

May 5, 2005

Mr. Bill Oakes, PE
Director
Island County Public Works
PO Box 5000
Coupville, WA 98239

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Subject: Review of Substantial Shoreline Development Permit Proposal
File SDP 359/04

Dear Bill:

Thank you for giving us the opportunity to assist you in the above-mentioned project. We have reviewed the following letters and correspondence that you have provided us:

- Holmes Harbor Community Partners letter, dated February 7, 2005.
- Waterfront Construction letter, dated February 3, 2005.
- Island County Planning and Community Development letter, dated December 23, 2004.
- United States Coast Guard letter, dated October 27, 2004.
- Associated Earth Science, Inc. letter, dated September 30, 2004.
- Permit set drawings by Waterfront Construction, Inc., dated September 8, 2004.
- Layton and Sell, Inc. Consulting Coastal and Civil Engineering, dated September 27, 1993.

From reviewing the above documents, it is apparent that the proposed site is very exposed to wind and wind generated waves that originate from the north, with significant waves as high as 5.1 feet and a maximum open water fetch distance as much as 16.6 miles.

According to the report by Layton and Sell, dated September 27, 1993, *Review of Environmental Setting and Wave Analysis*, using a breakwater protection is recommended, especially for protection against northerly-generated waves. It seems that Holmes Harbor Community Partners are proceeding with their project without any breakwater protection. According to the documents, the pile sizes have been increased to resist the extreme wind and wind generated wave forces on the fixed and floating structure without any breakwater. A detail review of the structural calculations for this project cannot be performed, since they are not provided. However, we would like to raise few questions related to design criteria and considerations used by Waterfront Construction in their design process. The questions are as follows:

1. Was any consideration given to the full motion analysis of the floating structures? The floating structures possess three translational and three rotational degrees of freedom, known respectively as surge, sway and heave, and roll, pitch, and yaw.

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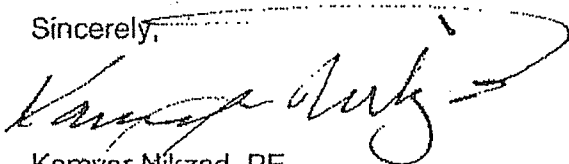
Of the six degrees of freedom, sway and heave and roll are generally of greatest consequence to floating breakwater performance, and therefore life safety. Based on research done by Rose and Kit, they arrived at the following limits in their study of acceptable motions within Small Craft Harbors:

- Maximum peak roll to roll motion: 6 degrees
 - Maximum linear accelerations: 1.3 feet per second square
 - Maximum angular accelerations: 2 degrees per second square
2. Was any hydrodynamic wave analysis performed on the floating structure to determine the values mentioned above and other design parameters? If not, we strongly recommend that such analysis be performed on the floating structure. Usually, hydrodynamic wave analysis is performed by computer programs designed specifically for full evaluation of the dynamic effects of wave impact on the floats, followed by a determination of the loads on the structure. Detail analysis showing the actual loads acting on the structure and how the loads have been mitigated throughout the structural system is required for the final evaluation.
 3. Is this facility seasonal; will the facility be used only during a certain part of the year? If yes, what months of the year will it be used, and will it be closed for the remaining part of the year? If the facility is closed, will the floats be removed and stored on land? If the facility will be closed due to wind or waves, what are the criteria for the closure? We recommend that the limiting criteria given in part 1 be used for closure.
 4. If the floats stay in the water during closure time, it must be investigated and demonstrated that the floating pontoons will withstand the full motion caused by maximum waves and wind during winter time.
 5. Is there any possibility that the structure will break-up during a major storm and become a hazard for the adjacent properties and nearby vessels?

Our main concern is that without an effective breakwater, the floating structure, even though the supporting guide piles are designed to withstand the extreme wave forces, will go through motions higher than what is acceptable for usage and for life safety.

If you have any questions or need more information, please don't hesitate to call me at (206) 622-5822.

Sincerely,



Kamyar Nikzad, PE
Associate

KN:rlc

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