

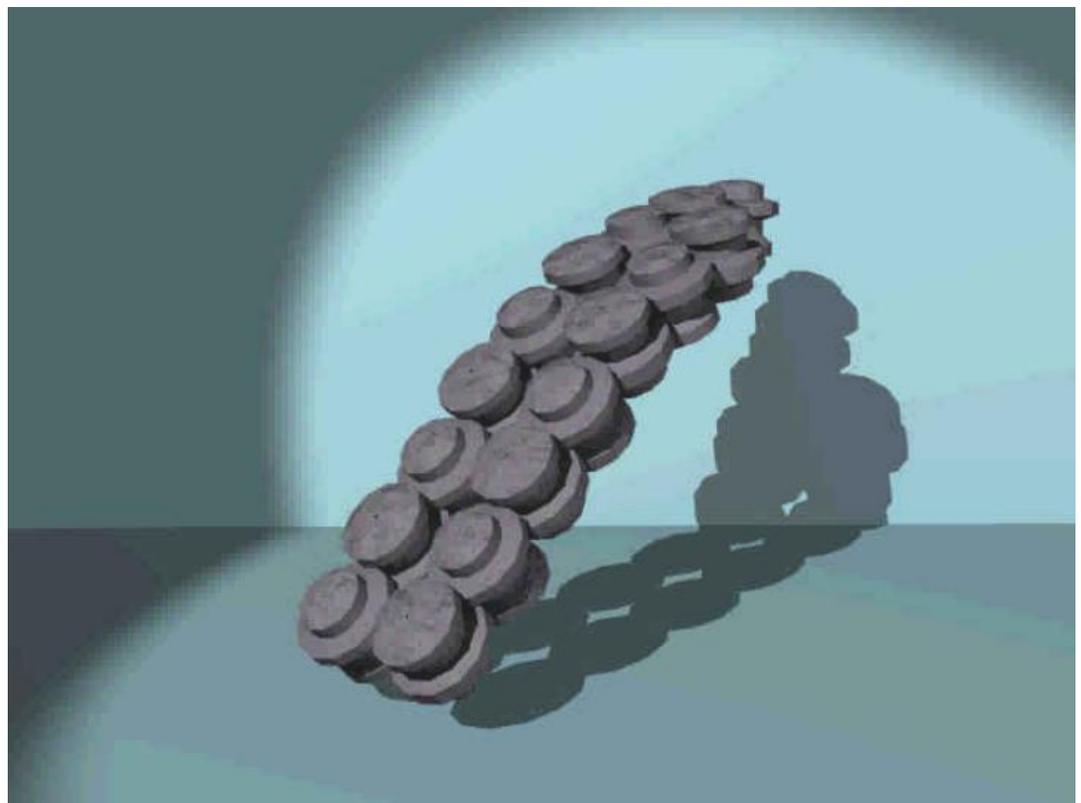


**US Army Corps  
of Engineers®**  
Engineer Research and  
Development Center

# Samoa Stone Used as Erosion Protection

## Technology

The Samoa Stone™, developed by ERDC's [Coastal and Hydraulics Laboratory](#), is a unique patented interlocking concrete erosion protection module used to protect shorelines, waterways, and hydraulic structures from erosion from waves and flowing water. Each Samoa Stone has a large circular end and a small circular end. By alternating the orientation of the units (large end up, small end up, large end up, etc.) a uniform, even surface is produced. This provides an aesthetically pleasing surface that can be finished with a natural stone surface.



**Illustration of Samoa Stone placement on slope**

## Problem

The product was developed in American Samoa where CHL experts consulted on the renovation of several shoreline revetments for the Federal Highways Administration. In the past, native stone had been the armoring of choice. However, due to environmental concerns, suitable stone was in short supply. Concrete armor units were adopted. However, several of the revetments being considered were located in small beautiful island villages on the island of Tutuila. In the village of Vatia, the proposed revetment was located directly in front of the local school. One problem with most existing concrete armor shapes was that the village children would naturally want to walk and climb on the large armor units, which could be dangerous due to the complex armor shapes and deep voids between units. A second problem was the unnatural visual appearance of raw

concrete. Samoa Stone was developed as an aesthetically pleasing armor unit with the appearance of natural stone that, when placed in a pattern, would produce an even surface that people could walk on.

**Expected Cost  
To Implement**

Costs vary throughout the world due to the fluctuating prices within the global market for supplies and labor.

**Benefits/Savings**

The Samoa Stone has a single set of side molds that can be fitted with either small end or large end molds to produce an exposed surface of alternating large and small end concrete surfaces with the look of natural stone. The natural stone surface provides superior aesthetics over raw concrete. The shape is simple and can be cast on site or precast and shipped to the site. In addition, the construction of a Samoa Stone layer is relatively simple compared to other more complex armoring alternatives.

The spacing of the interlocking surfaces in the matrix provides porosity, which dissipates wave energy, yet does not allow underlayer stone to filter out of the slope. The Samoa Stone has been shaped to provide a high degree of interlocking between adjacent units, promoting stability in high wave energy environments.

**Status**

Presently, patent licensing for the Samoa Stone is being pursued. In addition, several large revetment structures have been designed and are awaiting funding for construction.

**ERDC POC**

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