

Salix Rock Mattresses



Salix 

Building with Nature

Description

Salix Rock Mattresses are a robust and permanent revetment for use around reservoirs, shorelines, lake edges, streams and river banks.

They are cost-effective revetments that are suitable alternatives to rock rip rap and gabions in many scour applications.

Rock Mattresses are formed from Rock Rolls joined together to create a unit capable of resisting high velocities and shear stress

up to 1200 N/m² in high energy river situations.

They also accrete silt due to small stone size and can be fully vegetated. This is not possible with rock armour and large rip rap.

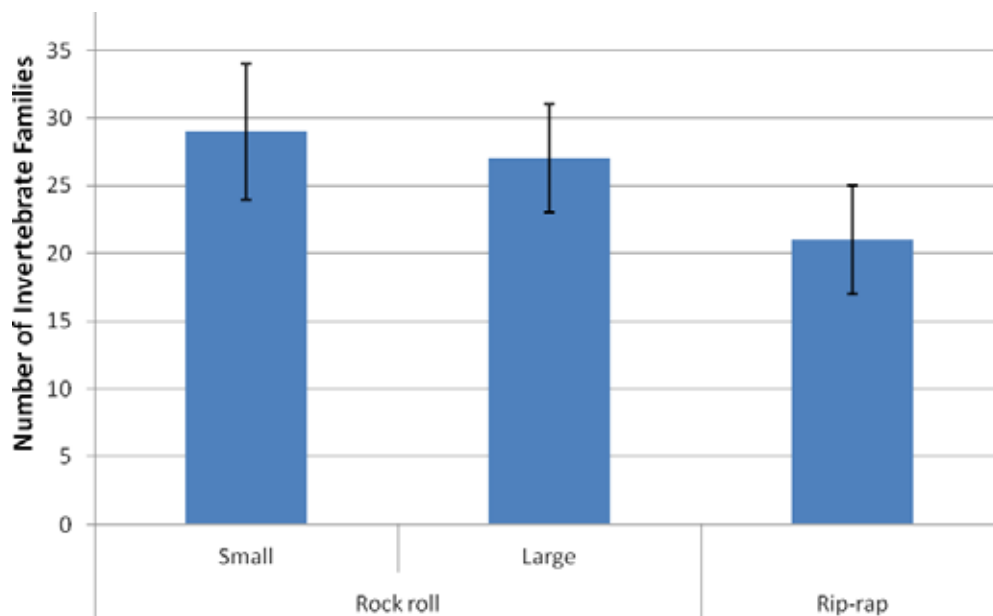
Rock Mattresses provide an instant flexible solution to many scour problems particularly below low water level where pure bioengineering techniques may not function.



Recently installed Rock Mattresses at the base of a spillway accrete silt and allow vegetation establishment



Established Rock Mattresses



Research by Swansea University has revealed the important habitat value that Salix's Rock Rolls & Mattresses provide for aquatic invertebrates.

The smaller stone grading provides better habitat than larger gabion or rip-rap stone sizes.

Niche Habitats

The small stone size provides greater areas of still water where finer sediments can deposit and provide niche habitats that can be quickly colonised with submerged, marginal and emergent vegetation.

Applications

- Shorelines
- Bioengineering Streams & Rivers
- Intertidal Zones
- Spillways
- Headwalls

Applications

Shorelines

Large water bodies such as reservoirs create a difficult environment for “soft” engineering revetments due to wave action and large fluctuations in water levels.

Rock Mattresses can be used as an alternative to rock armour and concrete below and above average water levels.

Natural colonisation of the mattresses in the marginal and bank zones can happen over time or soil/dredged material can be placed over them to speed up the process.



Bioengineering: Streams & Rivers

Rock Mattresses can be used within Bioengineering projects to form a robust toe that absorbs energy from water flow and wave action.

This allows the “living” elements of the bioengineering solution to establish in areas where energy levels would otherwise be too great.

The small stone size in the Rock Mattress allows vegetation to easily establish and so the whole revetment becomes a vegetated system.

Spillways

Rock Mattresses are an ideal revetment to tie in TRM's (Turf Reinforcement Mats) such as VMax C350 and P550 that are often used to cover spillways.

They can be used where there is concern over hydraulic jumps or very high flow rates.



Intertidal Zones

Rock Mattresses are not adversely affected by salt water therefore they can provide long term revetment that accrete sediment rapidly, especially in high sediment load intertidal applications.



Headwalls

Rock Mattresses are ideal as instant protection in scour zones around outfalls adjacent to headwalls especially in flowing water conditions where hand filled wire gabions would be impossible to fill in situ.

Construction times can be 95% quicker than standard hand filled options.



Specification



Rock Mattresses

Net Specification

Net Material:

3mm Synthetic Polyethylene braided knotted nets

Net Apertures:

32mm

Net Yarn Thickness:

3mm

Single Mesh Tensile Strength:

152,4kg = 1,495 kN/Mesh U.V. treated 350 Kly

Colour:

Black

Stone Specification

Weather and frost resistant granite:

40mm to 75mm (3% to 5% less than 32mm)

Unit Size

Standard size is shown although Rock Mattresses can be made to different lengths.

2m x 1m x 0.25m deep

2m x 0.9m x 0.3m deep

Weight per Unit

250mm deep: 510 kg (+/-15%)

300mm deep: 640kg (+/- 15%)

Rock Mattress Performance

Maximum permissible flow velocity 8m/s

Maximum wave height 1 metre

Maximum Shear Stress 1200N/m²

Aggregates

Salix provide Rock Mattresses pre-filled but also have the capability to manufacture on site using local stone or even recycled aggregates if required.

Stone size can be adjusted to match local river bed gravels or to provide habitat for specific flora or fauna species.

Rock Mattresses

- Salix Rock Mattresses are a tubular revetment consisting of small stones retained within a high strength polyethylene net
- Salix Rock Mattresses are used in all areas where vegetation alone will not provide sufficient erosion control
- Salix Rock Mattresses have been designed to provide invertebrate habitat and to accrete fine sediment to enable vegetation establishment within the stone interstices
- Salix Rock Mattresses can be combined with bioengineering solutions to create fully vegetated revetment
- Salix Rock Mattresses have been developed in partnership with the European Soil & Water Engineering Group (ESWEG).



Rock Mattresses on spillway toe



Rock Mattresses fully vegetated

Rock Mattress Benefits

- Rapid installation compared to filling wire mattresses on site with big savings on labour costs
- Can be installed in flowing water or below water level such as headwall outlets, lake margins and river beds
- Small stone size provides a suitable substrate for ecosystem development and diverse biotic communities
- Salix Rock Mattresses allow fine accretion of sediment to enable vegetation establishment providing habitat for insects, molluscs and other invertebrates, which in turn supports fish and water bird populations
- Unvegetated Salix Rock Mattresses blend in easily with river gravels and provide substratum for various faunal species
- Salix Rock Mattresses can often replace large rock armour, concrete and rip rap plus provide long term protection for soft/green engineering solutions, i.e Bioengineering
- Salix Rock Mattresses can be used in fresh or salt water
- Flexible system that contours to the surface
- UV stabilised nets are abrasion resistant and do not suffer from corrosion
- Health & Safety benefits due to no fabrication on site reducing accident risks
- Lengths and widths can vary in multiples of 250mm or 300mm to suit specific site conditions.



Rock Mattress placed on river bank

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