

Revetments

Revetments are onshore structures built to protect the toe of a bluff/bank from erosion caused by wave action. These structures are constructed at a stable slope angle and create a covering of erosion resistant material from the toe of the bluff up to a point where wave action typically does not reach. Since material eroded from the bluff/bank is one source of beach-building sand, some regulatory agencies may require that one of the design components for a revetment to be the inclusion of sand pre-filling in the amount equal to that which would have been added to the system by erosion of the bluff/bank over the life of the structure.

Typically consisting of armor stone, precast concrete block, or concrete modules, revetment slopes can be smooth or rough depending design of the structure. The toe or most lakeward part of a revetment is usually located on or buried in the lakebed. Burying the toe in the lakebed lessens the chance for damage to the structure due to scouring, or erosion, at the base of the structure. The crest or most landward part of a revetment is designed to a height where waves will no longer be a threat to the land. The crest height must be high enough to reduce the chances of waves removing the soils above or behind the structure. This upper extent of the revetment should be determined on a site-by-site basis according to the wave conditions.

Depending on the design, revetments can be permeable, allowing water to move through the structure, or impermeable, where the waves and water run off the face of the structure. In the case of the permeable structure, a proper filter layer of smaller stone and filter fabric must be included in the structure. If the filter layer is improperly designed or constructed, or not included, erosion behind the revetment is likely to occur because the water will move too quickly through the structure, eroding the less resistant materials underneath.

Revetments are built on areas adjacent to the bluff toe. The area covered by a revetment usually includes the beach area and/or the shallow nearshore, which is typically the same area where beach building occurs. Once the revetment is built, however, the area where a beach could build up in front of the structure will be deeper because it is further offshore. The likelihood of a new beach forming in this deeper area is lower than before construction because it would require the build up of much more sand due to the greater depth. Additionally, the sand which would have eroded from the area now covered by the revetment will need to be replenished within the system.

To maintain a revetment, periodic monitoring of the structure is necessary. This may include re-positioning or replacing the armor units.

Revetment construction requires the proper placement of large armor units along a specified slope. Due to these conditions, the design and construction of a revetment requires the services of a professional engineer and a contractor. Maintenance of these structures will likely also require a contractor's services.



Revetment



Revetment



Revetment