

R. Shoreline Stabilization

Definition.

Shoreline Stabilization and Armoring refer to actions taken to address erosion impacts to property and dwellings, businesses, or structures caused by natural processes, such as current, flood, tides, wind or wave action.

These actions include structural and nonstructural methods. Nonstructural methods, for example, include approaches such as building setbacks, structure relocation, groundwater management, and land use planning. 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 are a range of measures for shoreline stabilization, varying from soft to hard that include, but are not limited to:

“Soft”

- Vegetation enhancement;
- Beach enhancement;
- Bioengineering measures;
- Anchor logs and stumps; and
- Gravel placement/beach nourishment.

“Hard”

- Rock revetments;
- Gabions;
- Groins;
- Bulkheads; and
- Seawalls.

Environment Designations Permit Requirements.

For all designations, except where prohibited in the Aquatic designation:
SDP for soft Shoreline stabilization, except where exemption criteria met.
Administrative CUP for hard shoreline stabilization, where demonstrated necessary through the provisions of this section.

Exemptions from Substantial Development Permit for Shoreline Stabilization.

- 1) Construction of the normal protective bulkhead common to single-family residences shall not require an SDP. (*Current 22, WAC*)
- 2) A “normal protective” bulkhead includes those structural and nonstructural developments installed at or near, and parallel to, the ordinary high water mark for the sole purpose of protecting an existing single-family residence and appurtenant structures from loss or damage by erosion. Appurtenant structures may include:
 - Garages, as defined in KCC 17 Zoning;
 - Septic Drain Fields;
 - Utilities;
 - Driveways;
 - Boat Houses served by marine railways; or
 - Officially registered historic structures.
- 3) A normal protective bulkhead is not exempt if constructed for the purpose of creating dry land.
- 4) When a vertical or near vertical wall is being constructed or reconstructed, not more than one cubic yard of fill per one foot of wall may be used as backfill.
- 5) When an existing bulkhead is being repaired by construction of a vertical wall fronting the existing wall, it shall be constructed no further waterward of the existing bulkhead than is necessary for construction of new footings.
- 6) When a bulkhead has deteriorated such that a new ordinary high water mark has been established by the presence and action of water landward of the bulkhead, the replacement bulkhead must be located at or near the actual ordinary high water mark.
- 7) Beach nourishment and bio-engineered erosion control projects may be considered a normal protective bulkhead when any structural elements are consistent with the above requirements and when the project has been approved by the Department of Fish and Wildlife.
- 8) Exemption from an SDP is not necessarily an exemption from a CUP.

Application Requirements (*Current 22+additions*)

In addition to the general application requirements, applications for shore protection and bluff stabilization shall include the following information, when applicable:

1. Upland, onsite improvements and any existing shoreline structures.

2. Type of proposed shore protection and a description of alternatives to hard approaches where proposed, and a thorough discussion of the environmental impacts of each alternative;
3. Habitat survey prepared by a qualified professional biologist that describes the anticipated effects of the project on fish and wildlife resources and marine vegetation;
4. A description of any proposed vegetation removal and a plan to re-vegetate the site following construction;
5. Tidal elevations and field verified line of ordinary high water;
6. Ownership of the tidelands, shorelands and/or bedlands;
7. Purpose of shore protection;
8. Direction of net longshore drift (for marine shoreline);
9. Plan and profile of existing bank and beach;
10. Profile of adjacent existing bulkhead;
11. Geotechnical Report, including analyses demonstrating necessity and impact on nearshore processes;
12. Any other information that may be required to demonstrate compliance with the review criteria referenced in this section.

Development Standards.

General Regulations.

1. Applications for shore protection will be reviewed pursuant to comments made by the Washington Department of Fish and Wildlife pertaining to impacts on critical salt and freshwater habitats, and comments made by the Washington Department of Natural Resources for projects proposed on state owned aquatic lands. (*Current 22+recommended DNR*)
2. Soft shoreline stabilization measures shall be utilized unless demonstrated through a geotechnical analysis not to be sufficient to protect primary structures, dwellings and businesses. (*WAC*) Alternatives for shoreline stabilization shall be based on the following order of preference:
 - a) No action, increase building setbacks, or relocate structures;
 - b) Soft shoreline stabilization constructed of natural materials including bioengineering, beach nourishment, protective berms, or vegetative stabilization;
 - c) Hard shoreline stabilization constructed of materials such as rock, riprap or concrete.
3. Soft shoreline stabilization measures that provide restoration of shoreline ecological functions may be permitted waterward of the ordinary high-water mark. (*WAC*)
4. When hard shoreline stabilization measures are demonstrated to be necessary, they must:
 - a) Limit the size of stabilization measures to the minimum necessary
 - b) Assure no net loss of shoreline ecological functions.

- c) Ensure that publically 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.
- d) Where feasible, incorporate ecological restoration and public access improvements into the project. (WAC)
5. Shoreline stabilization measures shall not be for the purpose of creating dry land (Current 22). Leveling or extending property, creating or preserving residential lawns, yards or landscaping shall not be allowed except when otherwise allowed in this section due to health and safety.
6. Minimize disturbance pertaining to beach access by avoiding switchback trails which require hard stabilization. Where such avoidance is not feasible, mitigation for impacts to shoreline ecological functions shall be required.
7. Bluff stabilization walls shall be prohibited unless proven necessary through a geotechnical report.
8. Placement of shoreline stabilization methods shall follow the natural contour of the existing shoreline, be parallel to and at or above the ordinary high-water mark. (Current 22)
9. Shoreline stabilization on marine feeder bluffs, when determined necessary pursuant to the standards of this section, may require additional mitigation measures, including those necessary to offset the loss of sediment supply.
10. Shoreline stabilization must be designed by a professional engineer licensed in the State of Washington with demonstrated experience in hydraulic activities of shorelines. Alternatively, soft shoreline stabilization may be designed by a habitat biologist or a professional with demonstrated expertise in designing soft shoreline stabilization structures. (Current 19)

New and Expanded Shoreline Stabilization and Armoring.

1. New development shall be located and designed to avoid the need for future shoreline stabilization for the life of the structure. Likewise, any new development which would require shoreline stabilization which causes significant impacts to adjacent or down-current properties shall not be allowed. (WAC)
2. New development on lots constrained by depth, topography or critical areas shall be located to minimize, to the extent feasible, the need for shoreline stabilization.
3. New development on steep slopes or bluffs shall be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure, as demonstrated by a geotechnical analysis. (WAC)
4. If shoreline stabilization is necessary pursuant to a geotechnical analysis, the method, either hard or soft, shall not result in a net loss of shoreline ecological functions. (WAC) To meet this requirement, on and off-site mitigation measures may be required.
5. Shoreline stabilization structures shall not be constructed with waste materials such as demolition debris, derelict vessels, tires, concrete or any other materials which might have adverse toxic or visual impacts on shoreline areas. (Jefferson)
6. New structural stabilization measures shall not be allowed except when necessity is demonstrated in the following manner:
 - a) To protect legally existing primary structures:

- (i) New or enlarged structural shoreline stabilization measures for the existing primary structure, including residences and their primary appurtenant structures or uses, shall not be allowed unless there is conclusive evidence, documented by a geotechnical analysis, that the lawfully established, primary structure is in imminent danger from shoreline erosion caused by tidal actions, currents, or waves;
- (ii) Normal sloughing, erosion of steep bluffs, or shoreline erosion itself, without a scientific or geotechnical analysis, is not demonstration of need;
- b) In support of water-dependent development when all of the following apply:
 - (i) The erosion is not being caused by upland conditions, such as the loss of vegetation and drainage;
 - (ii) Nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient;
 - (iii) The need to protect primary structures from damage due to erosion is demonstrated through a geotechnical report;
- c) In support of new non-water-dependent development, including single-family residences when all of the following apply:
 - (i) The erosion is not being caused by upland conditions, such as the loss of vegetation and drainage;
 - (ii) Nonstructural measures, such as placing the development further from the shoreline, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient;
 - (iii) The need to protect the primary structures from damage due to erosion is demonstrated through a geotechnical report. The damage must be caused by natural processes, such as tidal action, currents and waves;
- d) To protect projects for the restoration of ecological functions or hazardous substance remediation projects pursuant to RCW chapter 70.105D when the following applies:
 - (i) Nonstructural measures, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient. (WAC)

Replacement and Repair of Existing Shoreline Stabilization and Armoring.

1. Additions to or increases in the size of existing shoreline stabilization measures shall be considered new structures. (WAC)
2. An existing stabilization structure may be replaced with a similar structure if there is a demonstrated need, through a geotechnical report, to protect principle uses or structures from erosion caused by currents, tidal action or waves. (WAC)
3. If the Ordinary High Water Mark has been re-established, the replacement structure must be located at or near the new Ordinary High Water Mark. In general, replacement of the shoreline stabilization structure within one year of damage will ensure recognition of the previous ordinary high water mark.
4. Alternative or soft stabilization approaches shall be considered prior to in-kind replacement.
5. The replacement structure shall:

- a) Be designed, located, sized , and constructed to assure no net loss of ecological functions. (WAC)
 - b) Perform the same stabilization function of the existing structure and does not require additions to or increases in size.
 - c) Not encroach water-ward of the ordinary high water mark or existing structure unless the residence was occupied prior to January 1, 1992, and there are over-riding safety or environmental concerns. In such cases, the replacement structure shall abut the existing shoreline stabilization structure. (WAC)
6. When possible or as an element of mitigation sequencing, failing, harmful, unnecessary, or ineffective structures should be removed, and shoreline ecological functions and processes should be restored using non-structural or soft and/or long term stabilization measures.

Shore Stabilization on Streams.

1. Hard shoreline stabilization methods are prohibited in jurisdictional shoreline streams on estuarine shores, in wetlands, and in salmon spawning areas, except for the purpose of fish or wildlife habitat enhancement or restoration, or when deemed necessary through a geotechnical report to protect an existing primary structure.
2. All revetments or similar structures shall be designed in accordance with WDFW Integrated Streambank Protection Guidelines.

Subdivisions and Existing Lots without structures.

1. Subdivision shall occur such that newly created lots will not require shoreline stabilization, using geotechnical analysis of the site and shoreline characteristics. (WAC)
2. Use of shoreline armoring to protect a platted lot where no primary use or structure presently exists shall be prohibited.

Additional Requirements for Geotechnical Reports

In addition to the general Geotechnical Report requirements at section xx.xxx , the following information shall be included for shoreline stabilization proposals:

1. Address the need to prevent potential damage to a primary structure through the use of shoreline stabilization measures. (WAC)
2. Estimate time frame and rates of erosion to report on the urgency associated with the specific situation. Urgent means:
 - a) That the primary structure will be damaged within three years as a result of natural shoreline erosion in the absence of hard armoring structures.
 - b) Waiting until the need is immediate would foreclose the opportunity to use measures that avoid impacts on ecological functions. (WAC)

3. If the report determines that the need is not as immediate as three years, it still may be used to justify a more immediate authorization to protect against erosion using soft measures. *(WAC)*
4. The geotechnical analysis shall evaluate on-site drainage issues and address drainage problems away from the shoreline edge. *(WAC)*