

**Draft 2011 SMP**  
Planning Commission

**Shoreline Modification**  
**Shoreline Modification Workgroup**

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**6.2. C. Shoreline Stabilization Armoring (Revetments and Bulkheads)**

**6.2.1 Principles**

Shorelines are by nature unstable, although in varying degrees. Erosion and accretion are natural processes that provide ecological functions and thereby contribute to sustaining the ecology of the shoreline. Human use of the shoreline has typically led to hardening of the shoreline for various reasons including reduction of erosion or providing useful space at the shore or providing access to docks and piers. The impacts of hardening any one property may be minimal but cumulatively the impact of this type of shoreline modification is significant.

Shoreline hardening typically results in adverse impacts to shoreline ecological functions such as:

- Starvation and/or impoundment of beach sediment which diminishes longshore sediment transport;
- Habitat degradation;
- Loss of shoreline vegetation and large woody debris;
- Ground water and hydraulic impacts; and
- Exacerbation of erosion.

Structural methods can be “hard” or “soft”. “Hard” structural stabilization measures refer to those with solid, hard surfaces, such as concrete bulkheads, while “soft” structural measures rely on less rigid materials, such as bioengineering vegetation measures or beach enhancement. Generally, the harder the construction measure, the greater the impact on shoreline processes, including sediment transport, geomorphology, and biological functions.

There is a range of measures structural and non-structural varying from soft to hard that include:  
“Soft”

- Upland drainage control;
- Vegetation enhancement;
- Beach enhancement;
- Bioengineering measures;
- Anchor trees; and
- Gravel placement.

“Hard”

- Rock revetments;

- Gabions;
- Groins (rock or concrete);
- Retaining walls and bluff walls;
- Bulkheads; and
- Seawalls.

### **6.2.2 Applicability**

Shoreline stabilization includes actions taken to address erosion impacts to property and dwellings, businesses, or structures resulting from natural processes, such as currents, flood tides, wind, or wave action. These actions include structural and nonstructural methods. Nonstructural methods include building setbacks, relocation of the structure to be protected, ground water management, and planning and regulatory measures to avoid the need for structural stabilization. The provisions of this section also apply to the construction, replacement and repair of structures intended to stabilize shorelines or protect property from erosion impacts. Even when exempt, however, these structures must comply with all applicable Master Program regulations. A statement of exemption for an individual, single-family residence must be obtained from the City before commencing construction of any bulkhead or revetment.

### **6.2.3 Policies**

1. Discourage shoreline stabilization, particularly “hard” structural stabilization, through application of appropriate shoreline environment use designations, development standards, and public outreach.
2. Design, locate, size and construct new or replacement-shoreline stabilization to minimize and mitigate adverse impacts on shoreline ecological functions and shoreline ecosystem-wide processes. An evaluation of the proposal should consider causes and effects of erosion, including upland erosion, and beach dynamics, such as sediment conveyance, geo-hydraulic processes and ecological relationships, and address these on a reach-specific basis.
3. Design and locate new development, including the creation of new lots, in a manner that prevents the need for shoreline stabilization and armoring.
4. Structural shoreline stabilization should be permitted only when it has been demonstrated that shoreline stabilization is necessary for the protection of existing legally established structures, primary uses or public improvements in danger of loss, and when it can be demonstrated that there are no alternative options to the proposed shoreline stabilization that have less impact on the shoreline environment.
5. Existing “hard” armoring and shoreline stabilization structures may be replaced if there is a demonstrated need to protect principal uses or structures from erosion and the replacement structure is designed, located, sized and constructed to assure no net loss of ecological functions.
6. Preference is given to those types of shoreline stabilization that have a lesser impact on ecological functions. To protect ecological functions, alternatives to

shoreline stabilizations should be considered and be based on the following sequencing of solutions:

- a. Avoidance (allow the shoreline to retreat naturally, increase building setbacks or relocate structures);
  - b. Flexible defense works constructed of natural materials including “soft” shore protection, bioengineering, including beach nourishment, protective berms, or vegetative stabilizations;
  - c. Combination of “soft” and structural “hard” shoreline stabilization, hybrid design, measures, which excludes structural stabilization below the ordinary high water mark;
  - d. “Hard” structural stabilization, or rigid works constructed of artificial materials such as riprap or concrete;
  - e. Materials used for construction of shoreline stabilization should be selected for long term durability, ease of maintenance, compatibility with local shore features, including aesthetic values and flexibility for future uses.
7. Ensure that publicly financed or subsidized shoreline erosion control measures do not restrict appropriate public access to the shoreline except where such access is determined to be infeasible because of incompatible uses, safety, security, or harm to ecological functions. Where feasible, incorporate ecological restoration and public access improvements into the project.
  8. Shoreline armoring should not be constructed waterward of feeder bluffs.
  9. Encourage neighboring property owners to coordinate planning and development of shoreline stabilization or other solutions for an entire drift sector or shoreline reach, to avoid erosion of down-drift properties and to address ecological and geo-hydraulic processes, sediment conveyance, and beach management.
  10. Where feasible, any failing, harmful, unnecessary, or ineffective structures should be removed and shoreline ecological functions and process should be restored consistent with the priorities of an ecosystem-wide restoration plan, and replace using shoreline stabilization measures that result in less impact to shoreline ecological functions and processes.
  11. Encourage non-structural stabilization using non-regulatory methods, to protect, enhance, and restore shoreline ecological functions and other shoreline resources. Non-regulatory methods should include incentives programs to utilize low impact development techniques and habitat/resource planning, voluntary enhancement and restoration projects, or programs that provide technical assistance and education to shoreline property owners.
  12. Shoreline stabilization should incorporate beach restoration or enhancement in accordance with the restoration provisions of this master program.

#### 6.2.4 Regulations - **General**

**Comment [KD1]:** Add exception here for stabilization as allowed by Overwater Structures section for docks/piers (“bulkhead-like base” is allowed per that section)

**Comment [KD2]:** Don't we want a general regulation that stabilization has to be located landward of OHWM unless otherwise allowed in following sections?

1. ~~Revetments and bulkheads are permitted uses in the Rural, Semi-rural, and Urban environments where there are either bulkheads or revetments within approximately 100 feet on either side of the property. If there are no revetments or bulkheads within 100 feet on either side of the property, new revetments and bulkheads shall be conditional uses. Bulkheads and revetments shall be prohibited in the Natural, Conservancy, and Aquatic Conservancy environments. Bulkheads and revetments may be permitted in the aquatic environment only if they are permitted in the adjacent upland environment and are located at or near ordinary high water. In addition, where permitted or conditional uses, bulkheads or revetments to protect a platted lot where no structure presently exists will require an SSDP.~~
    - a. ~~A statement of exemption shall be obtained from the City prior to construction of any bulkhead or revetment in front of a single family residence. The statement of exemption shall meet all requirements of this Master Program.~~
  2. ~~All forms of protective structures shall be designed, constructed, and maintained in a manner that does not degrade water quality and/or fisheries habitat, and conforms to state agency policies and regulations, including Washington State Department of Fish and Wildlife criteria and permit requirements.~~
  3. ~~Evidence of professional design of proposed protective structures is required if it is determined there are uncertainties, such as:~~
    - a. ~~Inadequate data on local geophysical conditions;~~
    - b. ~~Potential effect on adjacent property; or~~
    - c. ~~Potential adverse effects on beach seaward of structure.~~
  4. ~~Natural materials and processes such as protective berms, drift logs, brush, beach feeding, or vegetative stabilization shall be utilized to the maximum extent possible.~~
  5. ~~Revetments and bulkheads may be allowed only when evidence is presented which conclusively demonstrates that the following conditions exist:~~
    - a. ~~Serious wave erosion threatens an existing development or land;~~
    - b. ~~Bulkheads or revetments may be approved for the operations and location of water dependent and water related activities consistent with the Master Program, provided that all alternatives have proven infeasible (i.e., use relocation, use redesign, nonstructural shore stabilization options). Such bulkheads or revetments must meet other policies and regulations of this chapter; and~~
    - c. ~~That use of natural materials and processes and nonstructural solutions to bank stabilization are unworkable in protecting existing development.~~
  6. ~~Revetments should be constructed to provide no steeper than a 45 degree slope (1 horizontal to 1 vertical).~~
1. ~~Each application is required to apply for a pre application meeting prior to submitting for a replacement, repair or new shoreline stabilization modification project.~~
1. ~~The following chart provides the application requirement per specific to the structural stabilization proposed, dependent on the shoreline designation.~~

**Comment [R3]:** In the General Modification Section. 6/24/2011

**Comment [R4]:** Workgroup, changed permit to reflect incentives and

Table X

|   |                    |                  |         |                       |       |
|---|--------------------|------------------|---------|-----------------------|-------|
| SE= Exemption<br>SD = substantial development<br>CU = conditional use<br>X = Prohibited | Shoreline Res Cons | Island Conservan | Natural | Shoreline Residential | Urban |
| Repair of a structural  | SE                 | SE               | X       | SE                    | SE    |

ATTACHMENT 3

|   |     |                     |   |     |     |
|---|-----|---------------------|---|-----|-----|
| stabilization   |     |                     |   |     |     |
| New or Replacement Structural stabilization, <del>old structure with</del> hard                   | CU  | <del>CU</del><br>X  | X | CU  | CU  |
| New or Replacement Structural stabilization, <del>old structure, with</del> hybrid                | SD* | <del>SD*</del><br>X | X | SD* | SD* |
| New or Replacement Structural stabilization, <del>old structure with</del> soft or non-structural | SE  | SE                  | X | SE  | SE  |

\* If a proposal is on a feeder bluff, then a conditional use is required.  
**Note:** **Repair** of a structure is considered repairing or replacing less than 50% of the existing structure. See Repair of Existing Structural Stabilization, section xx; and  
**Replacement** of a structure is considered repairing or replacing 50% or more of the existing structure. See Replacement and New Structural Stabilization, section xx.”

**6.2.5 Prohibited**

1. Gabions (wire mesh filled with concrete or rocks), ~~vertical, concave and flat (hard) faced structures are prohibited in shoreline stabilization bulkhead construction.~~
2. Revetments ~~and bulkheads shall be prohibited~~ for any purpose unless part of a public facilities project. ~~if they will cause significant erosion or beach starvation.~~
3. Construction of a bulkhead, revetment, or other structure for the purpose of retaining a landfill or creating dry land; ~~is prohibited,~~ unless it is proposed in conjunction with a water-dependent or public use.
4. ~~6.~~Stabilization that would cause significant impacts to adjacent or down current ~~properties.~~
4. Shoreline hardening (i.e., revetments, bulkheads, seawalls) shall not be located on shores where valuable geo-hydraulic or biological processes are sensitive to interference and critical to shoreline conservation such as feeder bluffs, marshes, wetlands, or accretion shoreforms such as spits, hooks, bars, or barrier beaches.
5. ~~Vertical, concave and flat (hard) faced structures bulkheads are prohibited in shoreline stabilization construction.~~

**Comment [R5]:** Staff, deleted not needed, the section is titled prohibited. 6/24/2011

**Comment [RE6]:** Workgroup, moved from design section. 5/19/2011

**Comment [RE7]:** Workgroup, discussed the limit uses of revetments and decided to only allow for public project. 5/19/2011

**Comment [R8]:** Staff, deleted section is probited. 6/24/2011

**Comment [h9]:** Staff, 4/20/2011.

**Comment [h10]:** Staff, 4/20/2011.

**Comment [R11]:** Staff, combined with Prohibited #1. 6/24/2011

**6.2.6 Regulations - Repair of Existing Structural Stabilization,**

1. Repair of Existing Structural Stabilization Shall Be Allowed When:
  - a. Failing, damaged structural stabilization may be repaired up to 50% of the linear length feet. Repair area that exceed 50% shall be considered a replacement.
  - b. Repairs shall provide mitigation pursuant to Section XX.

**Comment [R12]:** Staff, moved for clarity 6/22/2011

**Comment [h13]:** Staff, Jefferson, 4/20/2011.

ATTACHMENT 3

- c. Repair applications shall be considered with each successive application within a five year period to ensure that the repair continues to fall under the 50% repair threshold.

**Comment [RE14]:** Workgroup, added 5yr threshold. 5/19/2011

**6.2.7 Regulations - Replacement and New Structural Stabilization, General**

**Comment [KD15]:** Add reference to Replacement Regulations for Hard Structural Stabilization section – they also have to follow it.

- 1. When evaluating the need for new, expanded or replacement structural stabilization, the Director Administrator shall require the applicant examine and implement alternatives in the following order of preference:
  - a. No action (allow the shoreline to retreat without intervention naturally).
  - b. Increase building setbacks and/or relocated and/or elevate the structures.
  - c. Implement flexible/natural materials and methods, vegetation, beach nourishment, protective berms or bioengineered stabilization.
  - d. Hybrid Structure.
  - e. Exclusively hard stabilization materials.
- 2. Analysis for these alternatives shall be included with each replacement or new structural stabilization application including a description of cost, maintenance needs and success in protecting the primary structure.

**Comment [RE16]:** Workgroup, changed for language consistency. 5/19/2011

**Comment [RE17]:** Workgroup, changed language for clarity. 5/18/2011

**Comment [R18]:** Workgroup, deleted for clarity. 6/24/2011

**Comment [R19]:** Staff, added “implement” to address Workgroup concern. Regulation is asking the applicant to examine as well as implement. Deleting the of changes it to just implement. 6/24/2011

- 3. Each application is first required to apply for a pre application meeting prior to submitting for a replacement, repair or new shoreline modification project.

**Comment [RE20]:** Staff, Moved to beginning of section. 6/20/2011

**6.2.8 Regulations - Replacement of Existing Structural Stabilization**

**Comment [KD21]:** Add reference to Replament Regulations for Hard Structural Stabilization section – they also have to follow it.

**Comment [KD22]:** Seems like this section and previous section cover the same instance – combine?

- 1. Replacement of existing structural stabilization shall be allowed when:
  - a. Replacement may be permitted landward of OHWM if feasible or in the same location with in-kind material when there is a demonstrated need to protect principal uses or structures from erosion caused by currents, tidal action or waves.
  - b. For the replacement of structural stabilization, a geotechnical report shall be required to demonstrate that there is significant possibility that the primary structure and primary appurtenance structure will be damaged within three (3) years as a result of shoreline erosion in the absence of hard structural stabilization measures; except that if the existing primary structure is located within ten (10) feet or less of the OHWM, then a geotechnical analysis is not required to identify danger of loss or substantial damage.
  - c. Where a geotechnical report confirms a need to prevent potential damage to a primary structure, but the need is not as immediate as three years, the report may be used to justify more immediate authorization to protect against erosion using non-structural, soft or hybrid structural measures.

**Comment [R23]:** Workgroup, reworded for clarity 5/19/2011

**Comment [RE24]:** Staff added for consistency with WAC 173-26-231 6/20/2011 (Policy # 5); Staff changed to reflect WAC 173-26-231 language

**Comment [RE25]:** Workgroup, Agreed to keep staff addition of 10 foot threshold. 5/19/2011

**Comment [h26]:** Staff, Kirkland has the 10 foot requirement which would provide a bright line and negate the need for a geotech. 4/20/2011.

**Comment [R27]:** Staff, added for consistency with a geotechnical report is required. 6/24/2011

**Comment [R28]:** This regulation would allow the continued use of shoreline stabilization, when there is evidence of ongoing erosion to protect land using structural means. 6/24/2011

- d. The replacement structure is designed, located, sized and constructed to assure no net loss of ecological functions.
- e. Replacement structures may encroach waterward of the OHWM for soft stabilization measures that provide restoration of ecological functions on properties developed with a residence occupied prior to January 1, 1992.

**Comment [RE29]:** Staff, reworded for clarity/ 6/20/2011

**6.2.9 New or Expanded Shoreline Armoring**

**Comment [KD30]:** How is this different than two sections previous? (other than expansion component).

- 1. The City may approve a new or enlarged structural stabilization measures to protect public transportation infrastructure, essential public facilities and primary structures when the following apply:

**Comment [R31]:** Staff, implements Policy #4/ 6/24/2011

- a. The danger of loss or substantial damage from shoreline erosion is caused by waves, rather than landslides, sloughing or other forms of shoreline erosion unrelated to water action at the toe of the slope and such has been identified through a geotechnical report, or if the existing primary structure is located ten (10) feet or less from the OHWM, then a geotechnical analysis is not to identify danger of loss or substantial damage; and
- b. There is significant possibility that the primary structure or primary appurtenance structures will be damaged within three (3) years as a result of shoreline erosion in the absence of hard structural stabilization measures;
- c. Where a geotechnical report confirms a need to prevent potential damage to a residential primary structure, but the need is not as immediate as three years, the report may be used to justify more immediate authorization to protect against erosion using non-structural or soft structural measures;
- d. Hard structural shoreline stabilization is limited to the zone of influence for protecting a primary structure and its primary appurtenances;
- e. The new or expanded structure is designed, located, sized and constructed to assure no net loss of ecological functions; and
- f. Non-structural measures, including planting of vegetation, relocation of existing structures or installing on-site drainage improvements are shown not to be feasible or sufficient.

**Comment [KD32]:** Needed? I think we should separate this out into its own line. And, wouldn't we still require a geotech report due to CAO requirement?

**Comment [RE33]:** Workgroup, Agreed to keep staff addition of 10 foot threshold. 5/19/2011

**Comment [h34]:** Staff, Kirkland has the 10 foot requirement which would provide a bright line and negate the need for a geotech. 4/20/2011.

**Comment [RE35]:** Staff, changed for language consistency. 6/20/2011

**Comment [h36]:** It has been considered by bulkhead designers that a 30 foot angle away from the primary structure on either side provides the level of protection for the structure, 4/20/2011. Define zone or cone of influence and provide citation 6/20/2011

**Comment [h37]:** It has been considered by bulkhead designers that a 30 foot angle away from the primary structure on either side provides the level of protection for the structure.

**Comment [h38]:** Staff, It has been considered by bulkhead designers that a 30 foot angle away from the primary structure on either side provides the level of protection for the structure, 4/20/2011.

**Comment [RE39]:** Workgroup, altered for language consistency. 6/20/2011

**Comment [KD40]:** I think this is duplicative of "Replacement and New Structural Stabilitation" section, which requires analysis.

**Comment [KD41]:** I think these two can just go in general regs.

**6.2.10 Regulations - Location**

- 1. Shoreline armoring stabilization shall not be approved in any known or suspected midden site without the written permission of the Director of the State Office of Archaeology and Historic Preservation (the State Historic Preservation Officer) (RCW 27.53.060 or its successor).
- 2. Shoreline hardening (revetments and bulkheads) shall be permitted only where local physical conditions such as foundation bearing material and surface and subsurface drainage are suitable for such alterations.
- 3. On all shorelines, armoring stabilization structures shall be located landward of the OHWM, landward of protective berms (artificial or natural), and generally parallel to the natural shoreline except as allowed below:

**Comment [R42]:** Staff, reworded for clarity and simplified. 6/24/2011

~~a. On marine accretion beaches, bulkheads shall be set back a minimum of twenty-five (25) feet landward of the OHWM and shall parallel the natural shoreline. However, for sloping or bluff/cliff shores, armoring stabilization structures shall be placed as far landward of the OHWM as is feasible.~~

**Comment [R43]:** Workgroup, deleted as unnecessary and not applied, accretion beaches do not require stabilization. 6/23/2011

a. ~~b.~~ On high bluffs or bank shorelines where no other armoring stabilization structures are adjacent, such structures shall be as close to OHWM ~~the bank~~ as feasible to accommodate the design of shoreline stabilization possible. However, a revetment footing shall ~~may~~ extend waterward only the minimum extent necessary sufficiently to permit adequate run-up to dissipate wave energy.

**Comment [R44]:** Staff, added to emphasis minimum impact to ecological functions. 6/24/2011

b. ~~e.~~ ~~Revetments and bulkheads~~ Shoreline stabilization shall tie in flush with existing bulkheads on adjoining properties, except when the action will create dry land, ~~or where the adjoining bulkheads extend waterward of the OHWM or the toe of the bank or permitted landfill, in which this case the location requirements of the above shall apply.~~

**Comment [R45]:** Staff, changed bulkheads to shoreline stabilization to include all types of stabilization shall be designed to tie into existing bulkheads. 6/24/2011

4. ~~Bulkheads and revetments to protect a platted lot where no structure presently exists shall be permitted with an SSDP where property is threatened as demonstrated in a geotechnical report and provided it complies with all other provisions in Regulations - General above.~~

**Comment [h46]:** Moved to a subdivision section

**Comment [h47]:** Staff, Moved to a subdivision section, 4/20/2011.

**6.2.11 Regulations - Design**

1. If an armored revetment is employed, the following design criteria shall be met:  
 a. ~~The size and quantity of the material shall be limited to only that necessary to withstand the estimated energy intensity of the hydraulic system;~~  
 b. ~~Filter cloth or adequate smaller filter rock shall be used to aid drainage and help prevent settling; and~~  
 c. ~~The toe reinforcement or protection must be adequate to prevent a collapse of the system from wave action.~~  
 2. ~~Revetments shall be sited and designed consistent with appropriate engineering principles. Professional, geologic, site studies or design may be required for any proposed revetment or bulkhead if the City determines sufficient uncertainties or potential for damage to other shoreline properties and features exist.~~

1. Soft structural shoreline stabilization measures shall be used to the maximum extent feasible, limiting hard structural shoreline stabilization measures to the portion or portions of the site where necessary.
2. Soft shoreline stabilization may be permitted waterward of the OHWM if the stabilization measures provide restoration of shoreline ecological functions.
3. When allowed on feeder bluffs, hard structural stabilization is prohibited waterward shall be located landward of the OHWM. of feeder bluffs (Policy #8); and For all other locations, unless found to be infeasible, hard shoreline stabilization shall be located landward of the ordinary high water mark and shall follow the natural contours of the shoreline; and

**Comment [KD48]:** Except hard and hybrid are allowed per the Table in the general regs. Maybe this should go as a caveat in the general regs.

1. ~~Hard structural stabilization shall tie in to existing bulkheads on adjoining properties, except where the adjoining bulkheads extend waterward of the ordinary high water mark. In this case, the new bulkhead must meet standard requirements.~~
2. ~~Flat faced and concaved bulkheads.~~

**Comment [R49]:** Staff, Deleted is in Location Section. 6/24/2011

**Comment [R50]:** Moved 5 and 6 to prohibite d section.

3. ~~Gabions are discouraged.~~
4. When a ~~revetment~~ hard structure is required at a public access site, provision for safe access to the water shall be incorporated into its design.
5. Stairs or other ~~permitted structures~~ may be built into hard structural stabilization ~~revetment~~, but shall not extend waterward of it.
6. ~~Revetments~~ Hard Structures shall be designed to permit the passage of surface or ground water without causing ~~ponding~~ or saturation of retained soil/materials.
7. Stabilization shall be designed to provide adequate toe protection to ensure future ~~mitigation or hard structural stabilization measures are not required.~~ ~~stability without relying on additional riprap.~~
8. Materials used in hard structural stabilization construction shall utilize stable, ~~nonerosion-prone, homogeneous materials such as concrete, wood, rock riprap, or other suitable materials which will accomplish the desired end with the maximum preservation of natural shoreline characteristics.~~

**Comment [KD51]:** But what if pier/dock is incorporated into hard structural stabilization? Then it would have to extend waterward.

**Comment [RE52]:** Workgroup, asked staff to reword for clarity. 6/20/2011

**Comment [KD53]:** Reference water quality section for allowed materials (e.g., no creosote)?

**6.2.12 Regulations – Design, Specific for Replacement of Hard Structural Stabilization**

**Comment [R54]:** Staff, added 5/20/2011

1. Replacement hard structural stabilization measures shall not encroach waterward of the OHWM or waterward of the existing shoreline stabilization measure unless the primary structure was constructed prior to January 1, 1992, and there is overriding safety or environmental concerns if the stabilization measure is moved landward of the OHWM. In such cases, the replacement structure shall abut the existing shoreline stabilization structure. All other replacement structures shall be located at or landward of the existing shoreline stabilization structure.

**Comment [h55]:** Staff, WAC 173.26.241, 4/25/2011.

**Comment [h56]:** Staff, Kirkland, 4/25/2011.

**6.2.13 Subdivisions and Existing Lots without Structures**

**Comment [R57]:** Staff, added 5/20/2011

1. Use of hard structural stabilization to protect a vacant platted lot shall be prohibited. If an owner removes an existing shoreline stabilization protecting a vacant platted lot mitigation credits will be provided as allowed in Mitigation Section XX and the action will be a considered an exemption. ~~Where such stabilization exists, property owners are encouraged to remove it.~~
2. Land subdivision shall be designed to assure future development will not require shoreline armoring for the next 100 years as demonstrated by a geotechnical report.

**Comment [h58]:** Staff, Jefferson, 4/20/2011. (Policy # 11)

**Comment [KD59]:** I think this should be in the subdivision section of residential regs.

**6.2.14 Submittal Requirements for All Shoreline Modification Projects: Application (Insert graphic of requirements)**

1. In addition to the general submittal requirements for all applications in the Administration Section XX, the following shall be submitted to the City when the

ATTACHMENT 3

primary structure is located more than ten (10) feet landward of the OHWM or for a use with no primary structure:

**Comment [h60]:** Staff, Staff, Kirkland has the 10 foot requirement which would provide a bright line and negate the need for a geotech, 4/20/2011.

- a. Purpose of the project; and
- b. Plan and cross section views of the existing and proposed shoreline configuration, showing accurate existing and proposed topography and ordinary high water mark (OHWM); and
- c. Documentation of pre-construction shoreline characteristics; and
- d. Description of physical, geological and/or soil characteristics of the site including existing and proposed slope profiles; and
- e. Examination and implementation of alternatives in the order of preference as described in Replacement and New Structural Stabilization Section XX; and
- f. Existing shoreline stabilization within the reach of the proposed project; and
- g. Any outreach efforts to coordinate with property owners within the shoreline reach to address an ecosystem-wide restoration plan (Policy #9); and
- h. A description of opportunities for providing public access to and along the affected shoreline, as well as any proposed on-site recreational features if applicable; and
- i. A description of any waste and debris disposal sites for materials generated during construction; and
- j. An assessment of the cause of erosion, looking at processes occurring both waterward and landward of the OHWM and on-site drainage. Fish and wildlife resources and suitability of site to support forage fish spawning; and
- k. Mitigation report as specified by Section XX No Net Loss and Mitigation Ppredicted impact upon area shore and hydraulic processes, ecological functions, public access, adjacent properties and shoreline and water uses for the reach; and
- l. Geotechnical report including the estimated rate of erosion and urgency (3 years) and an evaluation of alternative solutions (relocation), and the following:
  - i. Proof of a geotechnical design of the structural stabilization; and
  - ii. Washington State licensed civil engineer with a specialty in coastal engineering or a qualified Washington State licensed geologist with a specialty in coastal geology and a qualified marine habitat biologist shall evaluate the cumulative effects of stabilization methods within a drift cell;

**Comment [h61]:** Kirkland

**Comment [h62]:** Staff, Kirkland, 4/20/2011.

**Comment [R63]:** Staff, implements Policy #12

**Comment [h64]:** Jefferson Count Article 7

**Comment [h65]:** Staff, Jefferson county Article 7, 4/20/2011.

**Comment [h66]:** Jefferson County Article 7

**Comment [h67]:** Staff, Jefferson County Article 7, 4/20/2011.

**Comment [R68]:** This requirement is in the mitigation report.

**Comment [R69]:** Workgroup, asked staff to ensure compliance with NNL. This section has submittal requirements. 6/24/2011

**Comment [h70]:** Staff, Anacortes Chapter 8, 4/20/2011.

**Comment [h71]:** Staff, Anacortes, 4/20/2011.

**Comment [RE72]:** Workgroup, deleted 5/18/2011

**6.2.15 Additional Submittal Requirements for Minor Repairs of Hard Stabilization:**

- 1. An indication of the amount of area proposed to be repaired.
- 2. A calculation that demonstrates the amount proposed to be repaired and past amounts repaired.
- 3. The replacement, repair materials proposed.

**Comment [h73]:** Kirkland

**Comment [h74]:** Staff, Kirkland, 4/20/2011.

**6.2.16 Additional Submittal Requirements for Repair or Replacement of Soft Stabilization:**

- 1. The City shall allow repair or replacement of soft shoreline stabilization.
- 2. The applicant shall submit to the City design recommendations for minimizing impacts and ensuring the replacement or repaired stabilization measure is designed, located, sized and constructed to assure no net loss of ecological functions.

Comment [KD75]: Not a submittal requirement

**6.2.17 Additional Submittal Requirements for New, Enlarged, Replacement and Major Repairs of Hard Stabilization:**

- 1. The following shall be submitted to the City for an existing primary structure more than ten feet from the OHWM or for a new primary structure:
  - a. ~~2)~~ An assessment of the cause of erosion, looking at processes occurring both waterward and landward of the OHWM and on-site drainage.

~~1) An assessment of the necessity for hard structural stabilization by estimating time frames and rates of erosion and documenting the urgency associated with the specific situation.~~

Comment [R76]: Staff, deleted already in submittal requirement for all stabilization. 6/24/2011

Comment [h77]: Kirkland

Comment [h78]: Staff, Kirkland, 4/20/2011.

Subdivisions and Existing Lots without Structures

- ~~1) Land subdivisions shall be designed to assure that future development or use of the established lots will not require shoreline armoring, as provided in a geotechnical report for the next 100 years.(Policy # 3).~~
- ~~2) Use of hard structural stabilization to protect a vacant platted lot shall be prohibited. Where such stabilization exists, property owners are encouraged to remove it (Policy # 11).~~

Comment [RE79]: Staff, moved above. 6/20/2011

Comment [h80]: Staff, Jefferson, 4/20/2011.

Comment [h81]: Jefferson

Comment [h82]: Staff, Jefferson, 4/20/2011.

Comment [h83]: Jefferson

**6.2.18 Maintenance, Monitoring and Vegetation Plan**

- 1. All hard structural stabilization projects shall complete and submit 5 year Maintenance, and monitoring plan that address the shoreline stabilization mitigation measures, including the native riparian vegetation plan consistent with Vegetation and Conservation Section XX and beach nourishment plan. The plan shall consist of the following:
  - a. Goals and objectives of the shoreline stabilization plan;
  - b. Success Performance measures by which the implemented plan will be assessed;
  - c. A contingency plan in case of failure;
  - d. Once a year site visits, for five (5) years, by a qualified professional, with annual progress reports submitted to the Planning Director, with recommendations for maintenance and mitigation;

Comment [RE84]: Workgroup, added 5/18/2011

ATTACHMENT 3

- e. Proof of a written contract with a ~~Qualified~~ Professional who will perform the monitoring;
- f. Maintenance assurance pursuant to Section XX (bonding section in Mitigation);
- g. When plants are disturbed or the applicant is to determine no-net-loss, a vegetation plan shall be submitted. Unless recommended otherwise, the plan shall include the following:
  - i. A vegetation plan with at least 75% of the nearshore riparian area located along the edge of the ordinary high water mark extending a depth of a minimum of ten (10) feet shall be replanted, unless found to be infeasible. If unfeasible, a publicly owned site shall be replanted or the applicant shall submit a monetary amount for mitigation;
- h. The depth may be reduced to five (5) feet to allow for variation in landscape provided that the total square footage of the area planted equals 75%;
- i. Landscape plans shall best suit the nearshore environment, with a focus on providing shade bearing plants at known fish spawning sites;
- j. At a minimum, the site shall supply vegetation ~~beach and salt marsh plant~~ communities, appropriate to the site, that are tolerant of salt, relatively dry and free draining soils or soils or high organic content and disturbance from wave action, tidal inundation and shifting substrate that include one tree per every 20 linear feet of shoreline and one shrub per every five linear feet; and.
- k. A record to title for the maintenance, monitoring and vegetation plan.

**Comment [RE85]:** Staff, defined in Definition Section. 6/20/2011

**Comment [KD86]:** By who?

**Comment [RE87]:** Workgroup, wanted to add conservation easement however this does not provide offset of project disturbance from the baseline. 6/20/2011

**Comment [KD88]:** These are requirements, NOT submittal items. Move to regulations section.