civil Engineering, Inc. on February 4, 2021, and Warren Krager, Certified Engineering Geologist, dated February 25, 2020.

Since those reports were prepared, the lot numbering has been revised. On page 7 of his report, Mr. Krager referred to Lots 39 through 47 has requiring additional investigations at the time of development. These lots are now designated as Lots 43 through 52.

The 2021 report from Morgan Civil Engineering specifically states that for construction within 30 feet of a steep slope, an individual site-specific geologic hazard report should be prepared. This is the requirement that I recommend be incorporated with the subdivision Conditions of Approval. The only lots which contain a steep slope are 43 through 52. The remaining properties in the development are practically flat.

If you have any questions, please contact me at jason@morgancivil.com or 503-801-6016.

Sincerely,

MORGAN CIVIL ENGINEERING, INC.

Jason R. Morgan, PE
Professional Engineer

cc: Project File #19-10-Riv

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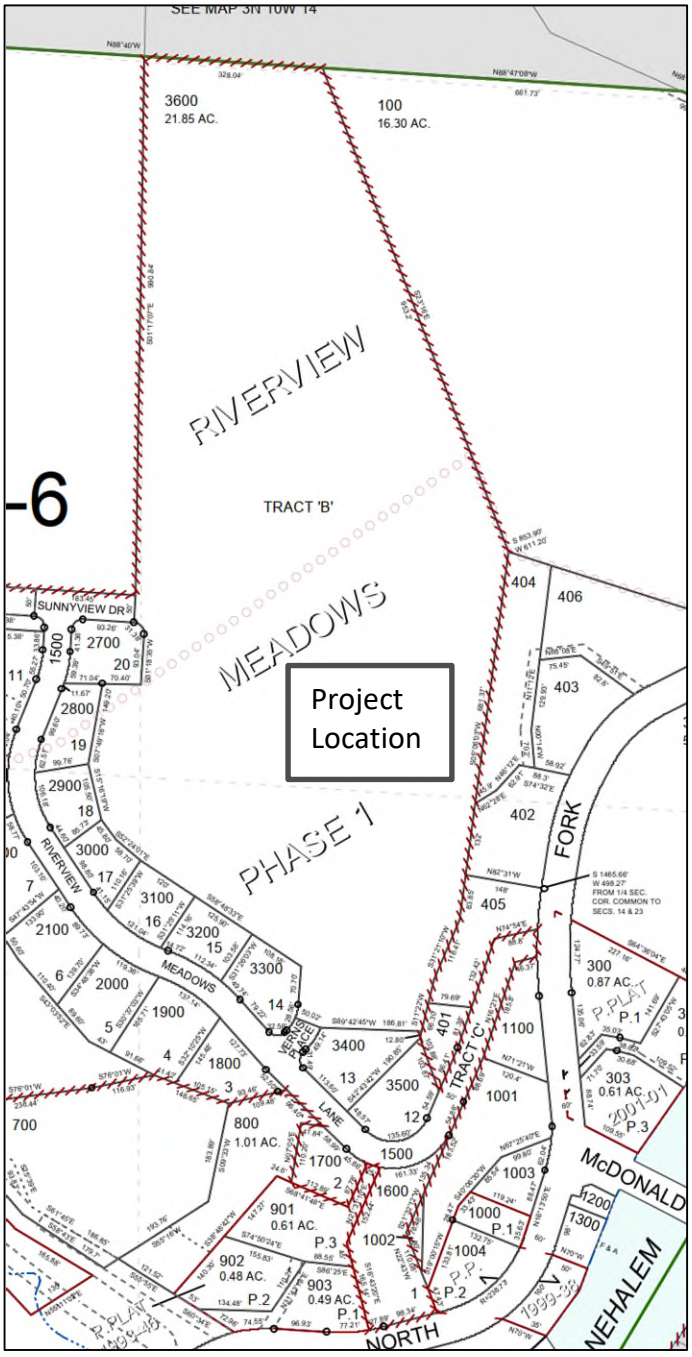


Tax Lot 3800, Map 3N 10W 23B
RIVERVIEW MEADOWS PHASE 2
Nehalem, Tillamook County Oregon

R. Warren Krager, R.G., C.E.G.
Consulting Engineering Geologist
Oregon CEG #E957
Washington LEG #314

February 25, 2020

Alex Reverman

In care of Morgan Civil Engineering, Inc.
Phone: 503-801-6016
Email: jason@morgancivil.com

Subject: Engineering Geologic Hazard Report
Tax Lot 3600 Map 3N 10 23B
Proposed Riverview Meadows Subdivision, Phase 2
Tillamook County, Oregon

Dear Mr. Reverman and Mr. Morgan:

As requested, I am pleased to submit my engineering geologic site investigation report for the proposed land division of Phase 2 of the Riverview Meadows residential subdivision. This geologic hazard report has been prepared in general accordance with the Tillamook County Land Use Ordinance (TCLUO) Section 4.130, Development Requirements for Geologic Hazard Areas. The property is mapped in inactive landslides, landslide topography and mass movement topography and has greater than 19 percent slope.

R. Warren Krager, R.G., C.E.G. (Oregon Licensed Engineering Geologist E-957) conducted the initial site visit with Jason Morgan, P.E. on Friday February 14, 2020. Approximately 2 hours was spent observing site conditions and discussing primarily the proposed building lots located on the break in slope along the eastern row of Lot 39 through 48. We discussed general slope setback considerations for home on lots, as well as allowances for specifically engineered foundation for homes that might use a daylight basement or other foundation system involving slopes. We observed exposed surface soils near slope crest areas and general drainage of existing manmade and natural soil drainage in internal roadway areas to be constructed to serve Phase 2 street access.

In preparing this report, available geologic hazard maps and reports, tax lot maps, design concept sketches and available topographic date and aerial photographic images were reviewed for detailed information pertinent to the subject property and vicinity. The following geologic reports, maps, aerial photos and other information were reviewed and used in preparation this report:

- Tillamook County Land Use Ordinance, Article 4, Section 4.130 Development Requirements for Geologic Hazard Areas.
- Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon, Oregon Department of Geology and Mineral Industries (DOGAMI), Bulletin 74, 1972.

- Evaluation of Coastal Erosion Hazard Zones Along Dune and Bluff Backed Shorelines in Tillamook County, Oregon: Cascade Head to Cape Falcon, Oregon Department of Geology and Mineral Industries (DOGAMI), Open File Report O-01-03, 2001.
- Geologic Map of the Tillamook Highlands, Northwest Oregon Coast Range (Nehalem, 15-minute Quadrangle), United States Geological Survey (USGS), Open File Report 94-21, 1994.
- Google Earth Aerial photographs of the Nehalem area, photo dates: September 3, 1994, July 29, 2000, June 15, 2003, June 29, 2005, December 12, 2005, August 1, 2011, July 6, 2012, July 30, 2014, August 23, 2016, and June 22, 2017.
- Topographic survey and tentative Lot Plan, Riverview Meadows Phase 2 and 3, prepared by Morgan Civil Engineering, Inc. for the Dorado Group, LLC.
- Oregon Department of Geology and Mineral Industries, DOGAMI LIDAR Viewer http://www.oregongeology.org/lidar/dataviewer/.

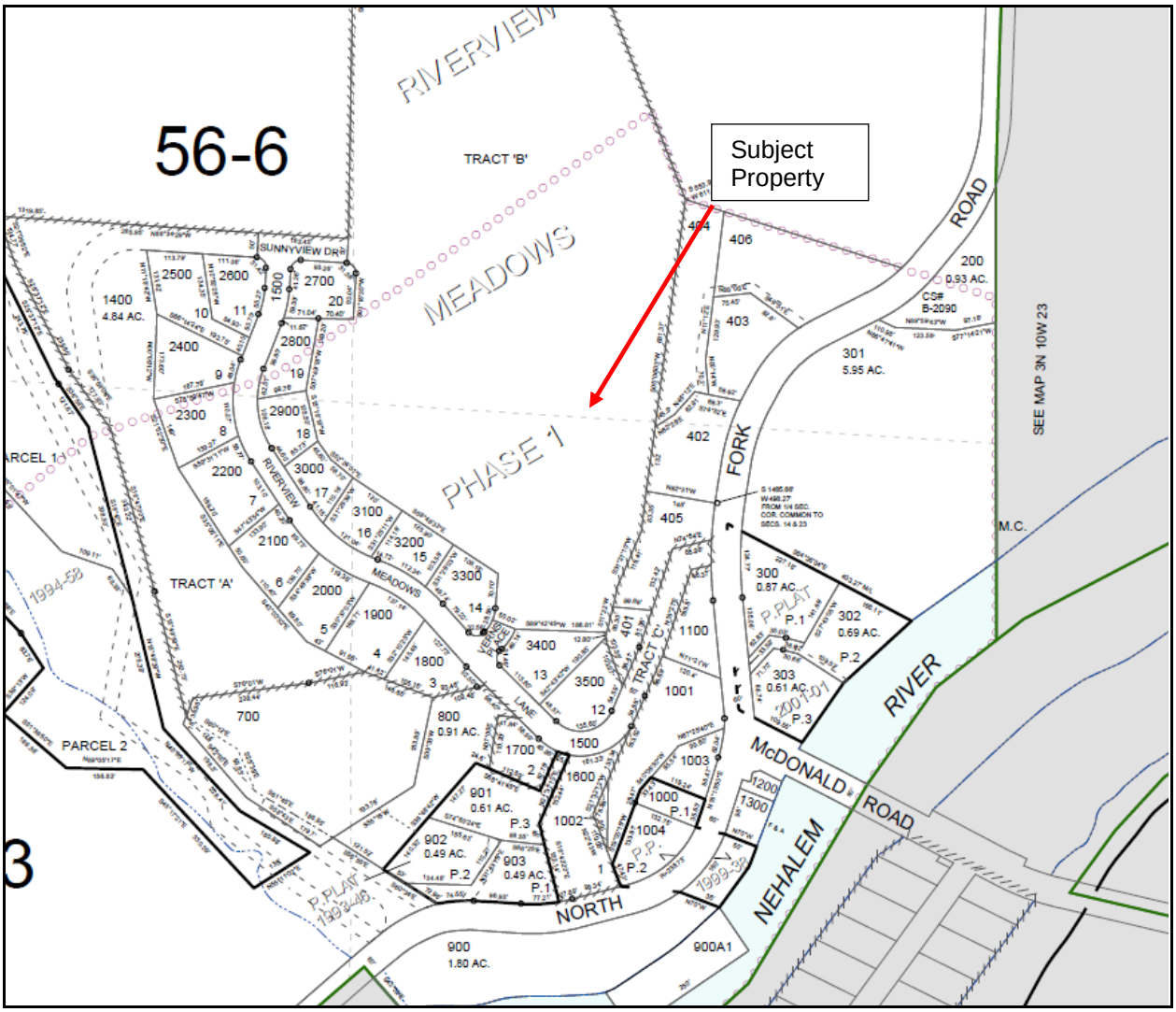


Figure 1- Portion of Tillamook County Tax Map 3N10W23B

Site Location and Project Description

The general location of the subject property is level-topped foothill located north of the confluence of main stem of the Nehalem River and the North Fork of the Nehalem River, east of in Tillamook County, Oregon. The subject property consists of Tract B, Lot 3600 of the Riverview Meadows Phase 1 Subdivision, Figure 1. It is my understanding that the vacant, undeveloped land in Tract B, will be further divided into approximately 33 new single-family residential building lots, ranging in size from about 8,000 to 14,000 square feet in area. The proposed land division will include construction of new paved streets and underground utilities.

Slope and Topography

Most of the proposed new phase of residential subdivision lies on a relatively level natural terrace at about 130 feet above mean sea level. Only along the eastern margins of proposed Lots 39 through 48 are slopes present that would create concern for slope instability or potential influence on home site location. Most of these proposed lots appear to have ample level area for conventional homes with shallow foundations to be placed well away from the crests of steep descending slopes. However, Lots 45, 46, and 47 are smaller and maybe limited in home footprint selection or foundation method because of steep slopes.

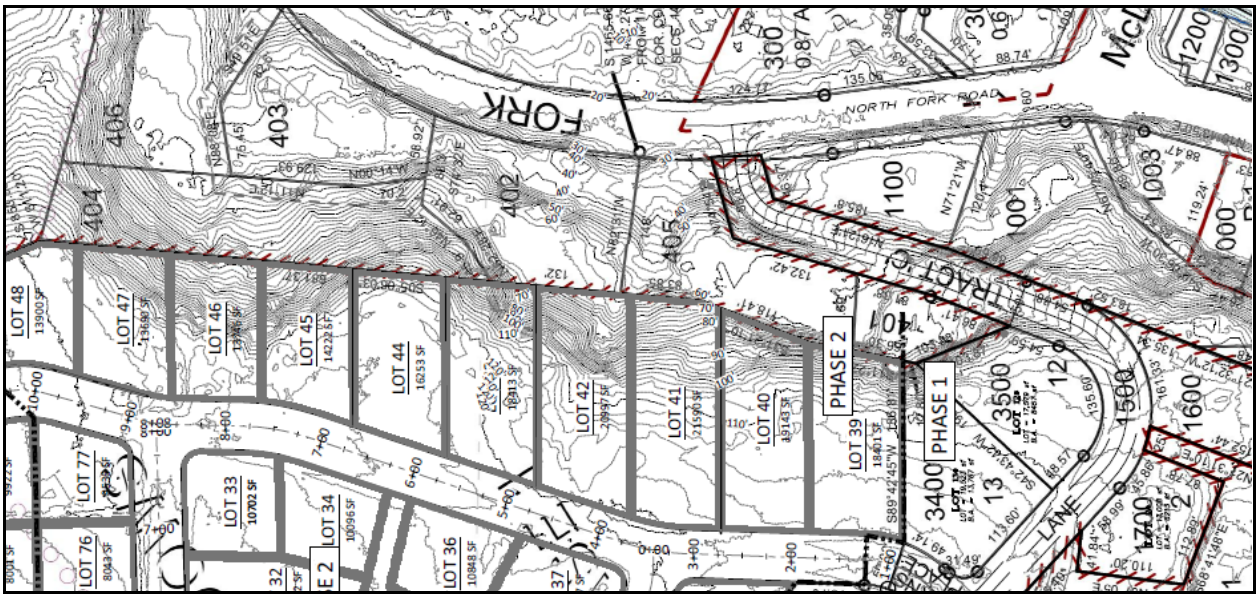


Figure 2 – North to left view, Sloped topography of proposed Riverview Meadows Phase 2 Subdivision. Site plan and LIDAR-based topography Provided by Morgan Civil Engineering, Inc.

From the level meadow, the eastern slope breaks abruptly downward at generally over 50 percent and as steep as 80 to 100 percent locally, based on the DOGAMI light detection and ranging (Lidar) derived topography, shown in Figure 2. The lowest elevations on the eastern margins of the lot are about 60 to 70 feet above sea level. The extremely steep slope gradients are generally at lower elevations. There appear to be several small block slide slope failures visible from near the crest of the slope. Trails from residences at the base of the steep slope to the upper level meadow follow slump block slope terrain. During our slope reconnaissance, we

could hear but could not locate what sounded like springs or cascading drainage issuing from near the base of the steepest slopes.

Soils and Geology

Surface soils in the near level portion of the project area are mapped by the USDA NRCS Web Soil Survey of Tillamook County, Oregon as Chitwood-Hebo complex, 0 to 5 percent slopes. This soil is derived from mixed alluvium and/or fluvio-marine deposits derived from sedimentary rock. The USDA describes the contact with underlaying bedrock at a depth of about 5 feet below the ground surface. The sloped soils at the eastern margin of the subject property are mapped as Templeton-Ecola medial silt loams, 30 to 60 percent slopes derived from colluvium and residuum of sedimentary rock.

Based on the DOGAMI geologic mapping, Figure 3, the subject property is located on a southern slope of coast range uplands composed of Tertiary age sedimentary deposits of Oligocene to Miocene age siltstone, geologic map symbol **Toms**. The blue triangle and stippled overprint pattern on the **Toms** geologic map unit indicates ancient landslide topography mapped by DOGAMI. The **Toms** tuffaceous siltstone geologic unit is typically highly weathered to decomposed and with closely spaced joints and fractures from the landsliding. Intact sedimentary bedding or bedrock dip angles are rarely observed in the hill slope colluvium. There were no apparent signs of sedimentary bedding in the hand auger explorations. In the landslide terrain it is unlikely that sedimentary bedding would be intact for any significant areal extent.

Younger Quaternary fluvial silt and clay deposits (**SC**) are present in embayments eroded into the older sedimentary rock at Bob's Creek, Anderson Creek and other drainages in the lower Nehalem Valley.

According to the USGS geologic mapping, Figure 4 , the project site lies in an area of Tertiary Alsea Formation (**Tal**) tuffaceous siltstone of Lower Miocene to Oligocene age. The upper part of this unit is generally massive but has thin feldspathic sandstone interbeds. The USGS does not map the project area as landslide terrain, but the sedimentary strike and dip symbols shown on the map vary substantially in orientation and dip angles, suggesting substantial disturbance of the originally horizontally bedded marine sedimentary deposit. As with the DOGAMI mapping, Nehalem River valley and tributary creeks are covered be younger Quaternary fluvial and estuarine (Qf) fine-grained sedimentary deposits.

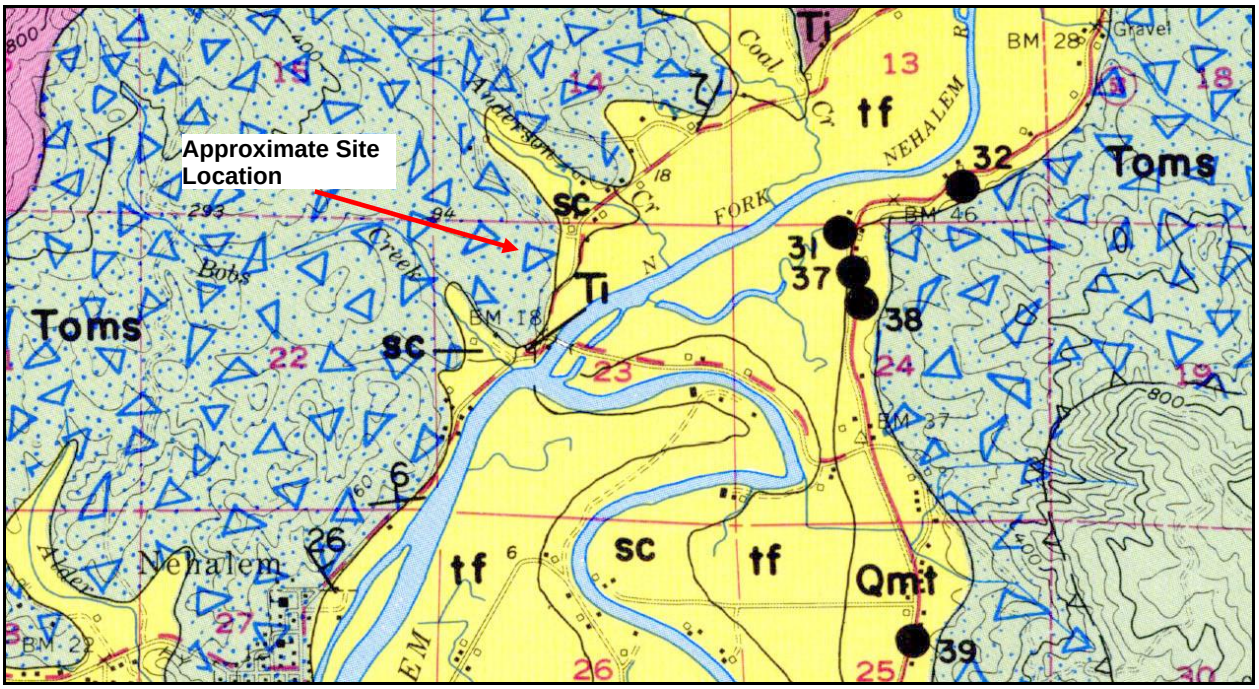


Figure 3- Portion of Geologic Map of Nehalem Quadrangle, DOGAMI Bulletin 74 (1972).

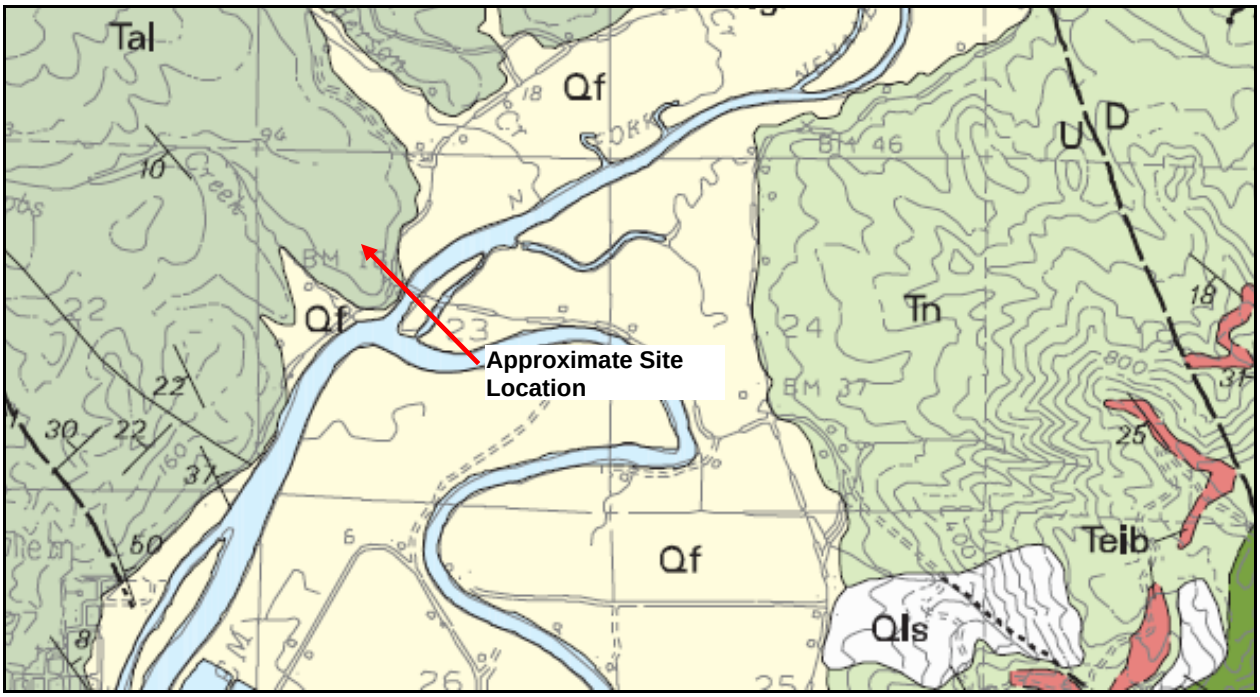


Figure 4 - Portion of Geologic Map of the Tillamook Highlands, Northwest Oregon Coast Range (Nehalem, 15-minute Quadrangle), United States Geological Survey (USGS), Open File Report 94-21, 1994.

Seismic Setting

The Oregon Coast is located near the western margin of the North American continental tectonic plate. The Pacific and Juan de Fuca Tectonic plates that form the ocean floor off the

northwest coast are converging and being subducted beneath the western edge of the North American Continental Plate. This zone of tectonic plate convergence, called the Cascadia Subduction Zone, has created a complex set of stress regimes that influence the tectonic and volcanic activity of the Pacific Northwest.

The Cascadia Subduction Zone, (CSZ), located approximately 50 miles to 60 miles off the Oregon coast, represents an immense thrust fault that has potential for earthquakes large enough to cause significant ground shaking throughout the Pacific Northwest Region. Geologic research over the past decades has shown that this offshore thrust fault zone has repeatedly produced large earthquakes every 300 to 700 years. Research of ancient Japanese tsunami records along with dendrochronology (tree ring dating techniques) have established that the last large CSZ earthquake occurred in January of 1700 AD. Although researchers do not agree on the likely magnitude of the next Cascadia Subduction Zone thrust fault earthquake, it is widely believed that earthquakes of moment magnitude (M_w) 8.5 to 9.5 are possible. The duration of strong ground shaking is estimated to be greater than 4 to 5 minutes, with minor shaking lasting several minutes longer. Possible aftershocks of magnitude 7 or greater may occur for hours or days after a major Cascadia Subduction Zone seismic rupture.

Other potential earthquake sources in this region include fault ruptures deep within the subducting oceanic plates and within the overlying continental crustal tectonic plate. However, the CSZ thrust fault earthquake mechanism is considered the greatest seismic hazard to the region and the seismic source which dictates building code design requirements for permitted habitable structures.

Geologic and Seismic Hazard Summary

The principal geologic hazard concern throughout western Oregon is an earthquake on the Cascadia Subduction Zone, CSZ. Based on the geologic record of CSZ Earthquake recurrence intervals, the next CSZ earthquake is potentially overdue and may occur within many of our lifetimes. In 2008 the United States Geologic Survey (USGS) released results of research that estimated 10% probability that a magnitude 8-9 Cascadia Subduction Zone earthquake would occur within 30 years.

During a CSZ earthquake, the local area will very likely experience a few minutes of very intense ground shaking. Steeper slopes on the eastern margin of the subdivision's Phase 2 lots may experience slope instability or landslides under seismic conditions.

Conclusions and Recommendations

It is our interpretation that the landslide topography likely formed many millennia ago when the lower Nehalem River Valley had greater topographic relief, steeper slopes and the river was actively eroding or cutting the base level. In general, the conditions that formed this mapped landslide topography are no longer active. However, in areas of steep slopes along the eastern margin of the project, the ancient landslide topography may be reactivated by heavy rainfall, changes in grading, drainage, or tree removal, or severe seismic ground motion.

Homes with shallow foundations should be designed with adequate slope setback for long-term slope stability and support of foundation soils. Any portions of proposed home footprints or site grading, including foundation backfill, on Lots 39 through 42 that extend east of the existing 110-foot elevation contour shown on Morgan Civil Engineering plans should be reviewed by an Engineering Geologist or Civil or Geotechnical Engineer for slope stability concerns. Similarly, any portions of proposed home sites on Lots 43 through 47 that extend east of the existing 120-foot elevation should be reviewed for slope stability concerns.

For home footprints that are designed specifically to extend east of the break in slope elevations noted above, it is expected that such homes would have either stepped or deep foundations and engineered retaining foundation walls. Release of storm water runoff from impermeable surface should be carefully managed such that concentrated stormwater does not flow over the crests of steep slopes.

In my opinion, firm, undisturbed silty clay soil or decomposed sedimentary bedrock is considered suitable for support of shallow spread foundations and retaining walls designed according to prescriptive building code methods outlined in the 2014 Oregon Structural Specialty Code (OSSC), Chapter 18 - Soils and Foundations. An allowable soil bearing capacity of 1,500 pounds per square foot would be appropriate for firm native undisturbed silty clay soil according to table 1806.2 of the OSSC. Any organic debris or fill should be removed from foundation areas.

Grading recommendations in accordance with OSSC Appendix J- Grading are considered generally appropriate for the general excavation and grading expected for construction on the generally level residential lots. The pertinent building code and sections should be referenced on final foundation construction plans for homes, noting assumed soil parameters used in the design.

For homes planned east of the 110-foot to 120-feet elevation contours slopes described above, It is recommended that the engineering geologist, civil engineer, or structural engineer be retained to observe and document foundation subgrade preparation, installation of drainage improvements, construction of engineered retaining walls, and structural fill placement and compaction.

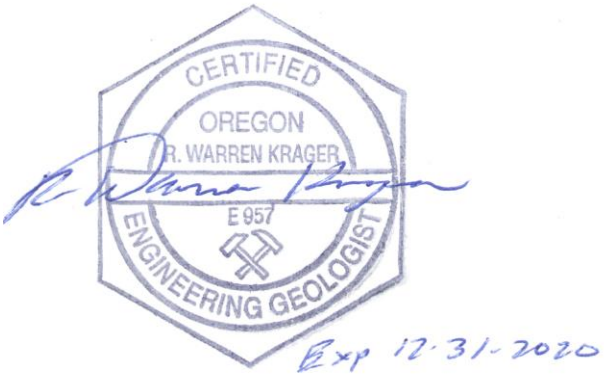
Limitations

The engineering geologic reconnaissance and geologic hazard review performed for the proposed residential land partition 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.

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 our findings. Therefore, 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, I would happy to review site and design conditions and revise this report if appropriate or provide detailed site investigation reports for future lots and proposed homes.

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