identify instances in which a local exception might be justified (such as to allow Highway 101 to apply for shoreline armoring due to coastal erosion).

Challenges:

- If this option were pursued, DLCD and the rulemaking committee would be faced with the challenge of coming up with clear and specific language to codify in rules how to outline the parameters of this particular issue.
- ODOT would still need to seek goal exceptions for each jurisdiction in which Highway 101 is vulnerable and where the best option is potentially an armoring option.
- Defining "critical infrastructure" to include in this option.

Feasibility: Rulemaking for Division 4 is a feasible option.

Next steps: DLCD would include this option in the department's policy agenda and then initiate a rulemaking process. The standard rulemaking process would apply: rules advisory committee, one public hearing in the affected region, final hearing and adoption by LCDC. DLCD should check in with other cities and counties along the coast to see if their public works departments have policies or preferences regarding assets that are subject to coastal erosion and whether they consider structural armoring as a necessary strategy.

2.4 Research Needs: This list summarizes information the group felt is still needed related to all the policy options discussed under Concept #2. It has been categorized by priority:

- *Tier 1:* Develop an inventory of critical infrastructure along the Oregon coast that may or may not need shoreline armoring. Within that inventory, identify the hazard (erosion, flooding, or landslide), the best mitigation tactic, its vulnerability to failure, the land uses nearby, and development date (pre- or post-1977).
- *Tier 2:* Research additional information related to public/critical infrastructure (including Highway 101):
    - Identify coastal areas with the highest potential for a goal exception
    - What is the value of the infrastructure at risk from coastal erosion along the oceanfront, and what are the economic impacts if the infrastructure fails?
    - Costs to relocate the highway and other alternatives to armoring
    - Cost benefit analysis of specific projects and various policy pathways
    - Determine the costs and impacts to public resources, local economies, cultural resources, tourism, and beach access
- The above information will help to justify (or not) a goal amendment to support the protection of Highway 101 or other public infrastructure assets.
- *Tier 3:* Assess each littoral cell along the Oregon coast:
    - Understand the physical processes that are causing change in those environments
    - Percent armored – identify eligibility and existing armoring patterns. (Steve Dundas, OSU can generate this information now)

- *Tier 4:* Utilize ongoing research (OSU Professor Ruggiero, Envision) to help evaluate tradeoffs between armoring and beach access. What is the public valuation of protection of private property vs. the protection of public infrastructure vs. the protection of the public beach?
- Additional research may inform policy choices (exception vs. amendment). Research universities, such as OSU, can help with this data.

Challenges: ODOT is concerned that this long list of research needs will preclude any forward progress on possible rule making. While more information may be necessary to advance a policy option, all of these research needs put together would be like a coast wide NEPA analysis - defeating the point of a programmatic approach. Goal exceptions would still be required site by site even with the rule making option.

Feasibility: Some research needs can be answered quickly with existing resources, such as through OSU, ODOT, or DLCD. Other questions are dependent upon securing additional resources and appropriate data.

Priorities for Concept #2:

High Priority:

2.3 Rulemaking for Chapter 660, Division 4 - this is doable now, and is low risk
2.4 Research Needs - targeted research will help advance future decisions on the best policy options

Low Priority

2.1 Status Quo (Local Goal Exception) - this option already exists and a jurisdiction or agency could try pursuing this process now; however there are perceived barriers to moving forward
2.2 Goal Amendment - this is not seen as feasible at this time and has high uncertainty in the outcome given the unsuccessful attempt by ODOT in 2002.

Priorities may change based on the results of research. These rankings are reflective of the group's thoughts at the time of this report.

3 - Small In-fill Parcels

Overview:

Currently, the definition of development in Goal 18 includes vacant subdivision lots which were physically improved through construction of streets and provision of utilities to the lot (as of January 1, 1977) as eligible for shoreline armoring. It does not include vacant parcels that were similarly committed to development prior to 1977 but that were not created by statutory subdivision. The result is that, in some cases, isolated ineligible parcels are scattered in between eligible properties in otherwise developed segments of the shoreline. These gaps can make permitting and effective armoring difficult due to the resultant edge effects of isolated structures. Also, in the developed segments of shoreline where these physically improved parcels exist, there is no functional, policy-based distinction between parcels and subdivision lots. Subdivision means the creation of 4 or more lots (divisions of land less than 4 lots would not be a subdivision). The policy intention of including vacant subdivision lots in the definition of development was that these lots tend to be small with limited space for siting structures.

This meeting focused on whether to include small parcels that were vacant but otherwise committed to development in 1977 as eligible for shoreline armoring. These parcels would be similar in size and characteristics to other vacant subdivision lots. Larger tracts of land would have had more siting options and were not considered in this policy concept.

DLCD gave a brief data analysis to help inform the discussion around this topic. The following is a summary of the main points of that analysis:

- The boundaries of the public beach are from extreme low water to the statutory vegetation line or the actual line of vegetation, whichever is further landward. The public beach is a rolling easement; as the beach erodes or accretes, the width of the public beach can change over time. Sometimes the statutory vs. actual line of vegetation can be quite different. A permit for a beachfront protective structure is required from OPRD if the structure is west of the vegetation line, but may not be if the structure is completely landward of that line. However, if and when the structure becomes exposed and is on the public beach due to erosion, the homeowner will have to get a permit from OPRD or remove the structure.
- In many cases, the private landowner still owns the land out on the public beach, but they do not pay taxes on this area. The public beach is a recreational easement.
- What is a small in-fill parcel? Tracts of land that are not part of a subdivision but have the same look and feel: small in size, in an area otherwise committed to development, with utilities and roads to the lot (as of January 1, 1977). Does not include large lots that were subsequently broken up into smaller lots post-1977, and had no services or development nearby prior to 1977. This discussion is limited to the configuration of the parcels on January 1, 1977, and is meant to capture the intent of the original policy.
- Preliminary data:
    - Figure 1 shows eligibility of lots by county that intersect the vegetation line (i.e. are on the oceanfront). This shows all types of lots (did not filter out public lands).

- How much room do you have to move back or build differently? Dark wedges on each circle (Figure 2) represent the percentage of lots (in Lincoln County only) where less than 40% of the lot is east of vegetation line, meaning there may not be much room to move a house backward on the property. Each column shows the percentage of lots in different size categories, with 10,000 square foot lots and under being the smallest category. Most lots fall into this category. There are very few bigger lots. This graph doesn't account for armoring but that data could be added later.

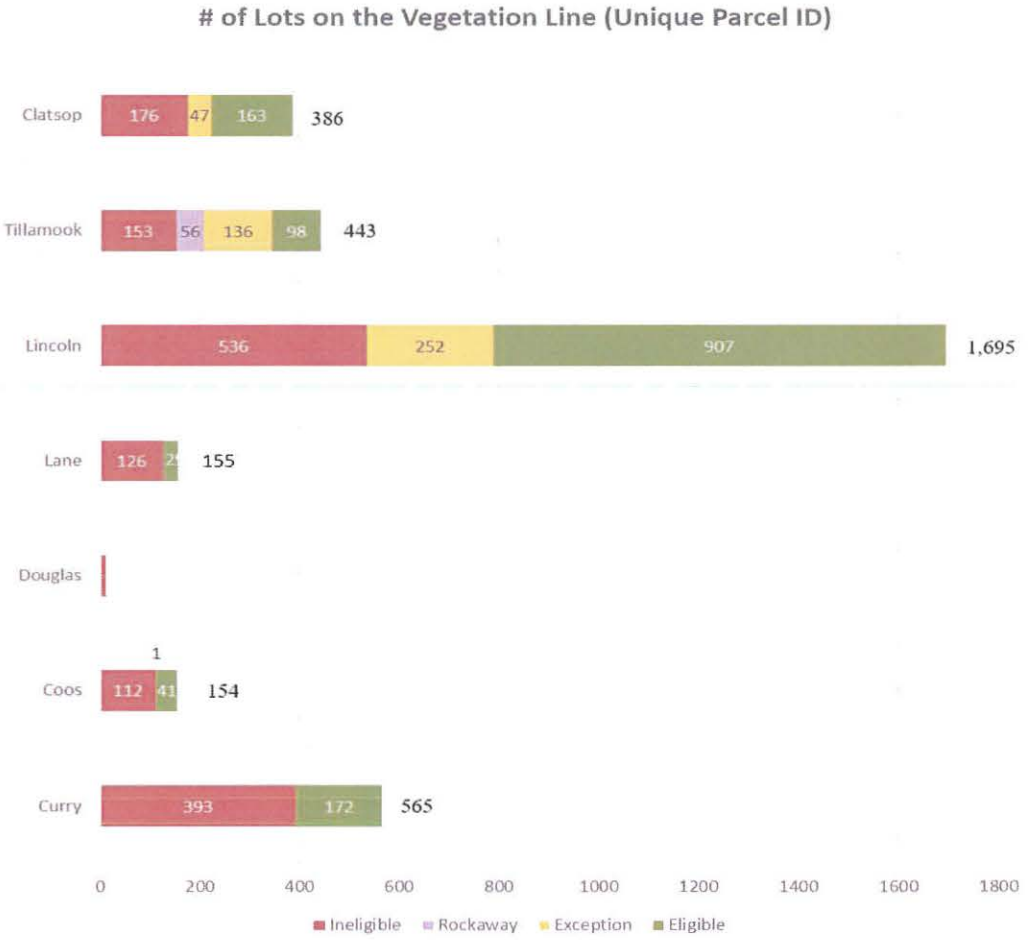

Figure 1: Parcels or lots that intersect the vegetation line and their eligibility status.

Steve Dundas, economics professor at OSU, provided a presentation to the group related to housing values and the impact of the private option to invest in erosion protection, as well as potential policy changes and sea level rise impacts on armoring trends on the Oregon coast. On average, the Goal 18 shoreline armoring eligibility policy does not appear to have an effect on housing values. When the analysis is specific to houses at a lower elevation with eroding beaches, then eligibility increases home value by 13-22% over an ineligible lot. The presence of riprap does not matter, just the ability to protect the home is of value. The more vulnerable the

parcel is to coastal erosion, the more the market values that ability for protection. The second study Professor Dundas shared was about shoreline armoring decision-making (data limited to Tillamook and Lincoln counties). Coastal homeowners respond to their direct neighbors and "learn" from their actions to armor. The key result is that both peer effects and coalition forming appear to determine the likelihood of choosing to armor. Including peer effects in the forecasting model doubles the armoring over the next 40 years. Sea level rise has the potential to increase projected armoring by about 10%. Removal of the Goal 18 eligibility provision with projected SLR results in about 135% increase in armoring. The policy does what it was intended to do and is preventing the proliferation of shoreline armoring on the Oregon coast that would otherwise occur if the policy weren't in place.

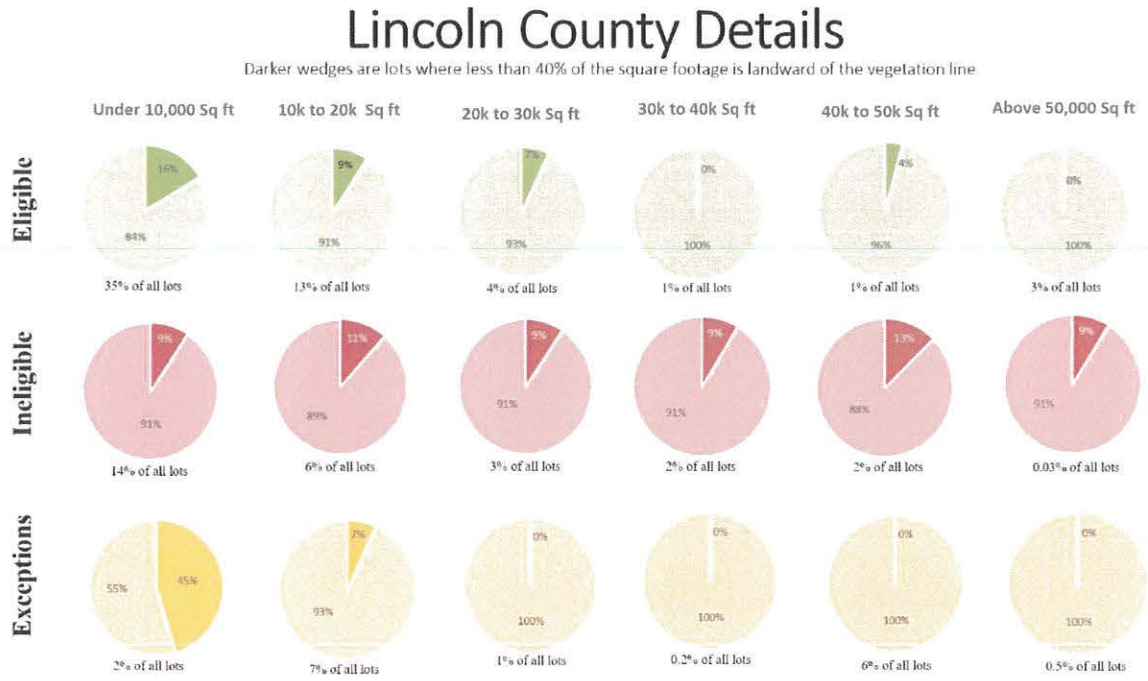

Figure 2: Parcel eligibility status by lot size for Lincoln County.

Summary of group discussion:

Group discussion after the presentations also talked about how to put parameters around a "small" parcel? The concept of a subdivision lot was used as a proxy for size because subdivision lots tend to be small. However, there is no size requirement or limitation for a subdivision lot – some can be quite large, while some metes-and-bounds parcels are quite small. Why are partitions (3 or fewer lots) not included as subdivisions? The only difference is the number of parcels created. This concept is related to the development-ready status of the lot/parcel. Trying to identify parcels in which the development decisions were essentially made already due to size (even if vacant in 1977). We don't have comprehensive data, but generally it is thought that this problem is somewhat confined to Lincoln County, though it may also occur

in Tillamook and Clatsop counties as well. Knowing the scope of this issue may help guide what policy path would be the best one.

Policy Options Discussed

3.1 **Status Quo**: There are three main status quo options for ineligible properties: 1) local "reasons" goal exception (what was discussed at the meeting); 2) dynamic (non-structural) erosion control treatments; 3) re-location/dismantling of structures subject to erosion (discussed at the following meeting).
Goal exceptions are completed on a project-by-project basis, with the decision made by the local government as a plan amendment. A goal exception may include a single property or multiple properties, but the reason for the exception would have to be the same for all. These decisions go to hearing in front of the planning commission and then final hearing by the governing body. Decisions can be appealed to LUBA (Land Use Board of Appeals).

Benefits: This approach already exists, is available now, and would require no changes to rules or the goal. This option has never been tried before for Goal 18, IR#5, so there is no evidence that the process doesn't work. Allows geographic specificity to a particular area, which may help with creating findings. Can do batch exceptions (more than one parcel at a time).

Challenges:
- The process can be onerous for a local jurisdiction and the outcome is uncertain. Because the process has never been tried before, there is a perception that it is too difficult to try (unchartered territory).
- Unclear who can initiate this process.
- There are data gaps (see *Research Needs*).
- There may be a "domino effect" where more people would come forward to get local goal exceptions if some people are granted an exception.

Feasibility: Feasible but difficult for local jurisdictions. Local jurisdictions need more capacity and assistance if they move forward with this.

Next steps:
- DLCD could support local jurisdictions in understanding and implementing the goal exceptions process – whether the process is initiated from a local jurisdiction or from a specific property owner.
    - DLCD could provide a guidance document or case study that outlines the existing rules for how to move forward with a goal exception.
- Local jurisdictions can try this approach for specific cases.

3.2 **Goal 18 Amendment:** Amending the definition of development under Goal 18, IR#5 to include small, vacant infill parcels. To complete a goal amendment, the directive would

need to be included in DLCD's policy agenda. The process includes 10 public hearings and a final hearing and adoption with LCDC.

Benefits: A goal amendment would establish a uniform statewide policy for the treatment of small, infill parcels and create a more comprehensive definition for "development". Including these types of parcels would create more certainty in outcomes from a private property perspective (in terms of protection from coastal erosion).

Challenges:

- Crafting a singular set of parameters that would address the variety of circumstances related to this concept would be challenging (e.g. what is a small parcel? Is a specific size consistent throughout all jurisdictions and environments?).
- Difficult to find balance between specificity and general policy to implement a specific purpose.
    - Sometimes a uniform approach is less flexible and more limiting than anticipated.
- The goal amendment process is resource and time intensive. There is a high bar required to amend a statewide planning goal and the outcome is uncertain.
- This provision could accelerate the presence of shoreline armoring and does not allow for a more geographically-defined approach. A one-size fits all approach might not work best for this particular topic because of the variability of the geography and development practices of the coast.

Feasibility: Low at this time.

Next Steps: See 3.4 Research Needs.

3.3 **Rulemaking for Chapter 660, Division 4**: OAR 660-004-0022 provides a list of reasons necessary to justify a goal exception. Specific reasons are set forth for certain identified goal requirements and uses; the rules provide set parameters for meeting the "reasons test." Examples: Goal 18, foredune development prohibition (implementation requirement 2); foredune breaching (implementation requirement 6).
Option: Add specific reasons for a goal exception to Goal 18, implementation requirement 5. There is nothing in the rules right now for this provision. This may be an option for making the local goal exception process more clear for specific issues related to G18 IR#5, such as vacant and small in-fill parcels that were similar to vacant subdivision lots as of January 1, 1977. Some considerations to specify for this approach: parcel size parameters, and development context. Rulemaking to help establish equal treatment for parcels that are in all other ways the same as an eligible vacant subdivision lot.

Benefits: A specific reason under Division 4 would provide essential guidance to local governments on the exception process related to goal 18 eligibility. Two separate reasons would need to be created for these two proposed concepts (in-fill parcels and public

infrastructure). They could be done at the same time or separately. Through this rulemaking, the process for a goal exception may become more clear or streamlined. It is also an opportunity to align with federal case law (see below).

- This option would still face the challenge of defining the parameters of such an exception and to codify that in rules. Need to try to foresee all the scenarios and unintended consequences. There is a lot of variability in both the planning environment and the geographic landscape.
- With rulemaking, must stay within the context of the goal (cannot change the original intent). This limits what can be accomplish through rulemaking alone.
- Might be risky to link the rulemaking for public infrastructure and small in-fill parcels in the same process. Might be best to keep them separate.

Feasibility: Feasible but difficult.

Next steps:

- The group would like more information about this process (revision to Division 4) and what it might look like.
- Need to define "small in-fill parcels." Creating a blanket definition could be difficult and more restrictive than anticipated, and could lead to equity issues.
- A broader discussion about the legal issues associated with the current definition of development in Goal 18, IR#5 in light of recent related legal decisions.
    - Private property interests on the group believe that the narrow language of IR#5 in Goal 18 does not comply with current Federal Due Process, Equal Protection and Takings case law. Further, a very recent Supreme Court decision in *Knick v. Township of Scott* opens the door to federal courts for landowners denied beachfront protective structure permits as a direct means of relief, rather than LUBA and state courts, thus adding to the urgency for rulemaking (see letter from David Phillips to the Focus Group, dated August 27, 2019).

3.4 **Research Needs:** This list summarizes information the group felt is still needed related to all the policy options discussed under Concept #3. Answers to these questions will help to inform what policy approach to take:

- How many vacant, small, in-fill lots existed on the OR coast as of January 1, 1977? Can this data be compiled? If this concept were to be pursued, what would be the scope? This will determine the magnitude of the issue and the best legal pathway to address it.
- Assess each littoral cell along the Oregon coast:
    - Understand the physical processes that are causing change in those environments
    - Percent armored – identify eligibility and existing armoring patterns. (Steve Dundas, OSU can generate this information now)
    - Look at this information in conjunction with other hazard information such as coastal erosion and sea level rise.

- If parameters can be outlined for what is a "small in-fill" parcel, can use that information to run a policy scenario through existing academic models to see what would be the change in armoring.

Feasibility: Some research needs can be answered quickly with existing resources, such as through OSU, ODOT, or DLCD. Other questions are dependent upon securing additional resources.

Priorities for Concept #3:

High Priority:

3.4 Research Needs - this research is needed to make future decision on the best policy options

3.1 Status Quo (Local Goal Exception) - this option already exists and a jurisdiction could try pursuing this process now; however there are perceived barriers to moving forward

3.3 Rulemaking for Chapter 660, Division 4 - could be done now, may be higher risk than pursuing for public infrastructure.

Low Priority:

3.2 Goal Amendment - this is not seen as feasible at this time and has high uncertainty in the outcome due to public opposition. Does not appear to be the best solution for this issue, as it is mostly a localized problem.

Priorities may change based on the results of research. These rankings are reflective of the group's thoughts now.

4 – *Mitigation and Alternatives to Shoreline Armoring*

Overview:
This topic area is a broad-based concept meant for brainstorming and discussion, the results of which may inform DLCD staff work programs or priorities. Goal 18, implementation requirement #5 outlines what development is eligible for shoreline armoring. However, it does not address strict requirements for siting oceanfront development, nor many options for development that cannot armor. This has implications for both existing (post-1977) and future oceanfront development. This concept looked at some options (such as increased land use regulations and managed retreat) to reduce the need for shoreline armoring along the Oregon coast or to mitigate the impacts of erosion on development.

The impacts of climate change and sea level rise (SLR) will bring increased erosion, flooding, and storminess, which can impact both private and public development and infrastructure. A few options to address both existing and future development were presented and discussed at a high level with focus group members. These options are summarized below. More information can be found in the presentation slides, available on the focus group webpage.

Potential options for existing development:

a. *Mitigation from increased shoreline armoring* – The purpose of this idea is to compensate the public any time shoreline armoring is added to the public beach. There are several ways of thinking about this idea. One is to coordinate with OPRD's existing ocean shore alteration permit process.
    - Mitigation could be an added requirement of the permitting process with an additional fee assessed on the applicant.
    - Potential uses for mitigation funds: creating/updating public beach access points; research & monitoring impacts of armoring; land acquisition and preservation.
    - Transfer of Development Rights approach – alternative approach to above, market-based approach to buy and sell "eligibility rights." Look to the wetlands mitigation banking model. Would have to set up a new system with rules.

b. *Buyouts* – voluntary program where homeowners can give up their property due to hazards. The structure(s) are then removed and the land is converted to open space, usually for public use or benefit.
    - NJ Blue Acres Buyout Program: state program that worked with FEMA as a result of Superstorm Sandy. Purpose was to buy clusters of homes or whole neighborhoods subject to coastal or riverine flooding and permanently preserve that land as open space.
        - Results so far: houses being bought-out tend to be in riverine environments and in low-income areas. Has been difficult to get participation from wealthy oceanfront homeowners.
    - FEMA Buyout program: 75% FEMA /25% Local split on funding. This option can be used for homes in danger of falling within 5 years due to erosion hazards -

homeowners get compensated to leave their homes. It is a voluntary program and can be quite lengthy from start to finish (can take up to 4 years). Difficult to get the 25% match and a public entity to take over the land.

c. *Relocation/managed retreat* – purposeful movement away from the ocean due to SLR, erosion, flooding, etc.
    - Examples: Increasing number of examples in Alaska, especially native villages (Meshik); Quinault Tribe, Olympic Peninsula, WA; Ventura, CA (public facilities at popular surfing beach)
    - This is a strategy for all oceanfront development (both armored and not armored) – armoring is still a short-term solution and may fail eventually with SLR. Retreat is a long-term strategy.
    - Current challenges in US: approach is reactive; focus is on post-disaster programs; language is fraught, causes fear; equity implications (affordable housing tends to be in hazardous areas); economic incentives tend to promote development in coastal zones; no specified relocation areas; active management required for the retreated area, even once the houses have been removed.
    - Georgetown Climate Center is developing a Managed Retreat Toolkit – to be released early in 2020.

Potential options for future development:

a. *Local government regulations* – to go beyond state requirements, to be specific to the local circumstances. These are currently voluntary measures, tailored to each jurisdiction and can include: comprehensive plan text, map amendments, development code amendments.
    - For example, Neskowin had a formal stakeholder engagement process to address coastal erosion issues in their community that started in 2009 and was completed in 2016 with the adoption of a coastal erosion overlay zone by Tillamook County. The group explored many options throughout their process, including: structural, non-structural, development, and policy/planning hazard alleviation techniques. They used DOGAMI coastal erosion data as the boundary of their overlay zone.
    - The work completed in Neskowin could serve as a model and be replicated in other communities. Neskowin has both dune and bluff features, making it a good pilot case.

b. *Statewide regulations* – new regulations could be imposed at the state level, such as universal setback requirements (minimum inland distance from a specific shoreline feature). Generally, there are two approaches to statewide setback requirements: fixed number of feet or long-term annual rate of erosion. Other statewide options might include limitations on repairing/replacing development in coastal hazard areas, re-zoning (permit higher density development outside of coastal hazard areas and lower density inside these areas), changing the anticipated lifetime of a structure, or compliance with flood hazard overlay standards in SLR areas.

- See examples of statewide setback requirements from other coastal states on PPT slides.
- California developed a SLR guidance document for local governments, could provide a summary of this work to coastal planners at DLCD's bi-annual coastal planners meetings.

c. *Implement Goal 7: Natural Hazards* – This statewide planning goal covers: floods (coastal and riverine), landslides, earthquakes and related hazards, tsunamis, coastal erosion, wildfires, and others as identified by a jurisdiction. Under the goal, the local government should evaluate new hazard information for risk to people and property and adopt or amend plans based on their evaluation of risk. This goal is not currently enforced by DLCD; a voluntary approach is used. Additional funding and support for local governments and DLCD would help implement this approach more systematically in the future.

d. *Coastal hazard erosion data* – Currently, DOGAMI has coastal erosion rates and zones established for select segments of the Oregon coast, but this data does not exist coast wide. This data product would be important to have in order to develop a statewide setback standard or for local governments to update their own land use plans to address coastal hazards and SLR.

Policy Options Discussed (for existing development)

4.1 **Mitigation/compensation:** Two different potential approaches discussed. The general idea for this option is to balance increases in shoreline armoring with compensation for the public beach.

- *Market-based approach*: A potential pathway for problem areas (ineligible properties experiencing erosion in an area that is mostly eligible for armoring). Allow ineligible parcels to apply for riprap (in certain very specific areas, such as Lincoln Beach area), but mitigate the taking of public beach in another way. Transfer the "eligibility" from one eligible parcel to another ineligible parcel through a market-based program, such as an auction. This could work in conjunction with other tactics – such as buyouts, managed retreat, and planning.
- *In combination with OPRD permitting*: Add a fee requirement to the permitting of BPS to make up for impacts to the public beach from additional armoring. This fee could be used for mitigation in various ways. This option would not be related to changing eligibility status, but as an additional criteria for the existing permitting process.

Benefits: Allows for a more balanced approach (public benefit) if adding more armoring to the coast.

Challenges: Mitigation could have unintended consequences. There are various opinions on the effectiveness of wetlands mitigation banking.

Feasibility: Feasible but would require a heavy lift in terms of staff and resources to create a new program or add a permit requirement.

Next steps: Decide on the scope and desired outcome of this tactic. Solana Beach, CA implemented a public recreation annual fee to homeowners to offset armoring impacts on the public beach. They developed a mitigation methodology. Look into this example and others for how this might apply to Oregon. *(See more examples below)*

- Dare County, NC: collects occupancy taxes to pay for beach replenishment through a Shoreline Management Fund. Tried a 1% sales tax to pay for beach nourishment. Implemented and repealed in the mid-2000s: https://outerbanksvoice.com/2014/09/22/sand-tax-would-have-helped-dare-foot-full-cost-of-nourishment/.

Same article above notes how municipalities reacted and funded projects, particularly Nags Head - increased property taxes on oceanfront homes, and contributions from county occupancy tax at hotels with proceeds going to shoreline management fund.

Suggested readings about mitigation banking:

- https://www.forbes.com/sites/ashoka/2014/04/25/how-private-capital-is-restoring-u-s-wetlands/#292c11605e83
- https://bioone.org/journals/wetlands/volume-29/issue-3/08-148.1/Evaluation-of-Permit-Success-in-Wetland-Mitigation-Banking--A/10.1672/08-148.1.pdf
- http://www.choicesmagazine.org/2005-1/environment/2005-1-13.htm

4.2 **Buyout:** If a private homeowner is willing to give up their oceanfront property due to erosion hazards, a public entity can "buy-out" that home and land for public use. The house and infrastructure would be removed and the land could be used for beach access, a public park, open space, or other. FEMA has an existing buyout program that can be used for homes experiencing coastal erosion (or other natural hazards such as flooding or landslides). A state program could be implemented as well.

Current programs are reliant on disasters to trigger federal assistance. To maximize the return on investment, these programs (e.g. NJ Blue Acres) seek voluntary buy-in at community scales.

Benefits: Option for ineligible properties experiencing severe erosion. New open space can provide a public benefit.

Challenges:

- Currently, buyouts tend to be done on an individual basis – this can create additional erosion problems (holes) for adjacent property owners. There is a need for a more comprehensive approach to achieve greater benefits from many perspectives, including for land ownership responsibilities, public benefits, and erosion mitigation.

  - The next row of houses will be vulnerable to erosion over time, too.
- The current FEMA process is clunky and resource intensive. The local jurisdiction is the applicant on the homeowner's behalf and the process can take up to four years to complete. The funding provided is 75% of the home value, the homeowner (or the city) is responsible for the other 25%. Most people want to live near the ocean – there is a reluctance to move elsewhere.
- It can be difficult to justify spending public money to assist private homeowners.

Feasibility: This option is available now, but incentives are low. Difficult but feasible; an improved process would make it more attractive.

Next steps: Identify areas where buyouts would be beneficial on a larger (neighborhood) scale, such as areas prone to erosion and areas with ineligibility for armoring. The modeling tool (Envision @ OSU) may be able to help identify these areas. Look into a state supported buyout program to complement FEMA's program – to help with applications, process, and funding.

4.3 **Managed retreat:** Systematic process of moving away from the oceanfront due to hazardous conditions.

Benefits:
- Option for ineligible properties experiencing severe erosion.
- New open space can provide a public benefit.
- Proactive response to coastal hazards. Allows approach to be comprehensive. Managed retreat is an alternative to unmanaged retreat, which is bound to happen at some point in the future. Set up the rules now to be ready for future events that are coming.
- This approach should be scenario-based and community-driven. There are benefits to moving together as a community.
- Increased tourism revenue from increased open space.

Challenges:
- Limited resources to help communities think about this approach at this time.
- There is a need for a more comprehensive approach to achieve greater benefits from many perspectives, including for land ownership responsibilities, public benefits, and erosion mitigation.
- Most people want to live near the ocean – there is a reluctance to move elsewhere. Emotionally challenging to move people from their homes.
- Municipality could lose tax revenue from loss of oceanfront properties that become open space:
  - https://www.cbsnews.com/news/rising-sea-levels-could-wipe-out-financial-stability-of-seaside-towns/
  - http://southrivernj.org/notices/SouthRiver-Fiscal-Impact-Report-Adopted-04272015.pdf
  - https://www.npr.org/2018/12/04/672285546/retreat-is-not-an-option-as-a-california-beach-town-plans-for-rising-seas

Feasibility: Requires more research and investigation. Challenges are not a reason for not moving this idea forward. It is happening elsewhere.

Next steps:

- Identify areas where relocation would be beneficial on a large (neighborhood) scale, such as areas prone to erosion and areas with ineligibility for armoring. The modeling tool (Envision @ OSU) may be able to help identify these areas.
- Examples around the world and in the US to look to for ideas and resources:
    - Pacifica State Beach, CA: https://climatechange.lta.org/pacifica-restoration/
    - Cape Hatteras Lighthouse: https://www.nps.gov/caha/learn/historyculture/movingthelighthouse.htm
    - Louisiana Bayou: https://www.npr.org/2018/01/04/572721503/louisiana-says-thousands-should-move-from-vulnerable-coast-but-cant-pay-them
    - Indonesia: https://www.npr.org/2019/08/26/754291131/indonesia-plans-to-move-capital-to-borneo-from-jakarta
    - *Science* article: https://science.sciencemag.org/content/365/6455/761
- There are many steps needed to move this idea forward, including identifying a funding source(s), outreach strategy for homeowners, incentives for homeowners and municipalities to participate in this approach, etc. Also need to identify sending areas (where people will move).
- Investigate how to set up a retreat program that is compliant with current statewide planning goals.
- Possible idea to pursue: public entity would buyout a neighborhood or area identified as a high priority for relocation due to coastal hazards. The entity would lease the land and structures back to private homeowners until the property is at risk of severe erosion or flooding. At that time, the homeowners would move, the structures would be removed, and the land would go into permanent public ownership. This could be offered as a compromise approach to allow people to enjoy living by the ocean for as long as possible, but gives the community a plan for the future.

Policy Options Discussed (for future development or re-development)

4.4 **Enhanced local regulations addressing coastal erosion:** Local jurisdictions could be encouraged or required to update their land use regulations to utilize new data and more comprehensively address coastal erosion and SLR, with DLCD assistance. For example, Lincoln City has imposed a setback requirement through their local code, which is 60 times the erosion rate plus 5ft for new development.

Benefits:

- Availability of new data does help to inform development decisions.
- Having a geotechnical report requirement for oceanfront areas can be beneficial for planners, in order to have up-to-date information and to understand which homes are in the hazard zones. It is beneficial to require these reports for development occurring in certain areas (such as along the oceanfront).
- Increased local regulations allow for local specificity. A locally-driven process can create buy-in and can influence people's opinions or decisions.
- Useful to have a model to start from (such as Neskowin).

Challenges:

- For small lots, a restrictive setback requirement can be difficult.
- The process for evaluating, adopting, and implementing new local regulations can be time-consuming and expensive. Must have a local champion to lead these efforts or it may not happen.
- Geotechnical reports put a lot of responsibility onto the hired geologist – don't always know the integrity of the reports. Oversight of reports and recommendations can be challenging for local governments.
- Developers don't always make the conservative call when developing along the oceanfront, despite report recommendations – want to develop right up to the edge, despite warnings and science.
- Using a set erosion rate is not always reflective of conditions. Oregon is prone to episodic erosion events, especially in some areas.

Feasibility: Updating local jurisdiction regulations to further address coastal erosion hazards is feasible at this time.

Next steps:

- Find out how much of the oceanfront of the Oregon coast is still undeveloped and which of these parcels are ineligible.
- Find support (money, staff, technical assistance) for local comprehensive plan updates with local jurisdictions. Many communities are in need of major updates or overhauls of their comprehensive plans, but need money and support to do so.

4.5 **Statewide regulations:** DLCD or others could develop new regulations to be imposed at the state level, such as universal setback requirements (minimum inland distance from a specific shoreline feature).

Benefits:

- Strategy recommended by NOAA Office for Coastal Management (not a requirement).
- Can be done at the state level or locally.
- Having a statewide, uniform erosion dataset (that incorporates SLR data) may be a good starting point for development (minimum requirements) – a local jurisdiction could recommend a further setback based on site specific information.

Challenges: Ecosystems in Oregon can be different (bluff vs. dune), making a uniform setback requirement more challenging to develop. A minimum setback requirement may not work well on existing small lots where there is no place to go.
Limitations to using an erosion rate for Oregon's beaches. Episodic events can greatly change this rate. Unique processes are driving change on Oregon's beaches.

Feasibility: Currently a comprehensive, standardized statewide coastal erosion dataset does not exist. Statewide minimum requirements are feasible pending the development of statewide datasets.

Next steps:

- Washington recently completed a comprehensive update of its shoreline master plans for each coastal community – could look for processes or outcomes that may be relevant and useful to Oregon's coastal communities.
- Prioritize developing a statewide coastal erosion dataset and then move forward with a potential statewide minimum setback requirement. Think about how these regulations would apply – only to new development or also re-development? Would this require an OAR or ORS change?

4.6 **Research Needs (for both future and existing development):** This list summarizes information the group felt is still needed related to all the policy options discussion under Concept #4. Answers to these questions will help to inform what policy approaches to take:

- Do we know how much of the oceanfront of the Oregon coast is still undeveloped? What are the sizes of these lots? What is the eligibility status?
- Inventory areas where there are many small holes in existing shoreline armoring (where erosion may be getting exacerbated)
- Develop a coast wide coastal erosion dataset with SLR projections (to implement statewide setback requirements) – some new data/tools coming from NOAA Digital Coast that could help with this, though they may have limited usefulness for Oregon.
- Inventory areas along the coast where buyouts or managed retreat would make the most sense.

- Create an exposure analysis for the outer Oregon coast similar to the estuary inventory that was already done by OCMP.
    - Some work has been done for Tillamook County by DOGAMI, could be scaled up. OCMP is looking into this now.
- Understand the economic value of the public beach and the economic and social effect of armoring on the public beach. What is the ecological value of an armored vs. unarmored beach?
- What is the economic value of the loss of property that has no development potential due to changing regulations?

Priorities for Concept #4:

The terms (high vs. low) were changed to reflect the difference in this concept related to the others. These priorities are based on need and feasibility and have been categorized as short term vs. long term strategies.

Short Term:

4.6 Research Needs - this research is needed to make future decisions on the best policy options.

4.5 Statewide Regulations - if coast wide erosion data is developed, statewide regulations are a feasible option to pursue, though the policy pathway would require dedicated resources and capacity.

4.4 Enhanced local regulations addressing coastal erosion - this option is available now and is feasible to pursue. Additional resources for local governments would help move this forward.

Long Term:

4.3 Managed retreat - this is a long-term strategy and requires high levels of resources and coordination to move forward

4.2 Buyout program - could be integrated into managed retreat research and coordination as a long term strategy. A complementary state program should be pursued.

4.1 Mitigation/compensation - would require additional research and decision-making to move forward

Main Takeaways

Based on the discussions at each meeting, the following main points have been summarized as potential takeaways for DLCD to consider.

- At this time, a goal amendment for Goal 18 is not a priority – there are other tools that would be more efficient to address certain issues.
- If a Goal 18 amendment or rulemaking is pursued in the future, a definition for *Beachfront Protective Structure* should be included in that process.
- DLCD could provide guidance on a definition of BPS.
- The local goal exceptions process has never been attempted for Goal 18, Implementation Requirement #5. This process could be pursued for areas that feel they haven't been served fairly by the goal (such as for small vacant lots in 1977 or public infrastructure at risk from erosion that cannot be moved).
- DLCD could pursue a Division 4 rule-making process to include a reasons exception for Highway 101 or other at-risk pre-1977 public infrastructure. This could make a more clear local exceptions process for those types of assets.
- DLCD could provide guidance on local goal exceptions process (a simplification of the current statutes and rules).
- DLCD could develop a guidance document of typical erosion control treatment options and whether they are considered a structure (and therefore allowed only on eligible properties) or non-structural (and would be allowed on non-eligible properties). This would assist regulators, property owners, and public entities in understanding the most common erosion control treatment options in Oregon and how they are regulated.
    - Can provide this without a definition for BPS, but might be challenged if there is no definition.
- Develop a coast wide coastal erosion dataset with SLR projections (to implement statewide setback requirements).
- Potential research or fellowship projects:
    - Analysis of oceanfront lots and their respective designations (eligibility, armoring, developed vs. vacant, public vs. private ownership, size, erosion vulnerability, SLR vulnerability, etc.) to better understand the scope and locations of areas subject to erosion that are limited in their ability to use armoring as a tactic. This should be done coast wide, by county, and by littoral cell. This information may help inform the most effective policy pathways.
    - Economic evaluation of the value of the public beach, impacts of armoring on the public beach, and the loss of private development opportunities if regulations change or development is lost to erosion.
    - A more complete assessment of Highway 101 in relation to Goal 18 provisions: where are the most vulnerable areas to coastal erosion; what are the alternative options for those areas (e.g. relocation), what is the cost/benefit analysis of those alternative options; and what are the economic impacts if the infrastructure fails or

has to be relocated. This information may help inform the most effective policy pathways.

- Identification of areas where buyouts or managed retreat would be a viable option.
- Investigate how to set up a managed retreat program that is compliant with current statewide planning goals.
- There is a general need for cost-benefit analyses of what the different policy options really mean for each concept. It was not possible for the group to make meaningful decisions on policy options without that information in front of them.

Public Comments

The focus group members and DLCD staff considered any public comment that was within the scope of the focus group. While most comments were outside of this focus group's charge, DLCD may want to consider their concerns in the future. Below is a list of some of the points conveyed through public testimony and written remarks. It represents an abbreviated version of what was said or written by those that gave comment and is *not* verbatim. A compilation of all written comments submitted to the group can be found in the Appendix.

- Recommendations for the state related to shoreline armoring permitting:
    - Support for allowing shoreline armoring for "in-fill" parcels, especially in areas where the majority of the parcels are already armored or eligible for armoring.
    - State should be more proactive in assisting property owners who are vulnerable to erosion and ineligible for armoring.
    - State and local agencies should work positively with homeowners and each other. Be consistent in permitting and messaging to the public – don't create requirements outside of the rules and statutes.
    - Add criteria to OPRD shoreline alterations permit decisions that armoring can protect houses behind the applicant.
- Arguments for why a particular parcel is eligible when the local jurisdiction has made a different determination (*several comments related to this point*).
    - Assets at risk if no structural protection allowed (public beach access, septic systems, etc.)
- Call for local governments to adopt their own goal 18 eligibility inventories as is called for in the goal language. Goal also calls for *areas* to be identified for eligibility, not every lot.
- Retreat is not the answer, look to engineering solutions (continuum of beach nourishment through hard structures) to protect ocean fronting assets, such as historic sites and critical infrastructure. Different options can work in different locations – assess the costs and benefits through a public process. Work with experts in the region.
- Transportation and land use are not separate – allow shoreline armoring for Highway 101 and other public infrastructure assets (such as water and sewer). Why should Highway 101 be treated any differently than private structures? Without 101, development cannot be sustained.
- Homeowners have been told that getting a local goal exception is highly unlikely and the process is too lengthy to adequately respond to the threat of erosion.
- Online eligibility inventory was completed in the 2000's - how were homeowners supposed to know about their status for shore protection before that?
- Request to get rid of the online eligibility inventory.
- Inconsistent messaging from state and local officials about whether a property is eligible for armoring or not and who makes that determination.
- The inability to apply for armoring has impacted housing values negatively.
- Support for a local goal exception for the area between Fishing Rock and Salishan Spit.

- The central Oregon coast, and specifically Lincoln County, is highly developed and already armored and prone to erosion. This area should be treated differently in terms of the ability to get shoreline armoring. Many ineligible properties are also already armored.
- Goal 18 has been applied inconsistently.
- Goal 18 doesn't account for climate change and SLR.
- Conditions have changed since 1977, should the rules be updated to reflect that?
- Properties that were zoned and approved for development should be permitted to install armoring when they are at potential risk from erosion.
- Local governments are supposed to make eligibility determinations, not the State.
- Request to remove goal 18 eligibility all together and have OPRD permit decisions be based solely on the criteria already in place in OAR Chapter 736, Division 20 (performance standards approach).
- The development date provision is arbitrary and not equitable.
- The legal underpinnings of the Oregon Beach Bill and the vegetation line are suspect and will become more so if DLCD doesn't change Goal 18, IR#5.
- Local governments are likely to face many takings cases soon due to recent court rulings related to private property rights. Goal 18, IR#5 requires re-workings to be consistent with the US Constitution.
- Hardening of the ocean shore to protect private property negatively impacts the public beach and the beach ecosystem.
- It is more feasible to add additional shore protection than to retreat from the oceanfront.

Technical Memorandum

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To: Wendie Kellington, Kellington Law Group

From: Chris Bahner, P.E., D. WRE

Date: March 25, 2021

Subject: Pine Beach and Ocean Boulevard Properties Revetment Design

1. Introduction

Pine Beach subdivision and subject Ocean Boulevard properties are located on the Oregon coast about 2 miles south of Rockaway Beach in the northwest part of Oregon (Figure 1). The landowners along the oceanfront have been losing portions of their property from coastal erosion, and experience coastal flooding during high tides combined with high wave run-up as was the case with the King Tides on February 8-12, 2020. During this event, the maximum stillwater level reached the ocean front homes, and went past the southernmost home for about 45 feet. There is a high level of risk for future damage to structures in the Pine Beach subdivision and the area to the north, which will be referred to as the "Ocean Boulevard properties" in this memorandum. There are 15 lots and 11 homes (4 lots are undeveloped) that are significantly threatened by coastal erosion and flooding, and forty homes threatened by coastal flooding. Furthermore, Pine Beach Loop and the water and sewer infrastructure that serves Pine Beach subdivision and the Ocean Boulevard properties are at risk if no actions to stop future erosion are implemented soon. As a result, WEST Consultants, Inc. (WEST) was contracted by Kellington Law Group to develop a rock riprap revetment design, which if constructed, is expected to prevent further erosion of the landowners' properties and to reduce the risk of coastal flooding. This technical memorandum documents the revetment structure design and information required by Tillamook County.

All geographic and spatial data used in this study were adjusted to a horizontal datum of the North American Datum (NAD) 1983 State Plane Oregon North, a vertical datum of North American Vertical Datum of 1988 (NAVD88), and feet units.

Figure 1. Location map

2. Loss of Property and Level of Flood Risk

In support of the design, WEST estimated the loss of property since 1994 and identified the coastal flood risk at the Pine Beach subdivision. The loss of property since 1994 was estimated using Google Earth for the period from 1994 to 2018 and the latest survey for the year 2021 (Figure 2).

The top of shoreline (identified using vegetation) was determined for the various years available from Google Earth. The following steps were followed for each year considered: (1) select the year from the historical imagery slide bar menu; (2) delineate the top of shoreline using the Add Path option (include the revetment at the Shorewood RV park starting at the northern end of the revetment); (3) convert the path to KMZ; (4) convert the KMZ to a shapefile using ArcGIS; (5) if necessary, move the line element to the control point defined using the 2018 aerial (minor shifts were noted for the years 2000 and 2005); and (6) measure the distance from the top of shoreline to the west edge of the oceanfront homes for the Pine Beach Development and Ocean Boulevard properties (identified as Shoreline Reference in Figure 2) using ArcGIS. The loss of property is summarized in Table 1. Using this data, the average annual erosion rate is 9 feet per year with the rate ranging from about 5 feet per year for the period between 1994 and 2021 to about 14 feet per year for the period between 1994 and 2000. When considering the 2005 as the basis, the average

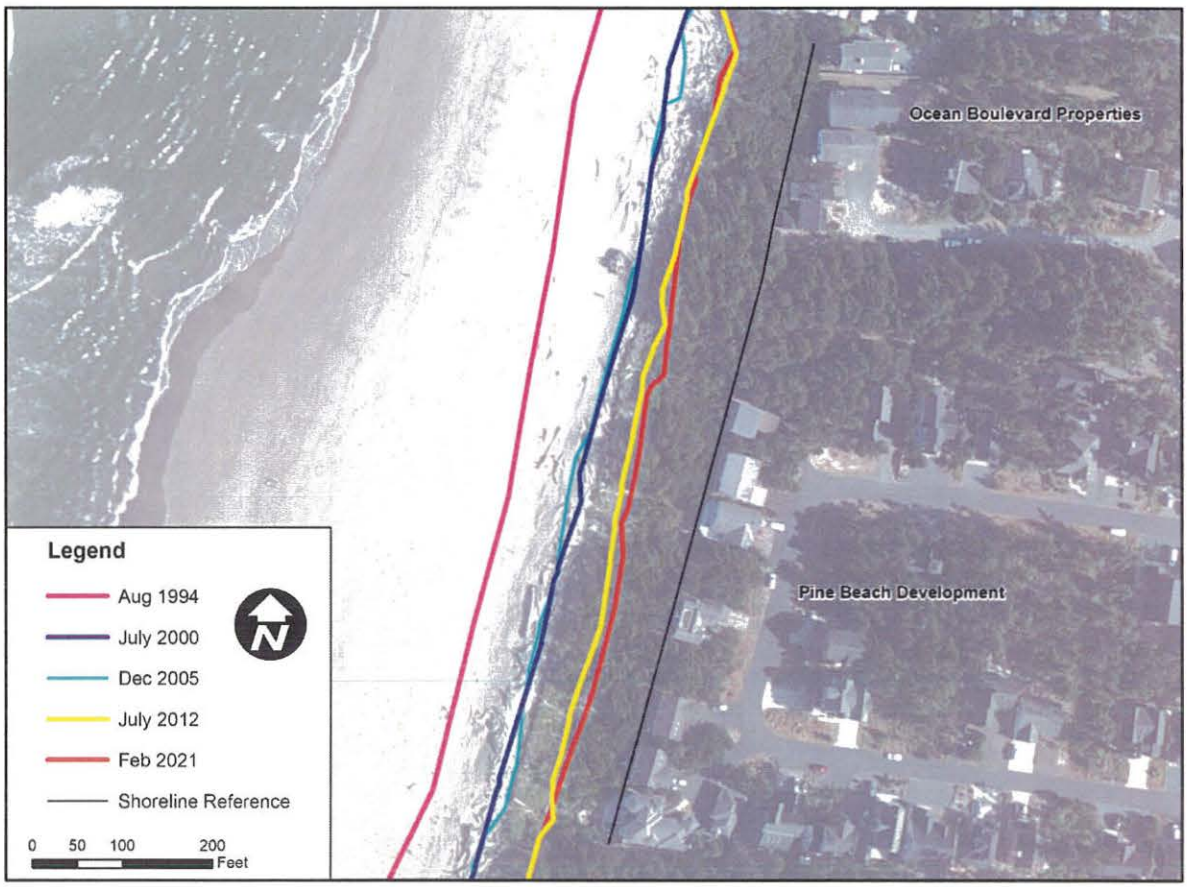

Figure 2. Top of shoreline for the period between 1994 and 2021

Table 1. Summary of Loss of Property from 1994 to 2021

Year	Distance from Western Edge of Oceanfront Homes along Pine Beach Development and Ocean Boulevard Properties (ft)	Loss of Property since 1994 (ft)
1994	221	0
2000	138	-83
2005	138	-83
2012	86	-135
2021	79	-142

annual erosion rate varies from about 4 feet per year for the period between 2005 and 2021 to about 8 feet per year for the period between 2005 and 2012. Using these rates and the distance from the top of foreshore to the homes being about 50 feet, the homes will be directly impacted by coastal erosion within four to ten years.

The present risk of significant flooding and significant damage to the 11 homes is high during King Tides and storm events in the absence of the construction of the recommended revetment.

The Pine Beach subdivision and the Ocean Boulevard properties are located within the Federal Emergency Management Agency (FEMA) Flood Hazard Zone "VE", which corresponds to areas impacted by coastal flooding and for which regulatory water surface elevations have been determined by FEMA. For coastal flooded areas, FEMA defines the stillwater (tide) levels for the 1- and 0.2-percent Annual Chance of Exceedance (ACE) and total water levels (tide plus wave runup) for the 10-, 2-, 1-, and 0.2-percent ACE. FEMA's stillwater and total water levels at the Pine Beach subdivision are summarized in Table 2 (FEMA, 2002).

Table 2. Summary of FEMA Stillwater and Total Water Levels versus Frequency

ACE (Percent)	Stillwater (feet)	Total Water Level (feet)[1]
10	-	23.4
2	-	25.0
1	11.8	25.6
0.2	12.1	26.8

Notes:
(1) Elevation is based on NAVD88 datum per FEMA FIS (FEMA,2002). The conversion factor from NAVD88 to NGVD29 is -3.54 feet.

3. Site Visit

A site visit was conducted by Chris Bahner, P.E., WEST Consultants, Inc., on January 17, 2020 and on January 30, 2021 to perform general site reconnaissance and document observations. Three board members from the Pine Beach subdivision participated in the January 17, 2020 site visit. Photos taken during the site visits are provided in Attachment 1.

Key observations from the January 2020 visit are as follow: (1) large woody debris had floated onto the backshore bench in front of the subject oceanfront properties, (2) large woody debris had accumulated at the western edge of the tree line (trees had prevented the woody debris from accumulating at the oceanfront houses), (3) beach access along the southern boundary is about 5.5 feet wide, (4) beach foreshore slope was constant and resembled a typical winter beach profile, (5) beach foreshore profile is consistent all the way up to the top of the shoreline (defined as the vegetation line, which is shown on sheet 2 of the construction plans provided in Attachment 2) with minimal vertical bank conditions, (6) a rock revetment structure is located along the Shorewood RV Park about 900 feet north of the Pine Beach subdivision, (7) the revetment consists of rock ranging in diameter from 1 to 5 feet placed at a slope of 1 Vertical (V) to 2 Horizontal (H), and (8) the rock revetment structure shows no signs of instabilities.

Key observations from the January 2021 visit are similar to the January 2020, but there were two noticeable differences: (1) the banks near the vegetation line were vertical, indicating some erosion has recently occurred, and (2) more debris existing along the beach foreshore slope.

4. Revetment Design

The revetment design includes the rock size, cross section configuration, and plan view layout. The rock size is based on typical rock size for rock revetment structures along the Oregon Coast.

They are comprised rocks ranging in diameter from 1 to 5 feet (well-graded gradation). A breaking wave height of 6.5 feet was estimated using the Hudson equation (USACE, 2011) and KD value for a well-graded gradation documented in Coastal Engineering Technical Note III-1 (CETN-III-1) (USACE, 2011). The breaking wave height would increase to 7.0 feet when using a uniform gradation with rocks ranging from 3 to 4 feet in diameter. The thickness of the revetment would also be slightly smaller. Thus, the uniform gradation is recommended to be placed with a total thickness of 6 feet. The rock should be angular and have a minimum specific gravity of 2.64 or a dry unit weight of 165 lbs/ft^3. The rock should consist of dense, natural rock fragments. They should be resistant to weathering and to water action; and free from overburden, spoil, shale and organic material. Shale and rocks with shale seams are not acceptable. The durability index and percent absorption shall be determined by American Association of State Highway and Transportation Officials (AASHTO) standards in AASHTO T 210 and AASHTO T 85, respectively. The rock revetment should also be placed over an 18-inch thick rock filter layer comprised of ODOT Class 50 (material ranging in diameter from 2 to 10 inches or fine gravel to large cobbles).

The cross section configuration includes the top and bottom elevations, top width, thickness, and side slopes. It is influenced by the physical constraints of a vegetation line along the eastern boundary, which defines the regulatory jurisdiction of the Oregon Parks and Recreation Department, and existing homes along the western edge. The cross section configure is shown in Figure 3. It consists of a top elevation of 23.8 feet, a bottom elevation of 12.0 feet, a side slope of 1V to 1.5H, and a launchable toe with an average length of about 10 feet. The top elevation was set as 3 feet above the ground along the proposed structure alignment. The maximum increase allowed by Tillamook County without a county land-use change approval is 3 feet. The survey and LiDAR data indicate that the ground along the proposed alignment is fairly flat. The average elevation along the proposed alignment was determined from the survey data to be 20.8 feet (Cook Surveying, 2019), so the top elevation of the structure will be 23.8 feet. The bottom elevation was set to be one-half the thickness of rock revetment below the elevation defined by projecting the beach foreshore slope to the eastern limit of the existing vegetation line, which was determined to be at an elevation of 15 feet. The foreshore slope was estimated from the LiDAR data to be 0.0448. This slope is consistent with the beach profiles for a medium-coarse sand beach, as documented in Figure 11-8 of *Beach Processes and Sedimentation* (Komar, 1976). A side slope of 1V to 1.5H was used because of the site constraints. A launchable toe is provided to ensure the rock revetment is not undermined by scour at the structure.

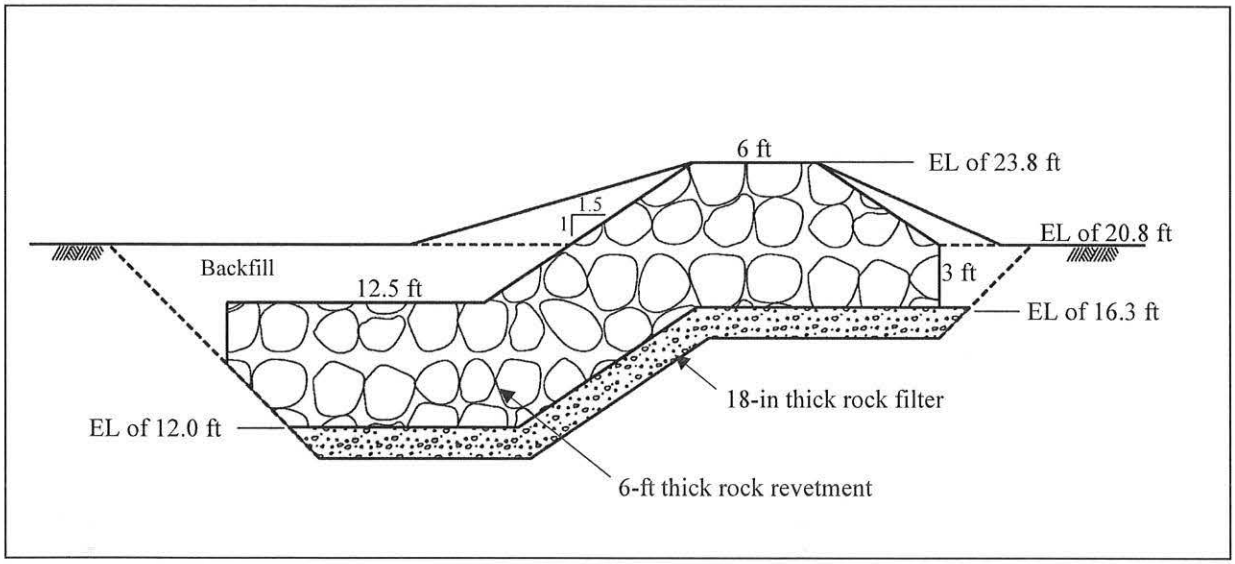

Figure 3. Cross section of proposed rock revetment structure

The layout of the proposed structure is shown in Figure 4. The proposed structure will be located landward (or east) of the existing vegetation line near the western edge of the beachfront properties and beachfront homes. The structure will be located about 185 feet landward of the "Oregon Ocean Shore Line". It will have a total length of about 840 feet. The northern and southern ends of the rock revetment will be angled into the bank to prevent flank erosion. An ecology block wall will be placed along the southern boundary and near the access ramp. Ecology blocks are concrete blocks that are used for building retaining walls. Typical blocks have a height of 2 feet, a width of 2 feet, and a length of 6 feet (or 3 feet). The wall at the southern boundary is required to ensure that the future wave runup does not flow around the main rock revetment structure and potentially flood the beachfront homes. The wall near the access ramp is required due to the physical constraints near the access area.

The construction of the rock revetment structure will require removal of the shrubs and trees where the structure will be built. All excavated sand shall be placed over and seaward of the rock revetment structure. It is also important that the disturbed area be re-planted with native grasses, shrubs, and trees; standard staked silt fences be placed along the disturbed area to prevent aeolian erosion; and that area is annually maintained in such conditions.

Construction plans for the proposed structure are provided in Attachment 2.

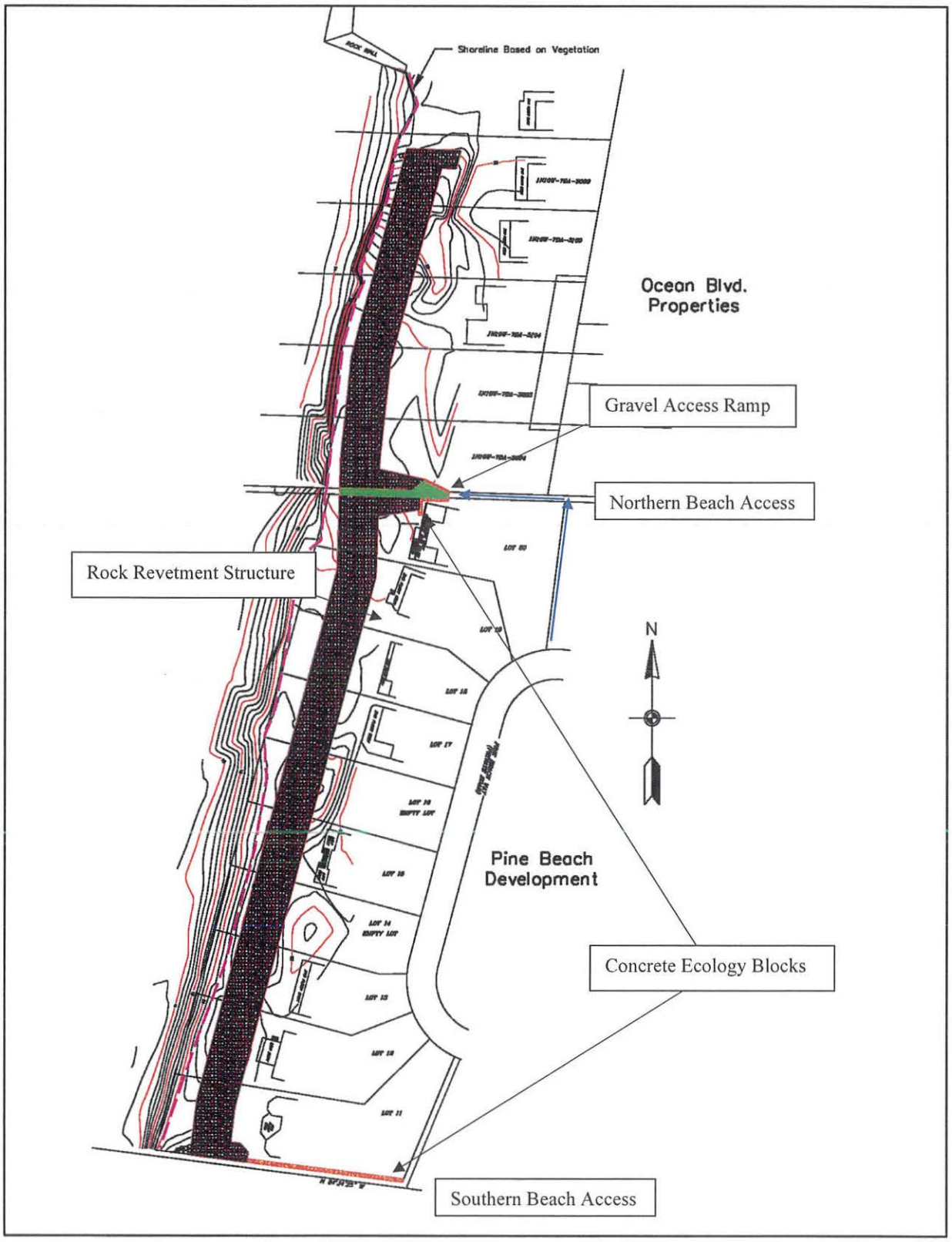

Figure 4. Plan view of proposed rock revetment structure

5. Tillamook County's "Detailed Site Investigation" Requirements

This section of the report addresses requirements of Tillamook County for the proposed revetment design to confirm that it will conform to the county's ordinance requirement.

5.1. Purpose

There is a high level of risk for future damage to structures, lots and infrastructure in the Pine Beach subdivision and Ocean Boulevard properties. There are fifteen lots and eleven homes (4 lots are undeveloped) that are significantly threatened by coastal erosion and flooding, and forty homes threatened by coastal flooding. Coastal flooding will also have an adverse impact on the water and sewer systems that Pine Beach subdivision and the Ocean Boulevard properties. Furthermore, if erosion is allowed to continue unchecked by the recommended revetment, the Pine Beach and Ocean Boulevard properties' water and sewer infrastructure is at risk as is Pine Beach Loop, which is the vehicular access to the Pine Beach subdivision development.

The proposed revetment structure will reduce the risk of damage to life, property, and the natural environment from beach erosion and coastal flooding resulting from large waves occurring during high tides. It will provide this protection over the lifetime of the structure. Due to the proximity of the shore and physical constraints, there are no other viable alternatives that are adequate to protect the Pine Beach subdivision and Ocean Boulevard properties.

The proposed structure will be located within the active eroding foredune, which has a crest elevation of about 20.8 feet and a width of about 100 feet. It will be located about 10 feet landward of the existing line of established vegetation and about 185 feet landward of the "Oregon Ocean Shore Line". The foredune has eroded about 142 feet since 1994 with the average erosion rate being 8 feet per year. This rate is consistent with the short-term rates (1960s to 2002) documented in *National Assessment of Shoreline Change: Historical Shoreline Change along the Pacific Northwest Coast* (USGS, 2012). No historic dune stabilization has been implemented and no protective structures exist within the immediate vicinity of the Pine Beach subdivision and Ocean Boulevard properties. However, there is a protective structure just north of the Ocean Boulevard properties and approximately 900 feet north of the Pine Beach subdivision, at the Shorewood RV Park.

All excavated sand shall be placed over and seaward of the rock revetment structure, so there will be no net loss of sand from the foredune area.

5.2. Location and Design of Roads and Driveways

The proposed revetment structure will be located in the backyards of the oceanfront houses along the Pine Beach Loop and Ocean Boulevard properties. It will not have any road or driveway features, or have any adverse impacts to existing roads or driveways.

5.3. Special Foundations Design

The proposed revetment structure was designed with granular filter per standards in the Oregon Department of Transportation Hydraulic Manual (ODOT, 2014). It was also designed with a launchable toe that will prevent undermining of the structure from future erosion near the structure.

5.4. Management of Stormwater Runoff During and After Construction

The proposed revetment structure will be constructed with rock, covered with sand material and planted with native beach grasses. It will be permeable and will not have any adverse impact on runoff from the project area during or after construction. Therefore, no management of stormwater runoff is required during or after construction of the proposed revetment structure. It should also be noted that there are not perennial streams or springs in the vicinity of the proposed structure.

5.5. Surrounding Property

The proposed structure will be constructed within the current backshore of the shore zone. The top of the revetment will be located about 35 feet east of the current top of foreshore. There will be no impacts to the surrounding property since it will not direct additional water to the surrounding property, increase wave heights/wave runup, or impact the natural littoral drift of sediment along the coast. The northern and southern ends of the rock revetment will be angled into the bank to prevent flank erosion.

A review of Google Earth photos of the shoreline within the vicinity of the Shorewood RV Park indicates no pronounced differences in the erosion of the shoreline south of the structure than what is naturally occurring within the area. The proposed structure will be located further inland and its location is at a higher elevation than the Shorewood RV Park, so the wave energy and erosion potential will be lower at the proposed structure. Thus, the proposed structure will not have an adverse impact to the surrounding properties. No additional measures are necessary to protect the surrounding area as a result of the proposed revetment structure.

5.6. Beach Access

The proposed project will improve the current beach access between tax lot 3204 and 123, which has accumulated large woody debris, making access difficult. The revetment design includes a gravel ramp that goes over the revetment to allow access to the beach. The ramp will consist of a 5-foot-wide gravel path that goes over the rock revetment at a 12-percent slope. Details of the path are shown in Sheet 5 of the Construction plans (Attachment 2). The proposed structure will not interfere with and there will be no impact to the other beach access along the southern boundary of the Pine Beach Subdivision.

5.7. Periodic Monitoring

Monitoring of the proposed structure should be performed by the owners on an annual basis and by an engineer or the contractor who builds the structure after a coastal event comprised of an extreme tide cycle coinciding with large waves or on a 5-year period. The annual inspections should note: (1) if rock structure is exposed, (2) any noticeable settlement of the structure, (3) displacement of rock or ecology block elements, (4) approximate distance of rock revetment to top of shoreline, and (5) vegetation conditions and identification if additional replanting is necessary. Annual inspection should be documented with pictures. The overall goal of the maintenance program will be that proposed revetment will be a sand-covered structure with native beach grasses and shrubs.

5.8. FEMA Hazard Zone "VE"

As previously stated, the proposed revetment structure will be located within the FEMA Hazard

Zone "VE," which is defined as coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. FEMA's minimum requirements as part of the National Flood Insurance Program (NFIP) for building, generally, within the "VE" zone include: (1) the building must be elevated on pile, post, pier, or column foundations; (2) the building must be adequately anchored to the foundation; (3) the building must have the bottom of the lowest horizontal structural member at or above the BFE; and (4) the building design and method of construction must be certified by a design professional. These requirements apply to construction of buildings within the "VE" zone, and only the last requirement is applicable to the proposed structure. The design and method of construction of the proposed rock structure will be certified and completed by design professionals, and the proposed structure will not cause an increase to the FEMA total water levels near the proposed structure.

5.9. Visual Effects

The recommended revetment will have no adverse visual effects as it will be covered in sand and planted with native beach grasses and maintained in that condition.

5.10. Findings and Conclusions

The rock revetment structure proposed for the Pine Beach subdivision and Ocean Boulevard properties is considered to be vital for reducing the risk of damage to life, property, and the natural environment from beach erosion and coastal flooding. The structure will be designed with adequate rock size and a launchable toe to prevent undermining of the structure. The structure will be located on private property within the FEMA Flood Hazard Zone "VE." It will meet the FEMA requirements for construction within this flood hazard zone. It will not have any adverse impacts to natural runoff of the area, beach access, or the surrounding properties. Finally, the structure will be monitored on an annual basis by the owners.

6. Summary

The beach front landowners of the Pine Beach subdivision and Ocean Boulevard properties (Figure 1) have been losing portions of their properties from coastal erosion, and have experienced coastal flooding of their homes. As a result, WEST conducted field site visits in January 2020 and January 2021, and designed a rock revetment structure to prevent future erosion of their property and to reduce the risk of coastal flooding. Photos taken during the site visits are provided in Attachment 1. A cross section of the proposed rock structure is shown in Figure 3. The plan view of the proposed structure is shown in Figure 4. Construction plans for the proposed structure are provided in Attachment 2. Information required by the Tillamook County code is also documented in Section 5 of this memorandum.

7. References

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ATTACHMENT 1

JANUARY 17, 2020 AND JANUARY 30, 2021 FIELD PHOTOS

Photo 1. Looking south at the rock revetment at the Shoreline RV Park located about 900 feet north of the Pine Beach subdivision.

Photo 2. Close-up of rock revetment at the Shoreline RV Park located about 900 feet north of the Pine Beach subdivision.

Photo 3. Looking south at the beach conditions in front of the Pine Beach subdivision.

Photo 4. Looking south at the vegetation line (top of shoreline) near the northern end of the Pine Beach subdivision.

Photo 5. Looking south at the vegetation line (top of shoreline) near the northern end of the Pine Beach subdivision. Note large debris on left side of photo.

Photo 6. Looking east at the debris existing in front of the southern-most house in the Pine Beach subdivision. Note presence of large debris.

Photo 7. Looking north at the upper part of the shoreline near the northern end of the Pine Beach subdivision.

Photo 8. Looking south at the foreshore conditions south of the Pine Beach subdivision.

Photo 9. Looking north at the vegetation line (top of shoreline) near the northern end of the Pine Beach subdivision.

Photo 10. Looking east along the southern boundary of the Pine Beach subdivision.

Photo 11. Looking east along the southern boundary of the Pine Beach subdivision.

Photo 12. Looking north from the southern boundary of the Pine Beach subdivision at top of shoreline.

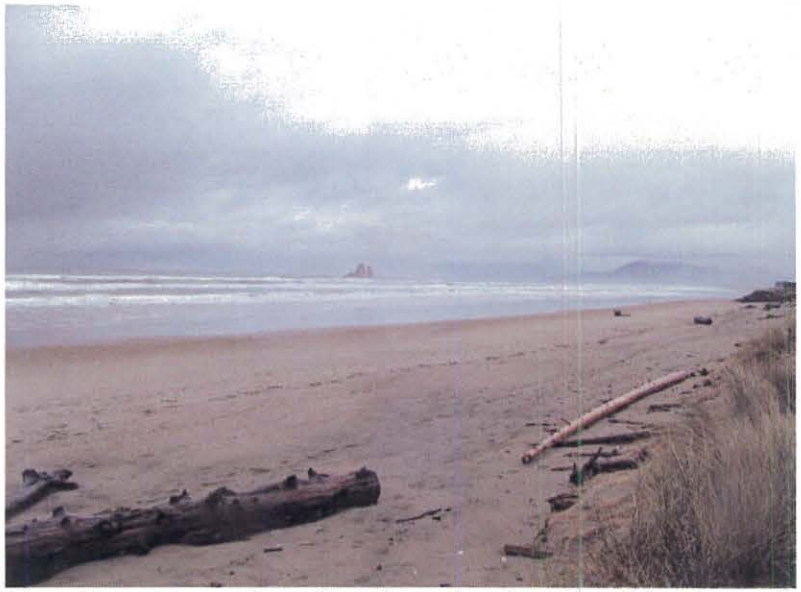


Photo 13. Looking northwest from the southern boundary of the Pine Beach subdivision at the foreshore conditions.

Photo 14. Pan view (Photos 14-15) of Pine Beach subdivision.

Photo 15. Pan view (Photos 14-15) of Pine Beach subdivision.

Photo 16. Looking north at the backshore bench in front of Pine Beach subdivision. Note presence of large debris.

Photo 17. Looking south at the backshore bench in front of Pine Beach subdivision. Note presence of large debris.

Photo 18. Looking south at the backshore bench in front of Pine Beach subdivision. Note presence of large debris.

Photo 19. Looking east along the northern boundary of the Pine Beach subdivision.

Photo 20. Looking west along the northern boundary of the Pine Beach subdivision.

Photo 21. Looking north at the vegetation line near the southern end of the Pine Beach subdivision.

Photo 22. Looking south at the vegetation line near the southern end of the Pine Beach subdivision.

Photo 23. Looking north at the foreshore conditions in front of the Pine Beach subdivision.

Photo 24. Looking north at the vegetation line from about 100 ft north of the southern end of the Pine Beach subdivision.

Photo 25. Looking south at the vegetation line from about 100 ft north of the southern end of the Pine Beach subdivision.

Photo 26. Looking north at the backshore bench in front of Pine Beach subdivision. Note presence of large debris.

Photo 27. Looking north at the top of the vegetation line from about 200 ft north of the southern end of the Pine Beach subdivision.

Photo 28. Looking south at the top of the vegetation line from about 200 ft north of the southern end of the Pine Beach subdivision.

Photo 29. Looking north at the backshore bench from the northern end of Pine Beach subdivision.

Photo 30. Looking south at the backshore bench from the northern end of Pine Beach subdivision. Note presence of large debris.

Photo 31. Looking south at the beach\vegetation line from about 50 ft south of the revetment at the Shoreline RV Park.

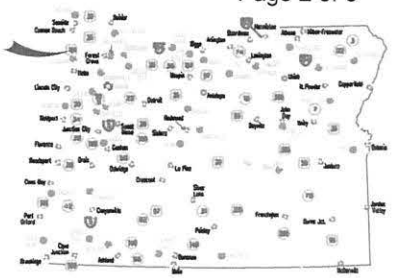
Photo 32. Looking south at the backshore bench from 50 ft south of the revetment at the Shoreline RV Park.

ATTACHMENT 2

CONSTRUCTION PLANS

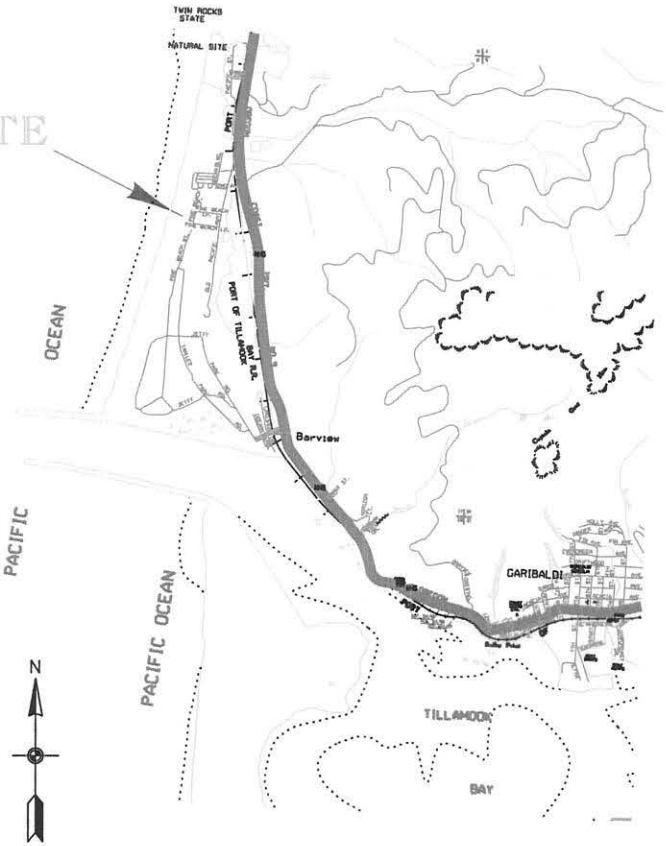
INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	EXISTING CONDITIONS
3	REVETMENT LAYOUT
4	REVETMENT DETAILS
5	REVETMENT RAMP DETAILS

PLANS FOR PROPOSED PROJECT
PINE BEACH DEVELOPMENT AND OCEAN BLVD. PROPERTIES ROCK REVETMENT
TILLAMOOK COUNTY
MARCH 2021



ATTENTION:
Oregon Law Requires You To Follow Rules Adopted By The Oregon Utility Notification Center. Those Rules Are Set Forth In OAR 952-001-0010 Through OAR 952-001-0090. You May Obtain Copies Of The Rules By Calling The Center. (Note: The Telephone Number For The Oregon Utility Center is (503) 232-1987.)

PROJECT SITE



GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIAL SHALL CONFORM TO THESE PLANS, THE PROJECT SPECIFICATIONS AND THE APPLICABLE REQUIREMENTS OF THE 2018 OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION.
2. THE COMPLETED INSTALLATION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, AND REGULATIONS.
3. ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULE ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER AT (503) 232-1987. EXCAVATORS MUST NOTIFY ALL PERTINENT COMPANIES OR AGENCIES WITH UNDERGROUND UTILITIES IN THE PROJECT AREA AT LEAST 48 BUSINESS-DAY HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS PRIOR TO COMMENCING AN EXCAVATION, SO UTILITIES MAY BE ACCURATELY LOCATED.
4. THE OWNER OR ENGINEER IS NOT RESPONSIBLE FOR THE SAFETY OF THE CONTRACTOR OR HIS CREW. ALL O.S.H.A. REGULATIONS SHALL BE STRICTLY ADHERED TO IN THE PERFORMANCE OF THE WORK.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL ROADWAYS, KEEPING THEM CLEAN AND FREE OF CONSTRUCTION MATERIALS AND DEBRIS, AND PROVIDING DUST CONTROL AS REQUIRED.
6. CONTRACTOR SHALL MAINTAIN ALL UTILITIES TO ADJACENT BUILDINGS AT ALL TIMES DURING CONSTRUCTION.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION AND SCHEDULING ALL WORK WITH THE OWNER.

REGISTERED PROFESSIONAL ENGINEER
67050
Chris Bahner
OREGON
7/9/2001
CHRIS D. BAHNER

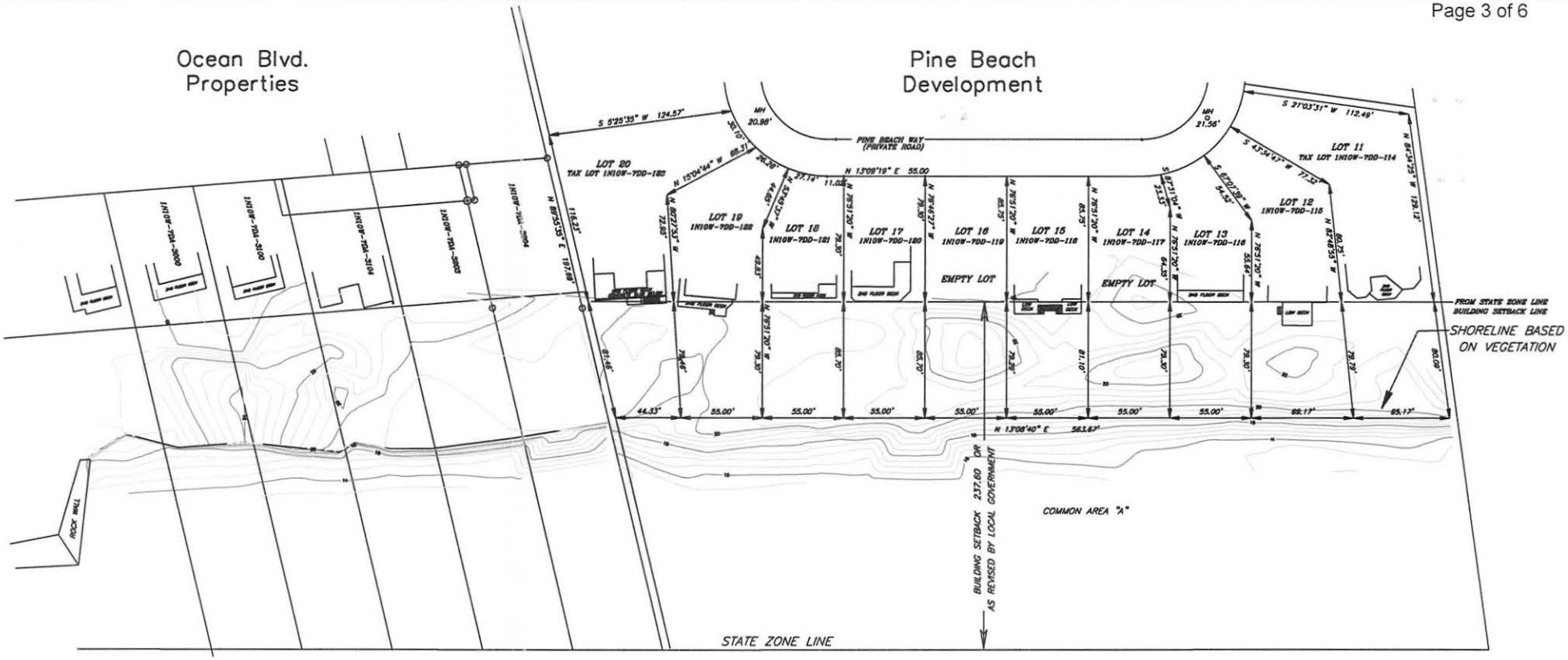
RENEWAL DATE: 12-31-2021

DESIGN ENGINEER

PINE BEACH DEVELOPMENT
ROCK REVETMENT
TILLAMOOK COUNTY

WEST Consultants, Inc.

SHEET NO. 1



NOTES

1. PINE BEACH DEVELOPMENT. TAX LOTS 114–123, SE–SE SECTION 7, T.1.N., R.10W. LOTS 11–20, PINE BEACH REPLAT TILLAMOOK COUNTY, OREGON.

2. OCEAN BEACH BLVD. PROPERTIES. TAX LOTS 3000, 3100, 3104, 3203 & 3204, NE–SE SECTION 7, T.1.N., R.10W., TILLAMOOK COUNTY, OREGON.

3. SURVEY COMPLETED BY C. WAYNE COOK LAND SURVEYING – 3180 ALDERCREST, TILLAMOOK, OREGON, (503–842–8380).

4. SURVEY COMPLETED FEBRAURY 2021.

5. VERTICAL DATUM OF NORTH AMERICAN VERTICAL DATUM OF 1988.

PLAN VIEW

70 35 0 70 140FT

SCALE: 1"=70'

REGISTERED PROFESSIONAL ENGINEER
67050
OREGON
7/9/2001
CHRIS D. BAHNER

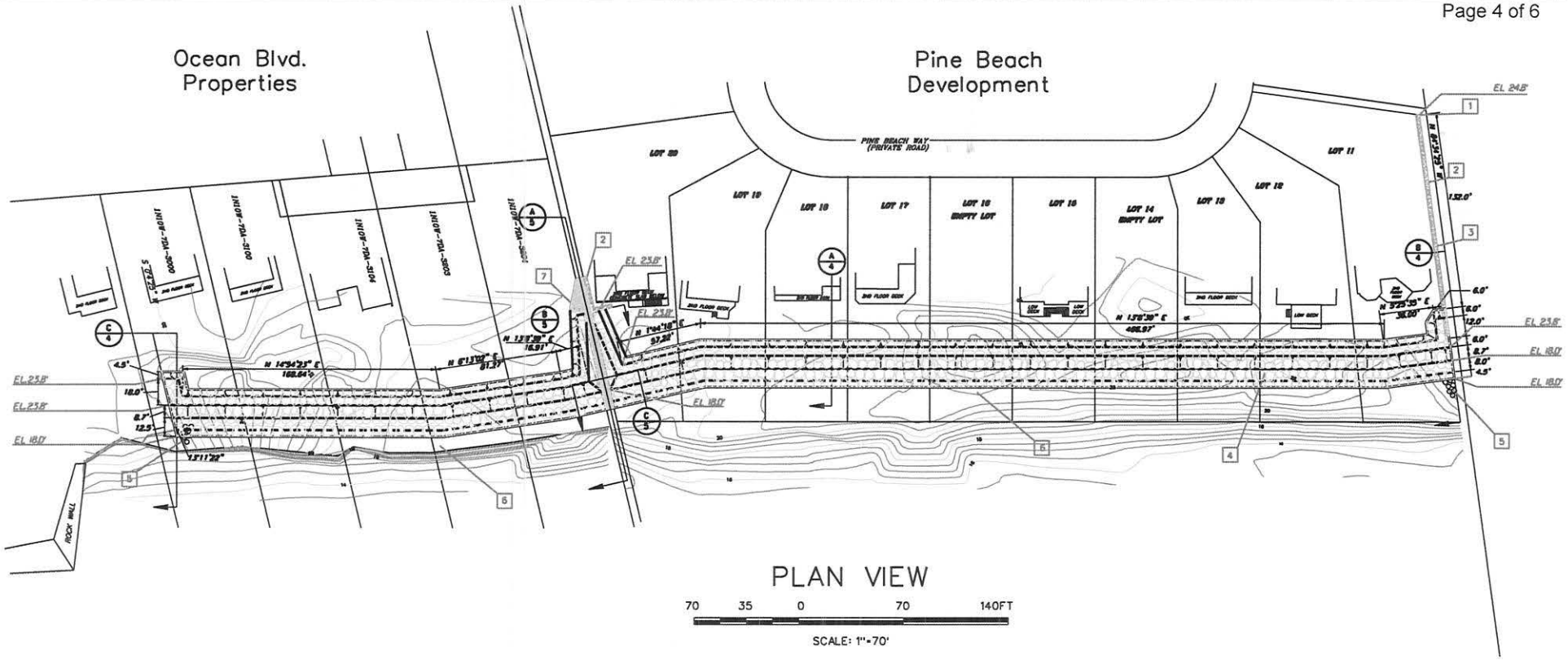
RENEWAL DATE: 12-31-2021

N

PINE BEACH DEVELOPMENT
AND OCEAN BLVD. PROPERTIES
ROCK REVETMENT
TILLAMOOK COUNTY

EXISTING CONDITIONS

SHEET NO. 2



PLAN VIEW

70 35 0 70 140FT

SCALE: 1"=70'

NOTES

1. CONTROL POINT AT CORNER OF WOOD FENCE ALONG THE SOUTHERN BOUNDARY OF PINE BEACH DEVELOPMENT LOT 11. X-COORDINATE OF 7,320,174.35 FT AND Y-COORDINATE OF 717,513.41 FT (HORIZONTAL DATUM OF NORTH AMERICAN DATUM OF 1983, STATE PLANE OREGON NORTH, FEET).
2. CONSTRUCT ECOLOGY BLOCK STRUCTURE. SEE DETAIL D ON SHEET 4.
3. REMOVE AND REPLACE EXISTING FENCE.
4. CONSTRUCT ROCK REVETMENT OVER GRANULAR FILTER. ROCKS SHOULD BE UNIFORM GRADATION RANGING IN SIZE FROM 3 TO 4 FT IN DIAMETER WITH THE ROCK HAVING A MINIMUM SPECIFIC GRAVITY OF 2.65. THE ROCK SHOULD CONSIST OF DENSE, NATURAL ROCK FRAGMENTS. ROCKS SHOULD BE RESISTANT TO WEATHERING AND TO WATER ACTION; AND FREE FROM OVERBURDEN SPOIL, SHALE AND ORGANIC MATERIAL. SHALE AND ROCKS WITH SHALE SEAMS ARE NOT ACCEPTABLE. THE DURABILITY INDEX AND PERCENT ABSORPTION SHALL BE DETERMINED BY AASHTO T 210 AND AASHTO T 85, RESPECTIVELY. COVER ROCK REVETMENT WITH SAND MATERIAL. SEE DETAIL A ON SHEET 4.
5. PLACE 7 3-FT-DIAMETER ROCKS AT AN ELEVATION OF 20.8 FT AND RANDOMLY SPACED NEAR THE NORTHERN AND SOUTHERN END OF PROPOSED STRUCTURE.
6. SAVE EXISTING LARGE LOGS, AND PLACE THROUGHOUT BENCH AREA. REPLANT DISTURBED AREA WITH NATIVE GRASS AND TREES. PLANTING COMPLETED BY OWNERS.
7. CONSTRUCT RAMP. SEE DETAIL ON SHEET 5.
8. ALL ELEVATIONS ARE BASED ON THE VERTICAL DATUM OF NORTH AMERICAN VERTICAL DATUM OF 1983.

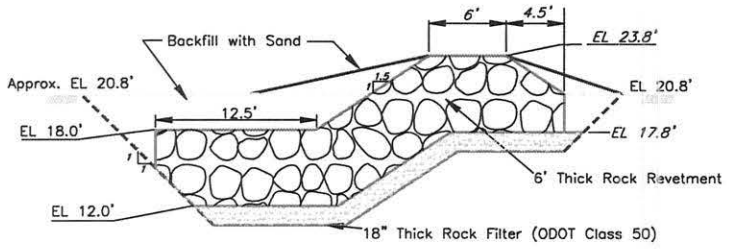
REGISTERED PROFESSIONAL ENGINEER
67050
Chris Bahner
OREGON
7/9/2001
CHRIS D. BAHNER
RENEWAL DATE: 12-31-2021

N

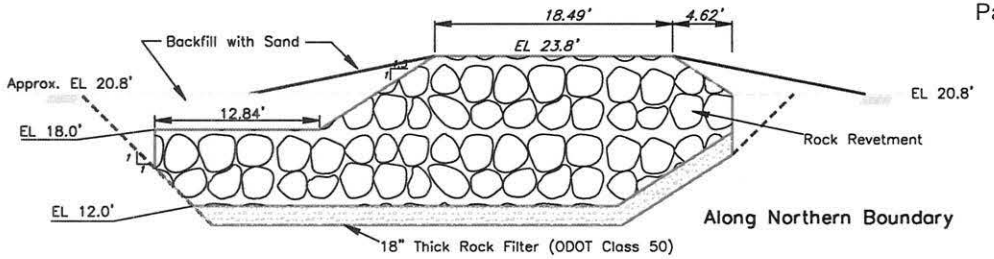
PINE BEACH DEVELOPMENT AND OCEAN BLVD. PROPERTIES ROCK REVETMENT
TILLAMOOK COUNTY

REVETMENT LAYOUT | SHEET NO. 3

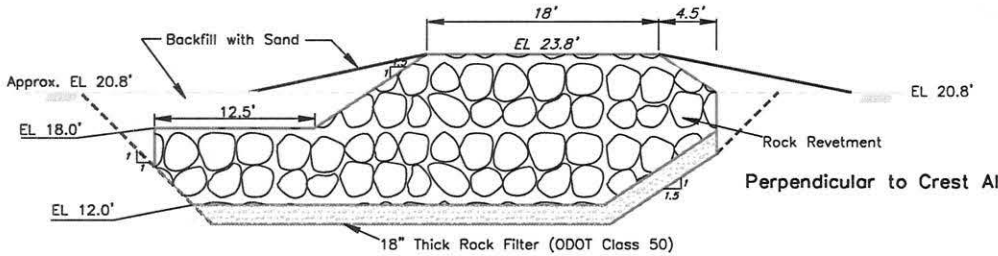
ALL ELEVATIONS ARE BASED ON THE VERTICAL DATUM OF NORTH AMERICAN VERTICAL DATUM OF 1988



DETAIL A – TYPICAL SECTION OF ROCK REVETMENT
(NOT TO SCALE)

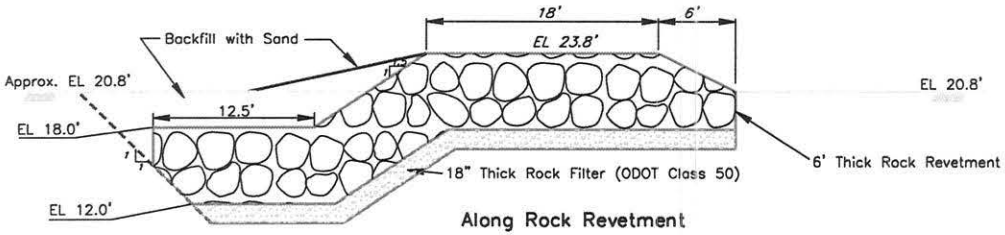


Along Northern Boundary

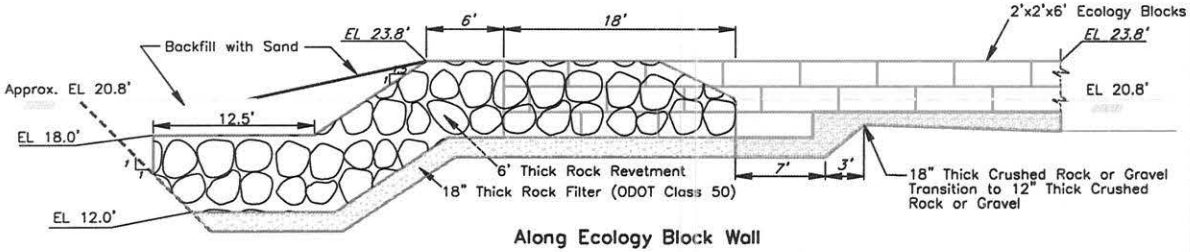


Perpendicular to Crest Alignment

DETAIL C – ALONG NORTHERN BOUNDARY
(NOT TO SCALE)

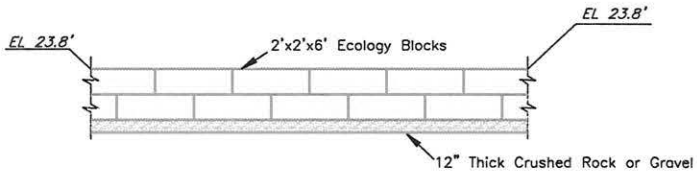


Along Rock Revetment



Along Ecology Block Wall

DETAIL B – ALONG SOUTHERN BOUNDARY
(NOT TO SCALE)



DETAIL D – ECOLOGY BLOCK WALL
(NOT TO SCALE)

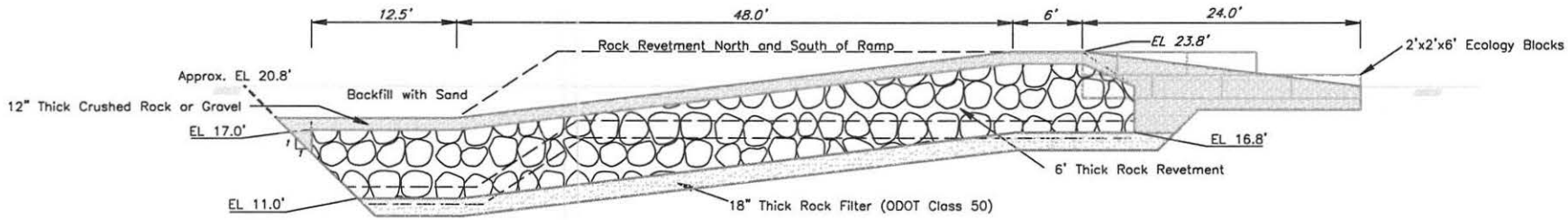
REGISTERED PROFESSIONAL ENGINEER
67050
OREGON
7/9/2001
CHRIS D. BAHNER
RENEWAL DATE: 12-31-2021

PINE BEACH DEVELOPMENT AND OCEAN BLVD. PROPERTIES ROCK REVETMENT
TILLAMOOK COUNTY

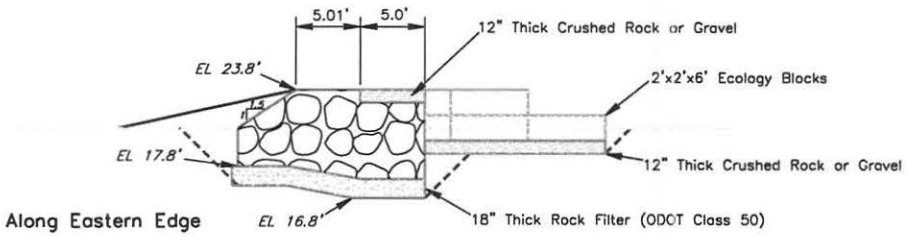
REVETMENT DETAILS

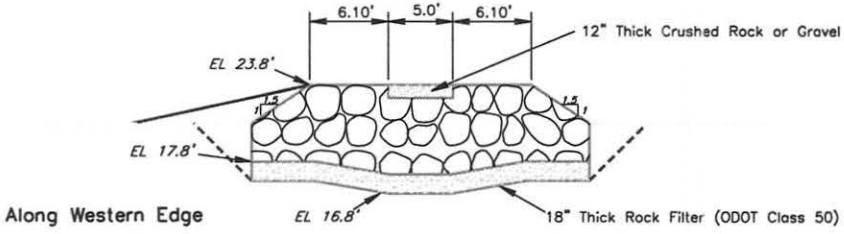
SHEET NO. 4

ALL ELEVATIONS ARE BASED ON THE VERTICAL DATUM OF NORTH AMERICAN VERTICAL DATUM OF 1988

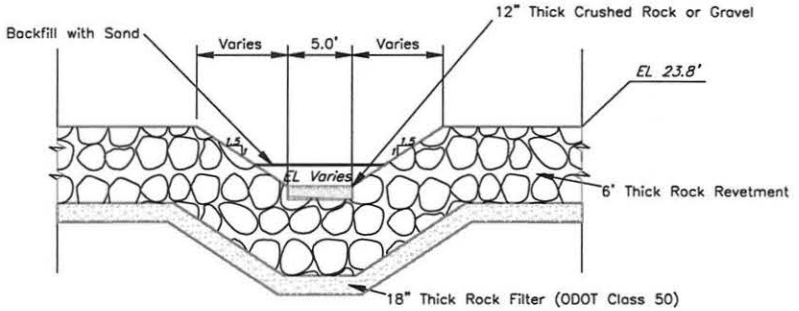


DETAIL A – TYPICAL PROFILE OF ACCESS RAMP
(NOT TO SCALE)





DETAIL C – TYPICAL SECTION OF ROCK REVETMENT
(NOT TO SCALE)



DETAIL C – TYPICAL SECTION OF ACCESS RAMP
(NOT TO SCALE)

REGISTERED PROFESSIONAL ENGINEER
67050
OREGON
7/9/2001
CHRIS D. BAHNER
RENEWAL DATE: 12-31-2021

PINE BEACH DEVELOPMENT
AND OCEAN BLVD. PROPERTIES
ROCK REVETMENT
TILLAMOOK COUNTY

ACCESS RAMP DETAILS

SHEET NO. 5

Tillamook County

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

201 Laurel Avenue
Tillamook, Oregon 97141

Land of Cheese, Trees and Ocean Breeze

Building (503) 842-3407
Planning (503) 842-3408
On-Site Sanitation (503) 842-3409
FAX (503) 842-1819
Toll Free 1-(800) 488-8280

DEPARTMENT OF COMMUNITY DEVELOPMENT
STAFF REPORT AND RECOMMENDATIONS
for
Preliminary Subdivision "Pine Beach Replat, Unit I"
Preliminary Subdivision "Pine Beach Replat, Unit II"
Variance Request V-94-19

STAFF REPORT DATE: September 1, 1994
PLANNING COMMISSION HEARING DATE: September 8, 1994

REPORT PREPARED BY: Lynda Willard, Operations Manager

I. GENERAL INFORMATION

Subdivision Name:	"Pine Beach Replat, Unit I" "Pine Beach Replat, Unit II"
Owner:	Jackson Roholt, et al. 10659 S.W. Lancaster Road Portland, OR 97219
Developer:	David Farr and Donald Nussmeier 25425 S.W. Swift Shore Drive West Linn, OR 97068
Designer & Engineer:	Handforth, Larson & Barrett, Inc. P. O. Box 219 Manzanita, OR 97045
Plat Size:	Unit I: 32 Lots in 7.8 Acres Unit II: 11 Lots in 2.4 Acres Total: 43 Lots in 10.2 Acres
Location:	Watseco; Tax Lots 100, 101 & 102 of Section 7DD, Township 1 North, Range 10 West
Zone:	R-2 (Medium Density Urban Residential)

Table of Contents:

General Information..... 1
Applicable Ordinance Provisions..... 2
Environmental Considerations and Other Applicable Findings..... 2
Analysis..... 4
Conclusions..... 9
Recommendation and Suggested Conditions of Approval..... 9
Exhibits..... 10

Proposed Development: "Unit I"-the developers are requesting Preliminary Subdivision approval for the creation of a 32-lot subdivision on 7.8 acres; "Unit II"-the developers are requesting Preliminary Subdivision approval for the creation of an 11-lot subdivision on 2.4 acres; and "Variance Request V-94-

19"-the developers are requesting approval to reduce the required minimum 150 ' road curve radius from 150' to 45' for two road curves on Pine Beach Loop for the proposed "Pine Beach Replat, Unit I" subdivision.

Description of Site and Vicinity: The subject requests are for property located within the Barview-Watseco-Twin Rocks Community Growth Boundary. More specifically, this property is located within the Watseco area, between Pacific Boulevard and the Pacific Ocean, immediately north of Camp Magruder and approximately two miles south of Rockaway Beach.

The subject property is designated as Tax Lots 100. 101 & 102 of Section 7DD, Township 1 North, Range 10 West of the Willamette Meridian; Tillamook County, Oregon.

Existing Services: The Subject parcel is located within the Twin Rocks Sanitary District, Watseco-Barview Water District, School District #56, and the Garibaldi Rural Fire Protection District. The subject parcel obtains access from Pacific Boulevard which is a public right-of-way.

II. APPLICABLE ORDINANCE PROVISIONS

These applications are for property located within an R-2 (Medium Density Urban Residential) zone. The proposed subdivisions are reviewed against the standards of Sections 21, 22, 23, 24, 41, and 42 of the Land Division Ordinance. Permitted uses and lots must meet the requirements of the R-2 zone, Section 3.014 of the Land Use Ordinance. These applications must also meet the requirements of the Beach and Dune and Flood Hazard Overlay zones. The variance from road standards of the Land Division Ordinance is reviewed against the review criteria of Section 51 of the Land Division Ordinance.

III. ENVIRONMENTAL CONSIDERATION AND OTHER APPLICABLE FINDINGS

Topography/Vegetation: This part of the coast consists of relatively flat dunefields stabilized by logs and vegetation. The topography of the property is generally flat, with a slight (approximately 5 foot) rise at the west end adjacent to the beach. The property is covered almost entirely with pines of varying ages, showing a gradation as one moves from west to east. The eastern end of the property at Pacific Blvd. is dominated by mature conifer species and salal. On moist winter days a number of mosses, lichens, and mushrooms may be found covering ground and trees alike. Further west, the mature stand gives way to younger pines, and eventually to bushy shore pines which have been shaped by the wind. Among the shore pines are salal and beach grasses.

Aerial photographs show a general thickening of vegetation since 1967 as younger pines have matured. The pines at the western end are interspersed with beach grass forming a foredune. The foredune vegetation ends abruptly at approximately the Beach Zone Line, where a 3-7 foot bluff separates the platted property from an open sand beach. This bluff is a nearly vertical face where the ends of buried beach logs are exposed. There is evidence of recent wave undercutting and slumping of the bluff. Although there is little vegetation on the beach west of the bluff, American Beachgrass is attempting to establish itself in small, isolated clumps adjacent to the bluff.

Soils: The 1975 publication Beaches and Dunes of the Oregon Coast, prepared by the U.S.D.A. Soil Conservation Service and the Oregon Coastal Conservation and Development Commission indicates that this area is a combination of active foredune, open dune sand conditionally stable, younger stabilized dune, and older stabilized dune classifications. In the time since that report, the increase in vegetation density and the prevalence of conifer species indicates that the stability of these soils has increased. Today, the site consists almost entirely of recently stabilized foredunes and older stabilized dunes. The older stabilized dunes are confined to the mature forest areas, whereas the younger forest stands indicate more recently stabilized dunes.

Geology: Since construction of the Tillamook Bay North Jetty, the area running from Watseco Creek to Barview has experienced periods of accretion. This property is part of that accumulation of beach sand adjacent to an older dune ridge all lying west of Highway 101. To the east rise steep foothills composed chiefly of sedimentary rocks. Trapped between the sand and the foothills is Smith Lake, a fresh water lake. Smith Lake is surrounded by a complex set of wetland types, indicating that part of this sandy area has been stable for a long period of time. The DOGAMI Bulletin #74 shows the western two-thirds of the

property to be an area of "High Ground Water" (with water table 6' or less below surface during wet seasons.)

Wetlands: The National Wetlands Inventory Map for the Garibaldi area shows that the 4.56 acre parcel east of Pacific Boulevard contains wetlands designated PFOC and PSSC. These wetlands have not been field delineated, but it is apparent that wetland areas lie immediately adjacent to the existing road. The Department has notified the Oregon Division of State Lands. The developer has submitted a letter which states that he has no intention of disturbing or modifying the wetland area at any time. The property to be developed has some of the characteristics of interdune deflation areas. Wetland areas are also characteristic of interdune areas. No wetlands were immediately recognized by staff in the field. However, the dune characteristics, heavy forest vegetation, and mapped high water table are evidence that some wetland areas may be present. The applicants have submitted recent wetland information contained within their report.

Other Findings of Fact:

A. The lots are 6,050 square feet or larger and the minimum lot size for the zone is 5,000 square feet. The density of the proposed development is 4.2 lots per acre. There are 10 ocean front lots for which special building setback and height regulations apply. (see Applicant's packet)

B. The property totals 16.8 acres, and is bisected by Pacific Boulevard. The 4.56 acres east of Pacific Boulevard is heavily vegetated and contains wetlands designated on the National Wetlands Inventory Map. The remaining 12.25 acres of the ownership lies west of Pacific Boulevard and is the area designated to be developed in this proposal.

C. The applicant has stated that there is no plan to develop the property east of Old Pacific Highway (Pacific Boulevard) at this time, and that they have no intention of modifying the wetland area at any time.

D. Element 14 (Urbanization) of the Tillamook County Comprehensive Plan established a Community Growth Boundary around the unincorporated communities of Twin Rocks and Barview. The Boundary was established by making findings which met the Goal 14 definition of "urban areas". Goal Element 14 explains: "A community growth boundary separate from that of the City of Rockaway has been developed so that Twin Rocks/Barview residents could retain their own sense of livability." Density of residential development in the Twin Rocks/Barview area is from 3 to 9 units per acre.

E. Under the Goal 2 exception process a Goal 17 (Shorelands) exception was taken for this area. However, no Goal 18 exception has been taken for this area.

F. Section 2.2 of the Goal 18 element of the Comprehensive Plan describes beach and dune capabilities. This section indicates that recently stabilized foredunes have low levels of tolerance for urban development and are prone to activation if the vegetative cover is removed. Older stabilized dunes have high levels of tolerance for urban development.

G. National Flood Insurance Rate maps indicate that a portion of the property is subject to flooding.

H. The existing adjacent zone to the north is R-2 and includes the Watseco subdivision. The area is bordered on the south by Camp Magruder, zoned RM Recreation Management. The property is bordered on the east by the Southern Pacific Railroad right of way, Highway 101, and land designated Forest (F).

I. The only road access from Highway 101 is via Pacific Boulevard. Highway 101 is currently developed with a two lane road at its intersection with Pacific Boulevard. The railroad right of way is immediately west of and parallel to Highway 101, and crosses Pacific Boulevard at this point. The distance to the subject area is 0.25 miles along Pacific Boulevard from this intersection.

J. Pacific Boulevard is currently improved with an asphalt surface approximately 15 feet wide. The development will improve Pacific Boulevard adjacent to the subdivision plat. This road section has been routed westward to avoid impacts to the wetlands along the eastern side of the road.

K. The developer has submitted proposed covenants, conditions and restrictions along with a planning justification statement, an engineering summary statement, a dune hazard report, wetland report, flood study, and a tentative plat. This information is, by this reference, made a part hereof.

L. The original plat of "Pine Beach" was recorded in 1932, and contained 121 lots which were generally 40 feet by 80 feet in size. The platted lots were bordered by Lakeside Drive at the Southern Pacific right of way on the east, and by Ocean Boulevard on the west. Six lots were sold in 1932 and 1933. The entire plat, with the exception of Second Street between Pacific Highway and Ocean Boulevard and the separate ownerships along Second Street, was vacated in 1941. The ownership was conveyed to the heirs of the owner, Elizabeth Jackson, in 1985.

M. Notices were mailed to 51 individuals and agencies, as required by law, prior to this hearing. To date staff has only received those agency responses found in the blue section of the report. Response submitted by individuals is found in the salmon colored pages. There comments are, by this reference, made a part hereof.

IV. ANALYSIS

Comprehensive Plan Ordinance (32)

Tillamook County established a Community Growth Boundary (CGB) around Barview, Watseco and Twin Rocks based on the procedures and requirements of the Goal 2 exceptions process. Planning for the these unincorporated communities was completed in accordance with Goal 14 Urbanization. This area is described as a "functionally urban area" primarily due to sewer and water service availability, a significant growth rate, and existing residential densities of 3 to 9 dwellings per acre. The proposed plat is located within this Community Growth Boundary (CGB). This is consistent with Plan policies for development within CGBs which encourage development within urban areas before conversion of urbanizable land and resource lands. The proposed density is less than 5 dwellings per acre.

The plat is also located in a beach and dune area as identified by the Goal 18 Element of the Comprehensive Plan. The Plan found that "younger and older stabilized dunes" are the most suitable dune forms for urban and rural development. Residential development can easily occur in these areas without creating any adverse effects or hazards on the site or in surrounding areas.

The plats are within a dune area suitable for development subject to a site evaluation. Land Use Ordinance Section 3.085(5) implements evaluation requirements and development standards through Dune Hazards Reports. The applicant has submitted a Dune Hazards Report.

Land Use Ordinance (33)

Section 3.014 Medium Density Urban Residential Zone (R-2), Subsection (4) Standards. All land divisions and development in the R-2 zone must conform to the standards of this section, unless more restrictive supplemental regulations apply or variance approval is granted

Findings: Only residential uses are proposed. All of the proposed lots in Unit I meet the size, width, and depth requirements of this section. One lot (# 43) in Unit II does not conform to the minimum required lot depth. A variance for that lot will be reviewed by the Planning Commission at their September 22 meeting. All other required standards will be reviewed at the time of building permit application.

Conclusion: Staff finds that the requirements of LUO Section 3.014 are met in Unit I and will need to be reviewed further for the one lot in Unit II later in September through the variance process

Section 3.060 Flood Hazard Overlay Zone (FH), requires that the following standards be met when reviewing subdivision proposals within the flood plane areas;

"(i) All subdivision proposals shall be consistent with the need to minimize flood damage.

"(j) All subdivision proposals shall have public utilities and facilities such as sewer, gas, electrical and water systems located and constructed to minimize flood damage.

"(k) All subdivision proposals shall have adequate drainage provided to reduce exposure to flood damage.

"(l) Where base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least 50 lots or 5 acres (whichever is less)."

Findings: These standards either will be met or have been justified within the applicants submittal information. The flood information provided by the applicant has been reviewed and approved by FEMA and as a result will be accepted by the County.

Conclusion: The applicant has provided sufficient information to indicate that these standards will be met.

Section 3.085 Beach and Dune Overlay Zone (BD): This zone contains requirements which are intended to regulate development in a manner that conserves, protects and, where appropriate, restores the natural resources, benefits, and values of coastal beach and dune areas, and reduces the hazard to human life and property from natural events or human-induced actions in these areas. The Overlay Zone establishes guidelines and criteria for the assessment of hazards resulting from beach and dune processes and development activities in beach and dune areas. The applicable portions of this section are listed below.

Applicability: Section 3.085 (2) A and B, defines areas where the provisions of the BD Overlay Zone apply. Applicability is based on dune type and the inventory of beach and dune landforms contained in the Soil Conservation Service 1975 report, Beaches and Dunes of the Oregon Coast.

Findings: The SCS report indicates that the plat site is fronted by Active Foredunes on the west, conditionally stable dunes inland initially, with an area of Younger Stabilized Dunes further inland. In 1993, the author of the 1975 SCS report, Dr. Frank Reckendorf, revisited the site at the request of Tillamook County. Dr. Reckendorf noted that the foredune area has eroded away recently, and the site is a mixture of conditionally stable dunes to the west of the proposed plat and younger stabilized dune in the location of the proposed plat.

The applicant has submitted a supplemental study indicating that the portions of the parcel designated for development are not subject to ocean undercutting or wave overtopping in a 100-year storm event. Section 3.085(4)(A) permits residential development in this type of dune area subject to the site development requirements of Section 3.085(5).

Staff notes that this site is not a location where beachfront protective structures are authorized by an exception to Goal 18 or where development existed as of January 1, 1977.

Site Development Standards: Section 3.085(5)(A) General Development Criteria.

Findings: No deflation plain or groundwater resources are to be impacted.

The Land Grading Practices of Subsection 2 apply to this request. Some grading will be required to site Pine Beach Loop road and for lot development. The drainage and erosion standards apply. The Dune Hazard Report contains the required erosion control and vegetation plans.

Conclusion: Staff finds that the proposal can meet these standards. A recommended condition of approval is requiring a vegetation conservation plan be approved prior to development.

Dune Hazard Report: Section 3.085(5)(B) requires a Dune Hazard Report prior to the approval of subdivisions. Subsection (3) of this section allows the applicant to submit a report which meets the standards of a Preliminary Site Investigation unless a Detailed Investigation is recommended by the consultant. All reports must contain the Summary Findings and Conclusions under subsection (3)(c).

Subsection (3)(a) Preliminary Site Investigation. The Preliminary Site Investigation is conducted by a qualified person, examples of which are listed. The purpose of the Preliminary Site Investigation is to describe the site, identify hazards and recommend either standards for development or additional investigation is needed. Descriptive geographic information is required.

Findings: The June 3, 1994 Dune Hazards report was prepared by Ron Larson, a Registered Professional Engineer, and Paul See, a Registered Professional Geologist.

Additionally, an Engineering Report prepared by David Simpson, a Coastal Engineer, dated September 1993 studies potential flooding conditions. This report was prepared for a Flood Insurance Rate Map Revision Request for the Pine Beach Replat. The map revision request was accepted by FEMA on April 16, 1994.

The report contains all the required descriptive geographic elements, as applicable.

Conclusions: Staff finds that the report adequately describes the geology and hazards of the site for the purposes of a Preliminary Site Investigation.

Subsection 3(b) Detailed Site Investigation. The purpose of the Detailed Site Investigation is to fully describe the extent and severity of identified hazards. The report is to recommend development standards to assure that proposed alterations and structures are properly designed so as to avoid or recognize the hazards identified and described.

Findings and Conclusions: Staff finds the report identifies situations where more detailed information would be required and recommends all the necessary development standards. Compliance with these standards is a recommended condition of approval.

Subsection (3)(c) Summary Findings and Conclusions. The Preliminary and Detailed Site Reports shall include the following summary findings and conclusions:

"1. The proposed use and the hazards it might cause to life, property, and the natural environment;

"2. The proposed use is reasonably protected from the described hazards for the lifetime of the structure.

"3. Measures necessary to protect the surrounding area from any hazards that are a result of the proposed development;

"4. Periodic monitoring necessary to ensure recommended development standards are implemented or that are necessary for the long-term success of the development."

Findings: Staff finds that the report makes the required findings and conclusions and recommends the Commission adopt the report as part of the basis for its decision.

Land Division Ordinance (35)

Section 21, Tentative Plat; General Information: This section specifies what general information is required on all tentative subdivision plats. The proposed name of the subdivision, the date, northpoint and scale of the drawing; description of the proposed tract; identification of the map as a tentative plat; names and addresses of those involved in preparation; is to be indicated on the Tentative Plat.

Findings: The proposed name of the subdivisions "Pine Beach Replat, Units I & II" duplicate the existing subdivision that is being replatted. Other than that the proposed names do not resemble or duplicate the name of any other subdivision in the county. All of the other information required under this section is included on the Preliminary Subdivision Plat maps, dated June 3, 1994, and supporting plans and documents submitted by the applicant. The applicants "Application Package for Pine Beach Replat I and II Index" lists all the documentation provided by the applicant all of which are in support of these requests, and are by the reference, made a part hereof.

Conclusion: This requirement is met.

Section 22, Tentative Plat; Existing Conditions: This section specifies the information required showing existing conditions in and surrounding the proposed subdivision.

Findings: Sheets 1 and 2 contain this information.

Conclusion: This requirement is met.

Section 23, Tentative Plat; Proposed Plan of Land Division: This section specifies the information required showing the proposed plan of land division. The Tentative Plat must show proposed street names, location width, grades, typical cross section, and curve radii, and how proposed streets intersect existing streets; description of easements, location and dimension of all lots and lot and block numbers; storm water drainage plan; water distribution plan; sewage disposal plan; and certificates or letters of service availability from utilities or special districts.

Findings: Sheets 1 and 2 and the applicants submitted information show the required information.

Conclusion: This requirement is met.

Section 24, Tentative Plat; Supplemental Information: This section allows the Department to require certain additional information to supplement the proposed plan of subdivision. Staff requested additional information under the items listed below.

"2. Special studies of areas which appear to be hazardous due to local geologic conditions."

"6. In areas subject to flooding, materials shall be submitted to demonstrate that the requirements of the Flood Hazard Overlay Zone (FH) of the County's Land Use Ordinance will be met."

Findings: Staff requested of and received documents from the applicant pertaining to flooding, wetlands and beach and dunes. Those reports are contained within the applicants submittal information which is a part of this report. Staff has reviewed all of the reports and finds that they are consistent with the applicable regulations and that the proposal is consistent with those reports.

Conclusion: This requirement is met.

Section 41 Improvement Requirements specifies improvements which shall be installed at the expense of the developer. These improvements include water supply, sewage disposal, streets, access to lots, and drainage.

Findings: All of the improvements required under this section are either indicated as being provided by the developer, or will be included as conditions of approval.

Conclusion: This requirement is met.

Section 42. Improvement Standards provides that the design, improvement, and construction of all roads and streets resulting from the division of land shall comply with the following standards and requirements to the extent possible given topography, aesthetics, safety, or other design considerations. This section also contains design standards for other elements of subdivisions, and gives the county authority to require reservation or dedication of land for public purposes.

Findings: With the exception of curve radii on two corners, the applicant indicates that all improvement standards will be met. This request includes a variance for two road radii and that discussion is contained further on in this report.

The Public Works Department has reviewed the plans and has submitted comments regarding their observations.

A special setback line is indicated on the plat which delineates the oceanfront setback line. No structures will be built westward of this line in the future.

Conclusion: The variance is discussed later, however, if the Commission approves the variance this requirement will be met.

Land Division Ordinance Section 51 Variance Application. The applicant is proposing a reduction in curve radii on two curves required by the street standards of LDO Section 42. The Planning Commission may authorize a variance to the LDO standards if it makes the following determinations:

"1. **Where there has already been tentative approval of the land division, a variance is necessary to serve the proposed lots or parcels;"**

Findings: No tentative approval has been granted.

"2. **Substantial hardship would result from strict compliance with these regulations or the conditions of the preliminary approval, due to special circumstances or conditions affecting the property, over which the developer has no control;"**

Findings: Item 1 of the applicants justification addresses this criteria and Staff concurs with the applicants analysis.

"3. **The variance complies with the intents and purposes of these regulations, and will not be injurious to the use of the tract for homesites or to other property in the vicinity;"**

Findings: Through conversations with the Public Works Department Staff it has been understood that the proposal is a logical request and is justified in this situation.

"4. **The requested variance is the minimum necessary to alleviate the hardship."**

Findings: The applicants address this criteria well within their report and Staff concurs with their analysis.

Conclusion: Staff feels that all review criteria have been adequately justified. Additionally, Staff feels that denying the applicants variance request for road curves in Unit I would require a redesign of the plat and probably lead to not only a decrease in lots, potentially, but an unusual loop situation for the roadway. If the Commission agrees that denial of this variance is a substantial hardship to the applicant then Staff feels the requirements of LDO, Section 51 are met.

Road Approach Ordinance (44)

Section VII Standards contains the design requirements for vehicle access to and from roads. These requirements include sight distance, minimum separation between approaches and from intersections, a standard profile of the slope at which a driveway may leave the edge of a traveled way, and other design standards. Lots platted through the subdivision process must be able to meet these requirements when they are developed.

Findings: All of the lots are planned to access onto streets that need little or no grading. Therefore, access should not be limited in any way.

V. CONCLUSIONS

Staff concludes that the applicants have satisfied the minimum application requirements, and can satisfy all applicable ordinance requirements prior to final plat approval. Staff also concludes that all of the Variance Review Criteria have been met as they apply to Variance Request V-94-19.

VI. RECOMMENDATION AND SUGGESTED CONDITIONS OF APPROVAL

Based upon the findings of fact, conformance with applicable Variance Review Criteria and other relevant information contained within this report, Staff recommends **APPROVAL** of Preliminary Subdivisions "Pine Beach Replat, Units I & II" and Variance Request V-94-19, subject to the following conditions:

A. Prior to development requiring a building permit, each future property owner shall provide a project-specific and site-specific Detailed Site Investigation/Dune Hazard Report meeting the requirements of the Beach and Dune Overlay Zone.

B. The Mandatory Standards listed in the Dune Hazard Report and modified Dune Hazard Report, dated June 3, 1994, for the Pine Beach Replat shall be required for all development or construction as outlined within this applications.

C. A vegetation conservation plan shall be required when applying for a building permit. The following elements shall be included in vegetation plans and on building plans. These are minimum standards/requirements. Staff may require further information prior to building permit approval, including but not limited to:

1. A signed written statement that excavation will not start more than 30 days prior to pouring foundation footings for houses or trenching for utilities installation.

2. A signed written statement that the site shall be stabilized by reestablishment of vegetation or other approved means no later than 9 months after termination of major construction.

3. Plans indicating methods to be used to protect footings from erosion and undermining during construction.

4. Plans indicating proposed method of stormwater disposal.

5. Stabilization plan for continued maintenance of disturbed areas.

6. Written documentation which describes protection measures for undisturbed areas such as installation of construction fencing.

7. Building plans shall show that the following lot coverage standard will be met: Disturbed lot area shall be the minimum necessary to place structures on a lot, but in no case shall the disturbed area for ocean front lots be greater than 50% of the lot, or not greater than 60% of lot area for non-oceanfront lots.

8. A signed written statement that tree topping will be limited to that which is necessary to maintain the stability of the tree.

D. Vegetative measures to maintain the existing foredune at or above its current height shall be implemented prior to or concurrent with any development of the parcel. Reasonable efforts shall be implemented to guard against adverse flood effects.

E. The development shall conform to all PUD policies.

F. The development shall conform to all applicable Fire District regulations.

G. The development shall meet all conditions contained within the Public Works Department letter regarding this application and all regulations contained within the Tillamook County Land Division Ordinance, except where a Variance to those regulations has been granted.

H. The development shall meet all of the conditions, regulations, and concerns of the Twin Rocks Sanitary District, Twin Rocks-Watseco Water District and United Telephone.

I. The building setback line delineated on the approved tentative plan of "Unit I" is to remain for all subsequent development in this subdivision. This information shall be written onto the final plat as text and shall be so delineated on the plat map.

J. All taxes owed shall be paid in full.

K. The common area will be held as an undivided interest by lot owners of the subdivision.

L. Access to the beach will be limited to the two platted easements.

M. The applicant shall conform to all Federal, State, and County regulations and shall obtain all required permits prior to construction and/or development.

VII. EXHIBITS

All Exhibits mentioned within this report are by this reference incorporated herein.

A. Assessor Map
B. Agency Responses and Staff Letters (blue pages)
C. Letters From Individuals (salmon pages)
D. Justification by Applicant (within binder)

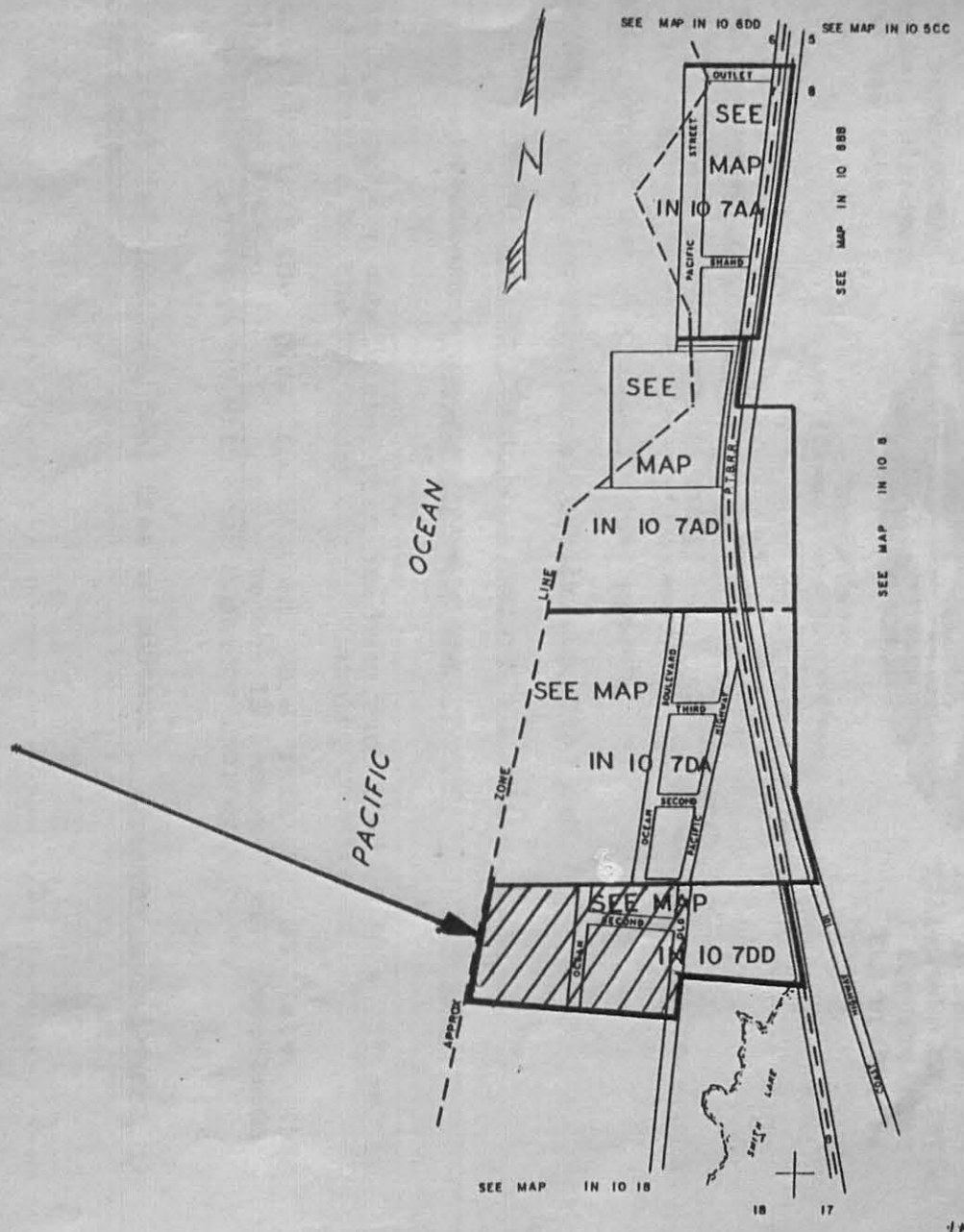
SECTION 7 T.1N. R.10W.W.M.

AMOOK COUNTY

1"= 400'

IN 10 7
INDEX

This map was prepared for assessment purposes only



C-466

PINE BEACH REPLAT UNIT 1

SE 1/4 SECTION 7, T1N, R10W, W.M. COUNTY

JUNE 24, 1996

DECLARATION:

KNOW ALL PEOPLE BY THESE PRESENTS THAT PINE BEACH DEVELOPMENT L.L.C., AN OREGON LIMITED LIABILITY COMPANY AND CENTENNIAL BANK, BEING THE OWNERS OF THE LAND HEREIN DESCRIBED, DO HEREBY MAKE, ESTABLISH, AND DECLARE THE ANNEXED MAP OF "PINE BEACH REPLAT UNIT 1", AS DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE, TO BE A TRUE AND CORRECT MAP AND PLAT THEREOF. ALL LOTS BEING OF THE DIMENSIONS SHOWN ON SAID MAP. AREA 'A' IS A COMMON AREA. WE DO HEREBY DEDICATE FOREVER, THE EAST 10.00 FEET OF THAT PORTION OF PARCEL 3, PARTITION PLAT NO. 1994-003, THAT LIES WEST OF OLD PACIFIC HIGHWAY AS A PUBLIC WAY, WITHOUT RESERVATION. EASEMENTS E-1 THROUGH E-4 AS SHOWN HEREON ARE HEREBY GRANTED AS NON-EXCLUSIVE EASEMENTS FOR THE PURPOSES STATED HEREIN. ALL STREETS WITHIN THIS PLAT ARE PRIVATE.

PINE BEACH DEVELOPMENT L.L.C.
BY DONALD K. NUSSMEIER,
ITS MANAGING MEMBER

PINE BEACH DEVELOPMENT L.L.C.
BY DAVID L FARR, ITS MANAGING MEMBER

CENTENNIAL BANK
BY JEFFERY P. TAINER,
ITS ASSISTANT VICE-PRESIDENT

ACKNOWLEDGEMENT:

STATE OF OREGON >
> S.S.
COUNTY OF WASHINGTON >

THIS INSTRUMENT WAS ACKNOWLEDGED BEFORE ME ON July 30th, 1996, BY DONALD K. NUSSMEIER, AND DAVID L FARR, AS MANAGING MEMBERS OF PINE BEACH DEVELOPMENT L.L.C., ON BEHALF OF THE COMPANY AND JEFFERY P. TAINER, AS ASSISTANT VICE-PRESIDENT OF CENTENNIAL BANK, ON BEHALF OF CENTENNIAL BANK.

NOTARY PUBLIC

MY COMMISSION EXPIRES: 7/30/98

OFFICIAL SEAL
ALICE M DEWEES
NOTARY PUBLIC - OREGON
COMMISSION NO. 043843
MY COMMISSION EXPIRES JUL 30, 1998

MONUMENT NOTES:

(1) FOUND OSHD ALUMINUM CAP ON A 5/8" IRON ROD STAMPED "WAT 1973", TOP 0.3' BELOW GROUND, 3.5' NORTHEAST OF METAL WITNESS STAKE, AT SOUTHWEST QUADRANT OF OLD PACIFIC HIGHWAY AND HIGHWAY 101. USED FOR NGS TIE. SET BY OSHD AS BEACH ZONE LINE CONTROL.

(2) FOUND OSHD ALUMINUM CAP ON A 5/8" IRON ROD STAMPED "AQU 1973", TOP FLUSH WITH GROUND, 1.0' WEST OF BROKEN METAL WITNESS STAKE, 10.3' EAST OF EAST EDGE OF PAVEMENT OF HIGHWAY 101. USED FOR NGS TIE. SET BY OSHD AS BEACH ZONE LINE CONTROL.

(257) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "ZAROSINSKI TATONE LS 1349", TOP 0.1' ABOVE SURFACE, 2.5' SOUTH OF CENTERLINE OF A FOOT PATH. NORTH 0.04' AND WEST 0.07' OF CALCULATED POSITION FOR THE NORTHEAST CORNER OF PARCEL 1, PARTITION PLAT NO. 1994-003. SEE MAP B-1218.

(258) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB INC", TOP FLUSH WITH SURFACE AND IN CENTERLINE OF A FOOT PATH. S 89°55'35" W 85.14' AND N 00°04'25" W 0.08' OF SET MONUMENT FOR THE MOST NORTHERLY NORTHEAST CORNER OF THE EXTERIOR BOUNDARY FOR PINE BEACH REPLAT. SEE MAP B-1760.

(262) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB INC", TOP 0.5' BELOW SURFACE, SOUTH 0.06' AND WEST 0.03' OF CALCULATED POSITION. PULLED THIS MONUMENT. SEE PARTITION PLAT NO. 1994-003.

(265) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB INC", TOP 0.6' BELOW SURFACE, SOUTH 0.07' AND EAST 0.19' OF CALCULATED POSITION. PULLED THIS MONUMENT. SEE PARTITION PLAT NO. 1994-003.

(268) FOUND COUNTY SURVEYOR'S BRASS CAP SET IN CONCRETE, INITIAL POINT FOR PINE BEACH, TOP FLUSH WITH SURFACE. HELD FOR BASIS OF BEARINGS. SEE REMTNESS BIN #30

(269) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "ZAROSINSKI TATONE LS 1349", TOP FLUSH WITH SURFACE. HELD FOR BASIS OF BEARINGS. SEE MAP B-1218.

(272) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "ZAROSINSKI TATONE LS 1349", TOP FLUSH WITH SURFACE. BEARS N 84°34'25" W 8.74' FROM SOUTHEAST CORNER OF LOT 9. SEE MAP B-1218.

(286) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "A DUNCAN LS 793", TOP FLUSH WITH SURFACE. SOUTH 0.14' AND EAST 0.06' OF CALCULATED POSITION FOR THE SOUTHWEST CORNER OF LOT 10, BLOCK 4, PLAT OF PINE BEACH. SEE MAP A-5178.

APPROVALS:

STATE OF OREGON >
> S.S.
COUNTY OF TILLAMOOK >

EXAMINED AND APPROVED BY THE FOLLOWING:

Allan E. Duncan 6-13-96
COUNTY SURVEYOR DATE

Ken Burdick 8-20-96
COUNTY COMMISSIONER DATE

Tim Sutz 8-19-96
COUNTY ASSESSOR DATE

COUNTY COMMISSIONER DATE

Josephine Veltri
by Susan Holmes 9-11-96
COUNTY CLERK Deputy DATE

Jerry C. Rose 9/19/96
COUNTY COMMISSIONER DATE

TAXES ARE PAID IN FULL TO JUNE 30, 1997.

Debi K Pointer 9-10-96
COUNTY TAX COLLECTOR DATE

Vicki M. Kirkpatrick 9-11-96
CHAIRMAN DATE
TILLAMOOK COUNTY PLANNING COMMISSION

MONUMENT NOTES:

(287) FOUND 1/2" IRON PIPE WITH PLUG AND TAGK, TOP 0.2' ABOVE SURFACE. SOUTH 0.38' AND WEST 1.45' OF CALCULATED POSITION FOR THE SOUTHWEST CORNER OF LOT 10, BLOCK 4, PLAT OF PINE BEACH. NO RECORD.

(289) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "A DUNCAN LS 793", TOP 0.2' ABOVE SURFACE. SOUTH 0.08' AND EAST 0.06' OF CALCULATED POSITION FOR THE SOUTHEAST CORNER OF LOT 7, BLOCK 4, PLAT OF PINE BEACH. SEE MAP A-5178.

(293) FOUND 5/8" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB INC", TOP FLUSH WITH SURFACE. S 89°55'35" W 190.41' AND N 00°04'25" W 0.14' OF SET MONUMENT FOR THE MOST NORTHERLY NORTHEAST CORNER OF THE EXTERIOR BOUNDARY FOR PINE BEACH REPLAT. SEE MAP B-1760.

SHEET INDEX:

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CERTIFICATE OF COUNTY CLERK
COPY STATEMENT
DETAILS A,B,C,D
CURVE TABLE DATA
LINE TABLE DATA

LEGEND:

- o INDICATES 5/8" X 40" REBAR SET WITH YELLOW PLASTIC CAP MARKED "HLB ASSOC. INC."
- ◉ INDICATES MONUMENT FOUND AS NOTED HEREON USED FOR CONTROL.
- • INDICATES MONUMENT FOUND AS NOTED HEREON.
- ( )[1] INDICATES RECORD VALUE PER PARTITION PLAT NO. 1994-003.
  NO ( ) INDICATES MEASURED VALUE.
- S.F. INDICATES SQUARE FEET.
- (G & N) INDICATES GROSS AND NET AREA
- (G) INDICATES GROSS AREA
- (N) INDICATES NET AREA

TILLAMOOK COUNTY SURVEYORS OFFICE SEP 11 1996

REGISTERED PROFESSIONAL LAND SURVEYOR
Ronald G. Larson
OREGON
July 13, 1984
2102
RONALD G. LARSON
RENEWAL DATE: DECEMBER 31, 1996

EASEMENTS OF RECORD:

RIGHTS AS CONTAINED IN PATENT FROM UNITED STATES OF AMERICA, TO LLOYD C. SMITH, HIS HEIRS AND ASSIGNS, AS DISCLOSED BY INSTRUMENT RECORDED SEPTEMBER 22, 1880, IN BOOK 1, PAGE 321, TILLAMOOK COUNTY DEED RECORDS.

EASEMENTS:

E-1: A 15.00' WIDE NON-EXCLUSIVE EASEMENT FOR SEWER SYSTEM IMPROVEMENTS, INGRESS AND EGRESS TO TWIN ROCKS SANITARY DISTRICT.

E-2: A NON-EXCLUSIVE EASEMENT FOR SEWER SYSTEM IMPROVEMENTS, INGRESS AND EGRESS TO TWIN ROCKS SANITARY DISTRICT.

E-3: A 8.00' WIDE NON-EXCLUSIVE EASEMENT FOR UTILITIES TO TILLAMOOK PEOPLE'S UTILITY DISTRICT.

E-4: A 8.00' WIDE NON-EXCLUSIVE EASEMENT FOR ELECTRICAL UTILITIES TO TILLAMOOK PEOPLE'S UTILITY DISTRICT.

CONDITIONS & RESTRICTIONS:

SEE BOOK 381, PAGE 172 TILLAMOOK COUNTY DEED RECORDS FOR DECLARATIONS, COVENANTS, RESTRICTIONS AND RESERVATIONS.

SURVEYOR'S CERTIFICATE:

STATE OF OREGON >
> S.S.
COUNTY OF TILLAMOOK >

I, RONALD G. LARSON, CERTIFY THAT:

I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE TRACT OF LAND REPRESENTED ON THE ANNEXED MAP, THE EXTERIOR BOUNDARY OF "PINE BEACH REPLAT UNIT1" BEING DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE WEST RIGHT-OF-WAY LINE OF PACIFIC HIGHWAY WHICH POINT IS SOUTH 89°55'35" WEST 10.05 FEET AND SOUTH 05°25'35" WEST 357.13 FEET FROM THE INITIAL POINT OF PINE BEACH, RECORDED AS MAP C-71, PLAT RECORDS OF TILLAMOOK COUNTY, LOCATED IN SECTION 7, TOWNSHIP 1 NORTH, RANGE 10 WEST OF THE WILLAMETTE MERIDIAN, TILLAMOOK COUNTY, OREGON, SAID POINT BEING THE INITIAL POINT OF THIS SUBDIVISION PLAT AND MARKED BY A 5/8" X 40" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB ASSOC. INC. ";

THENCE NORTH 84°34'25" WEST 230.00 FEET TO A 5/8" X 40" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB ASSOC. INC. ";

THENCE NORTH 05°25'35" EAST 40.00 FEET TO THE SOUTHEAST CORNER OF LOT 7, BLOCK 4, PINE BEACH;

THENCE NORTH 84°34'25" WEST ALONG THE SOUTH LINE OF LOTS 7,8 AND 10, BLOCK 4, PINE BEACH AND THE WESTERLY EXTENSION THEREOF 220.00 FEET TO THE WEST RIGHT-OF-WAY LINE OF OCEAN BOULEVARD;

THENCE NORTH 05°25'35" EAST ALONG SAID WEST RIGHT-OF-WAY LINE 220.00 FEET TO THE INTERSECTION WITH THE WESTERLY EXTENSION OF THE NORTH LINE OF LOT 10, BLOCK 2, PINE BEACH;

THENCE SOUTH 84°34'25" EAST ALONG SAID WESTERLY EXTENSION 5.00 FEET TO A 5/8" X 40" REBAR WITH YELLOW PLASTIC CAP STAMPED "HLB ASSOC. INC. ";

THENCE NORTH 05°25'35" EAST 54.28 FEET TO THE EASTERLY EXTENSION OF THE NORTH LINE OF PARCEL 1, PARTITION PLAT NO. 1994-003, RECORDS OF TILLAMOOK COUNTY;

THENCE NORTH 89°55'35" WEST 520 FEET, MORE OR LESS, TO THE MEAN HIGH WATER LINE OF THE PACIFIC OCEAN;

THENCE SOUTHERLY ALONG SAID MEAN HIGH WATER LINE 550 FEET, MORE OR LESS, TO SOUTH LINE OF PARCEL 3, PARTITION PLAT NO. 1994-003, THAT LIES WEST OF OLD PACIFIC HIGHWAY;

THENCE SOUTH 84°34'25" EAST ALONG SAID SOUTH LINE 1048 FEET, MORE OR LESS, TO THE WEST RIGHT-OF-WAY LINE OF PACIFIC HIGHWAY;

THENCE NORTH 05°25'35" EAST ALONG SAID WEST RIGHT-OF-WAY LINE 638.09 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF FIRST AVENUE;

THENCE SOUTH 89°55'35" WEST ALONG SAID SOUTH RIGHT-OF-WAY LINE 10.05 FEET TO A POINT WHICH IS 10.00 FEET WESTERLY AS MEASURED PERPENDICULAR TO THE WEST RIGHT-OF-WAY LINE OF PACIFIC HIGHWAY;

THENCE SOUTH 05°25'35" WEST PARALLEL WITH SAID WEST RIGHT-OF-WAY LINE 357.13 FEET TO THE INITIAL POINT.

HLB & ASSOC., INC.
HANDFORTH LARSON & BARRETT
SURVEYING • ENGINEERING • PLANNING

TILLAMOOK COUNTY
180 LANEDA AVE.
MANZANITA, OR 97130
(503) 368-5394
FAX: (503) 368-5847

CLATSOP COUNTY
4253A HWY 101 N.
GEARHART, OR 97138
(503) 738-3425
FAX: (503) 738-7455

12771601.DWG

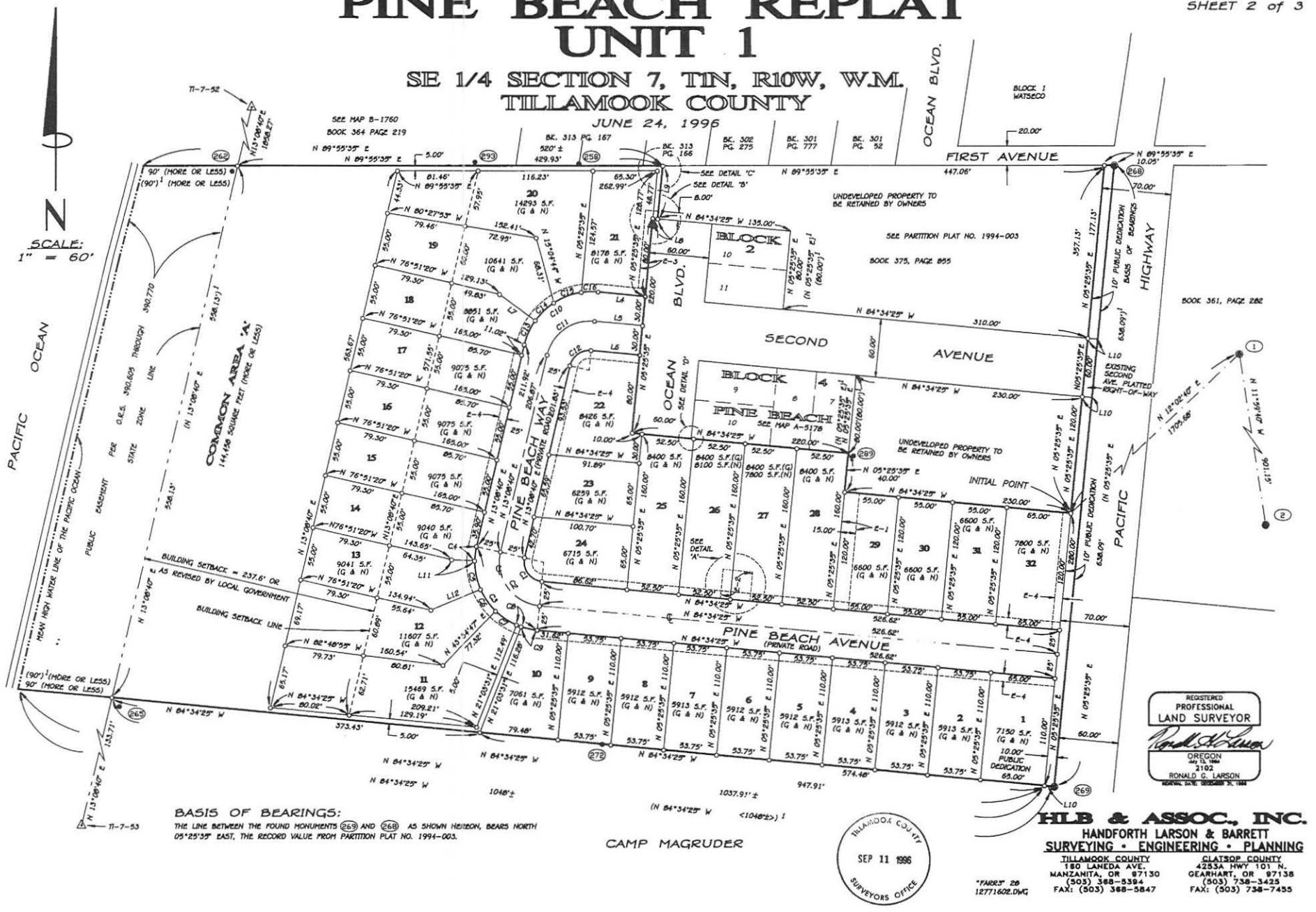
C-466

PINE BEACH REPLAT
UNIT 1

SHEET 2 of 3

SE 1/4 SECTION 7, T1N, R10W, W.M.
TILLAMOOK COUNTY

JUNE 24, 1996



BASIS OF BEARINGS:
THE LINE BETWEEN THE FOUND MONUMENTS (269) AND (268) AS SHOWN HEREON, BEARS NORTH 05°25'35" EAST, THE RECORD VALUE FROM PARTITION PLAT NO. 1994-003.

HLB & ASSOC., INC.
HANDFORTH LARSON & BARRETT
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(503) 738-3425
FAX: (503) 738-7455

"FARR" 28
12771602.DWG

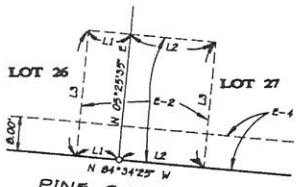
C-466

PINE BEACH REPLAT
UNIT 1

SE 1/4 SECTION 7, T1N, R10W, W.M.
TILLAMOOK COUNTY

JUNE 24, 1996

SHEET 3 of 3



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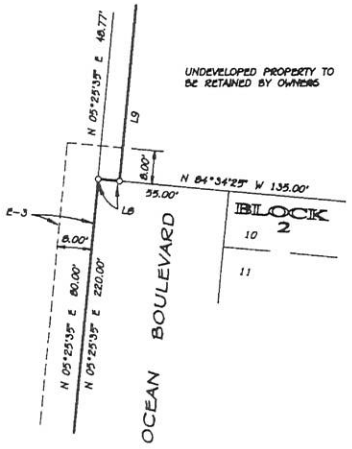

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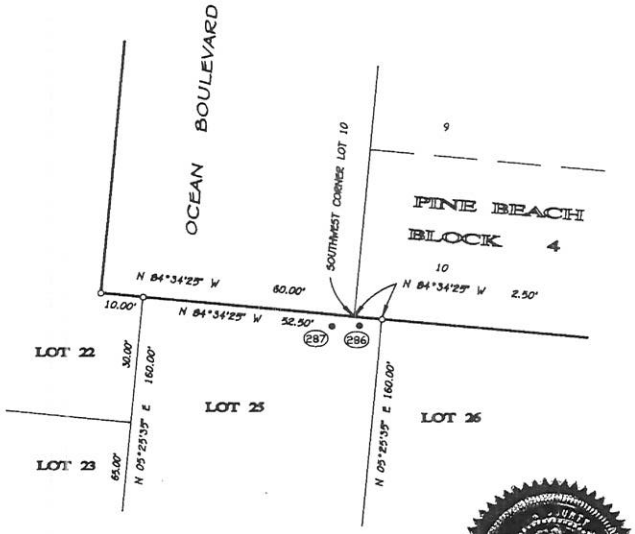

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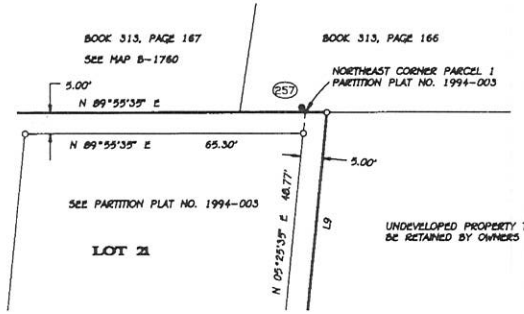

DETAIL 'C'
NOT TO SCALE

LINE TABLE DATA

LINE	DIRECTION	DISTANCE
L1	N 84°34'25" W	10.00'
L2	N 84°34'25" W	20.00'
L3	S 05°25'35" W	30.00'
L4	S 84°34'25" E	48.16'
L5	S 84°34'25" E	48.84'
L6	N 84°34'25" W	49.51'
L7	S 53°49'37" E	44.85'
L8	N 84°34'25" W	5.00'
L9	S 05°25'35" W	54.28'
L10	N 84°34'25" W	10.00'
L11	N 87°31'04" W	23.33'
L12	N 67°07'39" E	54.52'

NARRATIVE:

THIS SURVEY WAS CONDUCTED AS A DEPENDENT RESURVEY OF THE SUBJECT PROPERTY DESCRIBED AS PARCELS 1, 2 AND 3, PARTITION PLAT NO. 1994-003, RECORDED FEBRUARY 2, 1994, IN PLAT CABINET B, SLIDE 248, TILLAMOOK COUNTY RECORDS, EXCEPTING THEREFROM THAT PORTION OF SAID PARCEL 3 THAT LIES EAST OF OLD PACIFIC HIGHWAY AND WEST OF THE SOUTHERN PACIFIC RAILROAD RIGHT OF WAY. THE PURPOSE OF THIS SURVEY IS TO SUBDIVIDE THE SUBJECT PROPERTY INTO THIRTY-TWO LOTS AND A COMMON AREA. THE NORTH AND SOUTH 5.00 FEET OF SAID COMMON AREA ARE PRIVATE WALKWAYS FOR ACCESS TO THE BEACH.

HELD THE INITIAL POINT OF PINE BEACH AND MONUMENT (269) FOR BASIS OF BEARINGS. HELD RECORD ANGLES FROM PARTITION PLAT NO. 1994-003 TO ESTABLISH THE NORTH AND SOUTH LINES OF PLAT BOUNDARY.

PORTIONS OF OCEAN BOULEVARD ARE BEING VACATED WITH THE FILING OF THIS PLAT AND FILED AS ROAD VACATION PETITION #481. THE WEST RIGHT-OF-WAY LINE OF PACIFIC HIGHWAY IS BEING MONUMENTED THIS SURVEY TO INCLUDE THE 10.00 FOOT WIDE PUBLIC DEDICATION.

CURVE TABLE DATA

CURVE	RADIUS	LENGTH	CHORD	BEARING	DELTA
C1	20.00'	34.11'	30.12'	N 35°42'52" W	97°43'05"
C2	45.00'	76.75'	67.78'	N 35°42'52" W	97°43'05"
C3	70.00'	119.39'	105.43'	N 35°42'52" W	97°43'05"
C4	70.00'	14.90'	14.87'	N 07°08'51" E	12°11'39"
C5	70.00'	30.20'	29.97'	N 11°24'40" W	24°43'22"
C6	70.00'	26.86'	26.69'	N 34°45'52" W	21°59'03"
C7	70.00'	25.74'	25.60'	N 56°17'27" W	21°04'07"
C8	70.00'	5.00'	5.00'	N 68°52'21" W	04°05'36"
C9	70.00'	16.68'	16.64'	N 77°44'46" W	13°39'18"
C10	70.00'	100.53'	92.11'	N 54°17'08" E	82°16'55"
C11	45.00'	64.62'	59.21'	N 54°17'08" E	82°16'55"
C12	20.00'	28.72'	26.32'	N 54°17'08" E	82°16'55"
C13	70.00'	27.14'	26.97'	N 24°15'04" E	22°12'48"
C14	70.00'	26.28'	26.13'	N 46°06'47" E	21°30'37"
C15	70.00'	30.10'	29.87'	N 69°11'10" E	24°38'10"
C16	70.00'	17.01'	16.97'	N 88°27'56" E	13°55'20"

STATE OF OREGON >
> S.S.
COUNTY OF TILLAMOOK >

I HEREBY CERTIFY THAT THIS PLAT WAS RECEIVED FOR RECORD ON THE 11th DAY OF SEPTEMBER 1996 AT 2:41 P O'CLOCK AND RECORDED IN PLAT CABINET B-443-0 TILLAMOOK COUNTY RECORDS, AS INSTRUMENT NO. 353540.
JOSEPHINE VELTRI, COUNTY CLERK.

BY: Josephine Veltri, by Susan Holmes, deputy

CERTIFICATE OF COUNTY CLERK:

STATE OF OREGON >
> S.S.
COUNTY OF TILLAMOOK >

I, JOSEPHINE VELTRI, DO HEREBY CERTIFY THAT I AM THE QUALIFIED CLERK OF TILLAMOOK COUNTY, OREGON AND THAT THIS COPY IS THE FULL, COMPLETE AND TRUE COPY OF THE ORIGINAL PLAT OF SAME, AS RECORDED IN PLAT CABINET B-443-0 OF PLAT RECORDS OF TILLAMOOK COUNTY, OREGON, RECORDED SEPTEMBER 11, 1996 AT 2:41 P O'CLOCK, AS INSTRUMENT NO. 353540.

Josephine Veltri, by Susan Holmes, deputy
JOSEPHINE VELTRI

I, RONALD G. LARSON, DO HEREBY CERTIFY THAT THIS IS A FULL, COMPLETE AND TRUE COPY OF THE ORIGINAL PLAT AS REFERENCED ABOVE.

Ronald G. Larson
RONALD G. LARSON, PLS 2102

TILLAMOOK COUNTY SURVEYORS OFFICE
SEP 11 1996

REGISTERED PROFESSIONAL LAND SURVEYOR
OREGON
JULY 13, 1984
2102
RONALD G. LARSON
RENEWAL DATE: DECEMBER 31, 1996

HLB & ASSOC., INC.
HANDFORTH LARSON & BARRETT
SURVEYING • ENGINEERING • PLANNING
TILLAMOOK COUNTY
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MANZANITA, OR 97130
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HANDFORTH
LARSON &
BARRETT, INC.

Civil Engineering & Surveying

). Box 219
160 Laneda Avenue
Manzanita, OR 97130

TEL: 503-368-5394
FAX: 503-368-5847

June 3, 1994

Mr. Dave Farr & Mr. Don Nussmeier
25425 SW Swift Shore Drive
West Linn, OR 97068

RE: Dune Hazard Report and Modified Dune Hazard Report, Tax Lot 100, 101 & 102, 1N 10 7DD, PINE BEACH REPLAT, Watseco, Oregon

Dear Dave & Don:

In accordance with the requirements of the Tillamook County Development Ordinance, our firm has made a preliminary site investigation of the subject property, referenced above, using available geologic maps, published and unpublished geologic reports, along with a site inspection. We have visited the site of the subject property in the Watseco area on numerous occasions in the past two years in order to address the engineering, geologic and dune hazards of the specific site and to make recommendations for proposed residential development and residential construction thereon.

Our site visits were made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic and dune hazards. Mr. See's report on the subject property is attached to this report, and together with this report is the required Dune Hazard Report and Modified Dune Hazard Report for the proposed Tentative Plat for the PINE BEACH REPLAT. Also incorporated into this report by reference is a special report prepared by Frank Reckendorf, Sedimentation Geologist with the USDA SCS, dated Jan. 29, 1993, and a flood hazard investigation and report prepared by David Simpson, Coastal Engineer, dated September, 1993. The proposed subdivision development is as shown on the accompanying Tentative Plan, dated June 3, 1994, consisting of 2 sheets.

GENERAL SITE DESCRIPTION

The oceanfront property lies West of Pacific Boulevard and is located just North of Camp Magruder. The spot elevation map of the property is shown on Sheet 2 of the Tentative Plan. Elevations over the site vary from approximately 15 feet (in isolated low spots) to 21 feet (in isolated high spots). In general the site is quite flat with an average elevation of 17 feet (NGVD). That area which lies West of the proposed most Westerly building sites is a broad, low lying area which is the remaining portion of the back side of the foredune. The highest point of the remaining portion of the foredune is located very near to the Ocean Shores Boundary line as shown on Sheet 2 of the Tentative Plan.

There is much information available regarding the dune classification. In 1975, Reckendorf identified this area in 1973 as younger stabilized dunes (DS), with some inclusions of open dune sand conditionally stable (OCS). In 1993 Mr. Reckendorf prepared a special report for the subject property. In that report, Mr. Reckendorf made the following statement: "Since the time of dune mapping (1973) the shrub and tree species have essentially filled in the

map inclusion areas of OSC, that are east of the setback line at 180 feet." Mr. Reckendorf states further: "No active foredune occurs in the reach today, and erosion has removed essentially all of any prior conditionally stable foredune." Mr. Reckendorf concludes that the Westerly portion of the property where no development is proposed is classified as open dune sand conditionally stable (OSC). Mr. Reckendorf further concludes that the portion of the property where development is proposed is within a younger stabilized dune (DS), according to the SCS classification system. The dune classification of "younger stabilized dune" is used for the dune classification of the developed area related to this report.

In terms of Tillamook County's Beach and Dune Hazard Overlay Ordinance (Sec. 3.085), the portion of this property proposed for development is classified as Category (3) - Other Beach and Dune Areas: b.(2) Younger or Older Stabilized Foredunes.

The crest height and width of the foredune remnant is a variable on this property, however, the general dimensions could be stated as an overall dune width of about 40 feet (which includes only the back slope of the dune), a crest width of about 5 feet (near the beach level) and an average crest height of 18.6 feet (based upon an average of 14 points) with variation between 17.5 feet to 20.7 feet (NGVD).

The elevation of the crest of the remaining portion of the dune, as of April 1993 and as of June 1994, is located at elevations ranging from 17.5 feet (NGVD) to 20.7 feet (NGVD). A review of the 1967 OSHD aerial photos shows the dune at about elevation 16 feet. It can be seen that the foredune has grown significantly in elevation as the accretion process has continued with time.

HISTORY OF ACCRETION AND EROSION

A review of CoE and OSHD aerial photos for this area dated 1939, 1945, 1953, 1960, 1967, 1970, 1973, 1978, 1980 and 1984 show a steady increase in vegetation over the entire property. Copies of those aerial photos are included in the accompanying flood hazard study by David Simpson. These maps have also been previously submitted to Tillamook County and are available in the PINE BEACH REPLAT file. Also previously submitted are clear mylar overlays at the scales of 1"=100' for the 1967 photo and 1"=200' for the other OSHD photos. The most Westerly line of vegetation has moved Westward since at least 1939 as described by Frank Reckendorf (1/29/93), David Simpson (9/93) and Paul See (6/2/94). The original plat of PINE BEACH, dated 1932, shows the ocean beach to be located at least 320 feet East of where it is today. A copy of the original plat map for PINE BEACH have been previously submitted to Tillamook County and is available in the PINE BEACH REPLAT file.

Evidence of relatively active beach erosion is presented and discussed by John Marra (12/92), by David Simpson (9/93), by Frank Reckendorf (1/29/93) and by Paul See (6/2/94). Each of these individuals describes the erosion process as being cyclical with an overall net accretionary trend in this area. The winter of 1993-94 showed a net buildup in the sand on the beach which accumulated at the foreslope of the remnant of the foredune.

DISCUSSION OF FLOOD HAZARDS

Potential hazards due to ocean flooding have recently been studied, calculated and identified by a new flood hazard study by David Simpson, Coastal Engineer, dated September 1993. This new study was made at the request of the

developers and was carried out in accordance with existing regulations of the Federal Emergency Management Agency (FEMA) which manages the National Flood Insurance Program (NFIP). In summary, the study determined new flood hazards for this property which would result from an "eroded dune profile". The study determined the theoretical erosion which could occur and the resulting flood hazard zones, all in accordance with current FEMA regulations.

The new flood hazard zones are as shown on Sheet 2 of the Tentative Plan. A velocity flood hazard zone (VE zone Elevation = 19') is located on the Westerly approximately 150' (at the North end) to 195' (at the South end) of the subject property in an area where no development or structures will be allowed. Immediately East of the velocity flood hazard zone is an area of shallow flooding (AE zones with water depths of 1' to 3'). Only the most Southwesterly corner of the buildable portion of Lot 11 is affected by the AE flood zone. The balance of the property to the East of the AE zone is located in a B flood hazard zone which is an area between the 100 year and 500 year flood. There are no special requirements or restrictions for development in a B zone.

With respect to the one lot which is affected by the AE flood zone, there are demonstrated methods and accepted practices for construction standards and regulations in this flood hazard zone. Numerous structures have been built to such standards throughout this area and other areas of Tillamook County. Construction according to the required flood hazard standards will provide adequate protection from flood hazards for the life of the structures.

DISCUSSION OF SAND EROSION HAZARDS

Wind erosion and migration of sand is a hazard to any property near the beachfront which consists of sand. As Mr. See and the other geologists point out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the pathways to the beach. There are currently only three main beach access paths which provide access to the dry sand beach from this property (see aerial photos). Currently, there are no significant signs of erosion at these beach access pathways. During the winters of 1991-92 and 1992-93, the subject property experienced local erosion of the dune. The winter of 1993-94 saw an increase in sand accretion at the toe of the scarp on the ocean side of the foredune remnant. Open dune sand built up on what is now beach until at least 1984. The 1984 aerial photos shown the most Westwardly progression of dune sand. Since the 1984 aerial photo, the unvegetated, open dune sand on the beach has eroded Easterly some 80 to 90 feet to the position it is at today.

Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation, both on the foredune and on the younger stabilized areas to the East of the foredune. For this reason, it is recommended that natural beach vegetation be maintained on Lots 11 through 20 and the common area to the West of those lots. See below the specific standards for vegetation maintenance and removal. Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may

be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

The question of how much more dune erosion due to wave action may occur on this property has been investigated by David Simpson in 1993 in the revised flood hazard study. Mr. Simpson has determined that all proposed development on this property will be located outside of the extent of erosion. The maximum extent of erosion was determined in accordance with current FEMA standards at a 1:40 positive landward slope from the still water level intersection on the beach profile. The maximum extent of erosion is as shown on Sheet 2 of the Tentative Plan and is located on the Westerly approximately 115' (at the North end) to 160' (at the South end) of the subject property in an area where no development or structures will be allowed.

MODIFIED DUNE HAZARD REPORT FINDINGS AND CONCLUSIONS

1. Finding - The maximum extent of erosion is as shown on Sheet 2 of the Tentative Plan and is located on the Westerly approximately 115' (at the North end) to 160' (at the South end) of the subject property.
   Conclusion - The setback requirement of 237.6 feet from the Ocean Shores Boundary Line will provide reasonable protection from erosion for the lifetime of the structures.
2. Evidence of recent, active beach or dune erosion has been presented and discussed in the foregoing section of this report.
3. Finding - The average retreat of the shoreline has been calculated based upon aerial photographs. Since the 1984 ODOT Ocean Shores aerial photo, the unvegetated, open dune sand on the beach has eroded Easterly some 80 to 90 feet to the position it is at today.

DISCUSSION OF FOUNDATION SUPPORT HAZARDS IN SAND

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dunefield was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert the property owners and foundation contractors to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractors should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2-inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance.
3. Any logs discovered to be within 6 feet of the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

DISCUSSION OF EARTHQUAKE HAZARDS

Mr. Reckendorf comments on the potential hazard of dune destabilization due to fire. In short, fire can destroy or severely damage dune vegetation and thus destabilize the sand, making it vulnerable to wind erosion. Mr. Reckendorf advises that "care should be taken to include vegetative firebreaks in any development plan in a woody area, such as the younger stabilized dunes."

DISCUSSION OF EARTHQUAKE HAZARDS

Mr. See comments on the potential regional hazard of severe earthquake on a average 600 year interval basis. The most serious such earthquake, for which evidence goes back about 7700 years, is estimated to have been a magnitude of about 8 on the Richter scale. The 600 year period is about eight times the average life of a wood frame residence. Both Mr. See and Mr. Reckendorf note that this property is at risk from the very destructive earthquake phenomenon known as liquifaction, because of the type of soil on the property. Mr. Reckendorf notes that the hazard of liquifaction is greatest at the remnant of the conditionally stable foredunes near the beach where no development will take place. Present building code requirements for the State of Oregon do not address earthquakes of this magnitude, but there are recognized construction methods which can be used by contractors for owners wishing a degree of added protection in less than maximum earthquakes.

The property is located in a 90 mph wind zone with full exposure to ocean winds (Exposure 'C' as per UBC Section 2311(c).), therefore, the buildings must be designed to withstand the minimum required lateral wind loads. In general, one-story and two-story wood frame residential construction designed to withstand 90 mph Exposure 'C' wind loadings will also withstand earthquake loads. The hereinafter optional standards are recognized construction methods used for wind resistant wood frame construction which are also very effective in protecting against earthquake forces.

SITE INVESTIGATION SUMMARY

Existing and potential hazards have been identified and described in this report, and the referenced and attached reports. Known hazards have been investigated and development standards for buildable areas are included in this report. The new flood hazard zones has been determined. The general site and property, including property boundaries, is as shown on Sheet 1 of the Tentative Plan. The geographic information is as follows:

a. Dune landform identification is included in this report.
b. Dune stabilization in this area has historically been none other than natural accretion and natural revegetation.
c. History of erosion or accretion is detailed in Mr. See's report, in Mr. Reckendorf's report, in Mr. Simpson's report and further herein.
d. General topography including spot elevations are shown on Sheet 2 of the Tentative Plan.
e. Base flood elevation and areas subject to flooding are discussed herein. A new flood study has been completed for this property to determine current flood hazards. A copy of the FEMA LOMR and revised NFIP FIRM is attached hereto.
f. There are no perennial streams or springs on the property. All storm water percolates directly into the native sand. Smith Lake is located to the East of Pacific Blvd.
g. The State Beach Zone Line is located as shown on Sheet 1 of the Tentative Plan.

h. There are no beachfront protective structures in the vicinity.
i. The elevation and width of the foredune crest is as stated herein and as shown on the Tentative Plan, Sheet 2.
j. Land grading practices are included in the Development Standards.

In accordance with Section 3.085(5)B.3.b.1. it is a recommendation of this report that a detailed site investigation be prepared for each lot of the subdivision, since building and grading plans for site preparation of each individual lot are not available for review as part of the preliminary site investigation. Such reports shall be submitted at the time of building permit application in order to address specific development plans for each lot. The building and grading plans should be prepared in accordance with the following development standards.

DEVELOPMENT STANDARDS

A. Mandatory Standards:

1. **Development Density and Design** - The Westerly portion of the property which is subject to erosion and wave overtopping should remain undeveloped. The calculated Oceanfront Setback Line, which is located at 237.6' Easterly from the Ocean Shores Boundary Line, will limit the Westerly edge of buildings and will keep those buildings out of the area which is subject to erosion and wave overtopping. Development density in the balance of the property should be in conformance with the underlying residential zoning requirements.

2. **Location and Design of Roads and Driveways** - The roads used for the development of this property should be one continuous loop in order to minimize road length. Roads should be designed to Tillamook County Road Standards. The roads proposed on the Tentative Plan are acceptable. Similarly, driveway lengths should be minimized. Driveways should not be looped on an individual lot and multiple driveways on one individual lot should not be allowed.

3. **Foundations** - Residential foundations should be continuous reinforced concrete perimeter foundation systems. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. It is further recommended that minimum 18" wide footings be used for two-story construction, and that minimum 16" wide footings be used for one-story construction.

   All footings should bear directly on undisturbed native sand. The bottom of all footings should be excavated to below any organic material, or at least 12 inches below existing grade for single story construction and 18 inches below existing grade for two story construction. Do not place house footings on fill material. We recommend that the building contractors be alerted to the need to protect the footings during construction from sand erosion and undermining. All foundations excavations should be tested for the presence of buried logs within 6 feet of the ground surface as described hereinbefore.

4. **Stormwater Drainage** - All roof drainage should be collected with eave gutters and downspouts and piped to discharge either into on-site drywells or onto splash blocks adjacent to the footings such that all collected

drainage is disposed of on each building site by percolation into the porous native sand. Accumulated surface drainage should also be collected and discharged. During construction, roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed.

5. **Oceanfront Setback** - All proposed structures located on the most Westerly building sites of this property must be placed on each lot in accordance with the oceanfront averaging setback requirements of Tillamook County. For the subject property, the minimum most Westerly Oceanfront Setback Line has been determined by the Tillamook County Zoning Ordinance, Sec. 3.085(4)A.1.c.(1)(b), for all of the Westerly lots to be at 237.6 feet East of the Ocean Shores Boundary Line. It is a recommendation of this dune hazard report that the Oceanfront Setback Line be located at a minimum distance of 237.6 feet Easterly, as measured perpendicular thereto, from the Ocean Shores Boundary Line. No building construction should occur West of this line. The above recommendation for a Oceanfront Setback Line of 237.6 feet applies to the Westerly edge of any foundation of a proposed structure, including any exterior deck on the West side of a structure.

6. **Native Vegetation and Land Grading Standards** - Vegetation removal around the proposed structures on all lots should be kept to the minimum required for the placement of the structure and utilities in order to reduce the potential of wind erosion of the unprotected native sand. The vegetation which remains in accordance with this standard will assure that large areas devoid of vegetation are not created and that the subdivision development will not create a cumulative adverse effect on the stability of the native beach sand in this area. Clearing of vegetation and excavation shall not start more than 30 days prior to pouring concrete foundations or trenching for utilities.

   We recommend that the building contractors or property owners revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock. The site shall be revegetated or stabilized no later than 9 months after termination of major construction.

   No beach grass vegetation should be mowed, cut or removed, and no trees should be removed in that area located West of a line 20 feet West of the actual structure locations on Lots 11 through 20, however, in that area of those lots, trees may be topped and/or limbed. In the common area West of Lots 11 through 20, no vegetation should be removed or disturbed other than topping of trees. All such tree topping and limbing activities should not damage the root structure, disturb the ground surface, or kill the trees. Vegetation may be removed as required to construct new beach access pathways on the proposed 5' wide access areas on the South side of Lot 11 and on the North side of Lot 20.

7. **Excavation Standards** - Because the site is already relatively flat, land grading activities will be very minimal. The only cut proposed for the project will be made at the new roadways just West of Pacific Blvd. The cut slopes should be dressed and revegetated to a maximum slope of 2:1. The excess excavated material should be thinly spread at a uniform

thickness in the road rights-of-way to the West. It is proposed that pathways will be constructed on the proposed 5' wide access areas on the South side of Lot 11 and on the North side of Lot 20. These pathways should follow the grade of the existing ground surface in order to minimize excavation.

8. **Beach Access** - No new beach access paths should be constructed on the Westerly 100 feet of the common area West of Lots 11 through 20. The three existing main beach access paths should be monitored periodically (not less than annually) for signs of erosion, particularly at the Westerly edge of the vegetation. If local erosion at these pathways increases, such as might occur due to increased foot traffic, then sand fences with gates should be installed to control the erosion.

9. **Fire Breaks** - Firebreaks now exist as a beach access walkway on the North property line and as a trail just North of the South property line. These walkways or trails form effective firebreaks in the woody areas of the younger stabilized dunes and should be left open and void of low-growing dry woody vegetation. For the fire break on the South side of the property, individual lot owners who choose to revegetate the fire breaks should do so with purple beach pea.

10. **Periodic Monitoring** - The Architectural Review Committee (ARC) established by the subdivision CC&R's will be responsible for monitoring all development activity, both on the individual lots and on the streets and common areas, to ensure that all required development standards and conditions of the subdivision approval are being met. See the accompanying draft CC&R's for details of operation of the ARC.

    At a minimum, the ARC should review all site plans prior to the start of construction to determine the area of each lot to be disturbed during construction and to determine that all required development standards and conditions of the subdivision approval are being met. This review is in addition to the plan review and approval by the Tillamook County Department of Community Development. The ARC should conduct an on-site monitoring of the vegetation on each lot on a monthly basis throughout the course of construction on each lot. Such monitoring should continue on a monthly basis until 90 days after the end of construction on each lot. All bare sand areas outside of the immediate construction area on each lot shall be noted in the monitoring and shall be immediately revegetated. At the end of the monitoring period for each lot, the ARC should submit a written report to the Tillamook County Department of Community Development summarizing the monitoring activities throughout the construction period for that lot. This monitoring is in addition to any monitoring that may be done by the Tillamook County Department of Community Development.

B. Optional Standards for Added Seismic Protection:
These are standards not strictly required under conditions set out in the flood regulations and the Uniform Building Code lateral force resistance provisions for this area, but which a concerned property owner might wish to include in home construction to provide additional safety in view of the available information on the greater potential for major earthquakes and tsunamis with a possibility of a maximum worst-case tsunamis runup up to 31 feet high, and earthquakes in about the 8 or greater Richter category.

While no practical measures could guarantee protection in a maximum event, some reasonable steps could provide a degree of assurance against damage in lesser events. The design of the structure for wind loadings of 110 or 120 mph winds will generally add only a small cost to the entire structure and will effectively increase protection for both additional wind and earthquake loads. Examples of the results of such increased design loads are:

a. Install foundation anchor bolts on closer than normal spacing.
b. Secure floor framing to mudsills with galvanized steel framing anchors.
c. Secure roof framing to walls with galvanized steel hurricane clips.
d. Use plywood shear wall construction, with plywood sheathing applied to greater than building code requirements for plywood shear walls.

CONCLUSIONS

1. The proposed use of this property is a residential subdivision as shown on the Tentative Plat of PINE BEACH REPLAT. The hazards identified on this property include sand accretion and erosion hazards, flood hazards, foundation support hazards, fire hazards, and earthquake hazards.

2. The proposed development and use of this property in accordance with the mandatory standards set out herein will provide a residential subdivision reasonably protected from the hazards described herein for the life of typical residential structures, although not completely protected from major earthquake and tsunami, the possibility of which is discussed herein.

3. Development of this property in accordance with the recommended standards will involve negligible adverse effects to the surrounding area, therefore, no additional measures are necessary to protect the surrounding area from any hazards that are a result of the proposed development.

4. Development of this property in accordance with the optional standards set forth will provide additional, but not complete, protection against potential earthquakes and tsunami of the nature discussed herein.

LIMITATION

This report is based on site inspections of the subject property and vicinity and a review of the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are offered as professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied. Should you have any questions regarding our investigation and this report, please contact our office.

Very truly yours,
HANDFORTH LARSON & BARRETT, INC.

Ronald G. Larson, PE, PLS
<pb_94.dhr>
cc: Paul See, Geologist

REFERENCES

Beaches and Dunes of the Oregon Coast, by Frank Reckendorf, USDA SCS, 1975.

Pine Beach Development, letter to Till. Co. Dept. Of Comm. Devel., by John Marra, DLCD, December 4, 1992.

Special Report - Pine Beach Development, by Frank Reckendorf, USDA SCS, Jan. 29, 1993.

Engineering Report, FIRM Revision Request,Pine Beach Replat, by David P. Simpson, Coastal Engineer, September 1993

PAUL D. SEE AND ASSOCIATES, INC.

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

June 1, 1994 #1064 ref 8022

Ronald G. Larson
Handforth Larson and Barrett, Inc.
P. O. Box 219
Manzanita, OR 97130

RE: Geologic inspection, Pine Beach Development, Watseco area. (Farr)
T1N, R10W, Sec 7DA

Dear Ron:

The following letter report documents my inspection of the above described development site with you to evaluate applicable beach and dune hazards. On-site inspection reveals identical circumstances to those existing on adjoining frontage to the north, evaluated in detail in July of 1990, wherein a wide and relatively flat but hummocky dunefield has accumulated as a result of natural barrier development across an otherwise irregular shoreline, and coastal sand transport has been interrupted by construction of the Tillamook Bay north jetty in 1917.

The average elevation of the local dunefield lies between 17 and 20 feet, NGVD. Although this beach has experienced a net accretion over the past 70 years, severe storms have periodically eroded the dune front resulting in scattered property damage from Manhattan Beach to Tillamook Bay. Inspection of 1939, 1967, 1973, 1978, and 1984 Corps of Engineers and Oregon State Highway Division aerial photos reveals ongoing net accretion, with an apparently fresh local field of scattered drift logs over a 200+/- foot wide strip in 1967. Pine, willow, and beach grass vegetation had gradually obscured these logs from aerial view by 1984, but field inspection confirms their presence to this date. Periodic erosion, particularly during and following the 1982-83 El Nino event, removed several tens of feet of the dune frontage, exposing a dense tangle of logs weathered from the dune front. All present storm-tossed logs on the vegetated surface are old and decayed, however, having apparently been deposited prior to 1967.

Notwithstanding the periodic erosion by storm surf, records confirm that this segment of shoreline has been prograding since at least 1939. Because of the transcient and unpredictable episodes of regression, no consistent rate of accretion can be applied. However, between 1917 and this date, the shoreline has accreted westerly at least 1000 feet. Cooper (1) depicts an average of 300 meters of post-jetty accretion between 1917 and 1939. Stembridge (2) notes that the <u>least</u> prograding between the Nehalem River and Tillamook Bay totals more than 30 feet between 1939 and 1975.

The surface profile in this area includes a relatively low foredune, only

slightly higher than the hummocky, vegetated plain to its east. The area has obviously not experienced a net regression in the past 50 years, although the presence of fresh appearing logs in 1967 is evidence of storm wash-over at some point prior to that date.

The property is well vegetated with beach pines and willow and other upland shrubs and grasses. This cover has obviously developed in a few decades, and the shoreline remains at some risk from severe episodic storm wave overtopping due to its elevation. However, revised Velocity (storm wave) flooding limits have been modelled by Simpson (3), indicating an easterly limit of Velocity flooding at 200 feet from the beach, or well short (70 to 130 feet west) of the proposed construction setback, established at 237 feet east of the State Coastal Zone line.

In conclusion, the property appears to be relatively safe from long-term net erosion and shoreline regression. Current modelling of Velocity flooding will not impact the area proposed for development. The Tillamook Bay north jetty will continue to present a barrier to southerly offshore sand transport, causing a continued net accretion along this beach. No evidence exists to suggest reversal of a trend that has continued for more than 70 years.

The developer should be advised that contrary to long-held assumption, there is now abundant evidence for a series of geologically recent and severe regional earthquakes. Recent discoveries confirm a history of as many as thirteen major earthquakes originating in the local Cascadia subduction zone during the past 7700+/- years. Based on the calculated time span between such events, (approximately 600 years average, 340 years minimum), it follows that a major regional earthquake is indeed possible in the foreseeable future. The most recent event seems to have occurred about the year 1690. Current projections estimate a 20 to 30 percent chance of a magnitude 8 or greater regional quake in the next 50 years.

Coastal dunefields such as this are at risk from liquefaction of saturated sands at depth which can cause differential foundation settlement during strong seismic tremors, as well as impact from an accompanying tsunami. Whitmore (4) has calculated an initial tsunami wave height of 12.63 feet along the Rockaway Beach area for an 8.0 magnitude Cascadia earthquake, with an additional 18.17 feet allowance for error, diurnal tide maximum, and 2.2 feet of coseismic subsidence, for an overall runup potential of 30.8 feet under worst-case conditions.

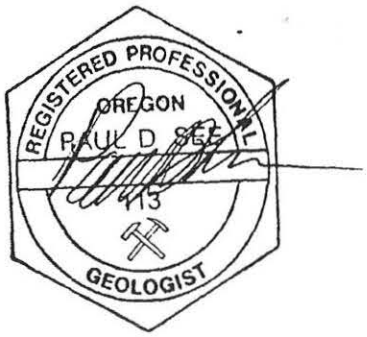
Risks associated with great Cascadia earthquakes must naturally be considered in light of the long and varied intervals between events. While our understanding of Northwest seismicity is expanding rapidly, the timing or magnitude of future events can only be broadly estimated.

Observations and recommendations incorporated herein are the result of

personal site inspection, the works of other specialists, and generally accepted principles of geologic investigation for a report of this nature. No warranties are expressed or implied.

Sincerely,

Paul D. See



References cited:

(1) Cooper, William S., **Coastal Sand Dunes of Oregon and Washington,** Geological Society of America Memoir # 72, June, 1958 Pl. 2

(2) Stembridge, James Edward, Jr. **"Shoreline Changes and Physiographic Hazards on the Oregon Coast"**, PhD dissertation, U of O 1975, p. 63.

(3) Simpson, David P., **Flood Insurance Rate Map Revision Request, Pine Beach Replat**, September, 1993.

(4) Whitmore, Paul, Alaska Tsunami Warning Center, Palmer, Alaska. Total wave height calculations for selected Tillamook County beaches, completed November 15, 1993.

HANDFORTH
LARSON &
BARRETT, INC.

Civil Engineering & Surveying

P.O. Box 219
160 Laneda Avenue
Manzanita, OR 97130

TEL: 503-368-5394
FAX: 503-368-5847

November 5, 1992

Tillamook County Planning Department
Courthouse Building
Tillamook, OR 97141

RE: Dune Hazard Report, Tax Lot 100, 1N 10 7DD, PINE BEACH REPLAT, Watseco, Oregon

Dear Staff:

In accordance with the requirements of the Tillamook County Development Ordinance, we have made an investigation of the subject property, referenced above, using available geologic maps, published and unpublished geologic reports, along with a site inspection. We have visited the site of the subject property in the Watseco area in order to address the engineering, geologic and dune hazards of the specific site and to make recommendations for proposed residential development and residential construction thereon. Our site visit was made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic and dune hazards. Mr. See's report on the subject property (2 pages dated February 18, 1992 with reference to 4 pages dated July 9, 1990) is attached to this report, and together with this report is the required dune hazard report for the proposed Tentative Plat for the PINE BEACH REPLAT. The proposed subdivision development is as shown on the attached Tentative Plan, consisting of 2 sheets.

INVESTIGATION

The oceanfront property lies West of Pacific Boulevard and is located just North of Camp Magruder. The spot elevation map of the property is shown on Sheet 2 of the Tentative Plan. Elevations over the site vary from approximately 15 feet (in isolated low spots) to 21 feet (in isolated high spots). In general the site is quite flat with an average elevation of 17 feet (NGVD). That area which lies West of the proposed most Westerly building sites is a broad deflation zone followed to the West by the primary foredune. The top of the foredune is located generally directly on the State Zone Line or within a few feet thereof. The top of the dune location is as shown on Sheets 1 and 2 of the Tentative Plan.

A review of OSHD aerial photos for this area dated 1967, 1973, 1978 and 1984 show a steady increase in vegetation over the entire property. Copies of those aerial photos are attached hereto, along with clear mylar overlays at the scales of 1"=100' for the 1967 photo and 1"=200' for the other photos. The most Westerly line of vegetation has moved Westward since at least 1939 as noted in Mr. See's reports. The original plat of PINE BEACH, dated 1932, shows the ocean beach to be located at least 320 feet East of where it is today. A copy of that map is included as Attachment 2 of the Property Ownership History report. The Westerly portion of the dune is classified as an Conditionally Stable Foredune and the Easterly portion of the property is classified as an Older Stabilized Dune.

Wind erosion and migration of sand is a hazard to any property near the beachfront which consists of sand. As Mr. See points out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the pathways to the beach. There are currently only three main beach access paths which provide access to the dry sand beach from this property (see aerial photos). Currently, there are no significant signs of erosion at these beach access pathways. Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation. For this reason, it is recommended that natural beach vegetation be maintained on Lots 11 through 20 and the common area to the West of those lots. See below the specific standards for vegetation maintenance and removal. Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dunefield was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert the property owners and foundation contractors to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractors should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2-inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance. Any logs discovered to be within 6 feet of the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

FLOOD HAZARD DISCUSSION

Potential hazards due to ocean flooding have been identified by the National Flood Insurance Program (NFIP). The Flood Insurance Rate Map (FIRM) for the Watseco area shows all of the subject property to be located in an 'AO' flood zone with a specified depth of flooding of one foot of water. A copy of the FIRM is attached to this report. A Velocity Flood Hazard Zone (V13), with a predicted 100 year base flood elevation of 22 feet, is located immediately West of the subject property. The current elevation of the crest of the dune is, coincidentally, now also approximately 22 feet (NGVD). After a review of the previously noted aerial photos, it can be seen that the foredune has grown significantly in elevation as the accretion process as continued with time.

The crest height and width of the foredune is a variable on this property, however, the general dimensions could be stated as an overall dune width of about 50 feet, a crest width of about 5 feet and a crest height of about 22 feet (NGVD). The foredune and deflation dune field to the East of the foredune is providing the protection from ocean flooding for this property. Every effort should be made to maintain the dune at or above the 100 year base flood elevation. This will be accomplished through the protection of the existing European beach grass and other vegetation on this property. Even at a lower elevation, however, the property will not be subject to velocity ocean flooding until the crest height is at least three feet lower than the 100 year base flood elevation. By definition, a velocity flood hazard zone cannot exist unless the ground elevations can support a three foot high breaking wave.

EARTHQUAKE HAZARD DISCUSSION

Mr. See comments on the potential regional hazard of severe earthquake on a roughly 600 year interval basis. The most serious such earthquake, for which evidence goes back about 7700 years, is estimated to have been a magnitude of about 8.5 on the Richter scale. There is no frequency estimate for such a maximum event, but it is far longer than 600 years. The 600 year period is about eight times the average life of a wood frame residence. Mr. See also notes that this property is at risk from the very destructive earthquake phenomenon known as liquifaction, because of the type of soil on the property. Present building code requirements for the State of Oregon do not address earthquakes of this magnitude, but there are recognized construction methods which can be used by contractors for owners wishing a degree of added protection in less than maximum earthquakes.

The property is located in a 90 mph wind zone with full exposure to ocean winds (Exposure 'C' as per UBC Section 2311(c).), therefore, the buildings must be designed to withstand the minimum required lateral wind loads. In general, one-story and two-story wood frame residential construction designed to withstand 90 mph Exposure 'C' wind loadings will also withstand earthquake loads. The hereinafter optional standards are recognized construction methods used for wind resistant wood frame construction which are also very effective in protecting against earthquake forces.

SITE INVESTIGATION SUMMARY

Existing and potential hazards have been identified and described in this report, including Mr. See's reports. Known hazards have been adequately investigated and development standards for buildable areas are included in this report. The general site and property, including property boundaries, is as shown on Sheet 1 of the Tentative Plan. The geographic information is as follows:

a. Dune landform identification is included in this report.
b. Dune stabilization has historically been none other than natural accretion.
c. History of erosion or accretion is detailed in Mr. See's reports.
d. General topography including spot elevations are shown on Sheet 2 of the Tentative Plan.
e. Base flood elevation and areas subject to flooding are discussed herein and a copy of the NFIP FIRM is attached hereto.
f. There are no perennial streams or springs on the property. All storm water percolates directly into the native sand. Smith Lake is located to the East of Pacific Blvd.
g. The State Beach Zone Line is located as shown on Sheet 1 of the

Tentative Plan.

h. There are no beachfront protective structures in the vicinity.
i. The elevation and width of the foredune crest is as stated herein and as shown on Sheet 2 of the Tentative Plan.
j. Land grading practices are included in the Development Standards.

DEVELOPMENT STANDARDS

A. Mandatory Standards:

1. **Foundations** - Residential foundations should be continuous reinforced concrete perimeter foundation systems. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. It is further recommended that minimum 18" wide footings be used for two-story construction, and that minimum 16" wide footings be used for one-story construction.

   All footings should bear directly on undisturbed native sand. The bottom of all footings should be excavated to below any organic material, or at least 12 inches below existing grade for single story construction and 18 inches below existing grade for two story construction. Do not place house footings on fill material. We recommend that the building contractors be alerted to the need to protect the footings during construction from sand erosion and undermining. All foundations excavations should be tested for the presence of buried logs within 6 feet of the ground surface as described hereinbefore.

   Due to the 'AO' flood hazard zone requirements, all finish floor elevations must be located at least two feet above the finish grade adjacent to the foundation of each residential building.

2. **Drainage** - All roof drainage should be collected with eave gutters and downspouts and piped to discharge either into on-site drywells or onto splash blocks adjacent to the footings such that all collected drainage is disposed of on each building site by percolation into the porous native sand. Accumulated surface drainage should also be collected and discharged. Roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed.

3. **Oceanfront Setback** - All proposed structures located on the most Westerly building sites of this property must be placed on each lot in accordance with the oceanfront averaging setback requirements of Tillamook County. The minimum most Westerly Oceanfront Setback Line will be determined by the Planning Commission for all of the Westerly lots, however, as each of the individual structures is constructed, the oceanfront averaging setback requirements of Tillamook County will apply on a case by case basis for each individual lot.

   It is the recommendation of this dune hazard report that the Oceanfront Setback Line be located at a minimum distance of 180 feet Easterly, as measured perpendicular thereto, from the Ocean Shores Boundary Line. No building construction should occur West of this line. The above

recommendation for a Oceanfront Setback Line of 180 feet applies to the Westerly edge of any foundation of a proposed structure, excluding any exterior deck on the West side of the structure.

4. **Vegetation** - Vegetation removal around the proposed structures on all lots should be kept to the minimum required for the placement of the structure and utilities in order to reduce the potential of wind erosion of the unprotected native sand. The vegetation which remains in accordance with this standard will assure that large areas devoid of vegetation are not created and that the subdivision development will not create a cumulative adverse effect on the stability of the native beach sand in this area. We recommend that the building contractors or property owners revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock.

   No beach grass vegetation should be mowed, cut or removed, and no trees should be removed in that area located West of a line 20 feet West of the actual structure locations on Lots 11 through 20, however, in that area of those lots, trees may be topped and/or limbed. In the common area West of Lots 11 through 20, no vegetation should be removed or disturbed other than topping of trees. All such tree topping and limbing activities should not damage the root structure, disturb the ground surface, or kill the trees. Vegetation may be removed as required to construct new beach access pathways on the proposed 5' wide access areas on the South side of Lot 11 and on the North side of Lot 20.

5. **Oceanfront Erosion** - Undercutting by wave action along this portion of the ocean front has not historically been a problem. Historically, this area has been subject to net accretion over a long period of time. Although it is impossible to predict what future winter storms may do to the coastline, it would seem likely that no significant wave undercutting will probably occur, based upon the history of this site. The proposed common open space on the West side of the plat and the proposed building setback line are designed and recommended to allow for the possibility of some very significant erosion to occur without adversely affecting the building sites.

6. **Land Grading Standards** - Because the site is already relatively flat, land grading activities will be very minimal. The only cut proposed for the project will be made at the new roadways just West of Pacific Blvd. The cut slopes should be dressed and revegetated to a maximum slope of 2:1. The excess excavated material should be thinly spread at a uniform thickness in the road rights-of-way to the West. It is proposed that pathways will be constructed on the proposed 5' wide access areas on the South side of Lot 11 and on the North side of Lot 20. These pathways should follow the grade of the existing ground surface in order to minimize excavation.

7. **Beach Access** - No new beach access paths should be constructed on the Westerly 100 feet of the common area West of Lots 11 through 20. The three existing main beach access paths should be monitored periodically (not less than annually) for signs of erosion, particularly at the Westerly edge of

the vegetation. If local erosion at these pathways increases, such as might occur due to increased foot traffic, then sand fences with gates should be installed to control the erosion.

B. Optional Standards for Added Seismic Protection:
These are standards not strictly required under conditions set out in the flood regulations and the Uniform Building Code lateral force resistance provisions for this area, but which a concerned property owner might wish to include in home construction to provide additional safety in view of the available information on the greater potential for major earthquakes and tsunamis with a possibility of a tsunamis up to 15 meters high, and earthquakes in about the 7 to 9 Richter category.

While no practical measures could guarantee protection in a maximum event, some reasonable steps could provide a degree of assurance against damage in lesser events. The design of the structure for wind loadings of 110 or 120 mph winds will generally add only a small cost to the entire structure and will effectively increase protection for both additional wind and earthquake loads. Examples of the results of such increased design loads are:

a. Install foundation anchor bolts on closer than normal spacing.
b. Secure floor framing to mudsills with galvanized steel framing anchors.
c. Secure roof framing to walls with galvanized steel hurricane clips.
d. Use plywood shear wall construction, with plywood sheathing applied to greater than building code requirements for plywood shear walls.

CONCLUSIONS

1. Development of this lot in accordance with the mandatory standards set out herein will provide a residence adequately protected from ordinary hazards, although not necessarily from major earthquake and tsunami, the possibility of which is discussed herein.
2. Development of this lot in accordance with the recommended standards will involve negligible adverse effects on the environment, on adjacent uses, and to the surrounding area.
3. Development of this property in accordance with the optional standards set forth will provide additional, but not complete, protection against potential earthquakes and tsunami of the nature discussed herein.

LIMITATION

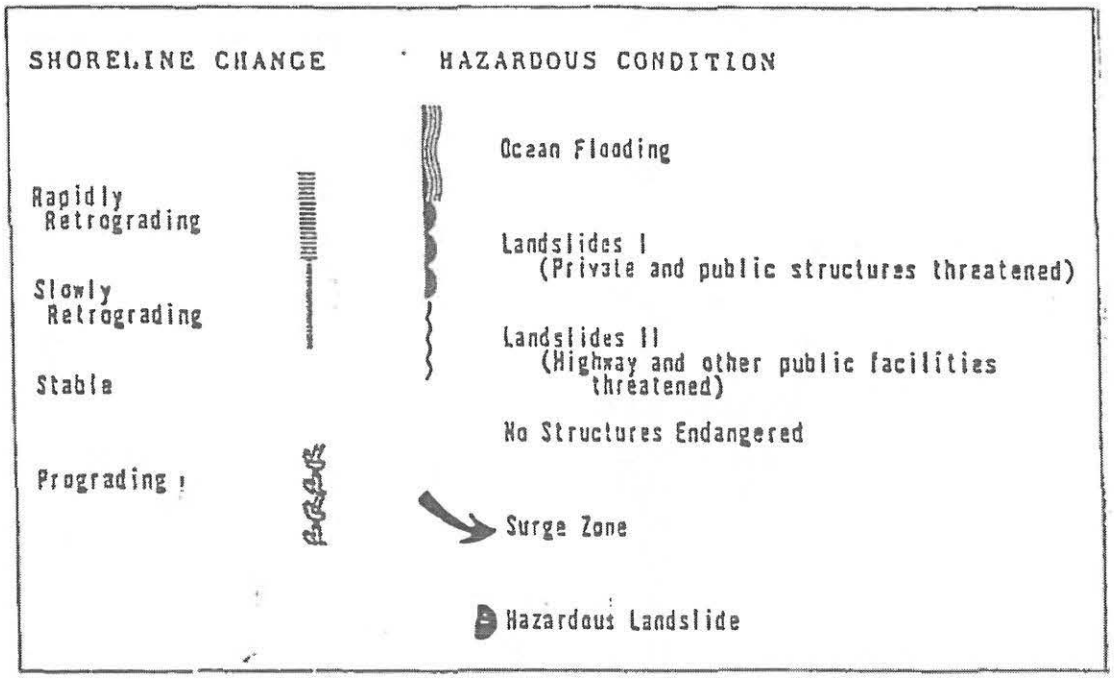
This report is based on a site inspection of the subject property and vicinity and a review of the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are offered as professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied. Should you have any questions regarding our investigation and this report, please contact our office.

Very truly yours,
HANDFORTH LARSON & BARRETT, INC.

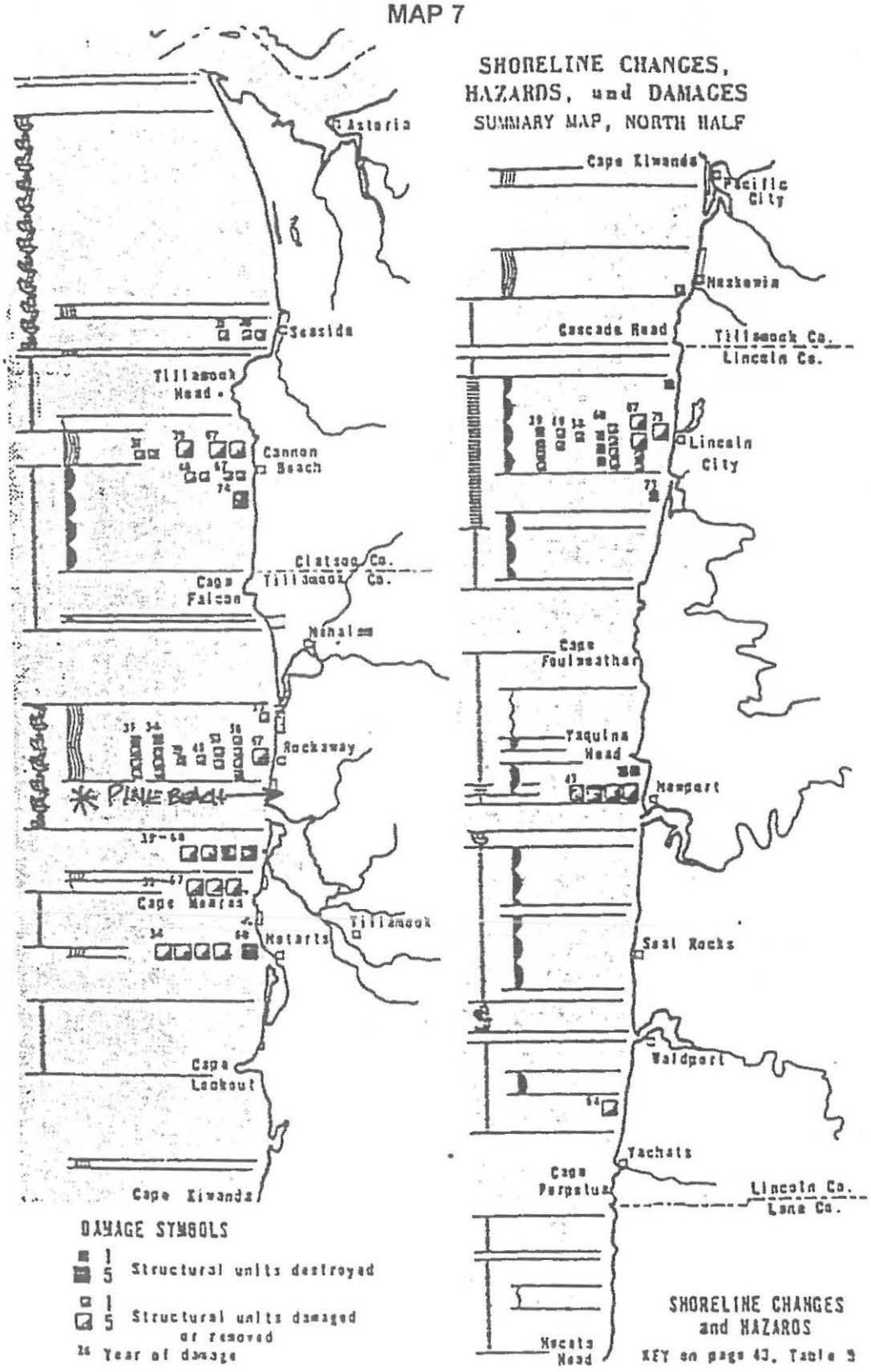
Ronald G. Larson

Ronald G. Larson, PE, PLS
<pinebch.dhr>

REGISTERED PROFESSIONAL ENGINEER 9443 OREGON SEPTEMBER 23, 1977 RONALD G. LARSON


SHORELINE CHANGE
HAZARDOUS CONDITION
Rapidly Retrograding
Slowly Retrograding
Stable
Prograding
Ocean Flooding
Landslides I
(Private and public structures threatened)
Landslides II
(Highway and other public facilities threatened)
No Structures Endangered
Surge Zone
Hazardous Landslide

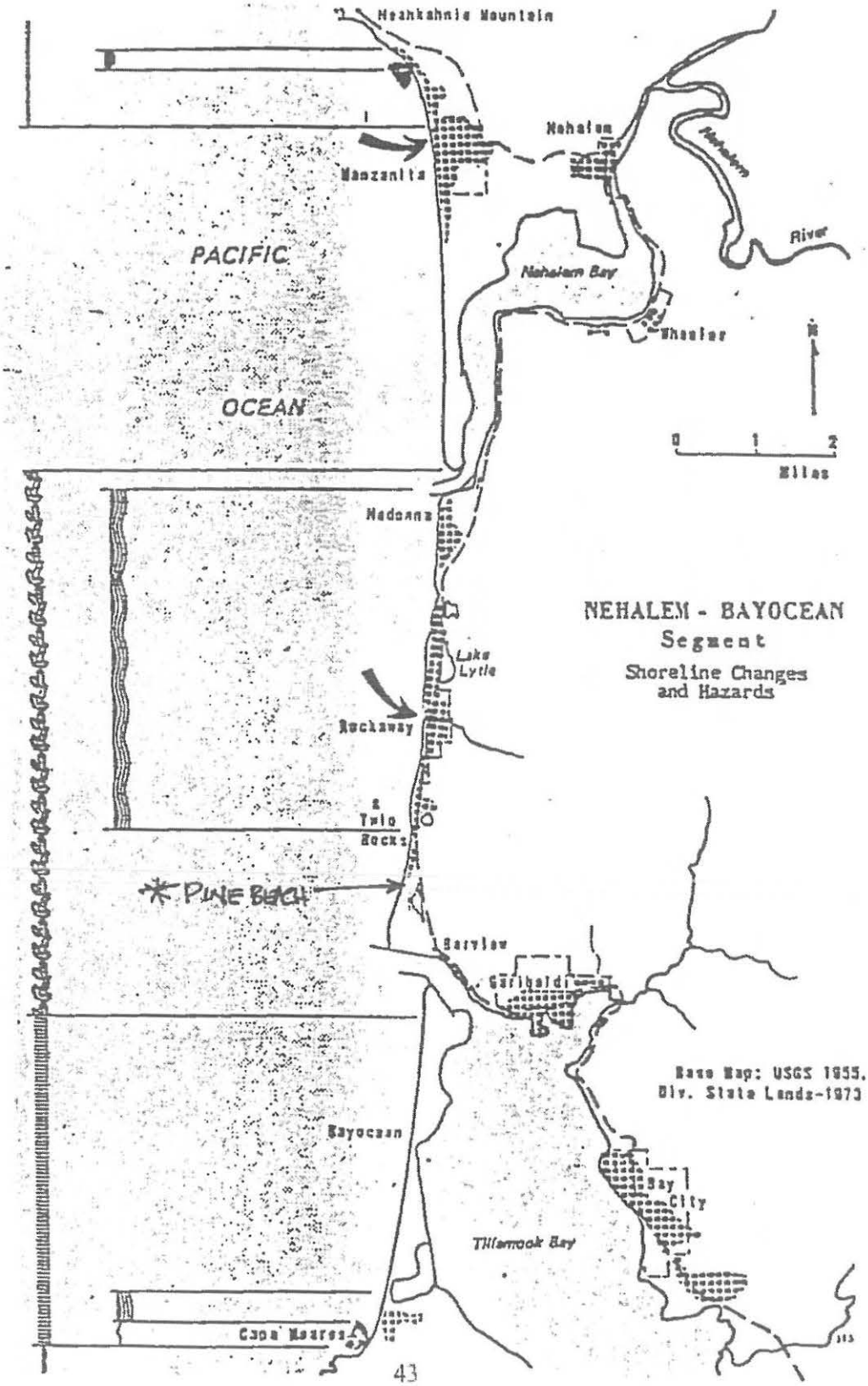
MAP 7



42

source: Stembridge

MAP 8

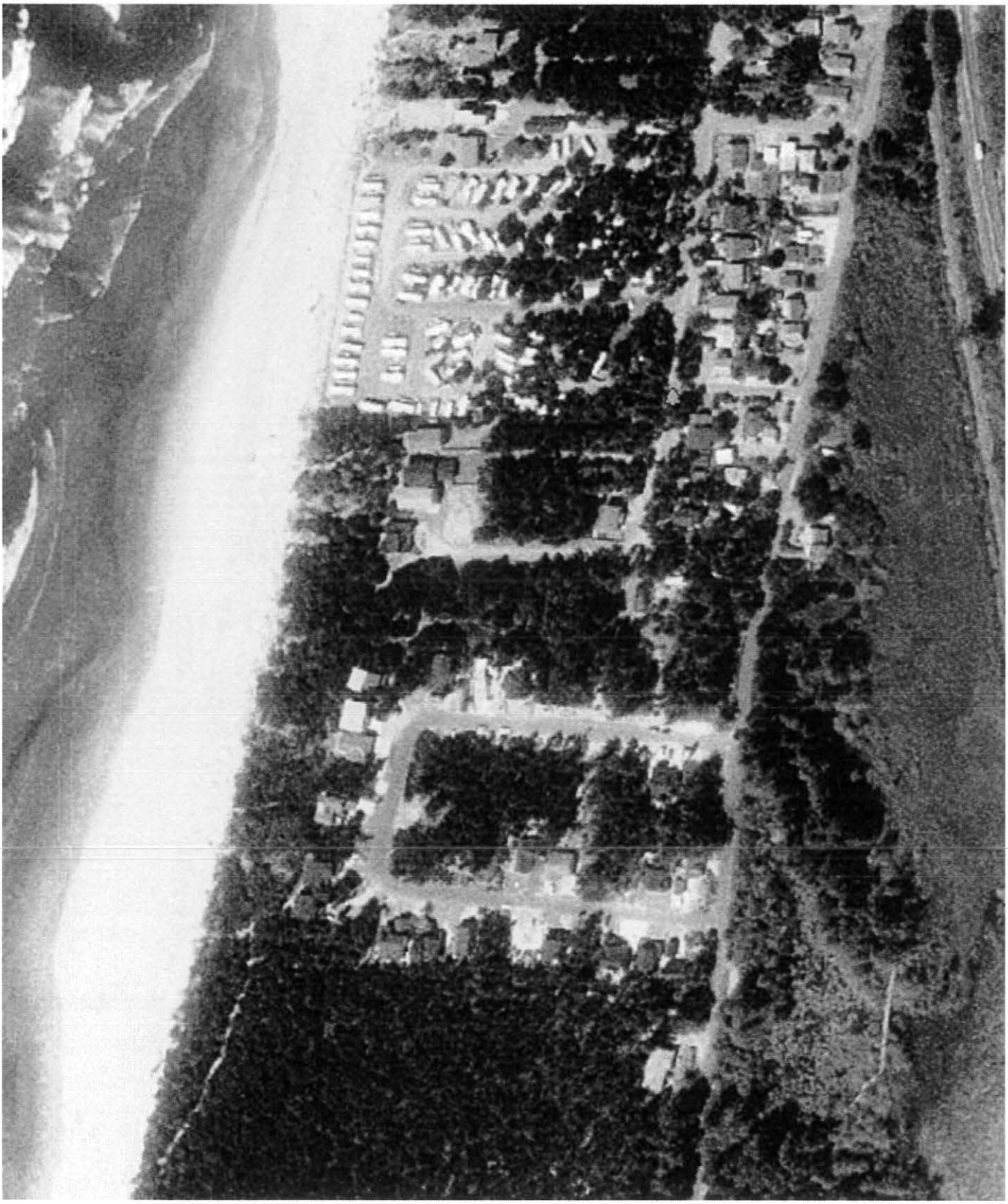


43

source: Stembridge

Beach Erosion History – Google Earth

1994



2000

August 2005

December 2005

2011

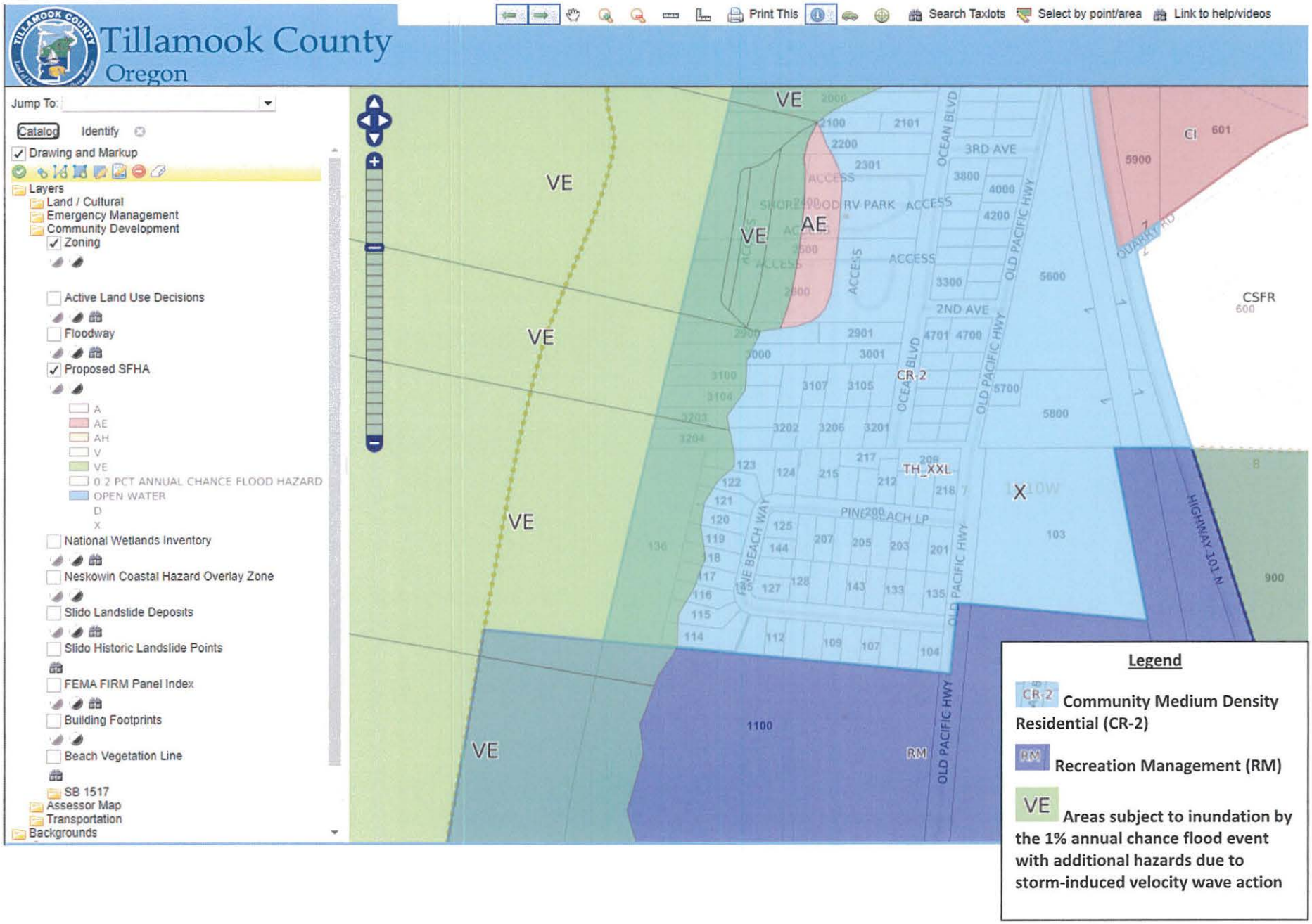
2014

2016

2017

2020

County Zoning Map



TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:14:27 pm

Account #	62425	Tax Status	ASSESSABLE
Map #	1N1007DA03000	Acct Status	ACTIVE
Code - Tax #	5624-62425	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	DOWLING, DAVID A & ANGELA M	Deed Reference #	2020-6069
Agent		Sales Date/Price	09-03-2020 / $695,000.00
In Care Of		Appraiser	EVA FLETCHER
Mailing Address	19690 WILDWOOD DR WEST LINN, OR 97068		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	27131-1

Situs Address(s)	Situs City
ID# 17560 OCEAN BLVD	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	338,830			Land	0	
	Impr.	351,300			Impr.	0	
Code Area Total		690,130	619,010	619,010		0	
Grand Total		690,130	619,010	619,010		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	0	☑		CR-2	Market	97	A	0.67		322,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.67		338,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1989	145	Two story or more	112	2,816			351,300
				Grand Total		2,816			351,300

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: 02/07/13 Reappraised land. Tabled values. RBB 08/29/17 Corrected mapping error that occurred during conversion to GIS. Size change only.ef

TILLAMOOK COUNTY CONSTRUCTION/PLACEMENT PERMIT APPLICATION
for
Building, Planning and Sanitation

Call when ready

APPLICANT

Permit # 89-027

Legally Recorded Owner Ralph Winczewski

Mailing Address 6615 S.E. Plum Dr Phone 322-0052

City Milwaukie State OR Zip Code 97222

CONTRACTOR/INSTALLER

Building Contractor D.L.I. Const. Reg. No. 48198
Sanitation Installer Reg. No.
Mobile Home Installer Reg. No.

LOCATION INFORMATION

Area Netarts 17560 Ocean Blvd.

Township 1N Range 10 Section 7DA Tax Lot 3000

Zone R-2 Lot Size 330' x 60' x x or Acres

****

PROPOSED USE

X /Single Family Dwelling
/ /Mobile Home/RV Placement
/ /Addition
/ /Accessory Structure
/ /Demolition/Move
/ /Temporary MH/RV Placement
/ /Replacement
/ /Alteration
/ /Public/Commercial/Industrial

MOBILE HOME/RECREATION VEHICLE

License Number
Make
Year

SIZE OF STRUCTURE

72 x 32' Dimensions
24' Height
2 Stories gar 1 story
1 Units
4 Bedrooms

WASTE DISPOSAL

X /Sewer District
/ /Septic Tank/Drainfield

WATER SUPPLY

Privat /Public/Creek/Spring/Well

VARIANCE/CONDITIONAL USE

File No.

SETBACKS

190' Front Yard
68' Rear Yard
5' Left Side
15 Right Side
River/Estuary/Creek Ocean

ROAD ACCESS

/ /State Highway
X /County Road/Public Way #
/ /Private Road

CONSTRUCTION COST INCLUDING LABOR AND MATERIALS @ 70,000.00

DATE RECEIPT # 12651

SANITATION	N/A	Dan	24 Jan 89	Sanitation Fee $ —
PUBLIC WORKS		GWU	2-15-89	D.E.Q. Surcharge —
HOUSE #	*	WILLARD	2-13-89	Building Fee 343.00
PLANNING	*	WILLARD	2-13-89	Plan Check Fee 222.95
PLAN CHECK		Nancy	1-30-89	5% State Surcharge 17.15
BUILDING OFFICIAL		Nabay	2-15-89	Planning Review Fee 50.00
				M.H/RV Fee (Planning) —
				M.H/RV Fee (Building) —
				B&D/GHZ Review Fee 50.00
				TOTAL DUE $ 6[illegible].10

SIGNATURE INDICATES COMPLIANCE WITH THE CURRENT LAND USE ORDINANCE COMPREHENSIVE PLAN AND STATEWIDE PLANNING GOALS. THE TYPES AND LEVELS OF SERVICES PROVIDED IN CONJUNCTION WITH THE DEVELOPMENT AUTHORIZED BY THIS PERMIT MEET TILLAMOOK COUNTY COMPREHENSIVE PLAN POLICIES.

Signed [signature] Title SP Date 2-13-89

CITY CONCURRENCE IF INSIDE U.G.B.: _____

Signed Title Date

****

Conditions: NEW HOUSE NUMBER;

* MUST CONFORM TO BEACH & DUNE REPORT RECOMMENDATIONS, FLOOD HAZARD ORD (3.060) STANDARDS & HOUSE # CONDITIONS, HEIGHT MUST NOT EXCEED 24' AVG,

****

Separate State of Oregon permits are required for electrical, plumbing, an mechanical work. The property owner is responsible for obtaining these additional permits prior to work being done.

This application, when approved, includes only the work described abov and/or plans and specifications bearing the same permit number. Th applicant agrees to comply with all applicable codes and ordinance governing zoning, sanitation and construction.

The granting of this permit does not presume to give authority to violat or cancel the provisions of any state or local law regulating constructio or the performance of construction.

This application, if approved, becomes null and void if buildin construction is not commenced within 180 days, is discontinued for 18 days, or installation of sewage disposal system and/or placement of mobil home or recreation vehicle is not completed within 1 year from the date o approval.

Prior to construction or placement, it is advisable that you check you deed for other restrictions that may apply.

FEES ARE NOT REFUNDABLE

APPLICANT: [signature] DATE 1-23-88

Revised 12/86

Handforth & Larson, Inc. Civil Engineering & Surveying

P.O. BOX 219 MANZANITA, OREGON 97130 (503) 368-5394

December 7, 1988

Mr. Ralph Winczewski
6615 SE Plum Drive
Milwaukie OR 97222

RE: Dune Hazard, Tax Lot 3000, 1N 10 7DA, Watseco, Oregon

Dear Mr. Winczewski:

At your request our firm has visited the site of your property in the Watseco area in order to address the engineering and geologic hazards of the specific site and to make recommendations for residential construction thereon. Our site visit was made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic hazards. Mr. See's report on the subject property is attached to this report, and together with this report is the required dune hazard report for the subject property. The site is shown on the enclosed vicinity map.

INVESTIGATION

The property lies on the West side of Ocean Boulevard. The enclosed spot elevation map of the property shows spot elevations on the property (on NGVD) as well as the high point of the dune formation. The top dune formation is approximately 40 feet West of the proposed building site.

A review of OSHD aerial photos for this area dated 1967, 1973, 1978 and 1984 show a steady increase in vegetation over the entire property. The most Westerly line of vegetation has moved Westward since at least 1939 as noted in Mr. See's report. The Westerly portion of the dune is classified as an Active Foredune and the Easterly portion of the property is classified as an Older Stabilized Dune.

Wind erosion and migration of sand is a hazard to any beachfront property which consists of sand. As Mr. See points out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the walkways to the beach. Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation. For this reason, it is recommended that no vegetation be cut to the West of the proposed building site.

CONDITION OF PERMIT

Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dune was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert your foundation contractor to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractor should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2 inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance. Any logs discovered to be near the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

Potential hazards due to ocean flooding have been identified by the National Flood Insurance Program. The Flood Insurance Rate Map (FIRM) for the Watseco area shows the subject property to be located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is immediately adjacent to a velocity zone (V13) with a predicted base flood elevation of 22 feet. The current elevation of the crest of the dune is now also approximately 22 feet (NGVD). Thus the crest and width of the dune field is providing all of the protection from flooding for this property. Every effort should be made to maintain the dune at or above the 100 year base flood elevation. This will be accomplished through the protection of the existing European beach grass and other vegetation on this property.

FLOOD CERTIFICATE REQUIRED

DEVELOPMENT STANDARDS

Development standards which are recommended for the subject property to adequately protect the proposed development from the above described potential hazards are as follows:

1. The foundation of the structure should be on continuous concrete footings. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. All footings should bear directly on undisturbed native sand. Do <u>not</u> place house footings on fill material. The bottom of all footings should be a minimum of 12 inches below grade for single story construction and 18 inches below grade for two story construction in native sand. We recommend that the building contractor be alerted to the need to protect the footings during construction from sand erosion and undermining.

CONDITION

2. Roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed. All collected runoff water should be disposed of either on splash pads or in drywells.

3. The structure may be placed on the property in accordance with the standard setback requirements of Tillamook County. More specifically, the Oceanfront Setback Line should be located as shown on the enclosed Topographic Study Map at 40 feet East of the Northwest property corner on the North property line and 68 feet East of the Southwest property corner on the South property line. No building construction should occur West of this line and no vegetation should be removed or disturbed West of this line. No beach grass or other vegetation should be cut West of this line. ↑ CONDITION

4. Vegetation removal around the proposed structure should be kept to the minimum required for the placement of the structure. We recommend that your contractor revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock. CONDITION ←

5. Undercutting by wave action along this portion of the ocean front has not historically been a problem. Although it is impossible to predict what future winter storms may do to the coastline, it would seem likely that no significant wave undercutting will probably occur. If such undercutting were to begin, remedial measures, such as riprap construction, would need to be implemented.

FINDINGS AND CONCLUSIONS

Based upon our site specific investigation of this property and the recommended development standards, the following are our conclusions:

a) The proposed residential use will have negligible adverse effects on adjacent uses and the surrounding area.

b) There are no hazards to life, property, and the natural environment which may be caused by the proposed use, subject to the conditions for development stated in the foregoing development standards.

c) The proposed residential use, subject to the foregoing development standards, will be adequately protected from the described hazards, notwithstanding the fact that riprap protection may be necessary in the future should erosion occur.

d) No periodic monitoring of site conditions is recommended other than monitoring of any erosion of the foredune, should it occur.

LIMITATION

This report is based on a site investigation of the subject property and vicinity and a review of existing aerial photography and the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied.

Very truly yours,
HANDFORTH & LARSON, INC.

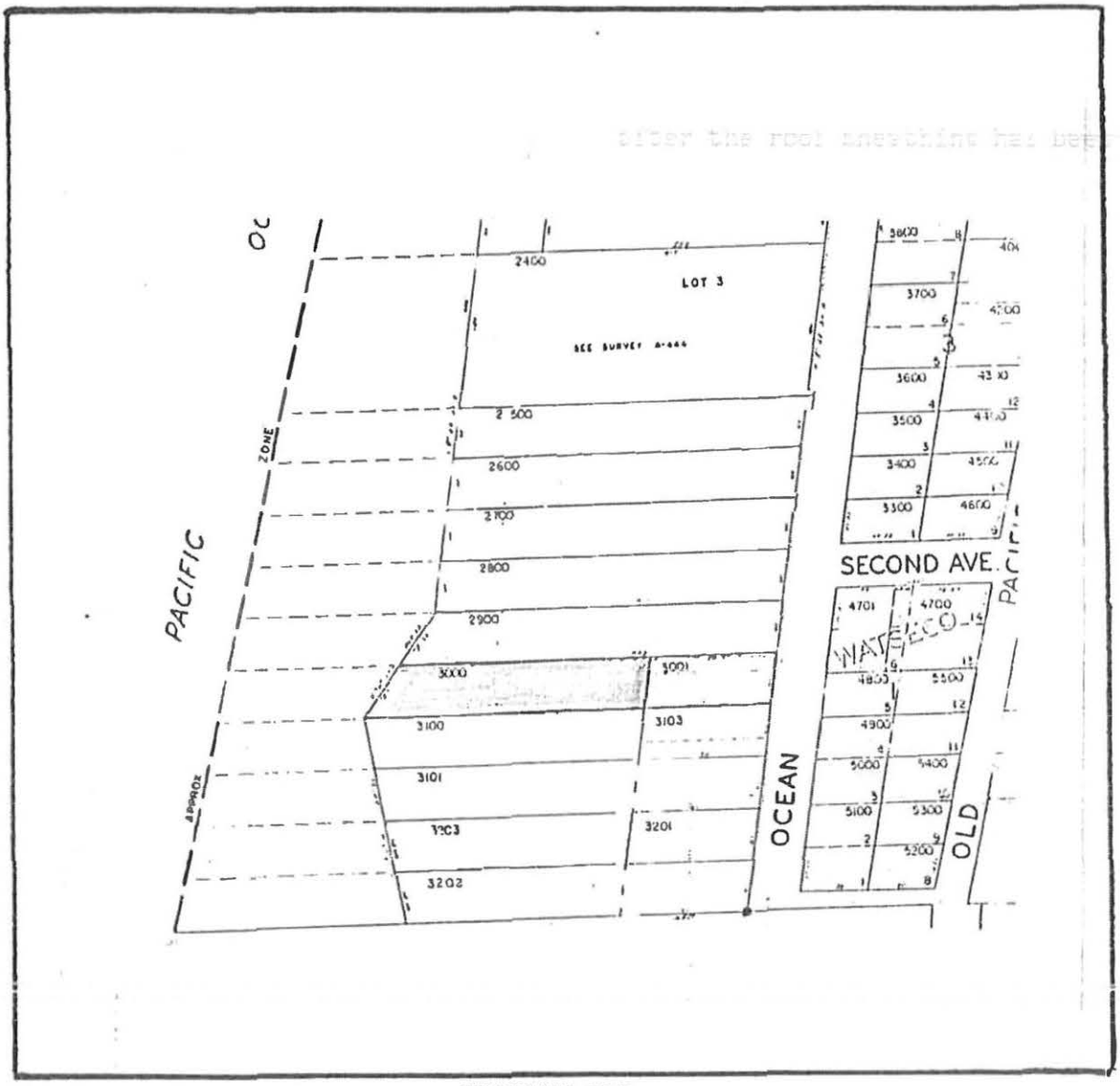
Ronald H Larson

Ronald G. Larson, PE, PLS

jj

cc: Paul D. See

Hardforth & Larson, Inc. Civil Engineering & Surveying
P.O. BOX 219 MANZANITA, OREGON 97130 (503) 368-5394



VICINITY MAP
SCALE 1" = 200'

ENGINEERING GEOLOGIC HAZARDS REPORT

Tax Lot 3000, 1N 10 7DA
WATSECO, Section 7, Township 1 North
Range 10 West of the Willamette
Meridian, Tillamook County, Oregon.

OWNER:

Ralph Winczewski
6615 SE Plum Drive
Milwaukie OR 97222

HLI Job #2659

PAUL D. SEE

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

#8098

September 15, 1988

Ronald G. Larson
Handforth and Larson, Inc.
P. O. Box 219
Manzanita, Oregon 97130

Re: Tax lot 3000, T1N, R10W, Sec 7DA, Watseco, Tillamook Co. (Winczewski)

Dear Ron:

The following observations and conclusions derive from our joint inspection of the above described property on September 8, 1988.

The property rests on a relatively flat but hummocky dunefield at an approximate elevation of 16+ feet. Sand has accumulated along this shoreline partly as a natural barrier across an otherwise irregular foothill frontage, and partly as a result of the interruption of coastal sand transport by construction of the Tillamook Bay north jetty in 1917.

Although this beach has experienced a net accretion in the past 70 years, severe storms have periodically eroded the dune front resulting in scattered property damage from Manhattan Beach to Tillamook Bay. Cooper[1] describes intense erosion in January, 1939, and Schlicker[2] describes with an accompanying photograph the abrupt erosion of 12+/- foot high dunes at Watseco Creek in the winter of 1971-72, along an area that had been stable for 15 years. The 1986 Nedonna Beach Foredune Study[3], although not directly incorporating this area, utilizes examples of erosion/deposition in the Watseco Creek area to illustrate factors applicable to their area of study. Concentrating on the effect of drift logs, they declare that: "Driftwood deposits on the backshore can either be a benefit or destructive force to the foredune, Massive driftwood deposits that interlock can provide excellent wave protection by breaking up wave energy before it reaches the foredune. They also collect wind-blown sand and can be the start of new foredunes. Backshore deposits known to the study team on other beaches are sometimes 50 to 100 feet wide and a mile long. They tend to create a false sense of security for oceanfront property owners".

Inspection of 1967, 1973, 1978, and 1984 Oregon State Highway Division aerial photos reveals a relatively fresh local field of scattered drift logs over a 200+/- foot wide strip in 1967. Vegetation had gradually obscured these logs from aerial view by 1984, but field inspection reveals that they have remained in place to date. Periodic erosion, particularly during the 1982-83 El Nino, has removed several tens of feet of the dune frontage, exposing a dense tangle of logs weathered from the dune. The low wave-cut bank visible on the 1984 photo is still observable at this time.

The surface profile in this area is atypical of most sandy beach fronts.

No true foredune exists, although the western edge of the dunefield is slightly higher than the hummocky, log-strewn plain to its east. Obviously the area has not experienced a net regression since 1967, although the presence of the fresh logs at that time is evidence of extreme wash-over just prior.

Notwithstanding the record of frequent storm damage, Stembridge[4] notes in 1975 that "with the exception of Neahkahnie and Manzanita beaches in the extreme north, the entire Rockaway-Nehalem shoreline has been prograding since at least 1939", and "The least prograding between the Nehalem River and Tillamook Bay totals more than 30 feet since 1939". He further notes the confusion among other investigators over erosion/deposition trends along this beach, citing their use of newspaper accounts of storm damage as evidence of long-term erosion.

A hummocky dune about eight feet higher than the building site and west of the property would inhibit damage from prolonged storm surf erosion or wash-over. However, the low elevation and vulnerability of the nearby trailer court on the north permits a degree of velocity flooding in the general area, including the subject property.

Quoting further from the Foredune Management Study, "Driftwood logs should not be removed when they accumulate in an eroded portion of a foredune because they aid the natural repair of the foredune.

"The accumulation of drift logs near Watseco Creek are not well interlocked and could be pushed or floated farther inland where they could block Watseco Creek. As a result, Watseco could move south and possibly endanger existing development. The logs at Watseco could also be washed out and transported to other shorelines. It is our opinion that the logs in the former foredune area should remain to aid in the rebuilding of the foredune".

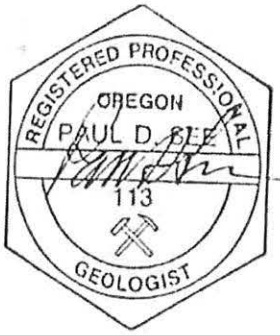
In summary, the property is well vegetated with beach pines and other upland grasses and shrubs. However, this has obviously developed in a few decades, and remains at slight risk from severe episodic storm wave overtopping due to its elevation. The presence of the numerous old drift logs and living vegetation would diminish velocity flooding at the building site. The Tillamook Bay north jetty will continue to present a barrier to southerly offshore sand transport, causing a continued net accretion along this beach. The timing and magnitude of future storm surges and consequent erosion cannot be predicted, however, and damage from velocity flooding cannot be ruled out.

Notwithstanding the possibility of flooding, the property appears to be relatively safe from long-term erosion and shoreline regression. No evidence exists to suggest a reversal in trend that has continued for more than 70 years.

The observations and recommendations incorporated in this letter report are the result of personal site inspection, the works of other specialists, and generally accepted principles of geologic investigation for a report of this nature. Conditions described are believed to accurately represent circumstances at the time of inspection. No warranties are expressed or implied.

Sincerely,

Paul D. See



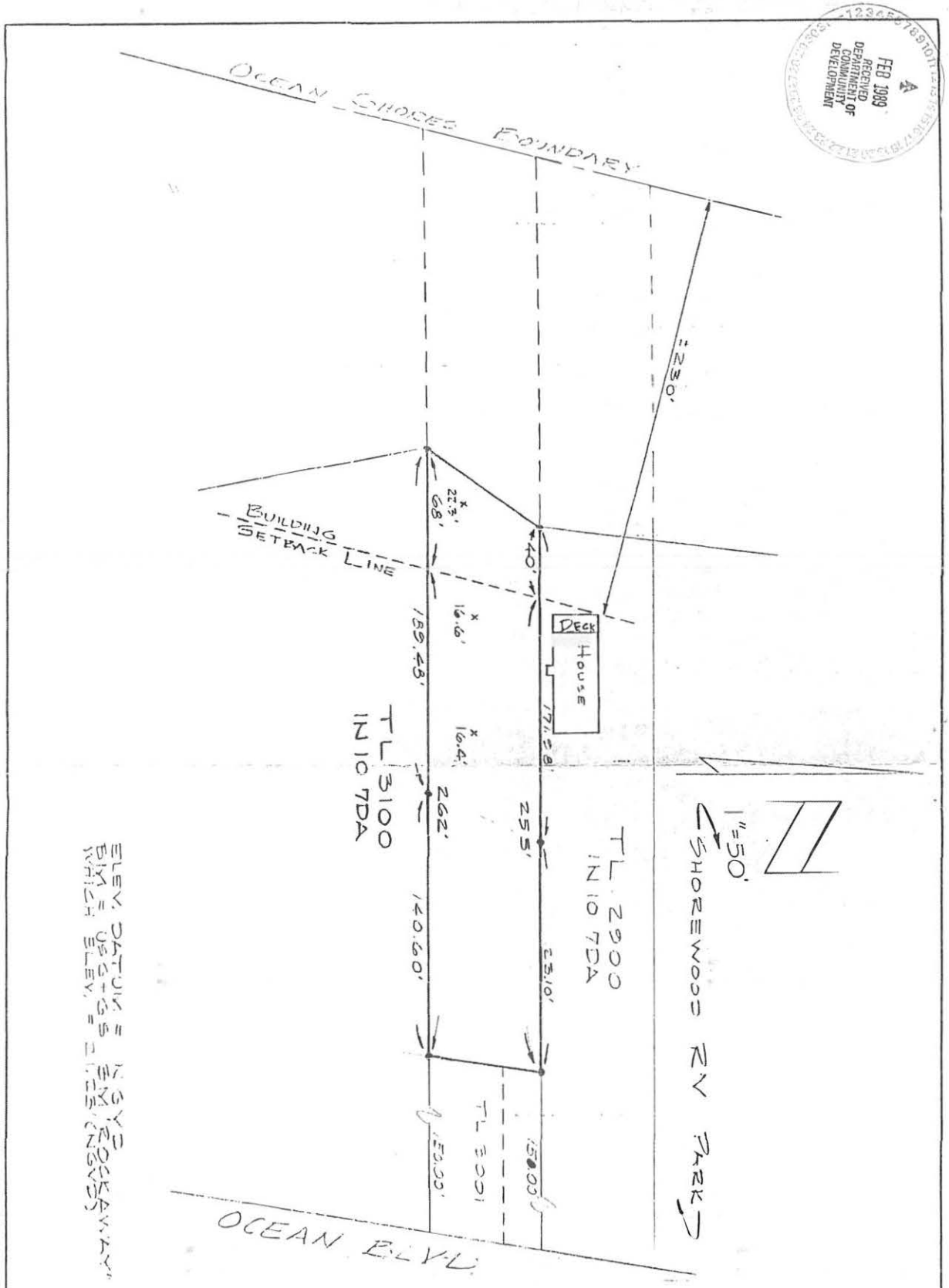
References cited:

[1]Cooper, William S. Coastal Sand Dunes of Oregon and Washington GSA memoir #72, 1958 (P. 84)

[2]Schlicker, H. G. et al Environmental Geology of the Coastal Portions of Tillamook and Clatsop Counties, Oregon Oreg. Dept. of Geol. and Mineral Indust. Bull #74, 1972.

[3]Nedonna Beach Foredune Management Study, pages 24, 25. Prepared for Oregon Land Conservation and Development Commission, 1986.

[4]Stembridge, James Edward, Jr. Shoreline Changes and Physiographic Hazards on the Oregon Coast. PhD Dissertation, University of Oregon, 1975. (P. 63).



FEB 1989
RECEIVED
DEPARTMENT OF
COMMUNITY
DEVELOPMENT

TOPOGRAPHIC STUDY MAP FOR RALPH WINCZEWSKI SHOWING OCEANFRONT SETBACK LINE NE1/4SE 1/4 SECTION 7, T.1N R.10W., W.M. TILLAMOOK COUNTY				SURVEY BY: HANDFORTH & LARSON, INC. P.O. BOX 219 MANZANITA, OR. 97130 (503) 368-5394	
DATE 12/7/88	JOB NO. 21079	EQUIPMENT JENA OZOA W/ TAPE	FIELD RGL/JPR	DRAWN RGL	CHECKED RGL

DUNE HAZARD REPORT – SHT 9 OF 9

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:19:57 pm

Account #	62611	Tax Status	ASSESSABLE
Map #	1N1007DA03100	Acct Status	ACTIVE
Code - Tax #	5624-62611	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	DANNO, EVAN F TRUSTEE	Deed Reference #	2020-5674
Agent		Sales Date/Price	08-25-2020 / $626,000.00
In Care Of		Appraiser	ROBERT BUCKINGHAM
Mailing Address	144 HIGHLAND RIDGE RD KALISPELL, MT 59901		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	27142-1

Situs Address(s)	Situs City
ID# 1 17490 OCEAN BLVD	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	334,830			Land	0	
	Impr.	363,480			Impr.	0	
Code Area Total		698,310	579,650	579,650		0	
Grand Total		698,310	579,650	579,650		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.22		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.22		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	149	Basement First Floor	112	2,544			363,480
				Grand Total		2,544			363,480

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: 09/15/09 Phase one review - updated inventory.ef 02/07/13 Reappraised land. Tabled values. RBB

RECEIVED
JAN 28 1997
COMMUNITY DEVELOPMENT

TILLAMOOK COUNTY CONSTRUCTION/PLACEMENT PERMIT APPLICATION
For *Building, Planning and Sanitation*

APPLICANT

Application 97-045

Legally Recorded Owner MELVIN G. and BETTY A LEWIS (verified 1-28-97)

Mailing Address 3397 NW Hyw 47 Phone 503 357-2800

City FOREST GROVE State OR Zip Code 97116

CONTRACTOR/INSTALLER

Building Contractor TIM HALL BUILDERS Reg. No.

Sanitation Installer NA Reg. No.

Mobile Home Installer NA Reg No.

[ ] Mail permit to Contractor/Installer:

APPROVED PERMIT

LOCATION INFORMATION BARVIEW/WATSECO

Situs Address 17490 OCEAN BLVD, ROCKAWAY

Township 1N Range 10 Section 7DA Tax Lot 3100 (verified 1-28-97 jr)

Zone R-2 Lot Size 60' x 95' x x or Acres (verified 1-28-97 jr)

PROPOSED USE

- [X] Single Family Dwelling
- [ ] MD/RV Placement
- [ ] Addition
- [ ] Accessory Structure
- [ ] Demolition/Move
- [ ] Temporary RV Placement
- [ ] Replacement
- [ ] Alteration
- [ ] Public/Commercial/Industrial

WASTE DISPOSAL

- [X] Sewer District
- [ ] Septic Tank/Drainfield
- [ ] Construction Permit
- [ ] Minor/Major Repair Permit
- [ ] Alteration Permit

Letters on file

WATER SUPPLY

Private (Public) Creek/Spring/Well

SIZE OF STRUCTURE 624 NLA 544 LA

30'x56' Dimensions
24' Height
2 Stories
1 No. of Dwelling Units
5 Bedrooms

VARIANCE/CONDITIONAL USE File No. V-96-12(a)

SETBACKS

20' Front Yard
5' Rear Yard
5' Left Side
5' Right Side
River/Estuary/Creek

plans in Bot

MOBILE HOME/RECREATION VEHICLE

License Number
Make
Year

ROAD ACCESS

- [ ] State Highway
- [X] County Road/Public Way
- [ ] Private Road

RAP to P.W. 1-28-97 jr

VALUATION (AS DETERMINED BY BUILDING OFFICIAL) Section 304 (b) $ 175,000—

All or a portion of this property may be located within an identified wetland. If the site is a jurisdictional wetland you must obtain any necessary State or Federal permits before beginning your project.

Separate State of Oregon permits are required for electrical, plumbing, and mechanical work. The Property owner is responsible for obtaining these additional permits prior to work being done.

This application, when approved, includes only the work described above and/or plans and specifications bearing the same permit number. The applicant agrees to comply with all applicable codes and ordinances governing planning, sanitation and construction and agrees to meet any and all or the conditions listed below.

The granting of this permit does not presume to give authority to violate or cancel the provisions of any State or Local law regulating construction of the performance of construction.

This application, if approved, becomes null and void if building construction is not commenced within 180 days, is discontinued for 180 days, or installation of sewage disposal system and/or placement of mobile home or recreation vehicle is not completed within one year from the date of approval.

Prior to construction or placement, it is advisable that you check your deed for other restrictions that may apply.

I certify that the information I have submitted is complete and accurate, and may be relied upon by the Department of Community Development in processing my application. I accept responsibility for any inaccuracies in the information I have provided, and for the consequences thereof.

FEES ARE NOT REFUNDABLE

APPLICANT SIGNATURE: Melissa G Lewis Date 1/28/97

********** FOR OFFICE USE ONLY **********

SANITATION	L Ryan 1-28-97	Sanitation Fee	$ 0
PUBLIC WORKS	[illegible] 2/10/97	D.E.Q. Surcharge	0
HOUSE NO.	[illegible] 2-12-97	Building Fee	620.50
PLANNING	[illegible] 2-7-97	Plan Check Fee	403.32
PLAN CHECK	Nancy 2-11-97	B.C.A. Surcharge	31.03
BUILDING OFFICIAL	Manly 2-11-97	Planning Review Fee	120.00
		A-level Plan Review	0
		Fire & Life Safety	0
		Address ($10.00)	10.00
		M.D./RV Fee (Planning)	
		M.D./RV Fee (Building)	0
RECEIVED BY:	lr	State M.D. Fee ($20)	0
DATE:	1-28-97	B&D/GHZ/Flood Fee	140.00 — GHZ Flood
RECEIPT NO.	2321	F-1 & F Review Fee	0
		PW Review Fee	4.00
		Road Approach ($125.00)	125.00
		TOTAL DUE	$ 1453.85

The signature below indicates that the proposed development is in compliance with the current Land Use Ordinance, Comprehensive Plan and Statewide Planning goals. The types and levels of services provided in conjunction with the development authorized by this permit meet the Comprehensive Plan policies.

CITY APPROVAL INSIDE U.G.B.: _____
City Official Signature Title Date

CONDITIONS OF PERMIT APPROVAL:

G:\Admin\Forms\Bldgform\Buipermit - 2/09/96

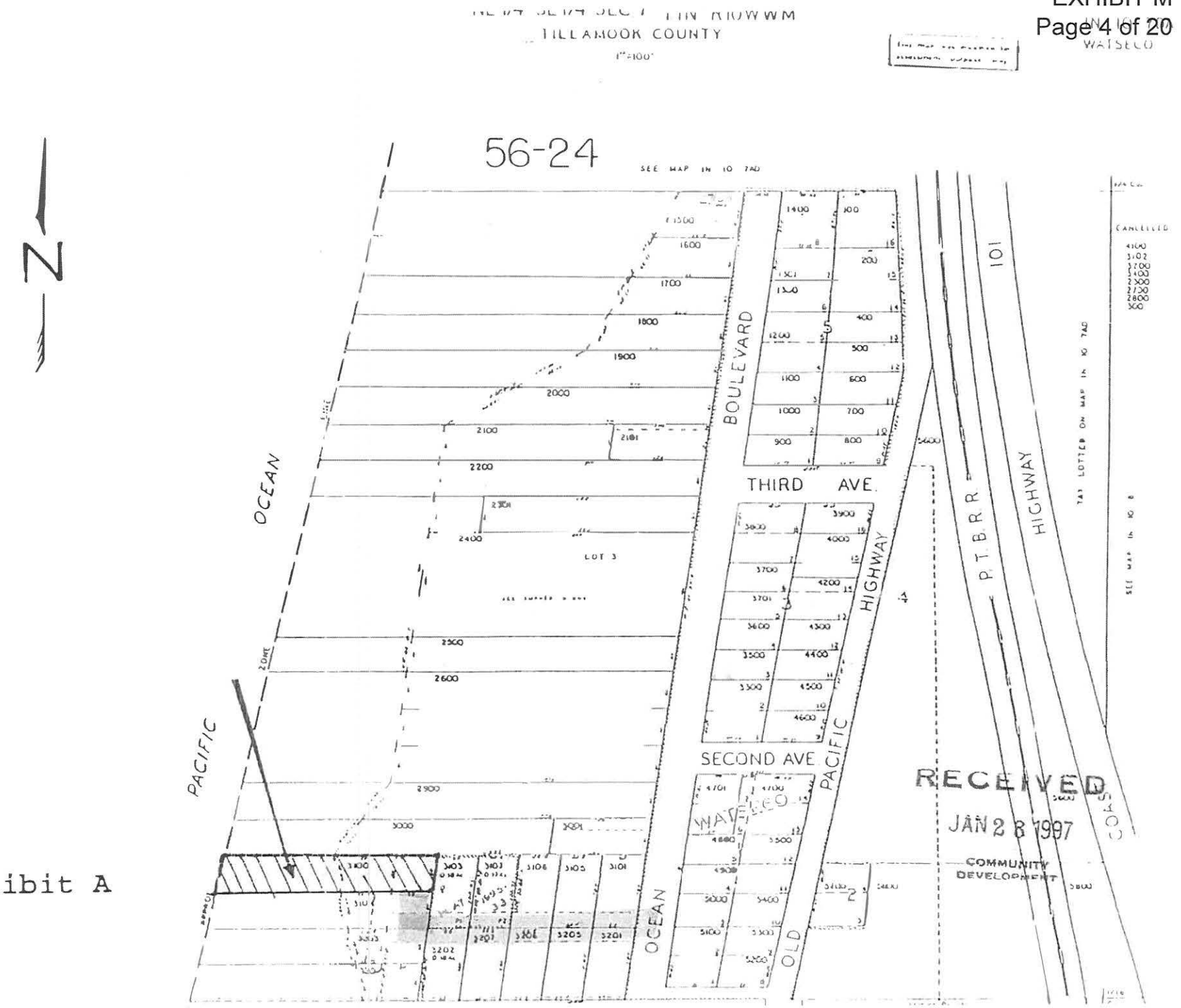
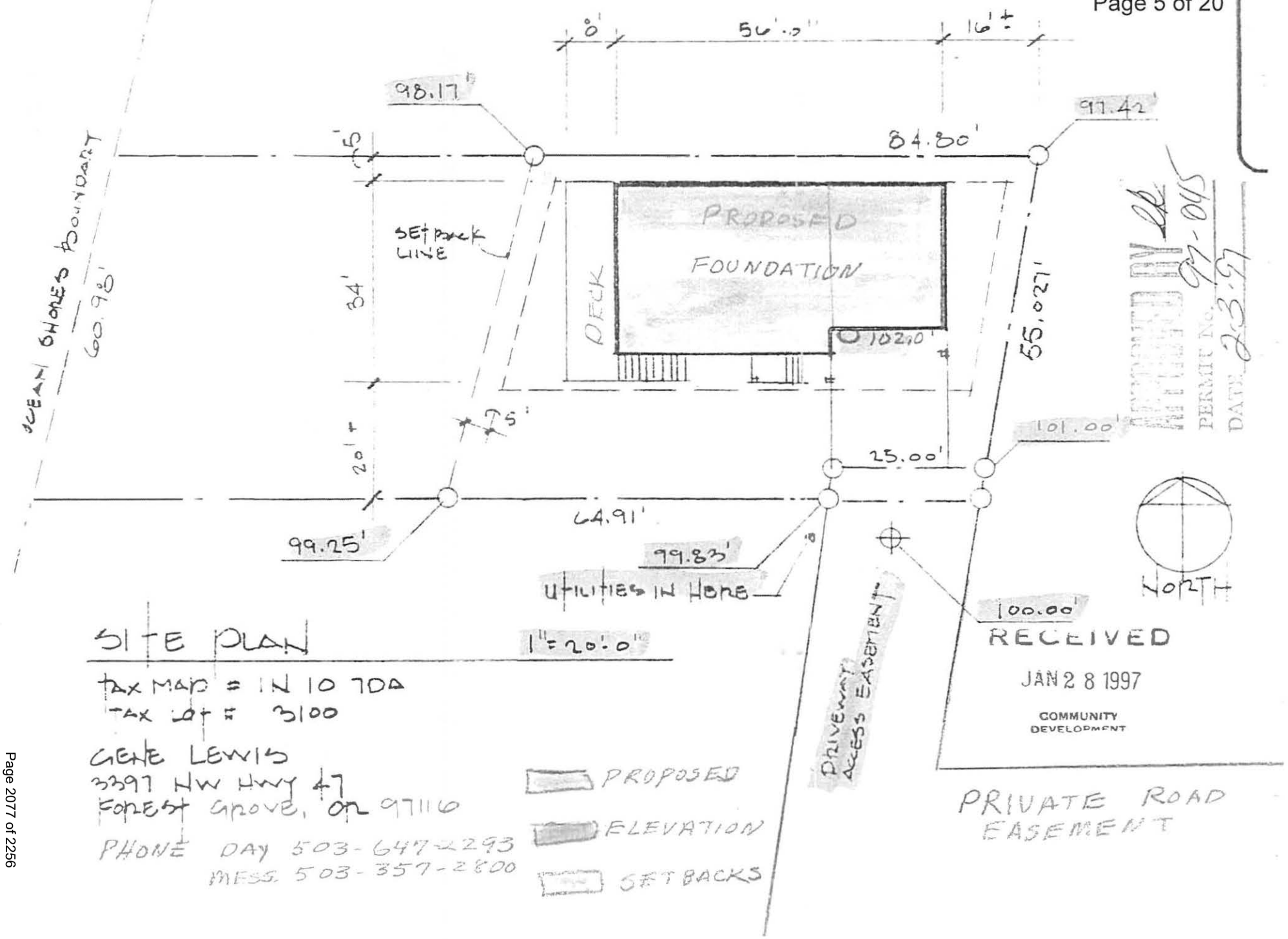

TILLAMOOK COUNTY
56-24
SEE MAP IN 10 7AD
OCEAN BOULEVARD
THIRD AVE.
SECOND AVE
PACIFIC HIGHWAY
P.T.B.R.R.
101
OCEAN
OLD PACIFIC HIGHWAY
LOT 3
WATSECO
CANCELLED
RECEIVED
JAN 28 1997
COMMUNITY DEVELOPMENT
COAST

Exhibit A



APPROVED BY
PERMIT No. 97-015
DATE 2-3-97

RECEIVED
JAN 2 8 1997
COMMUNITY DEVELOPMENT

SITE PLAN

1" = 20'-0"

TAX MAP = 1N 10 7DA
TAX LOT = 3100

GENE LEWIS
3397 NW HWY 47
FOREST GROVE, OR 97116
PHONE DAY 503-647-2293
MESS. 503-357-2800

Tom Asher

Linker/Lockwood
Iris Hamm
Decker Real Estate Inc.
842-8283

LB & Associates
INCORPORATED
Surveying, C

Box 219 • 160 Laneda Ave.
Manzanita, OR 97130

August 25, 1995

RECEIV
AUG 29 1995
COMMUNITY DEVELOPMENT

Mr. and Mrs. Don Linker
15917 SE Arista Drive
Milwaukie, OR 97267

RE: Addendum #1 to Beach and Dune Hazard Report, Tax Lots 3100 and 3104, 1N 10 7DA, Watseco, Oregon.

Dear Mr. and Mrs. Linker:

At your request we have reviewed the original Beach and Dune Hazard Report prepared by our firm and dated September 14, 1990. The original report has been incorporated into this addendum. This addendum is prepared for your use in planning the development for single family residences on the properties. Discussion items set forth herein should be incorporated into the development plans for that project.

SITE CONDITIONS

The site is generally as described in the original report. The elevation at the crest of the foredune was re-measured in June of 1995 for this report. The new measurements indicate that the dune has experienced some accretion since the original report. The average elevation of the foredune is now 23.1 feet (NGVD) with the lowest point along the top of the foredune in front of the subject property being 22.7 feet.

A. Dune Land Forms:

The Westerly portion of the property is classified as an Active Foredune. The crest of this dune is approximately 240' West of the Easterly property line with an elevation of approximately 23.1'. The Easterly portion of the property is classified as an Older Stabilized Dune.

B. History of Dune Stabilization:

There is no history of any dune stabilization projects.

C. History of Erosion and Accretion:

The dunes on the subject property have shown a net accretion of sand over the past 70 years as evidenced shown by aerial photographs over that time frame. There has also been a corresponding increase in natural vegetation cover in that time. There were fresh logs deposited in the photographs from 1967 which indicate that there was an extreme wash-over just prior to that date. In the five years since the original report, there has been a net accretion of approximately 0.6 feet.

FINDINGS AND HAZARDS ANALYSIS

The primary relevant hazard on this site is the movement of sand, both accretion and erosion. In addition to this hazard there is the hazard of flooding and earthquake. Mitigation of these hazards is discussed herein.

Erosion and Accretion: The dune in this area has been accumulating sand at least since 1939 and shows no indication of changing that pattern soon. There have been isolated incidents of winter storm erosion. There is no guarantee that the accretion patterns will continue as is so it is important to the property owner to monitor the condition of the dunes to detect any changes. In order to monitor and document the movement of sand on the subject property, the owner, and all future owners, should photograph the property from the ocean side at least once every six months. These photographs can be compared to determine the extent of sand movement and to determine if any additional mitigation measures are necessary.

Flooding: The property is located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is adjacent to a V-13 zone with velocity flooding to a depth of 22 feet and an average return period of 100 years. This level is below the height of the foredune which would tend to protect any structure from velocity flooding. It is important that the elevation of the dune be maintained at least at this level and that there is no vegetation removal from the entire foredune area.

In 1993 a new flood study was completed for the property to the South known as PINE BEACH REPLAT. The information presented in that study was submitted to and reviewed by the Federal Emergency Management Agency (FEMA) and was incorporated as a flood zone change as a part of the National Flood Insurance Program (NFIP). The NFIP modified the Base Flood Elevation (BFE) downward for the PINE BEACH REPLAT area to be Velocity Flood Hazard Zone with a BFE of 19 feet (previously 22 feet). That study indicates that the existing BFE of 22 feet for the subject property is conservative. Additionally, that study determined that flooding hazards on the PINE BEACH REPLAT property extended about 190 feet East of the Ocean Shores Boundary when the foredune was subject to erosion under computer modeling.

Earthquake: Mr. See comments in the original report of the potential regional hazard of severe earthquakes. The most serious such earthquake, for which evidence goes back about 7700 years, is estimated to have been a magnitude of about 8 or greater on the Richter scale. Current projections estimate a 30 percent chance of a magnitude 8 or greater regional earthquake in the next 50 years. Building code requirements for the State of Oregon do not presently address earthquakes of this magnitude, but there are recognized construction methods that can be used by contractors for owners wishing a degree of added protection in less than maximum earthquakes. In addition, strong seismic acceleration can be expected to result in liquefaction of weak saturated sediments, allowing for abrupt settlement of foundations. A pile foundation would not necessarily protect against damage by liquefaction of saturated ground in severe quakes.

The State of Oregon Department of Geology and Mineral Industries projects the maximum tsunami run-up from various possible earthquake events. The worst cast scenario would involve a M8.8 Cascadia Earthquake and could result in a wave 18 feet high with a total run-up of 39 feet. No practical engineering measures could protect a frame residence against this type of event.

The site is in a 90 mph wind zone exposed to the ocean winds (Exposure D as per UBC Section 2311(c).), therefore, the building must be designed to withstand the minimum required lateral wind loads. In general, one-story wood frame construction designed to withstand 90 mph Exposure D wind loadings also will withstand earthquake loads. The hereinafter optional standards are recognized construction methods used for wind resistant wood frame construction that are also very effective in protecting against earthquake forces.

MANDATORY DEVELOPMENT STANDARDS

In addition to the required standards of Section 4.070 (2) of the Tillamook County Land Use Ordinance, the following site specific standards shall also be required:

A. Development Density - This property is located in an R-2 zone (medium density urban residential) and should be developed for uses consistent with that zoning. Development of a single family home is consistent with the current zoning.

B. Structure Foundation and Road Location - Any house built on these lots should be located as far to the East as possible and still be within the requirements of the R-2 zoning including any exceptions. These setbacks are a 20' front yard (measured from the Westerly right-of-way line of the private road) and a 5' side yard. The Westerly edge of the building foundation (excluding any exterior decks with railings less than 36" above grade) should be located in accordance with the oceanfront setback requirements of the Tillamook County Zoning Ordinance. Based upon current houses in the area, the oceanfront setback requirement is now at 233.3 feet East of the Ocean Shores Boundary Line. That oceanfront setback is subject to change as other houses are built in the area. The lowest level of the finished floor should be at least one foot above the 100 year base flood elevation which corresponds to two feet above the exlsting grade. Driveways should b placed to the East of the structure only.

C. Land Grading Practices - All excavations for driveway and house foundation construction should be done when the sand is damp but not saturated (while it is not actually raining). All cut slopes should be retained using temporary or permanent means of stabilization. No excavation or grading should take place on the fore dune area.

D. Vegetation Removal and Revegetation - Removal of vegetation should be kept to the absolute minimum to allow construction. Upon the completion of construction the disturbed area should be either replanted with beach grass or protected with a 4" thick layer of crushed rock. Florence Beach Grass Nursery is suggested as a source for beachgrass sets - either planted and fertilized, or for the owner to plant and fertilize. This nursery is also a good source of information on proper fertilizing and time of planting.

E. Foundations - The foundation should be a continuous reinforced concrete perimeter system. The hazard of buried logs under the foundation is discussed in the original report. The guidelines from that report should be strictly adhered to.

The bottom of all footings and pads should be excavated to below any organic material and previously placed fill material. Soil bearing pressures at the bottom of all footings should not exceed 1500 pounds per square foot. Any retaining walls should be designed according to the following criteria:

Allowable Soil Bearing Pressure (at a minimum 2' below native grade)	1500 lbs/sf
Lateral Soil Bearing Pressure (Active) (excluding surcharge effects)	40 lbs/cubic foot of depth
Lateral Soil Bearing Pressure (Passive)	300 lbs/cubic foot of depth
Friction Angle (ϕ)	28°
Maximum unit weight	120 lbs/cubic foot

F. Driveway Location and Design - Any driveway should be constructed such that the roadbed is entirely on cut material or overexcavated and recompacted fill material. Access will be from any convenient location on the private road easement. Driveway design standards should include the use of a geotextile support fabric, 8" of pit run base rock and 2" of 3/4"-0" crushed rock surfacing.

G. Stormwater Management, Runoff and Drainage - All roof drainage should be collected with eave gutters and downspouts and discharged to splash pads or dry wells. Any drywell should be located at least 10' away from the foundation.

OPTIONAL DEVELOPMENT STANDARDS FOR ADDED SEISMIC PROTECTION:

These are standards not strictly required under conditions set out in the Uniform Building Code lateral force resistance provisions for this area, but a concerned property owner might wish to include in home construction to provide additional safety in view of the available information on the greater potential for major earthquakes in about the 8 or greater Richter category.

While no practical measures could guarantee protection in a maximum event, some reasonable steps could provide a degree of assurance against damage in lesser events. The design of the structure for wind loadings of 110 or 120 mph winds will generally add only a small cost to the entire structure and will effectively increase protection for both additional wind and earthquake loads. Examples of the results of increased design loads are:

- ☐ Secure floor framing to mudsills with galvanized steel framing anchors.
- ☐ Secure roof framing to walls with galvanized steel hurricane clips.
- ☐ Use plywood shear wall construction, with plywood sheathing applied to greater than building code requirements for plywood shear walls.

SUMMARY FINDINGS AND CONCLUSIONS

1. The proposed use is currently single family residential. There are no development plans currently available for review at this time There are no immediate adverse effects on adjacent properties from future house construction. Future house construction may be subject to flooding and erosion from wave action. Future development proposals should be further evaluated in the context of the recommendations of a final Dune Hazard Report, at the time of issuance of a building permit.

2. The proposed use is protected from erosion and wave action by the existing foredune, the required setback from that foredune and the required building floor elevation.

3. All runoff during and after construction will be readily absorbed into the ground either through drywells or splash pads and will not pose any hazard to adjacent property.

4. Periodic monitoring of the foredune accretion or erosion is described in this report.

LIMITATION

This report is based on a site inspection of the subject property and vicinity and a review of the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to represent the site and are offered as professional opinions derived according to current standards of professional practice for a report of this nature, and no warranty is expressed or implied. This report has been prepared for the timely use of the above addressee and parties to the pending development of the subject property, and does not extend to the activities of unidentified future owners or occupants of the property for which the writer bears no responsibility.

Should you have any questions regarding our investigation and this report, please contact our office.

Sincerely,

HLB, INC.

Ronald G. Larson, PE, PLS
Principal-In-Charge

Carl Tappert, PE

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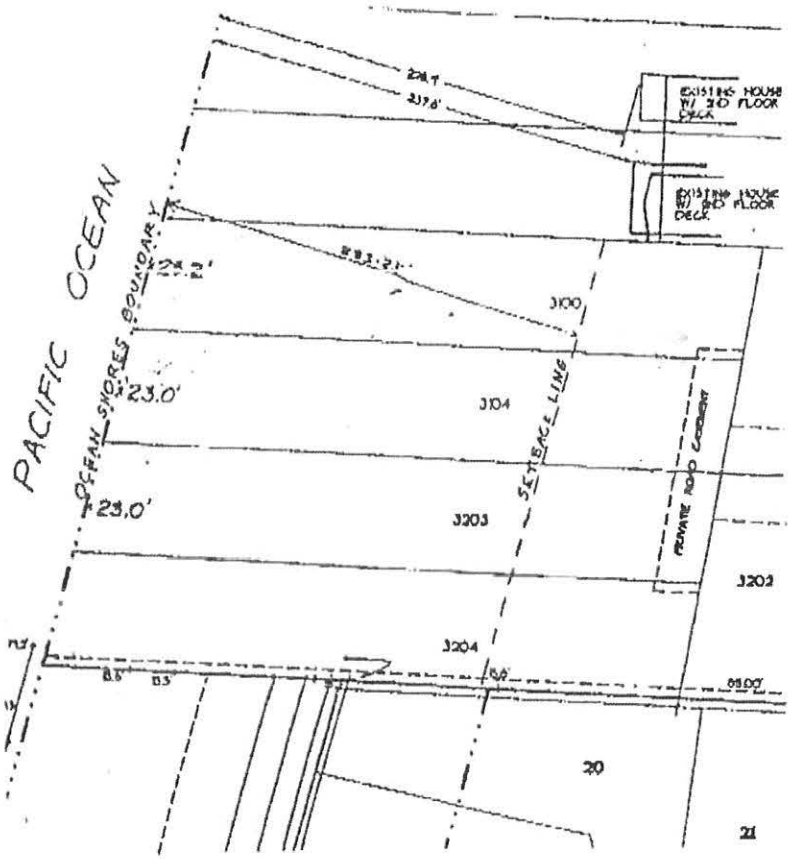
cc: GHR File

enc.



ENGINEERING GEOLOGIC HAZARD REPORT
VICINITY MAP
Scale: 1" = 100'

CLIENT: Mr. and Mrs. Don Linker
15917 SE Arista Drive
Milwaukie, OR 97267

PROPERTY: Tax Lots 3100 and 3400,
1N 10 7DA
Watseco, OR

HANDFORTH
LARSON &
BARRETT, INC.

Civil Engineering & Surveying

P.O. Box 219 Manzanita, Oregon 97130 503-368-5394

September 14, 1990

Mr. Eugene W. Larson
c/o Mr. & Mrs. Don Linker
15917 SE Arista Drive
Milwaukie OR 97267

RE: Beach and Dune Hazard Report, Tax Lots 3203 and 3204, 1N 10 7DA, Watseco, Oregon

Dear Mr. & Mrs. Larson:

At your request our firm has visited the site of your property in the Watseco area in order to address the engineering and geologic hazards of the specific site and to make recommendations for residential construction thereon. Our site visit was made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic hazards. Mr. See's report on the subject property is attached to this report, and together with this report is the required dune hazard report for the subject property. The site is shown on the enclosed vicinity map.

INVESTIGATION

The property lies West of Ocean Boulevard on a private street. The East line of the subject property is located approximately 384 feet West of the West line of Ocean Road. The enclosed spot elevation map of the property shows spot elevations on the property (on NGVD datum) as well as the high point of the dune formation. The highest point of the dune formation is virtually on the proposed building sites. West of the building sites lies a broad deflation zone and the primary foredune.

A review of OSHD aerial photos for this area dated 1967, 1973, 1978 and 1984 show a steady increase in vegetation over the entire property. The most Westerly line of vegetation has moved Westward since at least 1939 as noted in Mr. See's report. The Westerly portion of the dune is classified as an Active Foredune and the Easterly portion of the property is classified as an Older Stabilized Dune.

Wind erosion and migration of sand is a hazard to any beachfront property which consists of sand. As Mr. See points out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the walkways to the beach. Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation. For this reason, it is recommended that no vegetation be cut to the West of the proposed building site.

Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dune was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert your foundation contractor to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractor should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2-inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance. Any logs discovered to be near the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

Potential hazards due to ocean flooding have been identified by the National Flood Insurance Program. The Flood Insurance Rate Map (FIRM) for the Watseco area shows the subject property to be located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is immediately adjacent to a velocity zone (V13) with a predicted base flood elevation of 22 feet. The current elevation of the crest of the dune is now also approximately 22 feet (NGVD). Thus the crest and width of the dune field is providing all of the protection from flooding for this property. Every effort should be made to maintain the dune at or above the 100 year base flood elevation. This will be accomplished through the protection of the existing European beach grass and other vegetation on this property.

DEVELOPMENT STANDARDS

Development standards which are recommended for the subject property to adequately protect the proposed development from the above described potential hazards are as follows:

1. The foundation of the structure should be on continuous concrete footings. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. All footings should bear directly on undisturbed native sand. Do <u>not</u> place house footings on fill material. The bottom of all footings should be a minimum of 12 inches below grade for single story construction and 18 inches below grade for two story construction in native sand. We recommend that the building contractor be alerted to the need to protect the footings during construction from sand erosion and undermining.

2. Roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed. All collected runoff water should be disposed of either on splash pads or in drywells.

3. All proposed structures must be placed on the property in accordance with the setback requirements of Tillamook County. The Tillamook County Planning Department has indicated that special setback restrictions will be applicable to this property. More specifically, the Planning staff has indicated that a general exception is currently being processed to allow for a setback of 10 feet along the West right-of-way line of the private road. The Oceanfront Setback Line will be determined by the Planning Staff on a case by case basis for each individual lot. In general, the Oceanfront Setback must be at a maximum distance from the Ocean Shores Boundary Line in order to place the structure on the lot. This is the reason behind the exception to the Easterly setback.

4. With reference to the above setback requirements, it is recommended that the proposed structure be located as far East on the subject property as possible. It is a preliminary conclusion of this report that the most westerly location of a new residential construction on this property should be no further West than 60 feet Westerly of the Westerly right-of-way line of the private roadway adjacent to the East property line. The location of this line is as shown on the enclosed spot elevation map. No building construction should occur West of this line and no vegetation should be removed or disturbed West of this line. No beach grass or other vegetation should be cut West of this line.

5. The above recommendation of a building setback line of 60' applies to the Westerly foundation of the proposed structure, excluding any exterior deck on the West side of the structure. This recommendation should be taken as a general guideline or goal in the preparation of a site plan for development of the property. Any structure proposed to be located Westerly of this line may be possible, however, we recommend that a review of the specific site plan be accomplished by this engineer and consulting geologist.

6. Vegetation removal around the proposed structure should be kept to the minimum required for the placement of the structure. We recommend that your contractor revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock.

7. Undercutting by wave action along this portion of the ocean front has not historically been a problem. Although it is impossible to predict what future winter storms may do to the coastline, it would seem likely that no significant wave undercutting will probably occur. If such undercutting were to begin, remedial measures, such as riprap construction, would need to be implemented.

FINDINGS AND CONCLUSIONS

Based upon our site specific investigation of this property and the recommended development standards, the following are our conclusions:

a) The proposed residential use will have negligible adverse effects on adjacent uses and the surrounding area.

b) There are no hazards to life, property, and the natural environment which may be caused by the proposed use, subject to the conditions for development stated in the foregoing development standards.

c) The proposed residential use, subject to the foregoing development standards, will be adequately protected from the described hazards, notwithstanding the fact that riprap protection may be necessary in the future should erosion occur.

d) No periodic monitoring of site conditions is recommended other than monitoring of any erosion of the foredune, should it occur.

LIMITATION

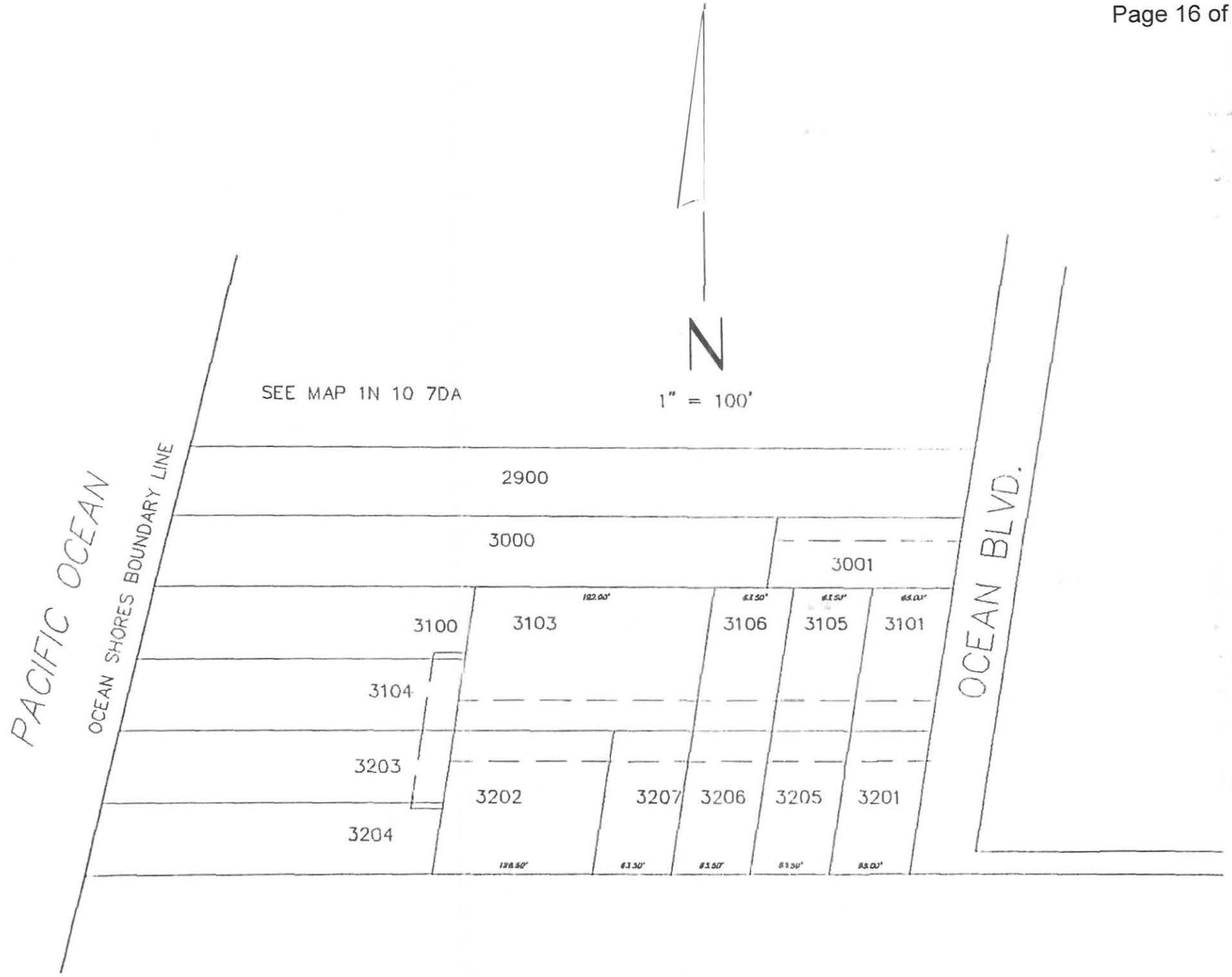
This report is based on a site investigation of the subject property and vicinity and a review of existing aerial photography and the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied.

Should you have any questions regarding our investigation and this report, please contact our office.

Very truly yours,
HANDFORTH, LARSON & BARRETT, INC.

Ronald G. Larson, PE, PLS

rgl/ms <at:\rpt\larson.dhr>
cc: Paul D. See



HLBI to - September 14, 1990 - I 5 of 10

PAUL D. SEE

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

July 9, 1990 #3070

Ronald G. Larson
Handforth Larson and Barrett, Inc.
P. O. Box 219
Manzanita, OR 97130

RE: Tax Lots 3203, 3204, T1N, R10W, Sec 7DA, Watseco. (Larson)

Dear Ron:

The following letter report documents my inspection of the above described property with you on Monday, July 2, to assess applicable geologic hazards.

TOPOGRAPHY AND DEPOSITIONAL HISTORY

The property rests on a relatively flat but hummocky dunefield at an approximate elevation of 16+ feet NGVD. Sand has accumulated along this shoreline partly as a natural barrier across an otherwise irregular foothill frontage, and partly as a result of the interruption of coastal sand transport by construction of the Tillamook Bay north jetty in 1917.

Although this beach has experienced a net accretion in the past 70 years, severe storms have periodically eroded the dune front resulting in scattered property damage from Manhattan Beach to Tillamook Bay. Cooper (1) describes intense erosion in January, 1939, and Schlicker (2) describes with an accompanying photograph the abrupt erosion of the 12+/-foot high dunes at Watseco Creek in the winter of 1971-72, along an area that had been stable for 15 years. The 1986 Nedonna Beach Foredune Study (3), although not directly incorporating this area, utilizes examples of erosion and deposition in the Watseco Creek area to illustrate factors applicable to their area of study. Concentrating on the effect of drift logs, they declare that: "Driftwood deposits on the backshore can either be a benefit or a destructive force to the foredune. Massive driftwood deposits that interlock can provide excellent wave protection by breaking up wave energy before it reaches the foredune. They also collect wind-blown sand and can be the start of new foredunes. Backshore deposits known to the study team on other beaches are sometimes 50 to 100 feet wide and a mile long. They tend to create a false sense of security for oceanfront property owners".

Inspection of 1967, 1973, 1978, and 1984 Oregon State Highway Division aerial photos reveals a relatively fresh local field of scattered drift logs over a 200+/- foot wide strip in 1967. Vegetation had gradually obscured these logs from aerial view by 1984, but field inspection confirms their presence to this date. Periodic erosion, particularly during the 1982-83 El Nino event, has removed several tens of feet of the dune frontage, exposing a dense tangle of logs weathered from the dune front. The

See/HLBI
7/9/90
(Larson)

low wave-cut bank visible on the 1984 photo is still observable at this time.

The surface profile in this area is atypical of most local sandy beach fronts. No true foredune exists, although the western edge of the dunefield is slightly higher than the hummocky, log-strewm plain to the east. The area has obviously not experienced a net regression in the past 23 years, although the presence of fresh logs in 1967 is evidence of extreme wash-over just prior to that date.

Notwithstanding the record of frequent storm damage, Stembridge (4) notes in 1975 that "with the exception of Neahkahnie and Manzanita beaches in the extreme north, the entire Rockaway-Nehalem shoreline has been prograding since at least 1939", and "the least prograding between the Nehalem River and Tillamook Bay totals more than 30 feet since 1939". He further notes the confusion among other investigators over erosion/deposition trends along this beach, citing their use of newspaper accounts of storm damage as evidence for long-term erosion.

The incipient foredune lies about eight feet higher than the average remainder of the property, tending to inhibit damage from prolonged seasonal storm and surf erosion or wash-over. However, the low elevation of this dune and even lower elevation at the nearby Watseco Creek estuary permits a degree of velocity flooding in the general area, including the subject property. The FEMA map predicts "AO" flooding of the Watseco area to a depth of one foot, and "100 year" velocity flooding to an elevation of 22 feet, coincident with the dune elevation.

The drift log accumulation should be allowed to remain on the upper beach to inhibit erosion and aid in dune buildup, and European beach grass should be encouraged to spread on the foreslope. I assume you will address the need to probe for buried logs beneath any foundation, to avoid settlement from slow decay.

SUMMARY, LOCAL HAZARDS

The property is well vegetated with beach pines and willow and other upland shrubs and grasses. However, this has obviously developed in a few decades, and the area remains at some risk from severe episodic storm wave overtopping due to its elevation. The presence of the numerous old drift logs and living vegetation would diminish velocity flooding at the building site. The Tillamook Bay north jetty will continue to present a barrier to southerly offshore sand transport, causing a continued net accretion along this beach. Future storm surges and consequent erosion cannot be predicted, however, and damage from velocity flooding cannot be ruled out. Notwithstanding the possibility of flooding, the property appears to be relatively safe from long-term erosion and shoreline regression. No evidence exists to suggest reversal of a trend that has continued for more than 70 years.

See/HLBI
7/9/90
(Larson)

REGIONAL HAZARD

Oregon coastal property owners should be advised that contrary to long-held assumption, there is now significant reason to believe (5) that the Oregon coast is vulnerable to severe impact from an intense local earthquake and accompanying tsunami, or seismic sea wave.

Recent discoveries in the coastal embayments of Oregon and Washington seem to confirm a history of seven or more large earthquakes, probably originating in the local Cascadia subduction zone, during the past 3300+/-years. All seem to have been accompanied by abrupt subsidence of the coastline by several inches to several feet, followed by a series of massive waves that buried marshland peat and coastal cedar forests under wave-deposited sand.

No major local earthquakes have been experienced during historic time. However, if we are to accept the current estimates of the average time span between such events, (approximately 300 years minimum), it follows that a disastrous coastal earthquake and tsunami are indeed possible in the foreseeable future. Based on tree-ring dating, the most recent event seems to have occurred about the year 1690.

Tsunamis are capable of great heights under some circumstances, and the evidence of past events along this coastline has led to an estimated wave height of 15 meters above prevailing tide, well above the local dunefield elevation. Depending on the intensity of ground acceleration, liquefaction can occur in loosely consolidated and saturated sediments, allowing structures to settle unpredictably into the sand.

Events of this magnitude must be considered only as a possibility at this time. Our understanding of Cascadia seismicity remains limited, and the timing or magnitude of future events cannot yet be quantified. However, I am professionally obliged to apprise clients of this newly recognized potential for earthquake damage, remote as it may be.

RECOMMENDATION

Considering all potential hazards noted above, I would recommend locating a structure as far east as possible, but certainly no farther west than a north-south line 60 feet from the easterly property line.

LIMITATIONS

Observations and recommendations incorporated in this letter report are the result of personal site inspection, the works of other specialists, and generally accepted principles of geologic investigation for a report of this nature. No warranties are expressed or implied. This report has been prepared for the timely use of the above addressee and parties to any pending development of the subject property, and does not extend to the

See/HLBI
7/9/90
(LArson)

activities of unidentified future owners or occupants of the property for which the writer bears no responsibility.

Sincerely,

Paul D. See

References cited:

(1) Cooper, william S. "Coastal Sand Dunes of Oregon and Washington", GSA Memoir #72, 1958 (p. 84).

(2) Schlicker, H. G., et al, "Environmental Geology of the Coastal Portions of Tillamook and Clatsop Counties, Oregon", Oreg. Dept. of Geol. & Mineral Indust. Bull. #74, 1972.

(3) Nedonna Beach Foredune Management Study, pages 24, 25. Prepared for Land Conservation and Development Commission, 1986.

(4) Stembridge, James Edward, Jr. "Shoreline Changes and Physiographic Hazards on the Oregon Coast", PhD dissertation, University of Oregon, 1975 (p. 63).

(5) Atwater, B., "Evidence for Great Holocene Earthquakes Along the Outer Coast of Washington State", AAAS Science Magazine, Vol. 236, 22 May, 1987, (and) Woodward, J., "Paleoseismicity and the Archeological Record: Areas of Investigation on the Northern Oregon Coast", Oregon Geology, Vol. 52 #3, May 1990.

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:20:11 pm

Account #	355715	Tax Status	ASSESSABLE
Map #	1N1007DA03104	Acct Status	ACTIVE
Code - Tax #	5624-355715	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	LOCKWOOD, MARY ANN CO-TRUSTEE &	Deed Reference #	2019-6887
Agent		Sales Date/Price	07-03-2019 / $0.00
In Care Of	KEMBALL, T. MARK CO-TRUSTEE	Appraiser	ROBERT BUCKINGHAM
Mailing Address	2355 SW SCENIC DR PORTLAND, OR 97225		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	17770-1

Situs Address(s)	Situs City
ID# 1 17488 OCEAN BLVD	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	334,830			Land	0	
	Impr.	301,390			Impr.	0	
Code Area Total		636,220	562,670	562,670		0	
Grand Total		636,220	562,670	562,670		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.17		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.17		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	143	One and 1/2 story	112	1,940			301,390
				Grand Total		1,940			301,390

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: 02/07/13 Reappraised land. Tabled values. RBB

RECEIVED
MAY 16 1997
COMMUNITY DEVELOPMENT

TILLAMOOK COUNTY CONSTRUCTION/PLACEMENT PERMIT APPLICATION
For *Building, Planning and Sanitation*

verified 5-16-97 er

APPLICANT

Application 97-309

Legally Recorded Owner Mary Ann A. Lockwood

Mailing Address 2770 S.W. Montgomery Drive Phone (503) 223-2455

City Portland State OR Zip Code 97201

CONTRACTOR/INSTALLER

Building Contractor Mark Widmer, Builder Reg. No. 37422

Sanitation Installer _____ Reg. No. _____

Mobile Home Installer _____ Reg No. _____

[X] Mail permit to Contractor/Installer: 4213 Third St. Tillamook, OR 97141

LOCATION INFORMATION

Situs Address 17488 Ocean Blvd Rockaway B. Watseco

Township 1 N Range 10 W Section 7DA Tax Lot 3104 verified 5-16-97 er

verified 5-16-97 er

Zone R-2 Lot Size _____ X _____ X _____ X _____ or _____ Acres

PROPOSED USE

- [X] Single Family Dwelling & deck
- [ ] MD/RV Placement
- [ ] Addition _____
- [ ] Accessory Structure _____
- [ ] Demolition/Move
- [ ] Temporary RV Placement
- [ ] Replacement _____
- [ ] Alteration _____
- [ ] Public/Commercial/Industrial

WASTE DISPOSAL

- [X] Sewer District _____
- [ ] Septic Tank/Drainfield
- [ ] Construction Permit
- [ ] Minor/Major Repair Permit
- [ ] Alteration Permit

APPROVED PERMIT

Letters are forthcoming

WATER SUPPLY

Private/Public/Creek/Spring/Well

SIZE OF STRUCTURE NLA ~~435~~ 295 LA 2344

45 X 49 Dimensions

24' Height

2 Stories

1 No. of Dwelling Units

2 Bedrooms

VARIANCE/CONDITIONAL USE File No. _____

SETBACKS

20' Front Yard

239' Rear Yard

5'2" Left Side

5'6" Right Side

_____ River/Estuary/Creek

Plot plan in file please in bot

MOBILE HOME/RECREATION VEHICLE

_____ License Number

_____ Make

_____ Year

ROAD ACCESS

- [ ] State Highway
- [ ] County Road/Public Way
- [X] Private Road

No RAP per Pat Oakes 5-16-97 er

166,354 00

VALUATION (AS DETERMINED BY BUILDING OFFICIAL) Section 304 (b) $ ~~46,191~~

All or a portion of this property may be located within an identified wetland. If the site is a jurisdictional wetland you must obtain any necessary State or Federal permits before beginning your project.

Separate State of Oregon permits are required for electrical, plumbing, and mechanical work. The Property owner is responsible for obtaining these additional permits prior to work being done.

This application, when approved, includes only the work described above and/or plans and specifications bearing the same permit number. The applicant agrees to comply with all applicable codes and ordinances governing planning, sanitation and construction and agrees to meet any and all or the conditions listed below.

The granting of this permit does not presume to give authority to violate or cancel the provisions of any State or Local law regulating construction of the performance of construction.

This application, if approved, becomes null and void if building construction is not commenced within 180 days, is discontinued for 180 days, or installation of sewage disposal system and/or placement of mobile home or recreation vehicle is not completed within one year from the date of approval.

Prior to construction or placement, it is advisable that you check your deed for other restrictions that may apply.

I certify that the information I have submitted is complete and accurate, and may be relied upon by the Department of Community Development in processing my application. I accept responsibility for any inaccuracies in the information I have provided, and for the consequences thereof.

FEES ARE NOT REFUNDABLE

APPLICANT SIGNATURE: Mark W. Dix Date 5/15/97

********************* FOR OFFICE USE ONLY *********************

SANITATION Lisa L P... 5/16/97
PUBLIC WORKS JB Finlay 5/20/97
HOUSE NO. Debbie Lyons 5-16-97
PLANNING ① George A Plumma 5-9-97
PLAN CHECK Chris Bar 6/30/97
BUILDING OFFICIAL Craig W 7-2-97

Sanitation Fee	$ 0
D.E.Q. Surcharge	0
Building Fee	600.50
Plan Check Fee	390.32
B.C.A. Surcharge	30.03
Planning Review Fee	120.00
A-level Plan Review	0
Fire & Life Safety	0
Address ($10.00)	10.00
M.D./RV Fee (Planning)	0
M.D./RV Fee (Building)	0
State M.D. Fee ($20)	0
B&D/GHZ/Flood Fee	70.00
F-1 & F Review Fee	0
PW Review Fee	4.00
Road Approach ($125.00)	0
TOTAL DUE	$ 1224.85

RECEIVED BY: lr

DATE: 5-16-97

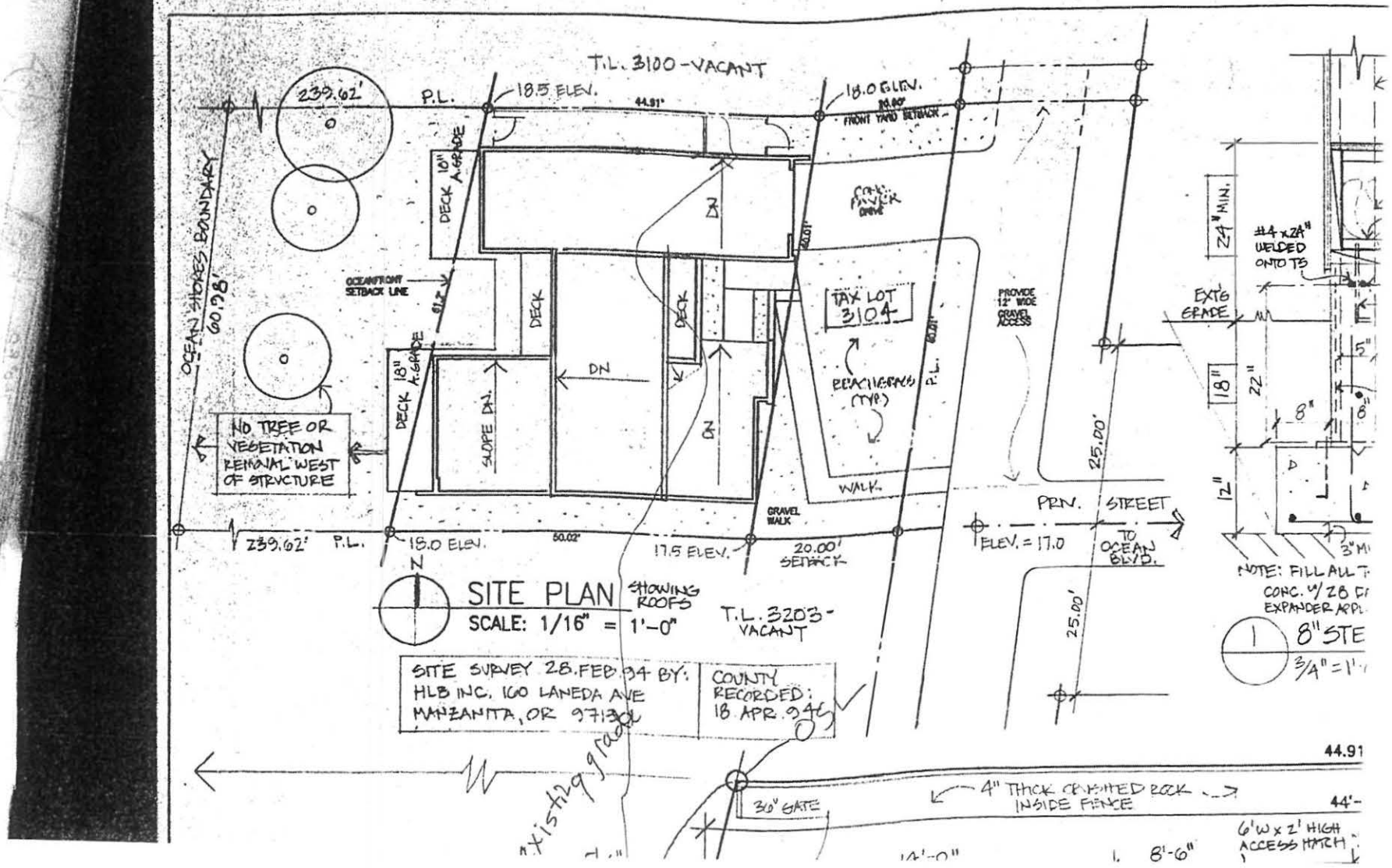
RECEIPT NO. 3342

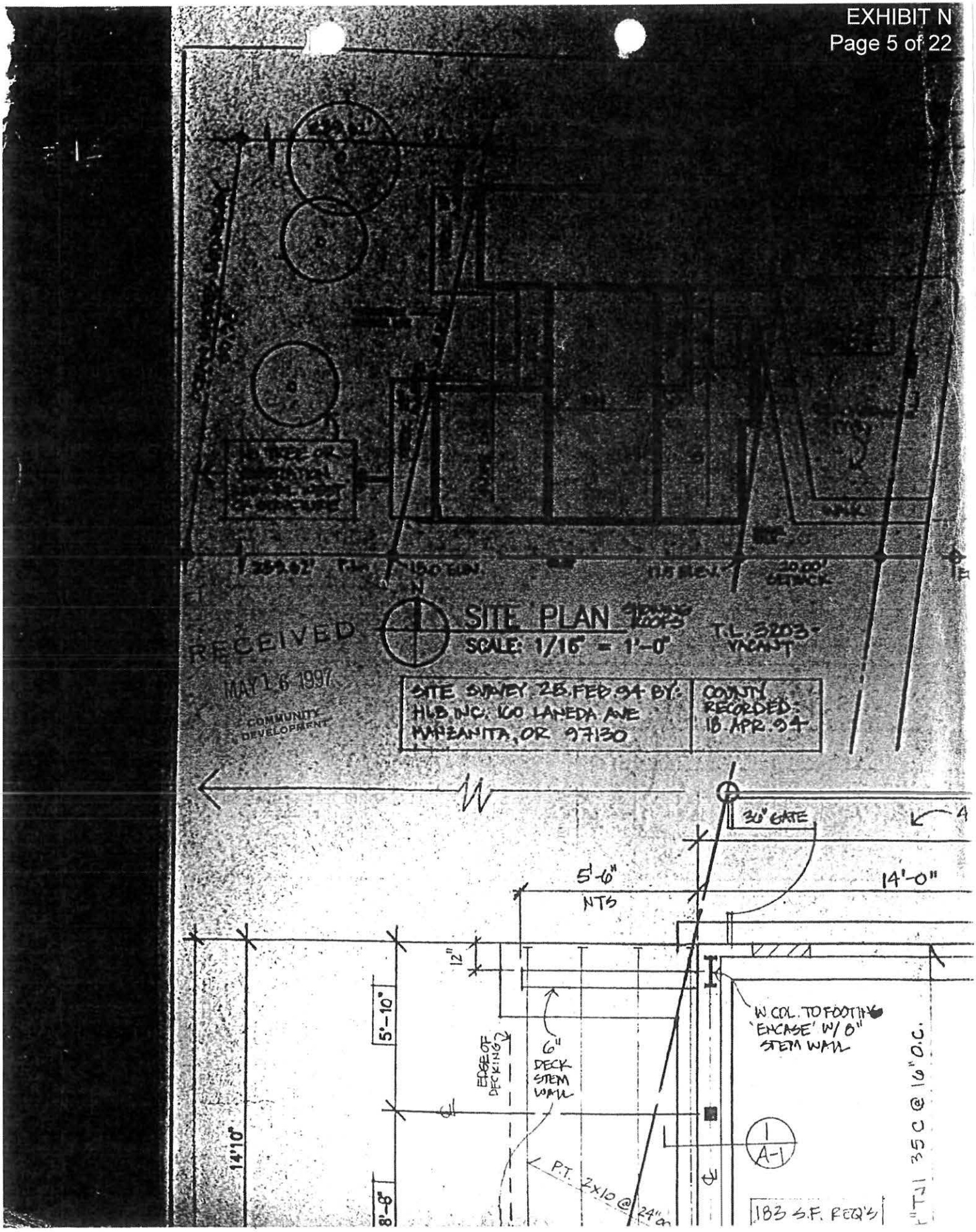
The signature below indicates that the proposed development is in compliance with the current Land Use Ordinance, Comprehensive Plan and Statewide Planning goals. The types and levels of services provided in conjunction with the development authorized by this permit meet the Comprehensive Plan policies.

CITY APPROVAL INSIDE U.G.B.: _____
City Official Signature Title Date

CONDITIONS OF PERMIT APPROVAL: ① 1st finished floor shall be 2 feet above highest existing grade, Plot plan ok as per revised plans submitted May 22, 1997 and shall conform to the 24' ht max limit, OSL for any structure greater than 36" above existing grade, Beaches & Dunes Std. conditions included on plan and Development Std. in Beaches & Dunes Rpt.

G:\Admin\Forms\Bldgform\Buipermit - 2/09/96


T.L. 3100 - VACANT
239.62'
P.L.
18.5 ELEV.
44.91'
18.0 ELEV.
FRONT YARD SETBACK
OCEAN SHORES BOUNDARY
60.98'
DECK 10" A.GRADE
OCEANFRONT SETBACK LINE
DECK
DECK
DECK 18" A.GRADE
SLOPE DN.
DN
DN
NO TREE OR VEGETATION REMOVAL WEST OF STRUCTURE
TAX LOT 3104
REDWOODS (TYP.)
PROVIDE 12' WIDE GRAVEL ACCESS
WALK
GRAVEL WALK
PRIV. STREET
ELEV. = 17.0
TO OCEAN BLVD.
25.00'
25.00'
239.62'
P.L.
18.0 ELEV.
60.02'
17.5 ELEV.
20.00' SETBACK
N
SITE PLAN SHOWING ROOFS
SCALE: 1/16" = 1'-0"
T.L. 3203 - VACANT
SITE SURVEY 28 FEB 94 BY: HLB INC. 160 LANEDA AVE MANZANITA, OR 97130
COUNTY RECORDED: 18 APR. 94
24" MIN.
#4 x 24" WELDED ONTO T3
EXIST'G GRADE
18"
22"
12"
8"
5"
6"
NOTE: FILL ALL T
CONC. W/ 28 D
EXPANDER APPL
1
8" STE
3/4" = 1'
44.91
4" THICK CRUSHED ROCK INSIDE FENCE
44'-
30" GATE
existing grade
14'-0"
8'-6"
6'W x 2' HIGH ACCESS HATCH


SITE PLAN
SCALE: 1/16" = 1'-0"
T.L. 3203
VACANT
RECEIVED
MAY 16 1997
COMMUNITY DEVELOPMENT
SITE SURVEY 25 FEB 94 BY:
H&B INC. 100 LANEDA AVE
MANZANITA, OR 97130
COUNTY RECORDED:
18 APR 94
30" GATE
5'-6"
NTS
14'-0"
12"
5'-10"
14'10"
8'-8"
EDGE OF DECKING
6" DECK STEM WALL
W COL. TO FOOTING 'ENCASE' W/ 6" STEM WALL
P.T. 2x10 @ 24"
1
A-1
183 S.F. REQ'S
#4 35 C @ 16" O.C.

Tillamook County

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

201 Laurel Avenue
Tillamook, Oregon 97141

Land of Cheese, Trees and Ocean Breeze

Building (503) 842-3407
Planning (503) 842-3408
On-Site Sanitation (503) 842-3409
FAX (503) 842-1819
Toll Free 1-(800) 488-8280

CONDITIONS OF APPROVAL
for BP 97-309

1. Must meet 24 foot average maximum building height limit measured from existing grade.

2. Shall conform to Tillamook County Land Use Ordinance (LUO) Section 3.060 Flood Hazards Standards (first floor and all utilities shall be at least 2 feet above the highest existing grade).

3. Shall conform to LUO Section 3.085 Beaches and Dunes Standards

4. No structure shall be built above 36 inches above the existing grade west of the Ocean Setback Line (OSL).

5 Plan shall be revised if necessary to assure compliance to any of these conditions.

APPROVED BY RP
PLANNING
PERMIT NO 97-309
DATE 6-9-97

Tillamook County

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

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Toll Free 1-(800) 488-8280

February 23, 1996

Dear Property Owner:

The Tillamook County Department of Community Development APPROVED WITH CONDITIONS **Dune Hazard Report** GH-96-05, and found that the report meets the requirements of Tillamook County Land Use Ordinance. This report approved a Geologic Hazard Report prior to issuance of a building permit on the subject parcel, in conjunction with a residential dwelling.

The application plans and staff report containing findings of fact and conclusions upon which this decision was based are on file in the office of the Department of Community Development and available upon request. Site details are described below:

GENERAL INFORMATION:

Request:	Review of Geologic Hazards Report
Zone:	Section 3.014: Medium Density Urban Residential Zone (R-2)
Location:	In the Watseco area, on an easement north of Ocean Blvd.; Township 1 North, Range 10 West W.M., Section 7DA, Tax Lot 3104, Tillamook County, Oregon
Applicant:	Garry Papers, 537 SE Ash #42, Portland OR 97214
Property Owner:	Mary Ann Lockwood, 2770 SW Montgomery Drive, Portland OR 97201

If you wish to appeal this decision to the Tillamook County Planning Commission you may do so by submitting the required form, written justification explanation in detail the reasons for the appeal, and fee, to this office by no later than 21 days from the date of this letter at 5:00 p.m. This decision was reviewed against the standards of Tillamook County Land Use Ordinance Section 3.085.

(over)

Conditions of Approval:
This permit is valid for two years from the date of this approval. All activities shall conform to the following conditions:

1. All of the development standards of Section 3.085(5)(A) shall be incorporated into any further development activity on the parcel.

2. The Mandatory Development Standards contained within the geologic hazard report shall be incorporated into any further development activity on the parcel.

3. Site excavation shall not exceed that necessary to site the building itself. Post-construction stabilization of exposed areas is required and shall be completed as soon as is feasible. Efforts shall be made to reduce the impacts of blowing sand on adjacent property.

4. There shall be no further vegetation removal west of the proposed structure.

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

If you have any questions about this notice, please call this department any weekday at 842-3408.

Sincerely,
Tillamook County Department of Community Development

George A. Plummer,
Associate Planner

TILLAMOOK COUNTY
1"=100'

This map was prepared for assessment purposes only

IVATSECO

56-24

SEE MAP IN ID 7AD

HAZARD REPORT GH-05

SUBJECT PROPERTY

OCEAN

PACIFIC

BOULEVARD

THIRD AVE.

SECOND AVE.

HIGHWAY

P.T.B.R.R.

101

COAST

OLD

OCEAN

PACIFIC

IVATSECO

LOT 3

SEE SURVEY A-444

CANCELLED
4100
3102
3200
5400
2300
2720
2800
300

TAX LOTTED ON MAP IN ID 7AD

SEE MAP IN ID 8

1/4 Cor

1/16 Cor

Initial Point

09-28-95 ID10 7DA

Tillamook County

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

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Tillamook, Oregon 97141

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FAX (503) 842-1819
Toll Free 1-(800) 488-8280

Geologic Hazard Report Review GH-96-05
ADMINISTRATIVE DECISION & STAFF REPORT

Decision: APPROVED with Conditions
Staff Report Date: February 23, 1996

Review Prepared By: George A. Plummer, Associate Planner

I. GENERAL INFORMATION

Request: Review of Geologic Hazards Report

Zone: Section 3.014: Medium Density Urban Residential Zone (R-2)

Location: In the Watseco area, on an easement north of Ocean Blvd.; Township 1 North, Range 10 West W.M., Section 7DA, Tax Lot 3104, Tillamook County, Oregon

Applicant: Garry Papers, 537 SE Ash #42, Portland OR 97214

Property Owner: Mary Ann Lockwood, 2770 SW Montgomery Drive, Portland OR 97201

Site Description Ocean front lot subject to wave overtopping and ocean undercutting.

II. ANALYSIS OF APPLICABLE ORDINANCE CRITERIA:

1. Land Use Ordinance Section 3.085 Beach and Dune Overlay Zone, Subsection (5)(B)(1) defines situations for which a Dune Hazard Report is required:

Findings: 3.085(5)(B)(1)(c) requires a Dune Hazard Report prior to the approval of a building permit in developed beachfront areas when there is evidence of active erosion at or near the proposed building site. The foredune area in this location is active.

2. **Section 3.085(5)(A) specifies standards for all development within beach and dune hazard areas, including land grading practices and drainage and erosion control.**

Findings: Compliance with these standards is required as a condition of this approval. The trees have already been cleared from the building site, no further vegetation removal should be necessary to site the residential dwelling.

3. **Section 3.085(5)(B)(3) describes the purpose of the site report as to identify and describe existing or potential hazards in areas proposed for development. The report shall be based on site inspections conducted by a qualifies person, such as a geologist, engineering geologist, or other person having professional experience analyzing the relevant geologic hazards.**

Findings: The submitted report, dated September 14, 1990 was prepared by Ron Larson, a Registered Professional Engineer. Paul See, a Registered Professional Geologist, provided a geologic analysis as part of the report dated July 8, 1990. The same authors prepared Addendum #1, dated August 25, 1995, which updates the earlier report.

5. **Section 3.085(5)(B)(3)(a)(3) lists required content standards for the dune hazard analysis.**

Findings: The submitted reports contains the required analysis.

6. **Section 3.085(5)(B)(3)(b)(2) lists required development standards that will protect development on the property and surrounding properties.**

Findings: The submitted reports contain all the required development standards.

7. **Section 3.085(5)(B)(3)(c) lists required summary findings and conclusions supported by the report.**

Findings: The submitted reports contain all the required summary findings and conclusions.

Conclusion: Based upon the findings and the contents of the hazard report, Tillamook County concludes that the reviewed report meets the requirements of Section 3.085.

III. Conditions of Approval:

This approval is valid for two years from the date of review. All development on the parcel shall meet the following conditions:

1. All of the development standards of Section 3.085(5)(A) (attached) shall be incorporated into any further development activity on the parcel.

2. The Mandatory Development Standards contained within the geologic hazard report shall be incorporated into any further development activity on the parcel.

3. Site excavation shall not exceed that necessary to site the building itself. Post-construction stabilization of exposed areas is required and shall be completed as soon as is feasible. Efforts shall be made to reduce the impacts of blowing sand on adjacent property.

4. There shall be no further vegetation removal west of the proposed structure.

Tillamook County Department of Community Development

George A. Plummer,
Associate Planner

G:\PLANNING\GHR\96-05BDR.RPT

HANDFORTH
LARSON &
BARRETT, INC.

Civil Engineering & Surveying

P.O. Box 219 (160 Laneda Avenue)
Manzanita, OR 97130

TEL: 503-368-5394
FAX: 503-368-5847

September 14, 1990

Mr. & Mrs. Don Linker
15917 SE Arista Drive
Milwaukie OR 97267

RE: Beach and Dune Hazard Report, Tax Lots 3100 and 3104, 1N 10 7DA, Watseco, Oregon

Dear Mr. & Mrs. Linker:

At your request our firm has visited the site of your property in the Watseco area in order to address the engineering and geologic hazards of the specific site and to make recommendations for residential construction thereon. Our site visit was made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic hazards. Mr. See's report on the subject property is attached to this report, and together with this report is the required dune hazard report for the subject property. The site is shown on the enclosed vicinity map.

INVESTIGATION

The property lies West of Ocean Boulevard on a private street. The East line of the subject property is located approximately 384 feet West of the West line of Ocean Road. The enclosed spot elevation map of the property shows spot elevations on the property (on NGVD datum) as well as the high point of the dune formation. The highest point of the dune formation is virtually on the proposed building sites. West of the building sites lies a broad deflation zone and the primary foredune.

A review of OSHD aerial photos for this area dated 1967, 1973, 1978 and 1984 show a steady increase in vegetation over the entire property. The most Westerly line of vegetation has moved Westward since at least 1939 as noted in Mr. See's report. The Westerly portion of the dune is classified as an Active Foredune and the Easterly portion of the property is classified as an Older Stabilized Dune.

Wind erosion and migration of sand is a hazard to any beachfront property which consists of sand. As Mr. See points out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the walkways to the beach. Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation. For this reason, it is recommended that no vegetation be cut to the West of the proposed building site.

Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dune was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert your foundation contractor to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractor should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2-inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance. Any logs discovered to be near the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

Potential hazards due to ocean flooding have been identified by the National Flood Insurance Program. The Flood Insurance Rate Map (FIRM) for the Watseco area shows the subject property to be located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is immediately adjacent to a velocity zone (V13) with a predicted base flood elevation of 22 feet. The current elevation of the crest of the dune is now also approximately 22 feet (NGVD). Thus the crest and width of the dune field is providing all of the protection from flooding for this property. Every effort should be made to maintain the dune at or above the 100 year base flood elevation. This will be accomplished through the protection of the existing European beach grass and other vegetation on this property.

DEVELOPMENT STANDARDS

Development standards which are recommended for the subject property to adequately protect the proposed development from the above described potential hazards are as follows:

1. The foundation of the structure should be on continuous concrete footings. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. All footings should bear directly on undisturbed native sand. Do <u>not</u> place house footings on fill material. The bottom of all footings should be a minimum of 12 inches below grade for single story construction and 18 inches below grade for two story construction in native sand. We recommend that the building contractor be alerted to the need to protect the footings during construction from sand erosion and undermining.

2. Roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed. All collected runoff water should be disposed of either on splash pads or in drywells.

3. All proposed structures must be placed on the property in accordance with the setback requirements of Tillamook County. The Tillamook County Planning Department has indicated that special setback restrictions will be applicable to this property. More specifically, the Planning staff has indicated that a general exception is currently being processed to allow for a setback of 10 feet along the West right-of-way line of the private road. The Oceanfront Setback Line will be determined by the Planning Staff on a case by case basis for each individual lot. In general, the Oceanfront Setback must be at a maximum distance from the Ocean Shores Boundary Line in order to place the structure on the lot. This is the reason behind the exception to the Easterly setback.

4. With reference to the above setback requirements, it is recommended that the proposed structure be located as far East on the subject property as possible. It is a preliminary conclusion of this report that the most westerly location of a new residential construction on this property should be no further West than 60 feet Westerly of the Westerly right-of-way line of the private roadway adjacent to the East property line. The location of this line is as shown on the enclosed spot elevation map. No building construction should occur West of this line and no vegetation should be removed or disturbed West of this line. No beach grass or other vegetation should be cut West of this line.

5. The above recommendation of a building setback line of 60' applies to the Westerly foundation of the proposed structure, excluding any exterior deck on the West side of the structure. This recommendation should be taken as a general guideline or goal in the preparation of a site plan for development of the property. Any structure proposed to be located Westerly of this line may be possible, however, we recommend that a review of the specific site plan be accomplished by this engineer and consulting geologist.

6. Vegetation removal around the proposed structure should be kept to the minimum required for the placement of the structure. We recommend that your contractor revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock.

7. Undercutting by wave action along this portion of the ocean front has not historically been a problem. Although it is impossible to predict what future winter storms may do to the coastline, it would seem likely that no significant wave undercutting will probably occur. If such undercutting were to begin, remedial measures, such as riprap construction, would need to be implemented.

FINDINGS AND CONCLUSIONS
Based upon our site specific investigation of this property and the recommended development standards, the following are our conclusions:

a) The proposed residential use will have negligible adverse effects on adjacent uses and the surrounding area.

b) There are no hazards to life, property, and the natural environment which may be caused by the proposed use, subject to the conditions for development stated in the foregoing development standards.

c) The proposed residential use, subject to the foregoing development standards, will be adequately protected from the described hazards, notwithstanding the fact that riprap protection may be necessary in the future should erosion occur.

d) No periodic monitoring of site conditions is recommended other than monitoring of any erosion of the foredune, should it occur.

LIMITATION
This report is based on a site investigation of the subject property and vicinity and a review of existing aerial photography and the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied.

Should you have any questions regarding our investigation and this report, please contact our office.

Very truly yours,
HANDFORTH, LARSON & BARRETT, INC.

Ronald G. Larson

Ronald G. Larson, PE, PLS

REGISTERED PROFESSIONAL ENGINEER 9443 RONALD G. LARSON SEPTEMBER 23, 1977

rgl/ms <at:\rpt\Linker.dhr>
cc: Paul D. See

Tom Fisher

LB & Associates

N C O R P O R A T E D

Surveying, C

Linker/Lockwood
Iris Hamm
Decker Real Estate Inc.
842-8283

Box 219 ▪ 160 Laneda Ave.
Manzanita, OR 97130

August 25, 1995

RECEIV

AUG 29 1995

COMMUNITY DEVELOPMENT

Mr. and Mrs. Don Linker
15917 SE Arista Drive
Milwaukie, OR 97267

RE: Addendum #1 to Beach and Dune Hazard Report, Tax Lots 3100 and 3104, 1N 10 7DA, Watseco, Oregon.

Dear Mr. and Mrs. Linker:

At your request we have reviewed the original Beach and Dune Hazard Report prepared by our firm and dated September 14, 1990. The original report has been incorporated into this addendum. This addendum is prepared for your use in planning the development for single family residences on the properties. Discussion items set forth herein should be incorporated into the development plans for that project.

SITE CONDITIONS

The site is generally as described in the original report. The elevation at the crest of the foredune was re-measured in June of 1995 for this report. The new measurements indicate that the dune has experienced some accretion since the original report. The average elevation of the foredune is now 23.1 feet (NGVD) with the lowest point along the top of the foredune in front of the subject property being 22.7 feet.

A. Dune Land Forms:

The Westerly portion of the property is classified as an Active Foredune. The crest of this dune is approximately 240' West of the Easterly property line with an elevation of approximately 23.1'. The Easterly portion of the property is classified as an Older Stabilized Dune.

B. History of Dune Stabilization:

There is no history of any dune stabilization projects.

C. History of Erosion and Accretion:

The dunes on the subject property have shown a net accretion of sand over the past 70 years as evidenced shown by aerial photographs over that time frame. There has also been a corresponding increase in natural vegetation cover in that time. There were fresh logs deposited in the photographs from 1967 which indicate that there was an extreme wash-over just prior to that date. In the five years since the original report, there has been a net accretion of approximately 0.6 feet.

FINDINGS AND HAZARDS ANALYSIS

The primary relevant hazard on this site is the movement of sand, both accretion and erosion. In addition to this hazard there is the hazard of flooding and earthquake. Mitigation of these hazards is discussed herein.

Erosion and Accretion: The dune in this area has been accumulating sand at least since 1939 and shows no indication of changing that pattern soon. There have been isolated incidents of winter storm erosion. There is no guarantee that the accretion patterns will continue as is so it is important to the property owner to monitor the condition of the dunes to detect any changes. In order to monitor and document the movement of sand on the subject property, the owner, and all future owners, should photograph the property from the ocean side at least once every six months. These photographs can be compared to determine the extent of sand movement and to determine if any additional mitigation measures are necessary.

Flooding: The property is located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is adjacent to a V-13 zone with velocity flooding to a depth of 22 feet and an average return period of 100 years. This level is below the height of the foredune which would tend to protect any structure from velocity flooding. It is important that the elevation of the dune be maintained at least at this level and that there is no vegetation removal from the entire foredune area.

In 1993 a new flood study was completed for the property to the South known as PINE BEACH REPLAT. The information presented in that study was submitted to and reviewed by the Federal Emergency Management Agency (FEMA) and was incorporated as a flood zone change as a part of the National Flood Insurance Program (NFIP). The NFIP modified the Base Flood Elevation (BFE) downward for the PINE BEACH REPLAT area to be Velocity Flood Hazard Zone with a BFE of 19 feet (previously 22 feet). That study indicates that the existing BFE of 22 feet for the subject property is conservative. Additionally, that study determined that flooding hazards on the PINE BEACH REPLAT property extended about 190 feet East of the Ocean Shores Boundary when the foredune was subject to erosion under computer modeling.

Earthquake: Mr. See comments in the original report of the potential regional hazard of severe earthquakes. The most serious such earthquake, for which evidence goes back about 7700 years, is estimated to have been a magnitude of about 8 or greater on the Richter scale. Current projections estimate a 30 percent chance of a magnitude 8 or greater regional earthquake in the next 50 years. Building code requirements for the State of Oregon do not presently address earthquakes of this magnitude, but there are recognized construction methods that can be used by contractors for owners wishing a degree of added protection in less than maximum earthquakes. In addition, strong seismic acceleration can be expected to result in liquefaction of weak saturated sediments, allowing for abrupt settlement of foundations. A pile foundation would not necessarily protect against damage by liquefaction of saturated ground in severe quakes.

The State of Oregon Department of Geology and Mineral Industries projects the maximum tsunami run-up from various possible earthquake events. The worst cast scenario would involve a M8.8 Cascadia Earthquake and could result in a wave 18 feet high with a total run-up of 39 feet. No practical engineering measures could protect a frame residence against this type of event.

The site is in a 90 mph wind zone exposed to the ocean winds (Exposure D as per UBC Section 2311(c).), therefore, the building must be designed to withstand the minimum required lateral wind loads. In general, one-story wood frame construction designed to withstand 90 mph Exposure D wind loadings also will withstand earthquake loads. The hereinafter optional standards are recognized construction methods used for wind resistant wood frame construction that are also very effective in protecting against earthquake forces.

MANDATORY DEVELOPMENT STANDARDS

In addition to the required standards of Section 4.070 (2) of the Tillamook County Land Use Ordinance, the following site specific standards shall also be required:

A. Development Density - This property is located in an R-2 zone (medium density urban residential) and should be developed for uses consistent with that zoning. Development of a single family home is consistent with the current zoning.

B. Structure Foundation and Road Location - Any house built on these lots should be located as far to the East as possible and still be within the requirements of the R-2 zoning including any exceptions. These setbacks are a 20' front yard (measured from the Westerly right-of-way line of the private road) and a 5' side yard. The Westerly edge of the building foundation (excluding any exterior decks with railings less than 36" above grade) should be located in accordance with the oceanfront setback requirements of the Tillamook County Zoning Ordinance. Based upon current houses in the area, the oceanfront setback requirement is now at 233.3 feet East of the Ocean Shores Boundary Line. That oceanfront setback is subject to change as other houses are built in the area. The lowest level of the finished floor should be at least one foot above the 100 year base flood elevation which corresponds to two feet above the existing grade. Driveways should b placed to the East of the structure only.

C. Land Grading Practices - All excavations for driveway and house foundation construction should be done when the sand is damp but not saturated (while it is not actually raining). All cut slopes should be retained using temporary or permanent means of stabilization. No excavation or grading should take place on the fore dune area.

D. Vegetation Removal and Revegetation - Removal of vegetation should be kept to the absolute minimum to allow construction. Upon the completion of construction the disturbed area should be either replanted with beach grass or protected with a 4" thick layer of crushed rock. Florence Beach Grass Nursery is suggested as a source for beachgrass sets - either planted and fertilized, or for the owner to plant and fertilize. This nursery is also a good source of information on proper fertilizing and time of planting.

E. Foundations - The foundation should be a continuous reinforced concrete perimeter system. The hazard of buried logs under the foundation is discussed in the original report. The guidelines from that report should be strictly adhered to.

The bottom of all footings and pads should be excavated to below any organic material and previously placed fill material. Soil bearing pressures at the bottom of all footings should not exceed 1500 pounds per square foot. Any retaining walls should be designed according to the following criteria:

Allowable Soil Bearing Pressure (at a minimum 2' below native grade)	1500 lbs/sf
Lateral Soil Bearing Pressure (Active) (excluding surcharge effects)	40 lbs/cubic foot of depth
Lateral Soil Bearing Pressure (Passive)	300 lbs/cubic foot of depth
Friction Angle (ϕ)	28°
Maximum unit weight	120 lbs/cubic foot

F. Driveway Location and Design - Any driveway should be constructed such that the roadbed is entirely on cut material or overexcavated and recompacted fill material. Access will be from any convenient location on the private road easement. Driveway design standards should include the use of a geotextile support fabric, 8" of pit run base rock and 2" of 3/4"-0" crushed rock surfacing.

G. Stormwater Management, Runoff and Drainage - All roof drainage should be collected with eave gutters and downspouts and discharged to splash pads or dry wells. Any drywell should be located at least 10' away from the foundation.

OPTIONAL DEVELOPMENT STANDARDS FOR ADDED SEISMIC PROTECTION:

These are standards not strictly required under conditions set out in the Uniform Building Code lateral force resistance provisions for this area, but a concerned property owner might wish to include in home construction to provide additional safety in view of the available information on the greater potential for major earthquakes in about the 8 or greater Richter category.

While no practical measures could guarantee protection in a maximum event, some reasonable steps could provide a degree of assurance against damage in lesser events. The design of the structure for wind loadings of 110 or 120 mph winds will generally add only a small cost to the entire structure and will effectively increase protection for both additional wind and earthquake loads. Examples of the results of increased design loads are:

- ☐ Secure floor framing to mudsills with galvanized steel framing anchors.
- ☐ Secure roof framing to walls with galvanized steel hurricane clips.
- ☐ Use plywood shear wall construction, with plywood sheathing applied to greater than building code requirements for plywood shear walls.

SUMMARY FINDINGS AND CONCLUSIONS

1. The proposed use is currently single family residential. There are no development plans currently available for review at this time There are no immediate adverse effects on adjacent properties from future house construction. Future house construction may be subject to flooding and erosion from wave action. Future development proposals should be further evaluated in the context of the recommendations of a final Dune Hazard Report, at the time of issuance of a building permit.

2. The proposed use is protected from erosion and wave action by the existing foredune, the required setback from that foredune and the required building floor elevation.

3. All runoff during and after construction will be readily absorbed into the ground either through drywells or splash pads and will not pose any hazard to adjacent property.

4. Periodic monitoring of the foredune accretion or erosion is described in this report.

LIMITATION

This report is based on a site inspection of the subject property and vicinity and a review of the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to represent the site and are offered as professional opinions derived according to current standards of professional practice for a report of this nature, and no warranty is expressed or implied. This report has been prepared for the timely use of the above addressee and parties to the pending development of the subject property, and does not extend to the activities of unidentified future owners or occupants of the property for which the writer bears no responsibility.

Should you have any questions regarding our investigation and this report, please contact our office.

Sincerely,

HLB, INC.

Ronald G. Larson, PE, PLS
Principal-In-Charge

Carl Tappert, PE

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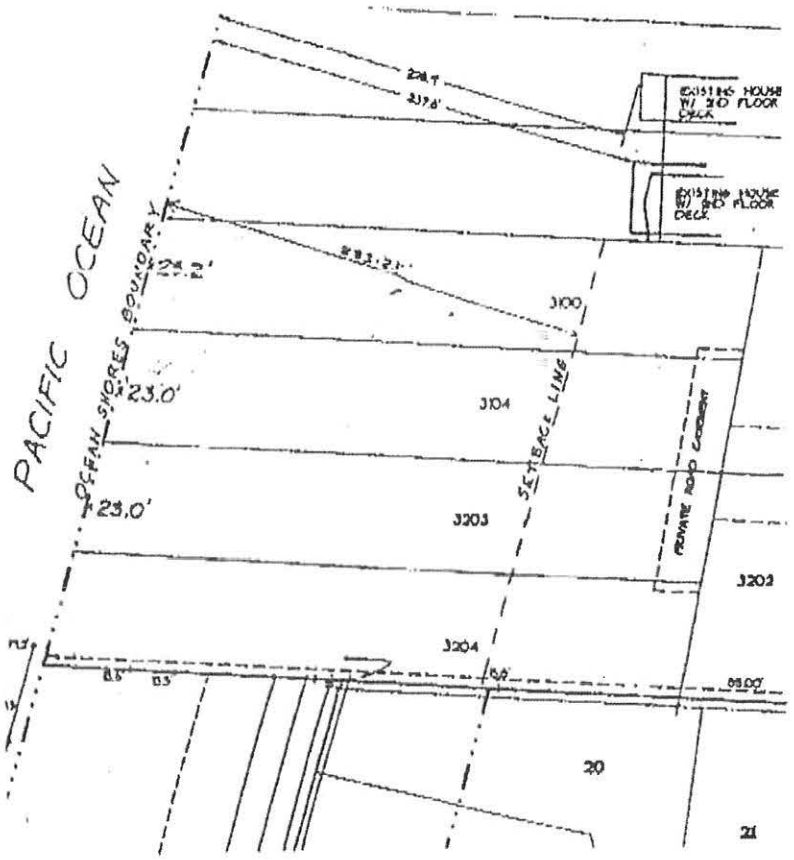
cc: GHR File

enc.



ENGINEERING GEOLOGIC HAZARD REPORT
VICINITY MAP
Scale: 1" = 100'

CLIENT: Mr. and Mrs. Don Linker
15917 SE Arista Drive
Milwaukie, OR 97267

PROPERTY: Tax Lots 3100 and 3400,
1N 10 7DA
Watseco, OR

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:21:00 pm

Account #	62719	Tax Status	ASSESSABLE
Map #	1N1007DA03203	Acct Status	ACTIVE
Code - Tax #	5624-62719	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	BERG, MEGAN	Deed Reference #	2020-29
Agent		Sales Date/Price	01-02-2020 / $180,000.00
In Care Of		Appraiser	ROBERT BUCKINGHAM
Mailing Address	1734 W YAMPA ST COLORADO SPRINGS, CO 80904		

Prop Class	100	MA	SA	NH	Unit
RMV Class	100	05	OF	536	13540-1

Situs Address(s)	Situs City

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	312,720			Land 0	
	Impr.	0			Impr. 0	
Code Area Total		312,720	283,800	283,800	0	
Grand Total		312,720	283,800	283,800	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624	0	☑		RK-R-2	Market	97	A	0.15		312,720
					Grand Total			0.15		312,720

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
				Grand Total		0			0

Comments: 02/07/13 Reappraised land. Tabled values. RBB

HANDFORTH
LARSON &
BARRETT, INC.

Civil Engineering & Surveying

P.O. Box 219 Manzanita, Oregon 97130 503-368-5394

September 14, 1990

Mr. Eugene W. Larson
c/o Mr. & Mrs. Don Linker
15917 SE Arista Drive
Milwaukie OR 97267

RE: Beach and Dune Hazard Report, Tax Lots 3203 and 3204, 1N 10 7DA, Watseco, Oregon

Dear Mr. & Mrs. Larson:

At your request our firm has visited the site of your property in the Watseco area in order to address the engineering and geologic hazards of the specific site and to make recommendations for residential construction thereon. Our site visit was made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic hazards. Mr. See's report on the subject property is attached to this report, and together with this report is the required dune hazard report for the subject property. The site is shown on the enclosed vicinity map.

INVESTIGATION

The property lies West of Ocean Boulevard on a private street. The East line of the subject property is located approximately 384 feet West of the West line of Ocean Road. The enclosed spot elevation map of the property shows spot elevations on the property (on NGVD datum) as well as the high point of the dune formation. The highest point of the dune formation is virtually on the proposed building sites. West of the building sites lies a broad deflation zone and the primary foredune.

A review of OSHD aerial photos for this area dated 1967, 1973, 1978 and 1984 show a steady increase in vegetation over the entire property. The most Westerly line of vegetation has moved Westward since at least 1939 as noted in Mr. See's report. The Westerly portion of the dune is classified as an Active Foredune and the Easterly portion of the property is classified as an Older Stabilized Dune.

Wind erosion and migration of sand is a hazard to any beachfront property which consists of sand. As Mr. See points out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the walkways to the beach. Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation. For this reason, it is recommended that no vegetation be cut to the West of the proposed building site.

Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dune was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert your foundation contractor to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractor should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2-inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance. Any logs discovered to be near the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

Potential hazards due to ocean flooding have been identified by the National Flood Insurance Program. The Flood Insurance Rate Map (FIRM) for the Watseco area shows the subject property to be located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is immediately adjacent to a velocity zone (V13) with a predicted base flood elevation of 22 feet. The current elevation of the crest of the dune is now also approximately 22 feet (NGVD). Thus the crest and width of the dune field is providing all of the protection from flooding for this property. Every effort should be made to maintain the dune at or above the 100 year base flood elevation. This will be accomplished through the protection of the existing European beach grass and other vegetation on this property.

DEVELOPMENT STANDARDS

Development standards which are recommended for the subject property to adequately protect the proposed development from the above described potential hazards are as follows:

1. The foundation of the structure should be on continuous concrete footings. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. All footings should bear directly on undisturbed native sand. Do <u>not</u> place house footings on fill material. The bottom of all footings should be a minimum of 12 inches below grade for single story construction and 18 inches below grade for two story construction in native sand. We recommend that the building contractor be alerted to the need to protect the footings during construction from sand erosion and undermining.

2. Roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed. All collected runoff water should be disposed of either on splash pads or in drywells.

3. All proposed structures must be placed on the property in accordance with the setback requirements of Tillamook County. The Tillamook County Planning Department has indicated that special setback restrictions will be applicable to this property. More specifically, the Planning staff has indicated that a general exception is currently being processed to allow for a setback of 10 feet along the West right-of-way line of the private road. The Oceanfront Setback Line will be determined by the Planning Staff on a case by case basis for each individual lot. In general, the Oceanfront Setback must be at a maximum distance from the Ocean Shores Boundary Line in order to place the structure on the lot. This is the reason behind the exception to the Easterly setback.

4. With reference to the above setback requirements, it is recommended that the proposed structure be located as far East on the subject property as possible. It is a preliminary conclusion of this report that the most westerly location of a new residential construction on this property should be no further West than 60 feet Westerly of the Westerly right-of-way line of the private roadway adjacent to the East property line. The location of this line is as shown on the enclosed spot elevation map. No building construction should occur West of this line and no vegetation should be removed or disturbed West of this line. No beach grass or other vegetation should be cut West of this line.

5. The above recommendation of a building setback line of 60' applies to the Westerly foundation of the proposed structure, excluding any exterior deck on the West side of the structure. This recommendation should be taken as a general guideline or goal in the preparation of a site plan for development of the property. Any structure proposed to be located Westerly of this line may be possible, however, we recommend that a review of the specific site plan be accomplished by this engineer and consulting geologist.

6. Vegetation removal around the proposed structure should be kept to the minimum required for the placement of the structure. We recommend that your contractor revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock.

7. Undercutting by wave action along this portion of the ocean front has not historically been a problem. Although it is impossible to predict what future winter storms may do to the coastline, it would seem likely that no significant wave undercutting will probably occur. If such undercutting were to begin, remedial measures, such as riprap construction, would need to be implemented.

FINDINGS AND CONCLUSIONS

Based upon our site specific investigation of this property and the recommended development standards, the following are our conclusions:

a) The proposed residential use will have negligible adverse effects on adjacent uses and the surrounding area.

b) There are no hazards to life, property, and the natural environment which may be caused by the proposed use, subject to the conditions for development stated in the foregoing development standards.

c) The proposed residential use, subject to the foregoing development standards, will be adequately protected from the described hazards, notwithstanding the fact that riprap protection may be necessary in the future should erosion occur.

d) No periodic monitoring of site conditions is recommended other than monitoring of any erosion of the foredune, should it occur.

LIMITATION

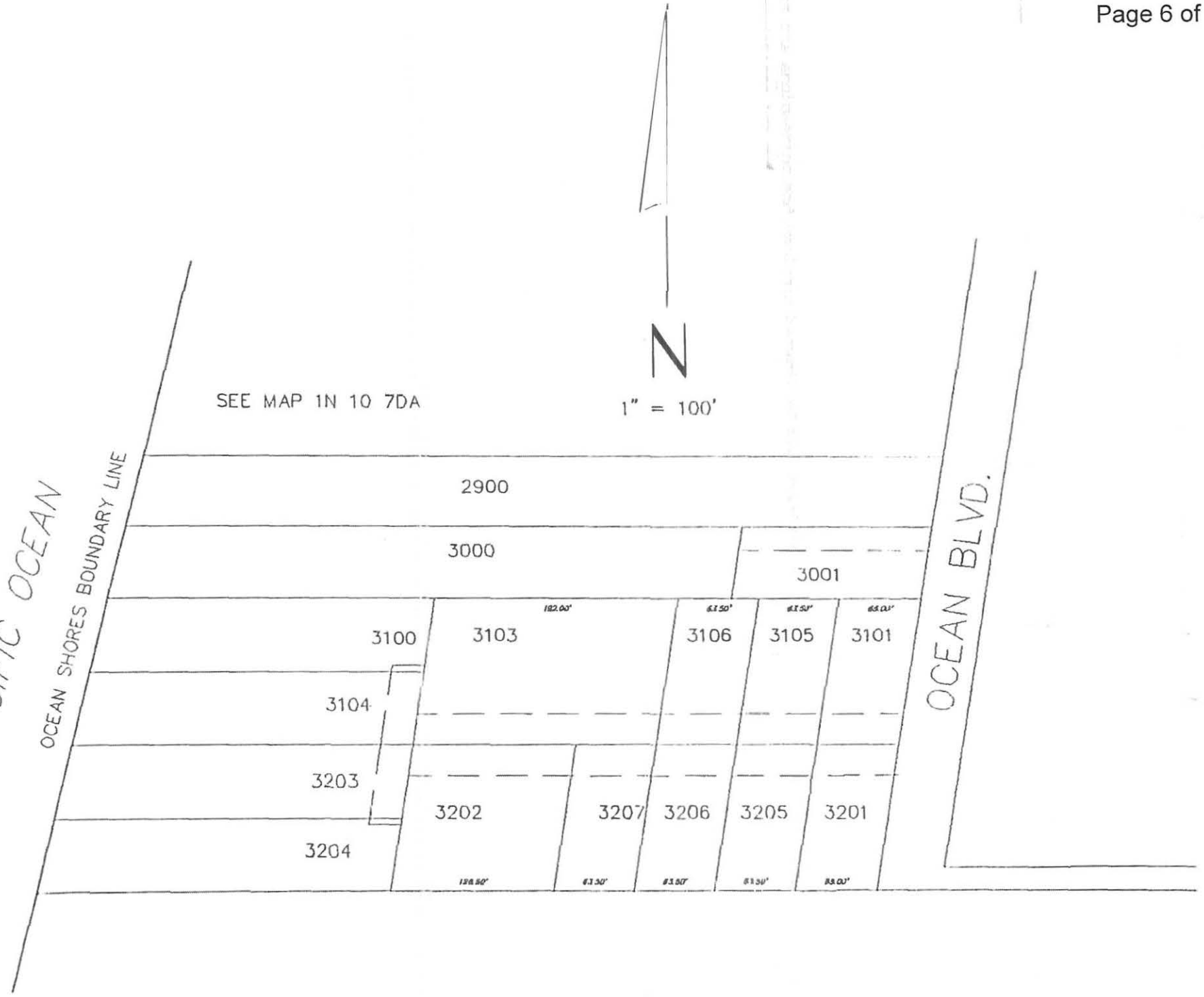
This report is based on a site investigation of the subject property and vicinity and a review of existing aerial photography and the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied.

Should you have any questions regarding our investigation and this report, please contact our office.

Very truly yours,
HANDFORTH, LARSON & BARRETT, INC.

Ronald G. Larson, PE, PLS

rgl/ms <at:\rpt\larson.dhr>
cc: Paul D. See



HLBI to - September 14, 1990 - I 5 of 10

PAUL D. SEE
300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

July 9, 1990 #3070

Ronald G. Larson
Handforth Larson and Barrett, Inc.
P. O. Box 219
Manzanita, OR 97130

RE: Tax Lots 3203, 3204, T1N, R10W, Sec 7DA, Watseco. (Larson)

Dear Ron:

The following letter report documents my inspection of the above described property with you on Monday, July 2, to assess applicable geologic hazards.

TOPOGRAPHY AND DEPOSITIONAL HISTORY

The property rests on a relatively flat but hummocky dunefield at an approximate elevation of 16+ feet NGVD. Sand has accumulated along this shoreline partly as a natural barrier across an otherwise irregular foothill frontage, and partly as a result of the interruption of coastal sand transport by construction of the Tillamook Bay north jetty in 1917.

Although this beach has experienced a net accretion in the past 70 years, severe storms have periodically eroded the dune front resulting in scattered property damage from Manhattan Beach to Tillamook Bay. Cooper (1) describes intense erosion in January, 1939, and Schlicker (2) describes with an accompanying photograph the abrupt erosion of the 12+/-foot high dunes at Watseco Creek in the winter of 1971-72, along an area that had been stable for 15 years. The 1986 Nedonna Beach Foredune Study (3), although not directly incorporating this area, utilizes examples of erosion and deposition in the Watseco Creek area to illustrate factors applicable to their area of study. Concentrating on the effect of drift logs, they declare that: "Driftwood deposits on the backshore can either be a benefit or a destructive force to the foredune. Massive driftwood deposits that interlock can provide excellent wave protection by breaking up wave energy before it reaches the foredune. They also collect wind-blown sand and can be the start of new foredunes. Backshore deposits known to the study team on other beaches are sometimes 50 to 100 feet wide and a mile long. They tend to create a false sense of security for oceanfront property owners".

Inspection of 1967, 1973, 1978, and 1984 Oregon State Highway Division aerial photos reveals a relatively fresh local field of scattered drift logs over a 200+/- foot wide strip in 1967. Vegetation had gradually obscured these logs from aerial view by 1984, but field inspection confirms their presence to this date. Periodic erosion, particularly during the 1982-83 El Nino event, has removed several tens of feet of the dune frontage, exposing a dense tangle of logs weathered from the dune front. The

See/HLBI
7/9/90
(Larson)

low wave-cut bank visible on the 1984 photo is still observable at this time.

The surface profile in this area is atypical of most local sandy beach fronts. No true foredune exists, although the western edge of the dunefield is slightly higher than the hummocky, log-strewm plain to the east. The area has obviously not experienced a net regression in the past 23 years, although the presence of fresh logs in 1967 is evidence of extreme wash-over just prior to that date.

Notwithstanding the record of frequent storm damage, Stembridge (4) notes in 1975 that "with the exception of Neahkahnie and Manzanita beaches in the extreme north, the entire Rockaway-Nehalem shoreline has been prograding since at least 1939", and "the least prograding between the Nehalem River and Tillamook Bay totals more than 30 feet since 1939". He further notes the confusion among other investigators over erosion/deposition trends along this beach, citing their use of newspaper accounts of storm damage as evidence for long-term erosion.

The incipient foredune lies about eight feet higher than the average remainder of the property, tending to inhibit damage from prolonged seasonal storm and surf erosion or wash-over. However, the low elevation of this dune and even lower elevation at the nearby Watseco Creek estuary permits a degree of velocity flooding in the general area, including the subject property. The FEMA map predicts "AO" flooding of the Watseco area to a depth of one foot, and "100 year" velocity flooding to an elevation of 22 feet, coincident with the dune elevation.

The drift log accumulation should be allowed to remain on the upper beach to inhibit erosion and aid in dune buildup, and European beach grass should be encouraged to spread on the foreslope. I assume you will address the need to probe for buried logs beneath any foundation, to avoid settlement from slow decay.

SUMMARY, LOCAL HAZARDS

The property is well vegetated with beach pines and willow and other upland shrubs and grasses. However, this has obviously developed in a few decades, and the area remains at some risk from severe episodic storm wave overtopping due to its elevation. The presence of the numerous old drift logs and living vegetation would diminish velocity flooding at the building site. The Tillamook Bay north jetty will continue to present a barrier to southerly offshore sand transport, causing a continued net accretion along this beach. Future storm surges and consequent erosion cannot be predicted, however, and damage from velocity flooding cannot be ruled out. Notwithstanding the possibility of flooding, the property appears to be relatively safe from long-term erosion and shoreline regression. No evidence exists to suggest reversal of a trend that has continued for more than 70 years.

See/HLBI
7/9/90
(Larson)

REGIONAL HAZARD

Oregon coastal property owners should be advised that contrary to long-held assumption, there is now significant reason to believe (5) that the Oregon coast is vulnerable to severe impact from an intense local earthquake and accompanying tsunami, or seismic sea wave.

Recent discoveries in the coastal embayments of Oregon and Washington seem to confirm a history of seven or more large earthquakes, probably originating in the local Cascadia subduction zone, during the past 3300+/-years. All seem to have been accompanied by abrupt subsidence of the coastline by several inches to several feet, followed by a series of massive waves that buried marshland peat and coastal cedar forests under wave-deposited sand.

No major local earthquakes have been experienced during historic time. However, if we are to accept the current estimates of the average time span between such events, (approximately 300 years minimum), it follows that a disastrous coastal earthquake and tsunami are indeed possible in the foreseeable future. Based on tree-ring dating, the most recent event seems to have occurred about the year 1690.

Tsunamis are capable of great heights under some circumstances, and the evidence of past events along this coastline has led to an estimated wave height of 15 meters above prevailing tide, well above the local dunefield elevation. Depending on the intensity of ground acceleration, liquefaction can occur in loosely consolidated and saturated sediments, allowing structures to settle unpredictably into the sand.

Events of this magnitude must be considered only as a possibility at this time. Our understanding of Cascadia seismicity remains limited, and the timing or magnitude of future events cannot yet be quantified. However, I am professionally obliged to apprise clients of this newly recognized potential for earthquake damage, remote as it may be.

RECOMMENDATION

Considering all potential hazards noted above, I would recommend locating a structure as far east as possible, but certainly no farther west than a north-south line 60 feet from the easterly property line.

LIMITATIONS

Observations and recommendations incorporated in this letter report are the result of personal site inspection, the works of other specialists, and generally accepted principles of geologic investigation for a report of this nature. No warranties are expressed or implied. This report has been prepared for the timely use of the above addressee and parties to any pending development of the subject property, and does not extend to the

See/HLBI
7/9/90
(LArson)

activities of unidentified future owners or occupants of the property for which the writer bears no responsibility.

Sincerely,

Paul D. See

References cited:

(1) Cooper, william S. "Coastal Sand Dunes of Oregon and Washington", GSA Memoir #72, 1958 (p. 84).

(2) Schlicker, H. G., et al, "Environmental Geology of the Coastal Portions of Tillamook and Clatsop Counties, Oregon", Oreg. Dept. of Geol. & Mineral Indust. Bull. #74, 1972.

(3) Nedonna Beach Foredune Management Study, pages 24, 25. Prepared for Land Conservation and Development Commission, 1986.

(4) Stembridge, James Edward, Jr. "Shoreline Changes and Physiographic Hazards on the Oregon Coast", PhD dissertation, University of Oregon, 1975 (p. 63).

(5) Atwater, B., "Evidence for Great Holocene Earthquakes Along the Outer Coast of Washington State", AAAS Science Magazine, Vol. 236, 22 May, 1987, (and) Woodward, J., "Paleoseismicity and the Archeological Record: Areas of Investigation on the Northern Oregon Coast", Oregon Geology, Vol. 52 #3, May 1990.

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:20:42 pm

Account #	322822	Tax Status	ASSESSABLE
Map #	1N1007DA03204	Acct Status	ACTIVE
Code - Tax #	5624-322822	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	VON SEGGERN, HEATHER STECK	Deed Reference #	2020-39
Agent		Sales Date/Price	01-02-2020 / $175,000.00
In Care Of		Appraiser	ROBERT BUCKINGHAM
Mailing Address	337 SOMERSET AVE SARASOTA, FL 34243		

Prop Class	100	MA	SA	NH	Unit
RMV Class	100	05	OF	536	4366-1

Situs Address(s)	Situs City

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	312,720			Land 0	
	Impr.	0			Impr. 0	
Code Area Total		312,720	283,800	283,800	0	
Grand Total		312,720	283,800	283,800	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624	0	☑		RK-R-2	Market	97	A	0.12		312,720
					Grand Total			0.12		312,720

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
				Grand Total		0			0

Comments: 02/07/13 Reappraised land. Tabled values. RBB

HANDFORTH
LARSON &
BARRETT, INC.

Civil Engineering & Surveying

P.O. Box 219 Manzanita, Oregon 97130 503-368-5394

September 14, 1990

Mr. Eugene W. Larson
c/o Mr. & Mrs. Don Linker
15917 SE Arista Drive
Milwaukie OR 97267

RE: Beach and Dune Hazard Report, Tax Lots 3203 and 3204, 1N 10 7DA, Watseco, Oregon

Dear Mr. & Mrs. Larson:

At your request our firm has visited the site of your property in the Watseco area in order to address the engineering and geologic hazards of the specific site and to make recommendations for residential construction thereon. Our site visit was made in conjunction with Mr. Paul See, Geologist, who examined the site for geologic hazards. Mr. See's report on the subject property is attached to this report, and together with this report is the required dune hazard report for the subject property. The site is shown on the enclosed vicinity map.

INVESTIGATION

The property lies West of Ocean Boulevard on a private street. The East line of the subject property is located approximately 384 feet West of the West line of Ocean Road. The enclosed spot elevation map of the property shows spot elevations on the property (on NGVD datum) as well as the high point of the dune formation. The highest point of the dune formation is virtually on the proposed building sites. West of the building sites lies a broad deflation zone and the primary foredune.

A review of OSHD aerial photos for this area dated 1967, 1973, 1978 and 1984 show a steady increase in vegetation over the entire property. The most Westerly line of vegetation has moved Westward since at least 1939 as noted in Mr. See's report. The Westerly portion of the dune is classified as an Active Foredune and the Easterly portion of the property is classified as an Older Stabilized Dune.

Wind erosion and migration of sand is a hazard to any beachfront property which consists of sand. As Mr. See points out, the sand has become stabilized due to the presence of logs, beach grass and other vegetation over the entire property. Open sand exists in very localized areas where the beach grass has been trampled by foot traffic such as the walkways to the beach. Because the stabilization of the sand is heavily dependent upon vegetation, every effort should be made to encourage the growth of natural beach vegetation. For this reason, it is recommended that no vegetation be cut to the West of the proposed building site.

Wind erosion and migration of sand may also be a hazard to residential construction if not properly controlled. Bare sand may erode around the building foundation and undermine the foundation. This erosion may be caused by wind, rain, or foot traffic, or a combination of all three. The hazard is greatest during and immediately after construction when both the vegetation and the sand have recently been disturbed.

Another potential hazard, which can occur in sand dune areas formed by accretion, is that of buried logs and other organic matter on the property. Logs and other flotsam may have become buried in the sand as the dune was formed by a build-up of sand. Over a period of time, the buried wood rots and forms a highly compressible soil. Soil of this type is very poor on which to build a structure. The greatest hazard occurs from logs near the ground surface which rot, since deeply buried logs will not decompose when located below the permanent water table. Our recommendations for dealing with this potential hazard are as follows:

1. Alert your foundation contractor to the potential problem of buried logs near the ground surface.
2. During excavation for concrete footings, the contractor should probe the sand under the proposed footings with a 6 foot long smooth steel rod, 3/8-inch to 1/2-inch in diameter. The rod should be able to be driven with a hammer into the sand with relative ease. Logs will produce a dull thumping sound on contact and greatly increase the driving resistance. Any logs discovered to be near the surface under the proposed footings should be removed and the excavation replaced with well compacted sand.

Potential hazards due to ocean flooding have been identified by the National Flood Insurance Program. The Flood Insurance Rate Map (FIRM) for the Watseco area shows the subject property to be located in an 'AO' flood zone with a specified depth of flooding of one foot of water. The property is immediately adjacent to a velocity zone (V13) with a predicted base flood elevation of 22 feet. The current elevation of the crest of the dune is now also approximately 22 feet (NGVD). Thus the crest and width of the dune field is providing all of the protection from flooding for this property. Every effort should be made to maintain the dune at or above the 100 year base flood elevation. This will be accomplished through the protection of the existing European beach grass and other vegetation on this property.

DEVELOPMENT STANDARDS

Development standards which are recommended for the subject property to adequately protect the proposed development from the above described potential hazards are as follows:

1. The foundation of the structure should be on continuous concrete footings. We recommend that the maximum allowable soil bearing pressure at the bottom of the footing not exceed 1500 pounds per square foot. This value may be increased for additional width and depth of footings in accordance with Table 29-B of the Oregon State Structural Specialty Code. All footings should bear directly on undisturbed native sand. Do <u>not</u> place house footings on fill material. The bottom of all footings should be a minimum of 12 inches below grade for single story construction and 18 inches below grade for two story construction in native sand. We recommend that the building contractor be alerted to the need to protect the footings during construction from sand erosion and undermining.

2. Roof gutters and downspouts should be installed as soon as possible after the roof sheathing has been installed. All collected runoff water should be disposed of either on splash pads or in drywells.

3. All proposed structures must be placed on the property in accordance with the setback requirements of Tillamook County. The Tillamook County Planning Department has indicated that special setback restrictions will be applicable to this property. More specifically, the Planning staff has indicated that a general exception is currently being processed to allow for a setback of 10 feet along the West right-of-way line of the private road. The Oceanfront Setback Line will be determined by the Planning Staff on a case by case basis for each individual lot. In general, the Oceanfront Setback must be at a maximum distance from the Ocean Shores Boundary Line in order to place the structure on the lot. This is the reason behind the exception to the Easterly setback.

4. With reference to the above setback requirements, it is recommended that the proposed structure be located as far East on the subject property as possible. It is a preliminary conclusion of this report that the most westerly location of a new residential construction on this property should be no further West than 60 feet Westerly of the Westerly right-of-way line of the private roadway adjacent to the East property line. The location of this line is as shown on the enclosed spot elevation map. No building construction should occur West of this line and no vegetation should be removed or disturbed West of this line. No beach grass or other vegetation should be cut West of this line.

5. The above recommendation of a building setback line of 60' applies to the Westerly foundation of the proposed structure, excluding any exterior deck on the West side of the structure. This recommendation should be taken as a general guideline or goal in the preparation of a site plan for development of the property. Any structure proposed to be located Westerly of this line may be possible, however, we recommend that a review of the specific site plan be accomplished by this engineer and consulting geologist.

6. Vegetation removal around the proposed structure should be kept to the minimum required for the placement of the structure. We recommend that your contractor revegetate or otherwise protect from erosion all disturbed sand adjoining the foundation. In all areas where vegetation will not grow or is not desired, it is recommended that the sand be protected with a 4 inch thick layer of crushed rock.

7. Undercutting by wave action along this portion of the ocean front has not historically been a problem. Although it is impossible to predict what future winter storms may do to the coastline, it would seem likely that no significant wave undercutting will probably occur. If such undercutting were to begin, remedial measures, such as riprap construction, would need to be implemented.

FINDINGS AND CONCLUSIONS

Based upon our site specific investigation of this property and the recommended development standards, the following are our conclusions:

a) The proposed residential use will have negligible adverse effects on adjacent uses and the surrounding area.

b) There are no hazards to life, property, and the natural environment which may be caused by the proposed use, subject to the conditions for development stated in the foregoing development standards.

c) The proposed residential use, subject to the foregoing development standards, will be adequately protected from the described hazards, notwithstanding the fact that riprap protection may be necessary in the future should erosion occur.

d) No periodic monitoring of site conditions is recommended other than monitoring of any erosion of the foredune, should it occur.

LIMITATION

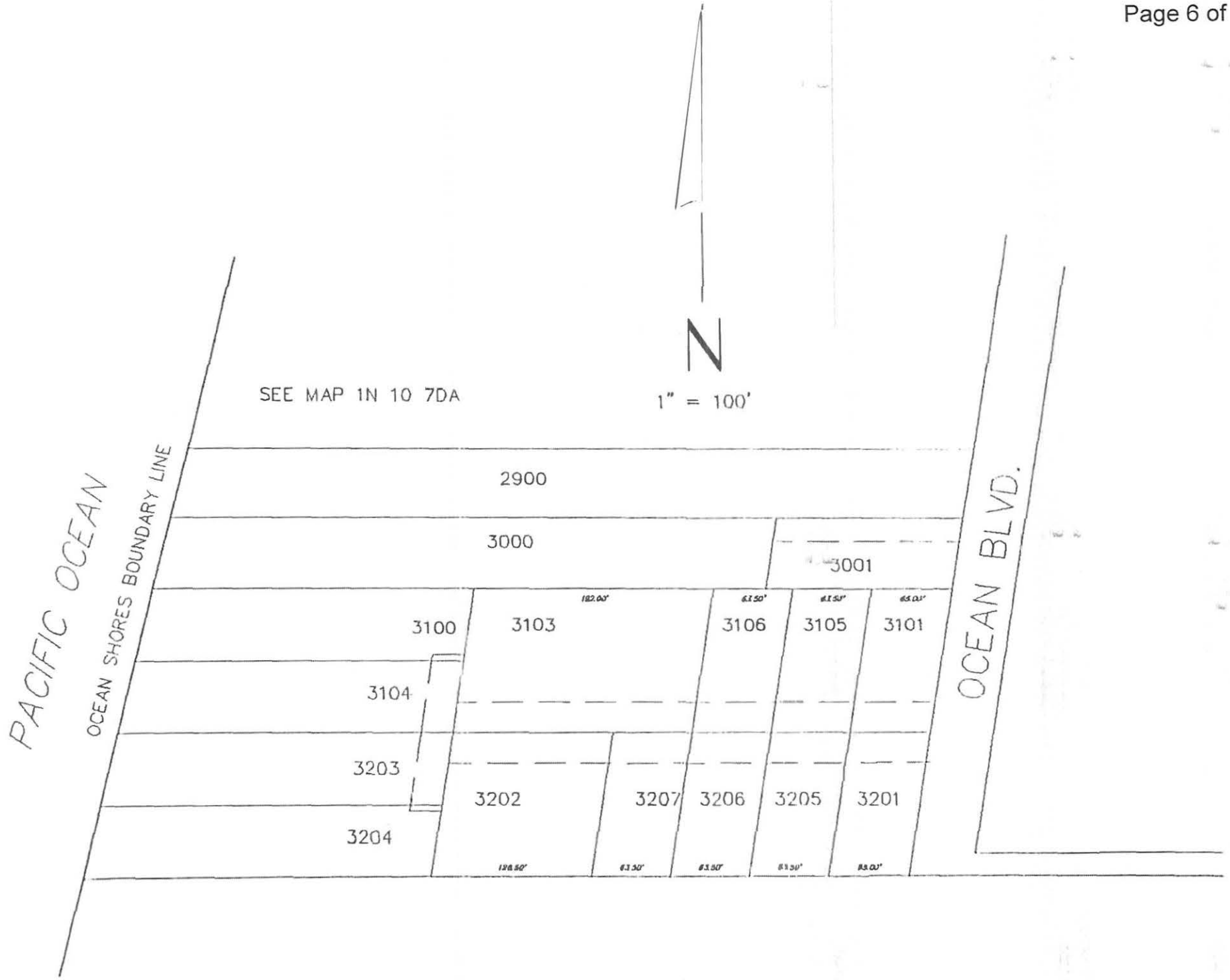
This report is based on a site investigation of the subject property and vicinity and a review of existing aerial photography and the site topography and subsurface conditions as explored by shallow hand digging. The conclusions and recommendations presented are believed to be representative of the site and are professional opinions derived in accordance with current standards of professional practice for a report of this nature, and no warranty is expressed or implied.

Should you have any questions regarding our investigation and this report, please contact our office.

Very truly yours,
HANDFORTH, LARSON & BARRETT, INC.

Ronald G. Larson, PE, PLS

rgl/ms <at:\rpt\larson.dhr>
cc: Paul D. See



HLBI to - September 14, 1990 - I 5 of 10

PAUL D. SEE

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

July 9, 1990 #3070

Ronald G. Larson
Handforth Larson and Barrett, Inc.
P. O. Box 219
Manzanita, OR 97130

RE: Tax Lots 3203, 3204, T1N, R10W, Sec 7DA, Watseco. (Larson)

Dear Ron:

The following letter report documents my inspection of the above described property with you on Monday, July 2, to assess applicable geologic hazards.

TOPOGRAPHY AND DEPOSITIONAL HISTORY

The property rests on a relatively flat but hummocky dunefield at an approximate elevation of 16+ feet NGVD. Sand has accumulated along this shoreline partly as a natural barrier across an otherwise irregular foothill frontage, and partly as a result of the interruption of coastal sand transport by construction of the Tillamook Bay north jetty in 1917.

Although this beach has experienced a net accretion in the past 70 years, severe storms have periodically eroded the dune front resulting in scattered property damage from Manhattan Beach to Tillamook Bay. Cooper (1) describes intense erosion in January, 1939, and Schlicker (2) describes with an accompanying photograph the abrupt erosion of the 12+/-foot high dunes at Watseco Creek in the winter of 1971-72, along an area that had been stable for 15 years. The 1986 Nedonna Beach Foredune Study (3), although not directly incorporating this area, utilizes examples of erosion and deposition in the Watseco Creek area to illustrate factors applicable to their area of study. Concentrating on the effect of drift logs, they declare that: "Driftwood deposits on the backshore can either be a benefit or a destructive force to the foredune. Massive driftwood deposits that interlock can provide excellent wave protection by breaking up wave energy before it reaches the foredune. They also collect wind-blown sand and can be the start of new foredunes. Backshore deposits known to the study team on other beaches are sometimes 50 to 100 feet wide and a mile long. They tend to create a false sense of security for oceanfront property owners".

Inspection of 1967, 1973, 1978, and 1984 Oregon State Highway Division aerial photos reveals a relatively fresh local field of scattered drift logs over a 200+/- foot wide strip in 1967. Vegetation had gradually obscured these logs from aerial view by 1984, but field inspection confirms their presence to this date. Periodic erosion, particularly during the 1982-83 El Nino event, has removed several tens of feet of the dune frontage, exposing a dense tangle of logs weathered from the dune front. The

See/HLBI
7/9/90
(Larson)

low wave-cut bank visible on the 1984 photo is still observable at this time.

The surface profile in this area is atypical of most local sandy beach fronts. No true foredune exists, although the western edge of the dunefield is slightly higher than the hummocky, log-strewn plain to the east. The area has obviously not experienced a net regression in the past 23 years, although the presence of fresh logs in 1967 is evidence of extreme wash-over just prior to that date.

Notwithstanding the record of frequent storm damage, Stembridge (4) notes in 1975 that "with the exception of Neahkahnie and Manzanita beaches in the extreme north, the entire Rockaway-Nehalem shoreline has been prograding since at least 1939", and "the least prograding between the Nehalem River and Tillamook Bay totals more than 30 feet since 1939". He further notes the confusion among other investigators over erosion/deposition trends along this beach, citing their use of newspaper accounts of storm damage as evidence for long-term erosion.

The incipient foredune lies about eight feet higher than the average remainder of the property, tending to inhibit damage from prolonged seasonal storm and surf erosion or wash-over. However, the low elevation of this dune and even lower elevation at the nearby Watseco Creek estuary permits a degree of velocity flooding in the general area, including the subject property. The FEMA map predicts "AO" flooding of the Watseco area to a depth of one foot, and "100 year" velocity flooding to an elevation of 22 feet, coincident with the dune elevation.

The drift log accumulation should be allowed to remain on the upper beach to inhibit erosion and aid in dune buildup, and European beach grass should be encouraged to spread on the foreslope. I assume you will address the need to probe for buried logs beneath any foundation, to avoid settlement from slow decay.

SUMMARY, LOCAL HAZARDS

The property is well vegetated with beach pines and willow and other upland shrubs and grasses. However, this has obviously developed in a few decades, and the area remains at some risk from severe episodic storm wave overtopping due to its elevation. The presence of the numerous old drift logs and living vegetation would diminish velocity flooding at the building site. The Tillamook Bay north jetty will continue to present a barrier to southerly offshore sand transport, causing a continued net accretion along this beach. Future storm surges and consequent erosion cannot be predicted, however, and damage from velocity flooding cannot be ruled out. Notwithstanding the possibility of flooding, the property appears to be relatively safe from long-term erosion and shoreline regression. No evidence exists to suggest reversal of a trend that has continued for more than 70 years.

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7/9/90
(Larson)

REGIONAL HAZARD

Oregon coastal property owners should be advised that contrary to long-held assumption, there is now significant reason to believe (5) that the Oregon coast is vulnerable to severe impact from an intense local earthquake and accompanying tsunami, or seismic sea wave.

Recent discoveries in the coastal embayments of Oregon and Washington seem to confirm a history of seven or more large earthquakes, probably originating in the local Cascadia subduction zone, during the past 3300+/-years. All seem to have been accompanied by abrupt subsidence of the coastline by several inches to several feet, followed by a series of massive waves that buried marshland peat and coastal cedar forests under wave-deposited sand.

No major local earthquakes have been experienced during historic time. However, if we are to accept the current estimates of the average time span between such events, (approximately 300 years minimum), it follows that a disastrous coastal earthquake and tsunami are indeed possible in the foreseeable future. Based on tree-ring dating, the most recent event seems to have occurred about the year 1690.

Tsunamis are capable of great heights under some circumstances, and the evidence of past events along this coastline has led to an estimated wave height of 15 meters above prevailing tide, well above the local dunefield elevation. Depending on the intensity of ground acceleration, liquefaction can occur in loosely consolidated and saturated sediments, allowing structures to settle unpredictably into the sand.

Events of this magnitude must be considered only as a possibility at this time. Our understanding of Cascadia seismicity remains limited, and the timing or magnitude of future events cannot yet be quantified. However, I am professionally obliged to apprise clients of this newly recognized potential for earthquake damage, remote as it may be.

RECOMMENDATION

Considering all potential hazards noted above, I would recommend locating a structure as far east as possible, but certainly no farther west than a north-south line 60 feet from the easterly property line.

LIMITATIONS

Observations and recommendations incorporated in this letter report are the result of personal site inspection, the works of other specialists, and generally accepted principles of geologic investigation for a report of this nature. No warranties are expressed or implied. This report has been prepared for the timely use of the above addressee and parties to any pending development of the subject property, and does not extend to the

See/HLBI
7/9/90
(LArson)

activities of unidentified future owners or occupants of the property for which the writer bears no responsibility.

Sincerely,

Paul D. See

References cited:

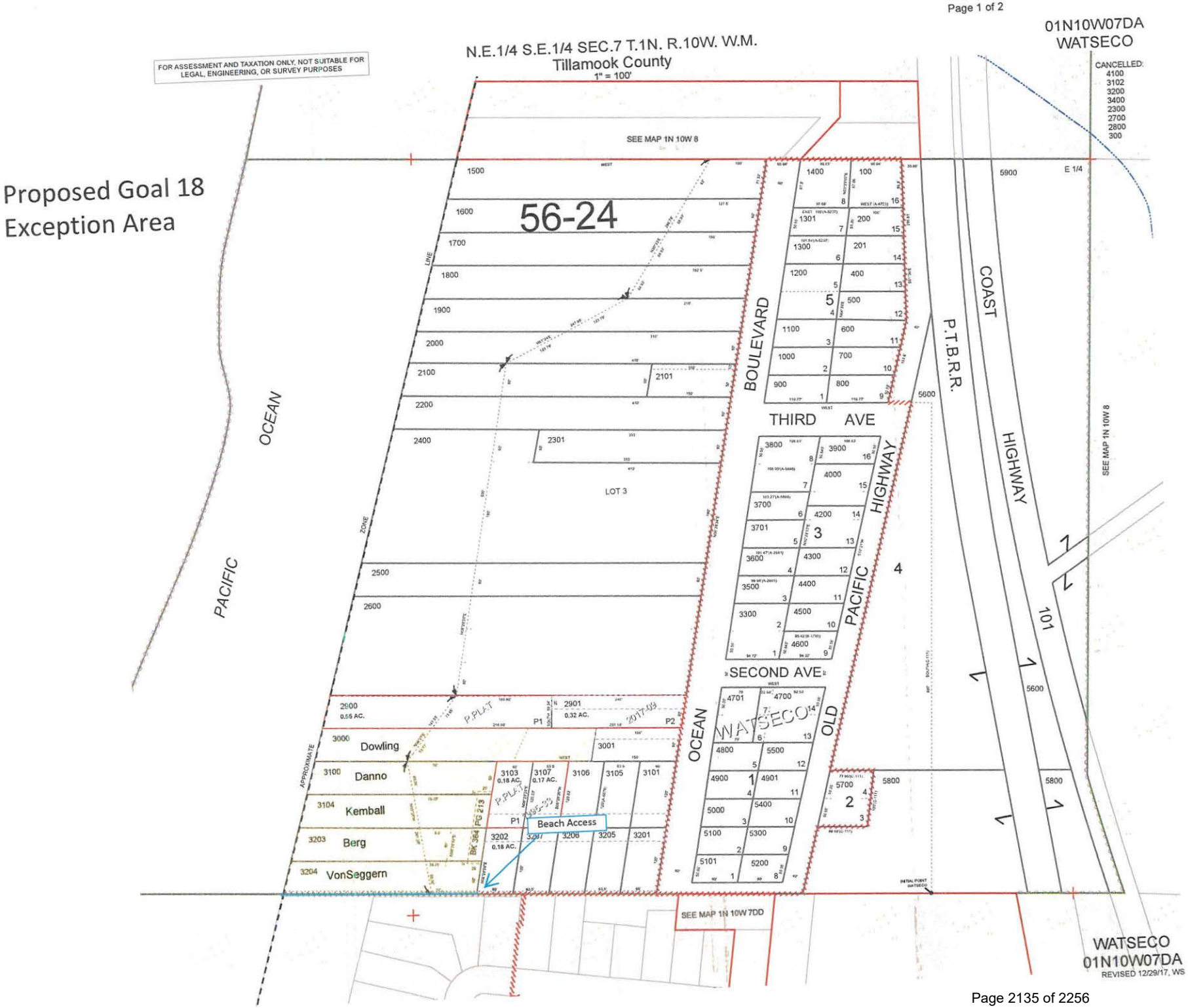
(1) Cooper, william S. "Coastal Sand Dunes of Oregon and Washington", GSA Memoir #72, 1958 (p. 84).

(2) Schlicker, H. G., et al, "Environmental Geology of the Coastal Portions of Tillamook and Clatsop Counties, Oregon", Oreg. Dept. of Geol. & Mineral Indust. Bull. #74, 1972.

(3) Nedonna Beach Foredune Management Study, pages 24, 25. Prepared for Land Conservation and Development Commission, 1986.

(4) Stembridge, James Edward, Jr. "Shoreline Changes and Physiographic Hazards on the Oregon Coast", PhD dissertation, University of Oregon, 1975 (p. 63).

(5) Atwater, B., "Evidence for Great Holocene Earthquakes Along the Outer Coast of Washington State", AAAS Science Magazine, Vol. 236, 22 May, 1987, (and) Woodward, J., "Paleoseismicity and the Archeological Record: Areas of Investigation on the Northern Oregon Coast", Oregon Geology, Vol. 52 #3, May 1990.


01N10W07DA
WATSECO
N.E.1/4 S.E.1/4 SEC.7 T.1N. R.10W. W.M.
Tillamook County
1" = 100'
FOR ASSESSMENT AND TAXATION ONLY. NOT SUITABLE FOR LEGAL, ENGINEERING, OR SURVEY PURPOSES
CANCELLED:
4100
3102
3200
3400
2300
2700
2800
300
Proposed Goal 18
Exception Area
SEE MAP 1N 10W 8
56-24
OCEAN
PACIFIC
ZONE
LINE
BOULEVARD
THIRD AVE
HIGHWAY
P.T.B.R.R.
COAST
101
E 1/4
LOT 3
SECOND AVE
OLD
WATSECO
Dowling
Danno
Kemball
Berg
VonSeggern
Beach Access
BK 364 PG 213
APPROXIMATE
SEE MAP 1N 10W 7DD
WATSECO
01N10W07DA
REVISED 12/29/17, WS

01N10W07DD
WATSECO

FOR ASSESSMENT AND TAXATION ONLY, NOT SUITABLE FOR LEGAL, ENGINEERING, OR SURVEY PURPOSES

S.E.1/4 S.E.1/4 SEC.7 T.1N. R.10W. W.M.
Tillamook County
1" = 100'

SEE MAP 1N 10W 7DA

Beach Access

OCEAN

PACIFIC

APPROXIMATE ZONE LINE

PINE BEACH REPLAT UNIT 1

COMMON AREA
TRACT "A"

136
2.13 AC.

123 0.33 AC. Ellis
122 0.24 AC. Holland
121 0.21 AC. Klein
120 0.21 AC. Munch
119 0.21 AC. Munch
118 0.21 AC. Roberts
117 0.21 AC. Creedon
116 0.21 AC. Farr
115 0.27 AC. Rogers
114 0.38 AC. Cogdall

124 0.19 AC.
145 1.06 AC.
125 .15 AC.
144 12 AC.
126 .14 AC.
127 0.15 AC.
113 .16 AC.

PINE BEACH WAY

PINE BEACH LOOP (SECOND AVE.)

PINE BEACH REPLAT UNIT 2

PINE BEACH AVENUE

209 0.26 AC. P.1
218 .16 AC. P.2
1999-53

OLD PACIFIC HIGHWAY

INITIAL POINT

103
2.00 AC.

56-24
PORTION PARTITION PLAT 1994-03
PORTION OF PARCEL 3

P.T.B.R.R.

SEE MAP 1N 10W 8

CANCELLED:
100
101
102
129
130
131
137
139
140
141
300

CAMP MAGRUDER

SEE MAP IN 10W

Beach Access

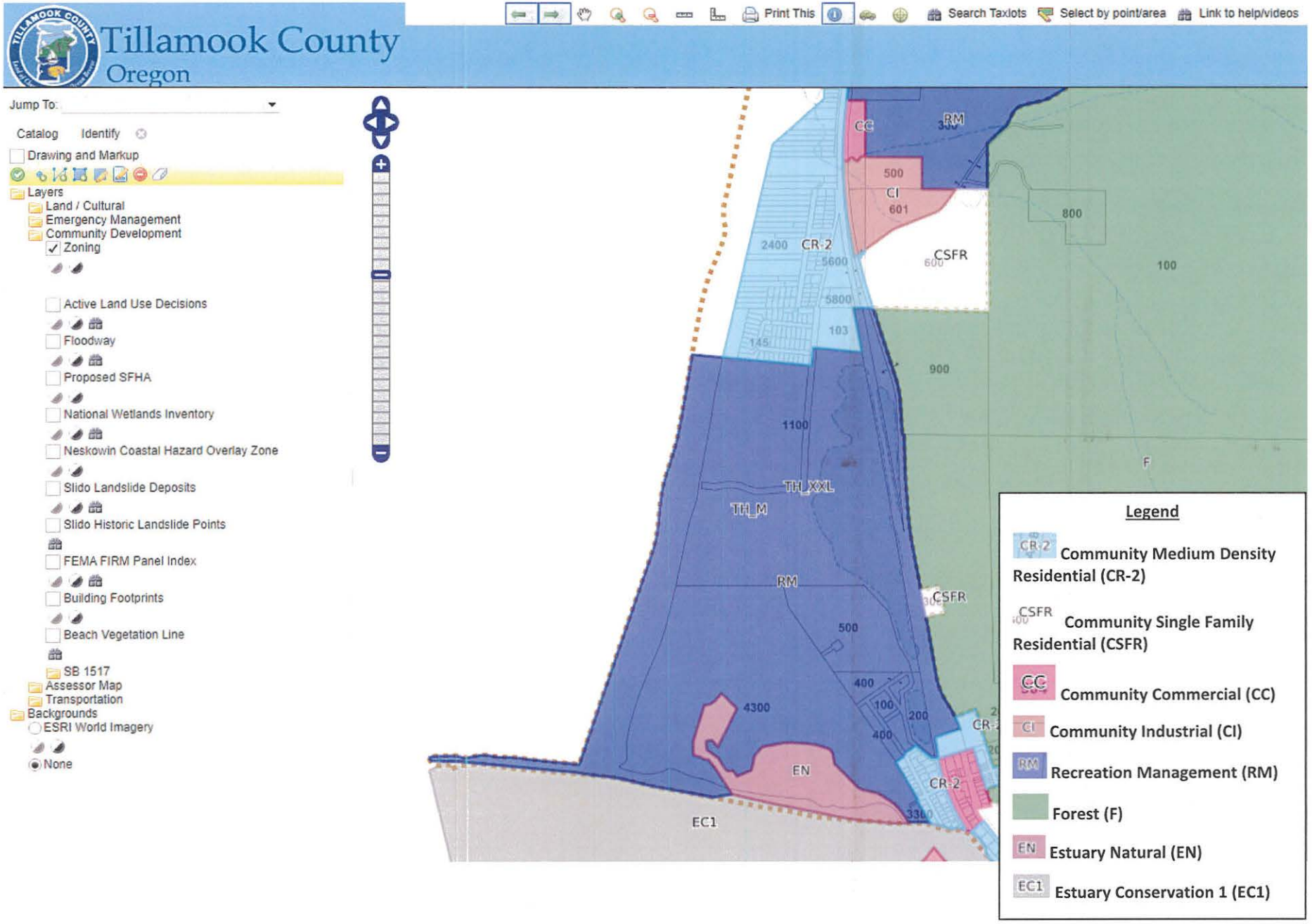
SMITH LAKE

7 8
18 17

WATSECO
01N10W07DD
REVISED 3/8/13, WS

Proposed Exception Area and Adjacent Lands Map

County Vicinity Zoning Map



Barview/Watseco/Twin Rocks Community Plan
Tillamook County, Oregon

December 4, 2002

Tillamook County Board of Commissioners

Charles Hurliman
Paul Hanneman
Tim Josi

Tillamook County Planning Commission

Kurt Heckeroth
Scott Hill
Joan Marti
Gale Ousele
Anne Price
Charles Swan

Tillamook County Department of Community Development

Bill Campbell, Director
Lynne Krueger, Senior Planner

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Executive Summary

Planning Overview

Planning for unincorporated communities in Tillamook County began with changes in the state land use rules in the early 1990's. The Rural Communities Rule (OAR 660-22) requires planning for Unincorporated Communities. Barview/Watseco/Twin Rocks is classified as a Rural Urban Community, one of twelve Unincorporated Communities in Tillamook County that meet the state's criteria. As part of its Periodic Review, The Tillamook County Department of Community Development has undertaken planning for each of these communities. Planning for the county's five Urban Unincorporated Communities occurred first, in the late 1990's.

Planning for Barview/Watseco/Twin Rocks and the county's five Rural Communities and one Rural Service Center began in 2000, with the adoption of Unincorporated Community Boundaries. In March and April of 2002, Community Development staff conducted a Community Survey by mail and held a Community Meeting in Barview/Watseco/Twin Rocks. The complete results of these community involvement measures are in Appendices B and C.

Community Profile

Barview-Watseco-Twin Rocks is an unincorporated community formed by three neighboring coastal settlements. It lies ten miles northwest of the City of Tillamook, just north of Tillamook Bay. The community is bounded on the north by the City of Rockaway Beach and on the west by the Pacific Ocean. Highway 101 passes through it.

The area is served by the Tillamook County Sheriff's office and is part of the 911 system. The Port of Tillamook Bay Railroad travels through the community although no passenger stops are established.

There are identified areas of flooding and this information can be found on the following Flood Insurance Rating Maps (FIRM): 410196 0090A, date August 1, 1978. These areas of flooding are primarily along the coast.

Community Zoning

With a total of 269 acres, Barview-Watseco-Twin Rocks has about 150 dwelling a few small businesses. It also has a small industrial district and two large church camps zoned for Recreation Management. The community has a wide variety of residential lots (many of them quite small) and an equally wide variety of residential zoning as described below. The community has 230 acres of undeveloped land zoned for residential use. An additional four acres of undeveloped commercially zoned land could be developed for residential use.

Community Goals and Policies

With the input of residents and other stakeholders through the community survey and community meeting, and with an understanding of the current state of the community, staff has identified four community goals for Barview/Watseco/Twin Rocks:

Goal 1: Barview/Watseco/Twin Rocks will be an attractive, safe and clean community
Goal 2: Barview/Watseco/Twin Rocks will support the park and beach.
Goal 3: Barview/Watseco/Twin Rocks will be surrounded protect natural resources.
Goal 4: Barview/Watseco/Twin Rocks will have a thriving business district supported by local residents and travelers.

Each goal is supported by several County policies.

Chapter 1: Planning Overview

1.1 The Planning Process

Planning for unincorporated communities in Tillamook County began with changes in the state land use rules in the early 1990' s. A court decision ruled that Oregon counties had to plan for their unincorporated communities. The Oregon Land Conservation and Development Commission adopted the Rural Communities Rule (OAR 660-22) in 1994 in order to comply with the ruling of the court.

Tillamook County has identified twelve Unincorporated Communities that meet the state' s criteria. Barview/Watseco/Twin Rocks has been classified as a Urban Unincorporated Community. The other communities identified in the county are:

Urban Unincorporated Communities:
Neahkahnie
Neskowin
Netarts
Oceanside
Pacific City
Barview/Watseco/Twin Rocks

Rural Communities:
Hebo
Beaver
Cloverdale
Idaville
Siskeyville

Rural Service Center:
Mohler

The Tillamook County Department of Community Development has undertaken planning for each of these communities. The department has included these efforts as part of its periodic review tasks. Planning for the county' s five of the Urban Unincorporated Communities occurred first, in the late 1990' s. Each of the Urban Unincorporated Communities went through a separate planning process guided by a committee in each community. Planning for the county' s five Rural Communities, one Rural Service Center, and the remaining Urban Unincorporated Community of Barview/Watseco/Twin Rocks began in 2000. The planning processes involved in creating and adopting the Unincorporated Community Boundaries and Community Plans are detailed in the rest of this chapter.

1.2 The Unincorporated Community Boundary

The Unincorporated Community Boundaries for Barview/Watseco/Twin Rocks and the other Rural Communities were determined through a public process in 2000 and 2001. The County adopted the boundaries in 2001. Barview/Watseco/Twin Rocks' s adopted Unincorporated Community Boundary contains 241 acres of land. Appendix A contains maps of the community growth boundary.

1.3 The Community Survey

In May of 2002, Community Development staff conducted a community survey. All registered property owners within the community boundary received a survey in the mail. The survey asked four questions of residents:

1. What do you feel is the most important issue facing Barview/Watseco/Twin Rocks?
2. What one thing would you like to change about Barview/Watseco/Twin Rocks in the next 20 years?
3. What is your favorite thing about Barview/Watseco/Twin Rocks?
4. What is your least favorite thing about Barview/Watseco/Twin Rocks?

246 surveys were mailed out to property owners and staff and community members distributed additional surveys. Twenty surveys were returned to Community Development. Appendix B contains the responses in detail. The most popular themes to come out of the surveys are summarized below:

What do you feel is the most important issue facing Barview/Watseco/Twin Rocks?
The majority of responses were directed toward water quality issues. Second was the "overly tight control of construction." Respondents identified trees in conjunction with shore erosion; increasing traffic; and the repair of the North Jetty.

What one thing would you like to change about Barview/Watseco/Twin Rocks in the next 20 years?
Respondents identified encouraging growth; residents to clean up properties; improve night lighting; lengthen North Jetty; Unified Water district for Barview/Watseco/Twin Rocks and Rockaway Beach; and reroute Highway 101 east.

What is your favorite thing about Barview/Watseco/Twin Rocks?
Many of the responses focused on the natural character of the surrounding area, followed by Barview/Watseco/Twin Rocks' s location as a part of Highway 101; and the beach and its impact.

What is your least favorite thing about Barview/Watseco/Twin Rocks?
Responses focused on the worry about erosion on the beach; feeling disenfranchised by County government; potholes; and Port of Tillamook Bay leftover railroad ties. Some responses decried a lack of pride and community in the town and in individual properties. Other responses dealt with noise and lack of businesses and services.

1.4 Community Open House

On May 13, 2002, Community Development staff held an open house for the Barview/Watseco/Twin Rocks community to discuss the community plan. Staff held the open house at the Twin Rocks Friends Camp in Twin Rocks. Staff notified citizens of the open house through a mailing to all property owners within the community growth boundary along with a community survey (see section 1.2). Notice of the meeting was also placed in the Headlight-Herald newspaper. Approximately 12 people attended the meeting.

At the meeting, staff briefly introduced those present to the process, and solicited suggestions. A question and answer technique was used to gather suggestions for changes in Barview/Watseco/Twin Rocks. Respondents were asked to "brainstorm" and a staff member wrote down what they most would like to change about Barview/Watseco/Twin Rocks in the next 20 years. Appendix C contains the responses in detail. A summary of the most popular themes to come out of the ensuing discussion are below:

Shore erosion/North Jetty
Traffic/ Highway 101, particularly the Barview/Watseco/Twin Rocks Inn
Encouraging business development
Water Quality
The beach experience

Chapter 2: Community Profile

2.1 Historic Information

The community boundary includes the three smaller beach communities of Barview, Watseco, and Twin Rocks. According to the book, *Oregon Geographic Names*, Barview received its name from L.C. Smith in 1884. It is just north of the bar at the entrance to Tillamook Bay and affords a fine view of the bay, bar and ocean. The style, "Barview" has been adopted by the United States Board of Geographic Names and not Bar View although Bar View was the original spelling. Barview supports a commercial and residential mix. Tourism has become a significant contributor to the community. Highway 101 is the primary access north to south and brings travelers year around.

Twin Rocks, according to *Oregon Geographic Names*, was named for the two large rocks more than a hundred feet high in the Pacific Ocean just below low tide line. The community at time was a resort community and a petition was circulated to establish the post office. The post office was established in summer of 1914, and the first Postmaster was William E. Dunsmoor. The post office was a part of the community until the Eisenhower administration. Much of Twin Rocks is now part of the City of Rockaway Beach Urban Growth Boundary. Twin Rocks remains a primarily residential community with beautiful vistas, beaches and accommodations.

The name Watseco is the shortened version of "Watt's Sea Coast." The Watts family originally developed Watseco Addition. The family initiated the stopping of the train by constructing a sign of black letters on a white background. Watseco remains a residential community.

Much of the history of this area is similar in nature to the majority of Tillamook County. Initially the draw was and still remains the natural resources of fishing and timber and the ever-present tourist. As identified above, these communities began and continue to be supported by these industries.

2.2 Community Form

The communities of Barview/Watseco/Twin Rocks is located on Tillamook Bay and the Pacific Ocean. The Oregon Coast Highway, U.S. Route 101, crosses Barview/Watseco/Twin Rocks. The community is made up of three beach communities and is predominately residential, with a commercial area along Highway 101. Route 101 runs from the north and to the south through the town, with a major curve in the center of the business district.

There are 241acres within the Barview/Watseco/Twin Rocks Unincorporated Community Boundary. Of these, 237 acres are in residential areas with the remaining 4 acres in the commercial zone. Commercial uses in Barview/Watseco/Twin Rocks include several stores, the US Coast Guard, and Barview/Watseco/Twin Rocks is also home to two private camps, Magruder and Friends Camp. The residential areas are urban in character. Small lots are common. The housing stock is mostly 20 years old or older.

2.3 Economics

Barview/Watseco/Twin Rocks' s economy, like that of much of the county, rests on tourism as a significant element. The Barview/Watseco/Twin Rocks area in general supports tourist based businesses catering to travelers passing through on the highway or stopping to enjoy nearby outdoor recreational opportunities including the two private camps.

2.4 Buildable Land

Tillamook County completed a Buildable Lands Inventory in 2001. The information gathered during the inventory process provides the County with an estimate of how much more residential development can occur within the Community Growth Boundary.

Within the community's 240 acres of residential land, there are is a total of 1,065 (gross) potential parcels, 340 of which are developed. Since much of the commercially zoned land was already developed, it was not included in the Buildable Lands Inventory analysis. Multiplying the by standard .75 coefficient, the Buildable Lands Inventory determined that 798 potential residential lots could be developed in Barview/Watseco/Twin Rocks.

Chapter 3: Community Goals and Policies

With the input of residents and other stakeholders through the community survey and community meeting, and with an understanding of the current state of the community, staff has identified four community goals for Barview/Watseco/Twin Rocks. Each of these goals is supported through specific policies that the county should work toward implementing in all its activities.

Goal 1: Barview/Watseco/Twin Rocks will be an attractive, safe and clean community
Goal 2: Barview/Watseco/Twin Rocks will have safe drinking water and sanitation
Goal 3: Barview/Watseco/Twin Rocks will be surrounded by outstanding protected natural resources.
Goal 4: Barview/Watseco/Twin Rocks will have a thriving business district supported by local residents and travelers.

Goal 1: Barview/Watseco/Twin Rocks will be an attractive, safe and clean community

Policy 1.1: The County recognizes the importance of local community groups and organizations and will support community groups and organizations in Barview/Watseco/Twin Rocks in their community-building activities.

Policy 1.2: The County will work with community groups and organizations, business and property owners and agencies to improve the general appearance of Barview/Watseco/Twin Rocks.

Policy 1.3: The County will work with the Oregon Department of Transportation to improve the function of Highway101 within Barview/Watseco/Twin Rocks in order to make auto traffic travel at appropriate speeds and improve safety for pedestrians and bicyclists.

Policy 1.4 The County recognizes the character of Barview/Watseco/Twin Rocks and will work with community groups and organizations, business and property owners and agencies to maintain and enhance Barview/Watseco/Twin Rocks' s character.

Goal 2: Barview/Watseco/Twin Rocks will have safe drinking water and sanitation

Policy 2.1: The County will work with property owners, community groups and organizations and agencies to secure safe drinking water and sanitation in Barview/Watseco/Twin Rocks.

Policy 2.2: The County will work with property owners, community groups and organizations and agencies to provide assistance for community infrastructure needs in Barview/Watseco/Twin Rocks.

Goal 3: outstanding, protected natural resource lands will surround Barview/Watseco/Twin Rocks.

Policy 3.1: The County will continue to protect beaches along Barview/Watseco/Twin Rocks from inappropriate development.

Policy 3.2: The County will work with the Corps of Engineers, Oregon Department of State Parks, Tillamook County Department of Park sand the Division of State Lands and other agencies, groups and organizations to conserve and improve outdoor recreational activities near Barview/Watseco/Twin Rocks.

Goal 4: Barview/Watseco/Twin Rocks will have a thriving business district supported by local residents and travelers.

Policy 4.1: The County will work with business and property owners to improve the appearance of properties in the business district.

Policy 4.2: The County will work with community groups and organizations, business and property owners and agencies to create a supportive environment for new and existing local businesses in Barview/Watseco/Twin Rocks.

Policy 4.3: The County will work with the Oregon Department of Transportation to improve the appearance and function of Highway 101 within Barview/Watseco/Twin Rocks in order to support healthy businesses along the highways.

Chapter 4: Community Zoning

Community Single Family Residential (CSFR)
Community Low Density Urban Residential (CR-1)
Community Medium Density Urban Residential- (CR-2)
Community High Density Urban Residential (CR-3)
Community Commercial (CC)

	Zoning	CSFR	CR-1	CR-2	CR-3	CC	Totals
1	Min Lot Size In Square Feet	20,000 sq. ft	7,500	5,000	5,000	*	*
2	Acre in Zone	122	40	73	2	4	241
3	Existing Lots	40	31	235	11	23	340
4	Developed Lots	2	16	133	11	12	174
5	Vacant Lots	38	15	102	0	*	155
6	Max Additional Lots	264	207	436	3	*	910
7	Gross Total Rows 5+6	302	222	538	3	*	1,065
8	Net Total lots Row 7 X0.75	226	166	404	2	*	798
	* Not Applicable						

Constraints on Development

Steep slopes and unstable sandy soils present a significant constraint to residential development on much of the remaining undeveloped land in Barview-Watseco-Twin Rocks. Access for most areas in the community is generally good but is a problem for some properties that lack frontage on Highway 101.

Public Services and Facilities

A community water system and a community sewer system serve this area.

Development Patterns and Potential

The predominant land use in Barview-Watseco-Twin Rocks is and will continue to be residential. The community has a large number of vacant residential lots (many of which are quite small) and the potential to create hundreds more through partitions and subdivisions. Most of the potential for new lots and subsequent residential development is found in areas zoned R-1 and R-2, which allow urban densities of development. The higher densities are made possible by community water and sewer systems.

Appendix A: Maps

Sections 5, 7, 8, 13, 14, 17 and 30 of Township 1 North, Range 10 West

Appendix B: Community Survey Results

BARVIEW/WATSECO/TWIN ROCKS
14 Responses to Survey, May 14, 2002

Most important issue?

- Overly tight control of construction.
- 6 X Water quality, charge more and go on new water service.
- 2 X Repair North Jetty before breaches.
- Appreciate effort to clean up water.
- Do not allow trees to be cut close to shore, erosion problem.
- Deal with increasing traffic.
- Over-development of mountain.
- One outlet at Old Pacific Highway, in emergency could be a hazard.

What would you change?

- 2 X Encourage growth, businesses, tax breaks.
- Require property owners to clean up property.
- Buying water from Rockaway Beach.
- Do not change anything.
- Trees in county park need to be topped.
- Improve night lighting. Fines for cutting trees by shore.
- 2 X Lengthen North jetty.
- Re-route 101 further east.
- Achieve living wage.
- Signs to attract tourists to parks.
- Unified water district for Barview/Watseco/Twin Rocks/Rockaway Beach/Garibaldi

Favorite thing?

- 2 X Quiet, views, close to fishing, ocean.
- X beach, livability, people.
- Walk beaches and look up to beauty of woods.
- Like area, enjoyed it for 35 years.
- X Community run, responsive to member needs.
- Natural beauty.

Least favorite?

- No new growth. People think of beach as Chinook Winds, & Outlet stores.
- Hardness and smell of water.
- County ignores us, requested street repair three times.
- Pot holes.
- Worrying about beach erosion.
- 2 X None.
- Narrow highway, major thoroughfare.
- Port of Tillamook Bays leftover railroad ties.
- Commercial and recreational facilities.

Appendix C: Community Meeting Results

What one thing would you change about Barview/Watseco/Twin Rocks?

- Could we have signage on beach re: fires.
- Port of Tillamook Bay needs to pick up ties, safety issue, falling into bay.
- In past overall Comp Plan, what were the most important issues for the planning department? What were they focusing on, accomplished?
- Are you trying to keep as commercial, smaller, recreational or develop with commercial?
- Widen highway? Possibly an extra lane.
- 45% left for building, 1200 projected.
- Traffic studies done re: increased growth? Bypass seems preferable.
- Speed limits vary so much, need more consistency.
- Could US Coast Guard go out farther in ocean for training? Confusion on highway, panic. (Love it, very entertaining.)
- When are you going to get rid of railroad? We could have third lane.
- Should have taken advantage of company putting in cable, made turnouts as 3 Graces.
- Jetty eroding, are more rocks going to be put in? Commissioner Hurliman said it is being studied and needs to be lengthened and work should start next year. It is high on screen. There are applications for wave generators on the Internet.
- Water system a big problem, after a shower you stink, stench in water. Some have good luck with a filter system, but filters need to be changed in one to three weeks. There seems to be no answer to the problem. Rockaway Beach wants $900,000 to hook up to their system, Garibaldi wants 1.3 million. We would be the first ones cut off. Dig new well but hill has lots of iron in it so any water will have stench.
- Proposal for a bike lane?
- Speeder cars are great.
- How often do you have Committee meetings? Barview was 18 years ago.
- Community Association? Get together and have input for Planning Department.
- Excursion in use? Summers
- Excursion train at night, 21 blasts. Why?

- Any plans for mass transit? Trains from Portland to Coast?
- Only one access to Watseco, can we develop a second?
- Twin Rocks Sewer District Board had planned to be under construction rebuilding plant when the rates were raised. Engineering phase has been approved. Should be in works by next summer, a year from now. Will dig 20' down and pump effluent a mile out under the ocean, or pump down to Rockaway Beach. Cost is 3.25 million. Now it is being dumped into creek.
- Ken Beebe gave a presentation on the pedestrian bridge being planned for crossing Highway 101. It will not be handicap assessable, so will drive handicapped across the highway.

Appendix D: Community Zoning

SECTION 3.011: COMMUNITY SINGLE FAMILY RESIDENTIAL ZONE (CSFR)

(1) PURPOSE: The purpose of the CSFR zone is to provide for the creation and use of small-acreage residential homesites. Land that is suitable for Community Single Family Residential use is located within an unincorporated community boundary and is physically capable of having homesites.

(2) USES PERMITTED OUTRIGHT: In the CSFR zone, the following uses and their accessory uses are permitted outright, subject to all applicable supplementary regulations contained in this Ordinance.

(a) Single-family dwelling.

(b) Mobile or Manufactured Home.

(c) Recreational vehicle used during the construction or placement of a use for which a building or placement permit has been issued.

(d) Home occupations according to the provisions of Section 4.140 of this Ordinance.

(e) Farm uses, including aquaculture.

(f) Forest uses.

(g) Roadside stands for produce grown on the premises.

(h) Signs, subject to Section 4.020.

(i) Electrical distribution lines.

(3) USES PERMITTED CONDITIONALLY: In the CSFR zone, the following uses and their accessory uses are permitted subject to the provisions of Article 6 and the requirements of all other applicable supplementary regulations contained in this Ordinance.

(a) Planned Developments subject to Section 3.080, or Mixed Use Developments subject to Section 4.130. The number of attached single family dwelling units in a cluster shall be established in the Planned Development approval process and may exceed four units per cluster if it is demonstrated that benefits in protection of natural conditions, better views, or access will be achieved by such clustering.

This shall apply only to CSFR/PD zoned property located within a community growth boundary.

(b) Mobile or manufactured home, in those areas identified in Section 5.160 as being subject to special mobile/manufactured home standards, which do not comply with those standards.

(c) Cottage industries.

(d) Recreational vehicle where not allowed outright by Section 5.130.

(e) A temporary real estate sales office.

(f) Churches and schools.

(g) Accessory structures or accessory uses without an on-site primary structure.

(h) Nonprofit community meeting buildings.

(i) Cemeteries.

(j) Fire or ambulance stations.

(k) Towers for communications, wind energy conversion systems, or structures having similar impacts.

(l) Public utility facilities, including substations and transmission lines.

(m) Mining, quarrying, and the processing and storage of rock, sand, gravel, peat, or other earth products; on a contiguous ownership of 10 or more acres.

(n) Small-scale primary wood processing facilities, such as a shake mill, chipper, or stud mill, on a contiguous ownership of 10 or more acres.

(o) Rural industries on a contiguous ownership of 10 or more acres.

(p) Mobile or Manufactured Home park on a contiguous ownership of 10 or more acres.

(q) Foster family homes accommodating six or more children or adults.

(r) Bed and breakfast enterprise.

(s) Temporary placement of a mobile home or recreational vehicle to be used because of health hardship, subject to Section 6.050.

(t) Parks, recreational campgrounds, primitive campgrounds hunting and fishing preserves, and other recreational uses and associated facilities, on a contiguous ownership of 10 or more acres.

(u) Residential care, training, or treatment facility as defined by ORS 443.400; any facility which provides care, training, or treatment for six or more physically, mentally, emotionally, or behaviorally disabled individuals. Facilities that provide for five or less are addressed as ADULT FOSTER HOMES or FOSTER FAMILY HOMES.

(v) Home occupations according to the provisions of Section 4.140 of this Ordinance.

(4) STANDARDS: Land divisions and development in the CSFR zone shall conform to the following standards, unless more restrictive supplemental regulations apply:

(a) The minimum lot size is 20,000 for permitted uses.

(b) The minimum lot width and depth shall both be 100 feet.

(c) The minimum front yard shall be 20 feet.

(d) The minimum side yard shall be 5 feet; on the street side of a corner lot, it shall be no less than 15 feet.

(e) The minimum rear yard shall be 20 feet; on a corner lot, it shall be no less than 5 feet.

(f) The maximum building height shall be 35 feet, except on ocean or bay frontage lots, where it shall be 24 feet. Higher structures may be permitted only according to the provisions of Article 8.

(g) Livestock can be located closer than 100 feet to a non-farm residential building on an adjacent lot only if one of the following conditions are met:

1. The location of the livestock is a nonconforming use according to the provisions of Article VII of this Ordinance.

2. The property has been taxed at the farm use rate during three of the past five year.

3. The location of the livestock has been reviewed and approved as a conditional use according to the provisions of Article VI of this Ordinance.

(h) No residential structure shall be located within 50 feet of an F-1, F, or SFW-20 zone boundary, unless it can be demonstrated that natural or man-made features will act as an equally effective barrier to conflicts between resource and residential used; or that a residential structure could not otherwise be placed on the property without requiring a variance to the 100 foot requirement. In either case, all yard requirements in this zone shall still apply.

SECTION 3.022: COMMUNITY COMMERCIAL ZONE (CC)

(1) PURPOSE: The purpose of the CC zone is to designate areas for high intensity commercial and some light industrial activities within unincorporated community boundaries. The zone is intended to accommodate all commercial needs of the community, surrounding rural areas, and visitors. Land that is suitable for the RC zone is suitable for the CC~~-2~~ zone, except that a higher level of use, and therefore a higher level of off-site impacts, must be anticipated.

(2) USES PERMITTED OUTRIGHT: In the CC zone, the following uses and their accessory uses are permitted outright, subject to all applicable supplementary regulations contained in this ordinance.

(a) General and specialty retail trade establishments.

(b) Personal and business services such as barbers, tailors, printers, funeral homes, shoe repair shops, upholsterers, and cleaners.

(c) Business, government, professional, and medical offices; financial institutions; and libraries.

(d) Animal hospitals, kennels and similar animal boarding facilities.

(e) Retail establishments requiring drive-in facilities such as gas stations, bank drive-up windows, and fast food restaurants.

(f) Sales and service activities requiring large outdoor storage space, including the sale and repair of cars, trucks, farm equipment, heavy machinery, and marine craft; the storage of construction, plumbing, heating, paving, electrical, and painting materials; and parking for trucks as part of a construction or shipping operation.

(g) Shopping centers.

(h) Warehousing, including mini-storage.

(i) Eating and drinking establishments.

(j) Lodges, clubs, or meeting facilities for private organizations.

(k) Motels, hotels, and cabin camps.

(l) A single-family dwelling, manufactured or mobile home for the owner of an active business located on the same lot or parcel.

(m) Mobile or manufactured homes or recreational vehicles used during the construction or placement of a use for which a building or placement permit has been issued.

(n) Community meeting buildings and associated facilities.

(o) Schools.

(p) Water supply and treatment facilities.

(r) Off-site advertising signs.

(s) Dwelling units accessory to an active commercial use, when located above the first story.

(t) Bed and breakfast enterprises.

(u) Swimming.

(v) Public park and recreation uses.

(w) Temporary produce stand- Not to exceed 45 days.

(3) USES PERMITTED CONDITIONALLY: In the CC zone, the following uses and their accessory uses are permitted subject to the provisions of Article 6 and the requirements of all applicable supplementary regulations contained in this ordinance:

(a) One or two-family dwelling not associated with an active business.

(b) Light industries.

(c) Multifamily dwellings, including townhouses, and condominiums.

(d) Mobile home or recreational vehicle.

(e) Hospitals, sanitariums, rest homes, and nursing homes.

(f) Fire and ambulance stations.

(g) Utility substations and power transmission lines.

(h) Towers for communications, wind energy conversion systems, or structures having similar impacts.

(i) Commercial amusement or entertainment establishments.

(j) Sewage treatment plants.

(k) Recreational campground.

(l) Foster family home accommodating six or more children or adults.

(m) Temporary mobile kitchen units.

(n) Mixed Use Developments subject to Section 4.130.

(o) Mobile/Manufactured Home Park.

(p) Residential care, training, or treatment facility as defined by ORS 443.400; any facility which provides card, training, or treatment for six or more physically, mentally, emotionally, or behaviorally disabled individuals. Facilities that provide for five or less are addressed as ADULT FOSTER HOMES or FOSTER FAMILY HOMES.

(q) Car wash.

(r) Outdoor Retail

(4) STANDARDS: Land divisions and development in the CC zone shall conform to the following standards, unless more restrictive supplemental regulations apply:

(a) The minimum lot dimensions and yard setbacks, and the maximum building heights for structures containing only residential uses, shall be the same as in the R-3 zone.

(b) In the CC zone, motels, hotels, and cabin camps shall be considered a commercial use.

(c) Minimum yards for any structure on a lot or parcel adjacent to a residential zone shall be 5 feet on the side adjacent to the residential zone, and 10 feet in the front yard. No rear yard is required.

(d) For commercial or combined commercial-residential structures, structures shall be either constructed on the property line or setback at least 3 feet or as required in Section 3.020 (4) (b)

(e) All structures shall meet the requirements for clear-vision areas specified in Section 4.010.

(f) All uses shall meet off-street parking requirements as provided in Section 4.030.

(g) Buildings shall not exceed 45 feet in height.

(h) Outdoor storage abutting or facing a lot in a residential zone shall be screened with a sight-obscuring fence.

(i) Maximum Floor Area Per Use: Individual uses shall not exceed 4,000 square feet of gross floor area.

SECTION 3.012: COMMUNITY LOW DENSITY URBAN RESIDENTIAL ZONE (CR-1)

(1) PURPOSE: The purpose of the CR-1 zone is to designate areas for low-density single-family residential development and other, compatible, uses. Suitability of land for low-density uses is determined by the availability of public sewer service and such limitations to density such as geologic and flood hazards, shoreline erosion, and the aesthetic or resource values of nearby natural features.

(2) USES PERMITTED OUTRIGHT: In the CR-1 zone, the following uses and their accessory uses are permitted outright, subject to all applicable supplementary regulations contained in this ordinance.

(a) Single-family dwelling.

(b) Farm and forest uses.

(c) Home occupations according to the provisions of Section 4.140 of this ordinance.

(d) Public park and recreation areas.

(e) Public utility lines.

(f) Mobile home, manufactured home or recreational vehicle used during the construction of a use for which a building permit has been issued.

(g) Signs, subject to Section 4.020.

(3) USES PERMITTED CONDITIONALLY: In the CR-1 zone, the following uses and their accessory uses are permitted subject to the provisions of Article 6 and the requirements of all applicable supplementary regulations contained in this ordinance.

(a) Two-family dwelling.

(b) Planned developments subject to Section 3.080, or Mixed Use Developments subject to Section 4.130. The number of attached single family dwelling units in a cluster shall be established in the Planned Development approval process and may exceed four units per cluster if it is demonstrated that benefits in protection of natural conditions, better views, or access will be achieved by such clustering.

(c) Churches and schools.

(d) Nonprofit community meeting buildings and associated facilities.

(e) Utility substations and power transmission lines.

(f) Swimming, tennis, racquetball and similar facilities.

(g) Golf courses and associated facilities.

(h) A temporary real estate sales office.

(i) Fire and ambulance stations.

(j) Towers for communications, wind energy conversion systems or structures having similar impacts.

(k) Water supply or treatment facilities or sewage treatment plants.

(l) Aquaculture facilities.

(m) Cottage industries.

(n) Accessory structures or uses without an on-site primary structure.

(o) Cemeteries.

(p) Foster family homes accommodating six or more children or adults.

(q) Bed and breakfast enterprise.

(r) Temporary placement of a mobile home or recreational vehicle to be used because of Health Hardship subject to Section 6.050.

(s) Residential care, training, or treatment facility as defined by ORS 443.400; any facility which provides care, training, or treatment for six or more physically, mentally, emotionally, or behaviorally disabled individuals. Facilities that provide for five or less are addressed as ADULT FOSTER HOMES or FOSTER FAMILY HOMES.

(t) Home occupations according to the provisions of Section 4.140 of this ordinance.

(4) STANDARDS: Land divisions and development in the CR-1 zone shall conform to the following standards, unless more restrictive supplemental regulations apply:

(a) The minimum lot size for permitted uses shall be 7,500 square feet, except that the minimum lot size for a two-family dwelling shall be 10,000 square feet Where public sewers are not available, the County Sanitarian may require lot sizes greater than the minimum if necessary for the installation of adequate on-site subsurface sewage disposal systems.

(b) The minimum lot width shall be 60 feet.

(c) The minimum lot depth shall be 75 feet.

(d) The minimum front yard shall be 20 feet.

(e) The minimum side yard shall be 5 feet; on the street side of a corner lot, it shall be 15 feet.

(f) The minimum rear yard shall be 20 feet; on a corner lot, it shall be 5 feet.

(g) The maximum building height shall be 35 feet, except on ocean or bay frontage lots, where it shall be 24 feet. Higher structures may be permitted only according to the provisions of Article VIII.

(h) Livestock shall be located no closer than 100 feet to a residential building on an adjacent lot.

SECTION 3.014: COMMUNITY MEDIUM DENSITY URBAN RESIDENTIAL ZONE (CR-2)

(1) PURPOSE: The purpose of the CR-2 zone is to designate areas for medium-density single-family and duplex residential development, and other, compatible, uses. Land that is suitable for the CR-2 zone has public sewer service available, and has relatively few limitations to development.

(2) USES PERMITTED OUTRIGHT: In the CR-2 zone, the following uses and their accessory uses are permitted outright, subject to all applicable supplementary regulations contained in this Ordinance.

(a) One or two-family dwelling.

(b) Farm and forest uses.

(c) Public park and recreation uses.

(d) Home occupations according to the provisions of Section 4.140 of this Ordinance.

(e) Public utility lines.

(f) Mobile homes or recreational vehicles used during the construction of a use for which a building permit has been issued.

(g) Signs, subject to Section 4.020.

(3) USES PERMITTED CONDITIONALLY: In the CR-2 zone, the following uses and their accessory uses are permitted subject to the provisions of Article 6 and the requirements of all applicable supplementary regulations contained in this Ordinance.

(a) Three or four-family dwelling.

(b) Planned Development subject to Section 3.080, or Mixed Use Developments subject to Section 4.130. The number of attached single-family dwelling units in a cluster shall be established in the Planned Development approval process and may exceed four units per cluster if it is demonstrated that benefits in protection of natural conditions, better views, or access will be achieved by such clustering.

(c) Mobile or manufactured homes subject to the exception contained in Section 5.160.

(d) Churches, schools, and colleges.

(e) Nonprofit community meeting buildings and associated facilities.

(f) Utility substation and power transmission lines.

(g) A temporary real estate sales office.

(h) Cemeteries.

(i) Hospitals, sanitariums, rest homes, and nursing homes.

(j) Swimming, tennis, racquetball and similar facilities.

(k) Accessory structures and accessory uses without an on-site primary use.

(l) Fire and ambulance stations.

(m) Towers for communications, wind energy conversion systems or structures having similar impacts.

(n) Water supply and treatment facilities and sewage treatment plants.

(o) Temporary mobile kitchen units.

(p) Cottage industries.

(q) Foster family homes accommodating six or more children or adults.

(r) Bed and Breakfast enterprise.

(s) Temporary placement of a mobile home or recreational vehicle to be used because of a health hardship, subject to Section 6.050.

(t) Golf course.

(u) Mobile/Manufactured Home Park.

(v) Residential care, training, or treatment facility as defined by ORS 443.400; any facility which provides care, training, or treatment for six or more physically, mentally, emotionally, or behaviorally disabled individuals. Facilities that provide for five or less are addressed as ADULT FOSTER HOMES or FOSTER FAMILY HOMES.

(w) Home occupations according to the provisions of section 4.140 of this s Ordinance.

(4) STANDARDS: Land divisions and development in the CR-2 zone shall conform to the following standards, unless more restrictive supplemental regulations apply:

(a) For a single-family dwelling, the minimum size for lots with an average slope of 20 percent or less shall be 5000 square feet. For lots averaging over 20 percent, the minimum lot size shall be 6000 square feet for a single-family dwelling. A two-family dwelling shall require 2500 square feet additional area, and each of the third and fourth dwelling units shall require an additional 3750 square feet. Where public sewers are unavailable, the County Sanitarian may require lot sizes

greater than the minimum, if necessary for the installation of adequate on-site sewage disposal systems.

(b) The minimum lot width shall be 50 feet; on a corner lot, the minimum width shall be 65 feet.

(c) The minimum lot depth shall be 75 feet.

(d) The minimum front yard shall be 20 feet.

(e) The minimum side yard shall be 5 feet; on the street side of a corner lot, it shall be 15 feet.

(f) The minimum rear yard shall be 20 feet; on a corner lot it shall be 5 feet.

(g) The maximum building height shall be 35 feet, except on ocean or bay frontage lots, where it shall be 24 feet. Higher structures may be permitted only according to the provisions of Article VIII.

(h) Livestock shall not be located closer than 100 feet to a residential building on an adjacent lot.

SECTION 3.016: COMMUNITY HIGH DENSITY URBAN RESIDENTIAL ZONE (CR-3)

(1) PURPOSE: The purpose of the CR-3 zone is to designate areas for a medium- to high-density mix of dwelling types and other, compatible, uses. The CR-3 zone is intended for densely-developed areas or areas that are suitable for high-density urban development because of level topography and the absence of hazards, and because public facilities and services can accommodate a high level of use.

(2) USES PERMITTED OUTRIGHT: In the CR-3 zone, the following uses and their accessory uses are permitted outright, and are subject to all applicable supplementary regulations contained in this ordinance.

(a) One, two, three, or four-family dwelling.

(b) Mobile or manufactured home subject to the exception contained in Section 5.160.

(c) Farm and forest uses.

(d) Home occupations according to the provisions of Section 4.140 of this Ordinance.

(e) Public park and recreation areas.

(f) Utility lines necessary for public service.

(g) A mobile home, manufactured home or recreational vehicle used during the construction or placement of a use for which a building or placement permit has been issued.

(h) Bed and Breakfast enterprise.

(i) Signs subject to Section 4.020.

(3) USES PERMITTED CONDITIONALLY: In the CR-3 zone, the following uses and their accessory uses are permitted subject to the provisions of Article 6 and the requirements of all applicable supplementary regulations contained in this ordinance.

(a) Mobile or manufactured home not subject to Section 5.160, and mobile or manufactured home park.

(b) Multifamily dwellings, including townhouses and condominiums.

(c) Planned Developments subject to Section 3.080, or Mixed Use Developments subject to Section 4.130. The number of attached single family dwelling units in a cluster shall be established in the Planned Development approval process and may exceed four units per cluster if it is demonstrated that benefits in protection of natural conditions, better views, or access will be achieved by such clustering.

(d) Motel and hotel, which may include eating and drinking establishments.

(e) Churches and schools.

(f) Nonprofit community meeting buildings and associated facilities.

(g) Accessory structures or uses without an on-site primary use.

(h) Swimming, tennis, racquetball or other similar facilities.

(i) Utility substation and power transmission lines.

(j) Cemeteries.

(k) Hospitals, sanitariums, rest homes, or nursing homes.

(l) Fire or ambulance stations.

(m) Towers for communications, wind energy conversion systems or structures having similar impacts.

(n) Water supply and treatment facilities and sewage treatment plants.

(o) Temporary mobile kitchen units.

(p) Cottage industries.

(q) A temporary real estate sales office.

(r) Mobile/Manufactured Home Park and recreational campground.

(s) Foster family home accommodating six or more children or adults.

(u) Temporary placement of a mobile or manufactured home or recreational vehicle to be used because of a health hardship, subject to Section 6.050.

(v) Residential care, training, or treatment facility as defined by ORS 443.400; any facility which provides care, training, or treatment for six or more physically, mentally, emotionally, or behaviorally disabled individuals. Facilities that provide for five or less are addressed as ADULT FOSTER HOMES or FOSTER FAMILY HOMES.

(w) Home occupations according to the provisions of Section 4.140 of this Ordinance.

(4) STANDARDS: Land divisions and development in the CR-3 zone shall conform to the following standards, unless more restrictive supplemental regulations apply:

(a) For a single family dwelling, the minimum size for lots with an average slope of 20 percent or less shall be 5000 square feet. For lots averaging over 20 percent, the minimum lot size shall be 6000 square feet for a single-family dwelling. Each additional dwelling unit shall require 2500 square feet additional area on slopes of 20 percent or less, and 3000 square feet additional area otherwise. Where public sewers are unavailable, the County Sanitarian may require lot sizes greater than the minimum, if necessary for the installation of adequate on-site sewage disposal systems.

(b) The minimum lot width shall be 50 feet, except on a corner lot it shall be 65 feet.

(c) The minimum lot depth shall be 75 feet.

(d) The minimum front yard shall be 20 feet.

(e) The minimum side yard shall be 5 feet; on the street side of a corner lot it shall be no less than 15 feet.

(f) The minimum rear yard shall be 20 feet; on a corner lot it shall be no less than 5 feet.

(g) The maximum building height shall be 35 feet, except that on ocean or bay front lots, it shall be 24 feet. Higher structures may be permitted only according to the provisions of Article 8.

(h) Livestock shall be located no closer than 100 feet to a residential building on an adjacent lot.

(i) Lot size and yard setback standards shall apply to motels or hotels in the CR-3 zone.

(j) For multifamily structures with separately owned dwelling units with common walls, yard setbacks shall apply to the entire structures only.

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:16:11 pm

Account #	399441	**Tax Status**	ASSESSABLE
Map #	1N1007DD00114	**Acct Status**	ACTIVE
Code - Tax #	5624-399441	**Subtype**	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 11		
Mailing Name	COGDALL, JOHN WILLIAM IV & LYNDA	**Deed Reference #**	(SOURCE ID: 443-236)
Agent		**Sales Date/Price**	01-13-2003 / $0
In Care Of		**Appraiser**	RANDY WILSON
Mailing Address	39455 NW MURTAUGH RD NORTH PLAINS, OR 97133		

Prop Class	101	**MA**	**SA**	**NH**	**Unit**
RMV Class	101	05	OF	536	1461-1

Situs Address(s)	Situs City
ID# 1 17300 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	336,830			Land 0	
	Impr.	1,238,690			Impr. 0	
Code Area Total		1,575,520	960,090	960,090	0	
Grand Total		1,575,520	960,090	960,090	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.36		320,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.36		336,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	2004	162	One story with basement	112	4,614			1,238,690
				Grand Total		4,614			1,238,690

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
	SPECIAL ASSESSMENT:							
	■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020	

Comments: 3/4/05 house is complete. added osd. gb 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:16:49 pm

Account #	399444	Tax Status	ASSESSABLE
Map #	1N1007DD00115	Acct Status	ACTIVE
Code - Tax #	5624-399444	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 12		
Mailing Name	ROGERS, MICHAEL TRUSTEE &	Deed Reference #	2020-8962
Agent		Sales Date/Price	12-07-2020 / $0.00
In Care Of	ROGERS, CHRISTINE TRUSTEE	Appraiser	RANDY WILSON
Mailing Address	17231 NW DAIRY CREED RD NORTH PLAINS, OR 97133		

Prop Class	RMV Class	MA	SA	NH	Unit
101	101	05	OF	536	16663-1

Situs Address(s)	Situs City
ID# 1 17320 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	336,830			Land 0	
	Impr.	321,130			Impr. 0	
Code Area Total		657,960	542,760	542,760	0	
Grand Total		657,960	542,760	542,760	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.27		320,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.27		336,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	145	Two story or more	112	2,198			321,130
				Grand Total		2,198			321,130

Exemptions/Special Assessments/Potential Liability

Code Area	Type						
5624	SPECIAL ASSESSMENT:						
	■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020

Comments: Inventory update 8/16/04 vy 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:17:27 pm

Account #	399447	Tax Status	ASSESSABLE
Map #	1N1007DD00116	Acct Status	ACTIVE
Code - Tax #	5624-399447	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 13		
Mailing Name	FARR, DAVID L & FRIEDA F	Deed Reference #	(SOURCE ID: 394-82)
Agent		Sales Date/Price	02-24-1998 / $0.00
In Care Of		Appraiser	GARY BARGER
Mailing Address	17340 PINE BEACH WAY ROCKAWAY BEACH, OR 97136		

Prop Class	MA	SA	NH	Unit
101				

RMV Class	MA	SA	NH	Unit
101	05	OF	536	16664-1

Situs Address(s)	Situs City
ID# 1 17340 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	334,830			Land 0	
	Impr.	499,240			Impr. 0	
Code Area Total		834,070	610,790	610,790	0	
Grand Total		834,070	610,790	610,790	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.21		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.21		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1998	155	Two story or more	112	2,584			499,240
				Grand Total		2,584			499,240

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
EXEMPTION:								
■ VETERANS AND SPOUSES 307.250 SERVICE RELATED	Amount	27,228	Letter Year	2014	Year Qualified	1946		
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: Inventory update 8/16/04 vy 2/13 Reappraised and tabled land. RCW 7/11/14 Reappraisal. Updated inventory. GB

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:17:50 pm

Account #	399450	Tax Status	ASSESSABLE
Map #	1N1007DD00117	Acct Status	ACTIVE
Code - Tax #	5624-399450	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 14		
Mailing Name	CREEDON, JONATHAN C	Deed Reference #	(SOURCE ID: 381-544)
Agent		Sales Date/Price	09-26-1996 / $160,000.00
In Care Of		Appraiser	RANDY WILSON
Mailing Address	7501 SE 17TH ST VANCOUVER, WA 98664		

Prop Class	100	MA	SA	NH	Unit
RMV Class	100	05	OF	536	1462-1

Situs Address(s)	Situs City

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	316,730			Land	0	
	Impr.	0			Impr.	0	
Code Area Total		316,730	249,690	249,690		0	
Grand Total		316,730	249,690	249,690		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624	0	☑		RK-R-2	Market	97	A	0.21		316,730
						Grand Total		0.21		316,730

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
				Grand Total		0			0

Comments: 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:18:16 pm

Account #	399453	Tax Status	ASSESSABLE
Map #	1N1007DD00118	Acct Status	ACTIVE
Code - Tax #	5624-399453	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 15		
Mailing Name	ROBERTS, DONALD W 1/2 TRUSTEE &	Deed Reference #	2006-3512
Agent		Sales Date/Price	04-25-2006 / $0
In Care Of	ROBERTS, BARBARA A TRUSTEE &	Appraiser	RANDY WILSON
Mailing Address	503 RHODODENDRON DR VANCOUVER, WA 98661		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	16665-1

Situs Address(s)	Situs City
ID# 1 17380 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	334,830			Land 0	
	Impr.	375,470			Impr. 0	
Code Area Total		710,300	595,390	595,390	0	
Grand Total		710,300	595,390	595,390	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.21		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.21		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	145	Two story or more	112	2,474			375,470
				Grand Total		2,474			375,470

Exemptions/Special Assessments/Potential Liability

Code Area	Type						
5624							
	SPECIAL ASSESSMENT:						
	■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020

Comments: Inventory update 8/17/04 vy 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:18:35 pm

Account #	399456	Tax Status	ASSESSABLE
Map #	1N1007DD00119	Acct Status	ACTIVE
Code - Tax #	5624-399456	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 16		
Mailing Name	MUNCH, MICHAEL T TRUSTEE	Deed Reference #	2011-6168
Agent		Sales Date/Price	11-15-2011 / $190,000.00
In Care Of		Appraiser	RANDY WILSON
Mailing Address	5012 DOGWOOD DR LAKE OSWEGO, OR 97035		

Prop Class	MA	SA	NH	Unit
100	05	OF	536	1463-1

RMV Class: 100

Situs Address(s)	Situs City

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	316,730			Land 0	
	Impr.	0			Impr. 0	
Code Area Total		316,730	249,690	249,690	0	
Grand Total		316,730	249,690	249,690	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624	0	☑		RK-R-2	Market	97	A	0.21		316,730
						Grand Total		0.21		316,730

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
				Grand Total		0			0

Comments: 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 4:02:59 pm

Account #	399459	Tax Status	ASSESSABLE
Map #	1N1007DD00120	Acct Status	ACTIVE
Code - Tax #	5624-399459	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 17		
Mailing Name	17420 PINE BEACH WAY LLC	Deed Reference #	2005-403
Agent		Sales Date/Price	12-21-2004 / $0
In Care Of	%MICHAEL T MUNCH	Appraiser	RANDY WILSON
Mailing Address	5012 DOGWOOD DR LAKE OSWEGO, OR 97035		

Prop Class	RMV Class	MA	SA	NH	Unit
101	101	05	OF	536	16666-1

Situs Address(s)	Situs City
ID# 1 17420 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	334,830			Land 0	
	Impr.	370,290			Impr. 0	
Code Area Total		705,120	561,360	561,360	0	
Grand Total		705,120	561,360	561,360	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.21		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.21		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	149	Basement First Floor	112	2,421			370,290
				Grand Total		2,421			370,290

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624	SPECIAL ASSESSMENT:							
	■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020	

Comments: Inventory update 8/17/04 vy 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:18:57 pm

Account #	399462	Tax Status	ASSESSABLE
Map #	1N1007DD00121	Acct Status	ACTIVE
Code - Tax #	5624-399462	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 18		
Mailing Name	KLEIN, JEFFREY S & TERRY	Deed Reference #	2018-6375
Agent		Sales Date/Price	10-24-2018 / $679,000.00
In Care Of		Appraiser	RANDY WILSON
Mailing Address	12230 SW RIVERVIEW LN WILSONVILLE, OR 97070		

Prop Class	RMV Class	MA	SA	NH	Unit
101	101	05	OF	536	16667-1

Situs Address(s)	Situs City
ID# 1 17440 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	334,830			Land	0	
	Impr.	345,810			Impr.	0	
Code Area Total		680,640	582,980	582,980		0	
Grand Total		680,640	582,980	582,980		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.20		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.20		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1999	147	Split level	112	2,214			345,810
				Grand Total		2,214			345,810

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: Inventory update 8/17/04 vy 2/13 Reappraised and tabled land. RCW

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:19:15 pm

Account #	399465	Tax Status	ASSESSABLE
Map #	1N1007DD00122	Acct Status	ACTIVE
Code - Tax #	5624-399465	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 19		
Mailing Name	HOLLAND, GLENNA M TRUSTEE &	Deed Reference #	2019-4673
Agent		Sales Date/Price	08-08-2019 / $775,000.00
In Care Of	HOLLAND, RACHAEL M TRUSTEE	Appraiser	EVA FLETCHER
Mailing Address	3136 NE 45TH AVE PORTLAND, OR 97213		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	16668-1

Situs Address(s)	Situs City
ID# 1 17460 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	336,830			Land 0	
	Impr.	362,100			Impr. 0	
Code Area Total		698,930	554,120	554,120	0	
Grand Total		698,930	554,120	554,120	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.24		320,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.24		336,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	147	Split level	112	2,296			362,100
				Grand Total		2,296			362,100

Exemptions/Special Assessments/Potential Liability

Code Area	Type						
5624							
SPECIAL ASSESSMENT:							
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020	

Comments: Inventory update 8/17/04 vy 2/13 Reappraised and tabled land/Size chge. RCW 07/23/15 Added porch conversion to living, new porch, gas fireplace, and new decks - applied exception. Added concrete and asphalt and increased eff year for new siding and windows - RMV only.ef

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:19:37 pm

Account #	399468	Tax Status	ASSESSABLE
Map #	1N1007DD00123	Acct Status	ACTIVE
Code - Tax #	5624-399468	Subtype	NORMAL
Legal Descr	PINE BEACH REPLAT UNIT 1 Lot - 20		
Mailing Name	ELLIS, MICHAEL LEON TRUSTEE	Deed Reference #	2017-5655
Agent		Sales Date/Price	09-18-2017 / $0.00
In Care Of		Appraiser	EVA FLETCHER
Mailing Address	2614 Q ST VANCOUVER, WA 98663		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	1464-1

Situs Address(s)	Situs City
ID# 17480 PINE BEACH WAY	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	336,330			Land	0	
	Impr.	802,560			Impr.	0	
Code Area Total		1,138,890	814,310	814,310		0	
Grand Total		1,138,890	814,310	814,310		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624	0	☑		RK-R-2	Market	97	A	0.33		320,730
5624					OSD TYPE A - AVERAGE	100				15,600
					Grand Total			0.33		336,330

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	2016	157	Split level	112	3,637			802,560
				Grand Total		3,637			802,560

Exemptions/Special Assessments/Potential Liability

Code Area	Type						
5624							
SPECIAL ASSESSMENT:							
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020	

Comments: 2/13 Reappraised and tabled land. RCW 04/11/17 Added new SFD at 63% complete and added new detached garage. Removed development adjustment. Added OSD and SW. ef 05/22/18 Home is now complete.ef

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:14:27 pm

Account #	62425	Tax Status	ASSESSABLE
Map #	1N1007DA03000	Acct Status	ACTIVE
Code - Tax #	5624-62425	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	DOWLING, DAVID A & ANGELA M	Deed Reference #	2020-6069
Agent		Sales Date/Price	09-03-2020 / $695,000.00
In Care Of		Appraiser	EVA FLETCHER
Mailing Address	19690 WILDWOOD DR WEST LINN, OR 97068		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	27131-1

Situs Address(s)	Situs City
ID# 17560 OCEAN BLVD	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	338,830			Land 0	
	Impr.	351,300			Impr. 0	
Code Area Total		690,130	619,010	619,010	0	
Grand Total		690,130	619,010	619,010	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	0	☑		CR-2	Market	97	A	0.67		322,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.67		338,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1989	145	Two story or more	112	2,816			351,300
				Grand Total		2,816			351,300

Exemptions/Special Assessments/Potential Liability

Code Area	Type						
5624							
SPECIAL ASSESSMENT:							
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020	

Comments: 02/07/13 Reappraised land. Tabled values. RBB 08/29/17 Corrected mapping error that occurred during conversion to GIS. Size change only.ef

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:19:57 pm

Account #	62611	Tax Status	ASSESSABLE
Map #	1N1007DA03100	Acct Status	ACTIVE
Code - Tax #	5624-62611	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	DANNO, EVAN F TRUSTEE	Deed Reference #	2020-5674
Agent		Sales Date/Price	08-25-2020 / $626,000.00
In Care Of		Appraiser	ROBERT BUCKINGHAM
Mailing Address	144 HIGHLAND RIDGE RD KALISPELL, MT 59901		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	27142-1

Situs Address(s)	Situs City
ID# 1 17490 OCEAN BLVD	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	334,830			Land	0	
	Impr.	363,480			Impr.	0	
Code Area Total		698,310	579,650	579,650		0	
Grand Total		698,310	579,650	579,650		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.22		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.22		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	149	Basement First Floor	112	2,544			363,480
				Grand Total		2,544			363,480

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: 09/15/09 Phase one review - updated inventory.ef 02/07/13 Reappraised land. Tabled values. RBB

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:20:11 pm

Account #	355715	Tax Status	ASSESSABLE
Map #	1N1007DA03104	Acct Status	ACTIVE
Code - Tax #	5624-355715	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	LOCKWOOD, MARY ANN CO-TRUSTEE &	Deed Reference #	2019-6887
Agent		Sales Date/Price	07-03-2019 / $0.00
In Care Of	KEMBALL, T. MARK CO-TRUSTEE	Appraiser	ROBERT BUCKINGHAM
Mailing Address	2355 SW SCENIC DR PORTLAND, OR 97225		

Prop Class	101	MA	SA	NH	Unit
RMV Class	101	05	OF	536	17770-1

Situs Address(s)	Situs City
ID# 1 17488 OCEAN BLVD	COUNTY

Value Summary

Code Area		RMV	MAV	AV	RMV Exception		CPR %
5624	Land	334,830			Land	0	
	Impr.	301,390			Impr.	0	
Code Area Total		636,220	562,670	562,670		0	
Grand Total		636,220	562,670	562,670		0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624					LANDSCAPE - FAIR	100				500
5624	1	☑		RK-R-2	Market	97	A	0.17		318,730
5624					OSD TYPE A - AVERAGE	100				15,600
						Grand Total		0.17		334,830

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
5624	1	1997	143	One and 1/2 story	112	1,940			301,390
				Grand Total		1,940			301,390

Exemptions/Special Assessments/Potential Liability

Code Area	Type							
5624								
SPECIAL ASSESSMENT:								
■ SOLID WASTE	Amount	12.00	Acres	0	Year	2020		

Comments: 02/07/13 Reappraised land. Tabled values. RBB

TILLAMOOK County Assessor's Summary Report

Real Property Assessment Report

FOR ASSESSMENT YEAR 2020

March 21, 2021 2:21:00 pm

Account #	62719	Tax Status	ASSESSABLE
Map #	1N1007DA03203	Acct Status	ACTIVE
Code - Tax #	5624-62719	Subtype	NORMAL
Legal Descr	See Record		
Mailing Name	BERG, MEGAN	Deed Reference #	2020-29
Agent		Sales Date/Price	01-02-2020 / $180,000.00
In Care Of		Appraiser	ROBERT BUCKINGHAM
Mailing Address	1734 W YAMPA ST COLORADO SPRINGS, CO 80904		

Prop Class	100	MA	SA	NH	Unit
RMV Class	100	05	OF	536	13540-1

Situs Address(s)	Situs City

Value Summary

Code Area		RMV	MAV	AV	RMV Exception	CPR %
5624	Land	312,720			Land 0	
	Impr.	0			Impr. 0	
Code Area Total		312,720	283,800	283,800	0	
Grand Total		312,720	283,800	283,800	0	

Land Breakdown

Code Area	ID#	RFPD	Ex	Plan Zone	Value Source	TD%	LS	Size	Land Class	Trended RMV
5624	0	☑		RK-R-2	Market	97	A	0.15		312,720
						Grand Total		0.15		312,720

Improvement Breakdown

Code Area	ID#	Yr Built	Stat Class	Description	TD%	Total Sq. Ft.	Ex%	MS Acct #	Trended RMV
				Grand Total		0			0

Comments: 02/07/13 Reappraised land. Tabled values. RBB