

# Insitu Concrete Armour

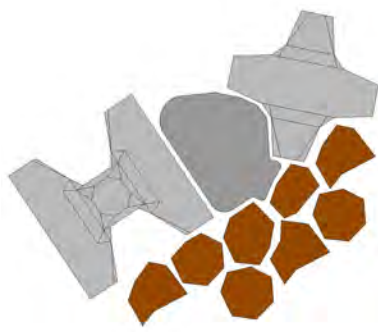
## - repairs to revetments

Rock or concrete armour units to most revetments suffer a degree of movement or localised failure. Mobilising plant to repair with similar replacement armour is often not practical once construction is complete or is very costly using marine plant for small quantities. Pumped concrete into pre-placed fabric formwork units provides an effective solution.

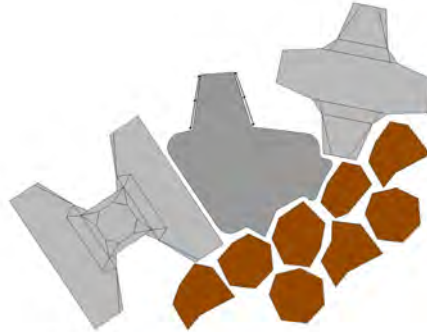
**Proserve Ltd.**  
80 Priory Road,  
Kenilworth,  
Warwickshire, CV8 1LQ,  
England

UK: 01926 512222  
Int: 00 44 1926 512222  
office@proserveltd.co.uk  
www.proserveltd.co.uk

**Fabriform**



**Natural Form Infill Repair**



**Shaped Form Infill Repair**

Insitu concrete armour is often used to infill gaps and lost areas of the top armour layer. It has been used to rock revetments and other common forms of concrete armour units. The void or damaged area needs to be surveyed to allow the infill forms to be sized to achieve a weight comparable with the armour units for future long-term stability. The repairs can be performed in the dry with suitable safety arrangements, or underwater. In the wave zone, forms can typically be filled in wave heights up to 0.5 m before initial hardening. The forms are normally suspended by crane or temporary scaffold pole top support. The units are normally filled with C35/45 mix, 45 N/mm<sup>2</sup> strength concrete or micro concrete. Micro concrete can be pumped via 50mm Ø hose which is readily handled by divers. The forms are filled in tremie fashion. Perimeter 'free water' bleed through the fabric enhances strength, durability and abrasion resistance. The forms are normally filled with a prescribed minimum volume to ensure the minimum design weight is achieved.

The bottom of the infill block forms an intimate shape to adjacent units and neighbouring repairs need to be spaced or shaped, to maintain revetment porosity. Repair blocks can be shaped to provide matching upstand legs for interlock, using shaped mesh formers which are lost or by using removable top shutters. Where a particular infill arrangement is required, it can be developed and demonstration tested.



**Repair Above Water**

Initially the infill units produce a more intimate and stabilised arrangement, although this changes if movement is progressive. For stability comparisons, the coefficient of friction between insitu fabric formwork units and smooth concrete armour units has been determined by testing to be 0.48. If required, degradable hessian forms can be used to match frictional properties between concrete units, or repair armour weight can be increased accordingly.



**Repair Under Water**

Insitu armour repairs have proved to be effective. Repairs involving modest quantities can be undertaken quickly and cost effectively before more extensive damage occurs.