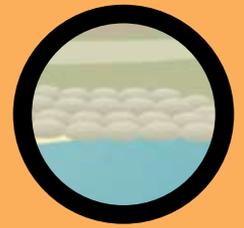


Guidelines



Rock revetments

G-15.1

Rock revetments are used to increase the stability of eroding foreshores. They are costly to install and require regular maintenance. They must be designed by a coastal engineer in consultation with a coastal geomorphologist otherwise they may be subject to failure or create erosion problems further along the foreshore. Rock revetments have many advantages over vertical seawalls in that they provide more opportunities to create habitat for marine and coastal wildlife and vegetation; cause less wave reflection and survive storms for longer and can sustain considerable damage without total failure.

Thorough planning and specialist advice are essential. Managing problems after construction is more expensive than dealing with them in the planning stage. All revetment works must meet legislative requirements and may require approval from a number of agencies. An assessment of the proposed activity will determine the level of environmental harm.

Use these guidelines in conjunction with the information provided in Chapter 15 when planning works and engaging consultants and contractors to ensure the proposed works use the most effective methods and minimise the risk of causing damage to coastal values.

When to use a rock revetment

Rock revetments can be suitable for high wave energy environments, however the potential for scouring in the upper reaches should be considered carefully. They should not be used when erosion is due to interruption of sediment transport such as the impact of a poorly sited groyne.

Because of the degree of back preparation required and the large footprint they should not be used in sensitive coastal environments where there will be an unacceptable loss of natural or cultural values.

Approvals

Approval and permits will be required. All works on Crown Land which includes all land below the high tide mark will require approval from Crown Land Services. A planning permit from the local council will also be required. Other approvals and permits may be required seek advice from DPIPWE.

Environmental and cultural considerations

Rock revetments require disturbance of the shoreline and as such have the potential to impact on vegetation communities, wildlife habitat, Aboriginal and maritime heritage values, threatened species and marine life and habitats. In most cases an Environmental Management Plan will be required to address these issues.

It is important to identify all natural values that may be affected. Seek advice from specialists. Vegetation and fauna assessments may be required.

It is important to identify all cultural values that may be affected. Contact Heritage Tasmania and Aboriginal Heritage Tasmania, a desktop search will determine if an assessment and permit are required.

Revetment design

Revetments must be designed by an experienced engineer in consultation with a coastal geomorphologist. Revetments can cause erosion problems, be ineffective or impact on visual amenity and recreational spaces if poorly designed or sited.

Consider the attractiveness of the structure and foreshore access in design.

Design must consider a thorough analysis of the site and the coastal processes in the context of the expected life and maintenance regime of the structure.

Soil filters or geotextiles will minimise seepage from runoff that can dislodge the rock material. Geotextiles must be completely covered by a gravel layer behind the rock to protect them from UV exposure.

Ensure engineering considers the following coastal processes in design:

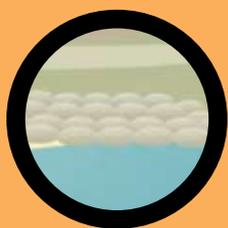
- Types of wave action, i.e. swells or wind driven waves
- Current and future water levels (taking into account sea level rise, storm surges and king tides)
- Direction and speeds of currents
- Water flows (runoff) from the land

Climate change and sea level rise predictions based on Intergovernmental Panel on Climate Change (IPCC) predictions must be incorporated into the design. Consider not just elevated water levels but inundation, and increased wave energy and storminess.

Incorporate features such as rock pools and crevices into the design to provide habitat for marine life. Revetments can be designed to have a step profile with a bench for saltmarsh to provide an intertidal environment.

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G-15.1

Rock revetments

Materials

Use local rock when possible or match the rock as closely to the surrounds as possible. This improves habitat values and visual amenity.

Choose rocks and materials that will minimise production of fine materials that can easily become suspended.

Install geotextile behind the rock to stabilise the shoreline material and reduce the risk of scouring. Cover geotextile with gravel.

Costs to consider

Rock	Labour
Sediment fill	Engineering
Gravel fill	Assessments
Crushed stone	Supervision
Filter size rock	Truck and transport
Geotextiles	Excavator use
Sediment traps	Soil compactor use
Other mitigation activities	Shotcrete use

Adapted from *Best management practices for foreshore stabilisation. Approaches and decision-support framework*, Swan River Trust 2009

Installation

Minimise impacts on coastal values during installation.

Schedule works to avoid significant wildlife events such as shorebird and penguin breeding times, fish spawning times.

Schedule works when tides, currents and waves will be most favourable for minimising disturbance and spread of sediments and disturbed materials.

Ensure all works staff and contractors are briefed on minimising environmental impacts and provide adequate supervision to ensure best practice environmental standards are being implemented.

Minimise the amount of excavation of the shoreline and the impacts on adjacent coastal vegetation. Do not dump excavated material onto coastal vegetation.

Rehabilitate disturbed areas as soon as possible.

Monitoring

Follow-up surveys and ongoing monitoring are essential to detect any adverse impacts from the construction works and any unwanted changes to coastal processes as a result of the structure.

Use established photopoints to monitor any build-up or loss of sand and growth of vegetation.

Monitoring of rehabilitation works is also required.

Maintenance

All revetments should be inspected regularly to ensure they are working as intended.

Inspections should identify any movement or erosion of the rock material and/or any scouring or erosion of the shoreline behind the structure.

Inspections are necessary after extreme storm events and very high tides to determine if waves are overtopping the structure.

Ongoing inspections are necessary to ensure the structure is not posing a hazard to the public.

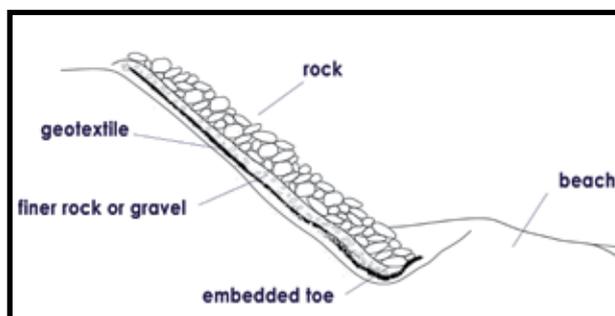
More Information

Best management practices for foreshore stabilisation. Approaches and decision-support framework, Swan River Trust 2009. Western Australia

Coastal engineering manual, United States Army Corps of Engineers 2002 (Part V Chapter 3 Shore Protection Works)

<http://chl.ercd.usace.army.mil/cem>

Tasmanian coastal works manual: Chapter 15, Page & Thorp 2010



Example of rock revetment construction. The geotextile and embedded toe help to reduce scouring and movement of the rock due to wave action and water run-off from the land. Adapted from *Coastal engineering manual*, United States Army Corps of Engineers 2002

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