

From: Shipman, Hugh (ECY) [mailto:HSHI461@ECY.WA.GOV]
Sent: Wednesday, September 22, 2010 11:37 AM
To: Michael Jones
Cc: Alex Wenger; Wenger, Barry (ECY); KAUFMAN, LISA (DNR); Thompson, Doug S (DFW); Meyer, Susan (ECY)
Subject: RE: Blaine Marine Park Draft Shoreline Restoration Report

Mike,

Thank you for sharing the draft report. I thought it did a good job of capturing the basic ideas that you presented and that we all discussed in January.

You raised two specific questions in your email:

1. Use of rubbleized concrete. I suspect there are a number of issues here, but from my limited geological perspective, I see no problem in using this material as long as it is clean, limited to subgrade applications, and meets engineering specs for use beneath armor stone or as backfill.
2. I think the idea of incorporating periodic additions of sand and gravel in order to maintain beaches is a good one. This might be done by placing sediment along the armored segments at D4 and D1, or by the construction of a "feeding" beach near the west end of the project. Ideally, the park shoreline could be maintained with small, relatively infrequent, additions at the west end and without the need to add sediment in the central portions of the site, which might be more difficult.

I'm not sure how helpful the following comments are at this stage, but here are some thoughts on the draft report. Overall, I thought it was very good and consistent with my recollections of our discussions earlier in the year. Feel free to either pass these along or to bury them in the files to be resurrected at the next stage of the project!

Page 4-5: The report does a nice job of identifying the different segments of the shoreline, but I thought the geomorphic analysis did not give as much attention to the significance of this as I would have liked. One of the most important aspects of the site's behavior and its future design is the configuration of the shoreline into a series of distinctly different segments by the presence of artificial headlands. By controlling the orientation of each segment, this influences the presence and character of beaches throughout the park. It explains the stability of the pocket beaches at C4 and C1, the erosion at C2 and B3 (east of headlands), and the shape of the more complicated beach in B2, which may gradually erode to supply the lower energy spit that has formed in A2. A successful design for the park will depend on using or modifying this basic configuration to maximize the availability of soft shorelines and to minimize the need for expensive armored structures. Wave exposure and sediment availability are both important considerations, but the design of the project hinges most on how to take advantage of the complex configuration of the shoreline.

Page 8: I think the division of the shoreline into four different "types" or "designs" was helpful, although I might have picked a slightly different set. For example, I believe the design for the armored banks in D4 and D1 may be quite different than the design of the headlands at D2, C3, X, and B1. The term "shoreline restoration" is confusing. I think "beaches" are a typical design, whereas "nourishment" is a tool for building and maintaining them. The use of LWD and of planting may be elements of designs, not designs in themselves.

Page 9: Structural protection will be necessary at the headlands (D2, C3, X, B1) and along segments D4 and D1. The emphasis should be on durability, safety in a public environment, and minimizing encroachment into aquatic areas. Because the headlands are "points", because they act as "groins" for the adjacent beaches, and because they may serve a special function as

viewpoints or gathering places, I suspect their design might be quite different than the more linear armored segments.

The report discusses the desire to minimize wave reflection off the rock structures, perhaps by decreasing the slope. This should be examined carefully. The idea is to protect the beach in front of the structure from scour, yet the expanded footprint of a gradual-sloped structure may bury that same area of beach. I would suggest that a steeper rock structure that maximizes beach area may be a better choice in some cases. In a public setting, a steep rock seawall or a steep rock revetment using large, high-quality rock, may be much safer and more aesthetically pleasing than a gradual slope of loose riprap.

The report suggests that the toe of these slopes might be armored with rock, but that the slope above MHHW might be protected with geotextile-encased earthen lifts and vegetation. Conceptually this is good, but I suspect the transition would have to be several feet above MHHW.

Page 10: The use of LWD should be limited to those locations where it would naturally be found – along the crest of the beach berm and in backshore areas. In many of these situations, there may be no need to anchor the wood, other than by partially burying it. I'm not sure how much erosion control or ecological benefit is derived from incorporating LWD into rock structures and it may pose some distinct engineering challenges.

Page 10: This project already supports several viable beach areas. By modifying the headlands at the east end of each segment and adding small amounts of new sediment, these features should do well. The performance of these beaches will be aided by the provision of new sediment, but is largely a function of the orientation of the beaches and the extent to which each forms a true pocket beach. The beaches in segments B and A are not pockets and some source (small, I suspect) of sediment may be necessary to assure their long term stability. It's preferable if this can be done through nourishment farther west, rather than needing to deliver material by truck into the central portion of the park, and this should be considered carefully in the development of final site designs.

Page 11: I think the terms bioengineering and vegetation planting should be distinguished. The former tends to imply biotechnical techniques, which might be appropriate for the upper slopes of armored banks, but probably aren't necessary elsewhere. Along most of this shoreline, planting and maintenance of vegetation may be used to help protect steep slopes, but is not really an engineering issue.

Finally, I found it a little confusing in the report sorting out which datums were being used. This should be made clear on the drawings and should be consistent with any elevations referred to in the body of the report. In general, shoreline people like myself prefer to work with MLLW=0.0'. If NGVD or another datum is used, this should be made clear. It would help to show MHHW on the drawings (MHHW = 9.5' MLLW in Blaine, I believe). OHW is shown, but this is something different.

Thanks for the opportunity to comment. Please let me know if I can be of additional assistance. I'm looking forward to seeing this project happen.

Hugh

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From: Meyer, Susan (ECY) [mailto:sume461@ECY.WA.GOV]
Sent: Monday, September 27, 2010 4:23 PM
To: Michael Jones; Wenger, Barry (ECY); Shipman, Hugh (ECY); KAUFMAN, LISA (DNR); Thompson, Doug S (DFW)
Cc: Alex Wenger
Subject: RE: Blaine Marine Park Draft Shoreline Restoration Report

Hi Michael, I finally looked over the Marine Park Restoration report. I agree with Hugh and Barry, that this is a well thought out study and well written/easy to follow. It is really an exciting project. The only comment I have, which is, of course geared toward plantings, is the following:

Page 11 discusses planting zones including those depositional areas above MHHW (assuming below OHWM) that are proposed for planting. You will only want to install plants below the OHWM in LOW energy areas. In areas that receive wind-driven waves or wave run-up, you will want to stay above the OHWM with plantings, because the high energy of the waves and wind (as well as the salt) will uproot or kill any plants installed below OHW. In low energy areas, that are not subject to the high energy waves, you can plant salt-tolerant vegetation below OHW. I think the plant list I provided you last year indicated this. Let me know if you have questions, and thanks for giving us the opportunity to comment!

Susan

OHWM Determinations on High Energy Marine Environments

Clarifying Criteria:

- (i) In **high energy** environments **where the action of waves or currents is sufficient to prevent vegetation establishment below mean higher high tide, the ordinary high water mark is coincident with the line of vegetation.** Where there is no vegetative cover for less than one hundred feet parallel to the shoreline, the ordinary high water mark is the average tidal elevation of the adjacent lines of vegetation. Where the ordinary high water mark cannot be found, it is the elevation of mean higher high tide.

WAC 173-22-030 (1)(a)(i)

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From: Thompson, Doug S (DFW) [mailto:Doug.Thompson@dfw.wa.gov]
Sent: Tuesday, September 28, 2010 9:24 AM
To: Michael Jones; Meyer, Susan (ECY); Wenger, Barry (ECY); Shipman, Hugh (ECY); KAUFMAN, LISA (DNR)
Cc: Alex Wenger
Subject: RE: Blaine Marine Park Draft Shoreline Restoration Report

Hi Michael,

Sorry for the delay in getting back to you. Thank you for the though analysis you have put forward. Conceptually I am on board with the design and agree with Hugh's comments. It is okay with me if you want to use the rubblized concrete as structural fill, we just don't want to see this material resurfacing at a later date. With periodic beach nourishment and adaptive engineering to correct any high erosion areas after storm events this should not be a problem. I look forward to the next design step and the successful completion of this project. Thanks for keeping me informed.

Regards,

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