

PRIMARY USE: Minimize bank erosion.

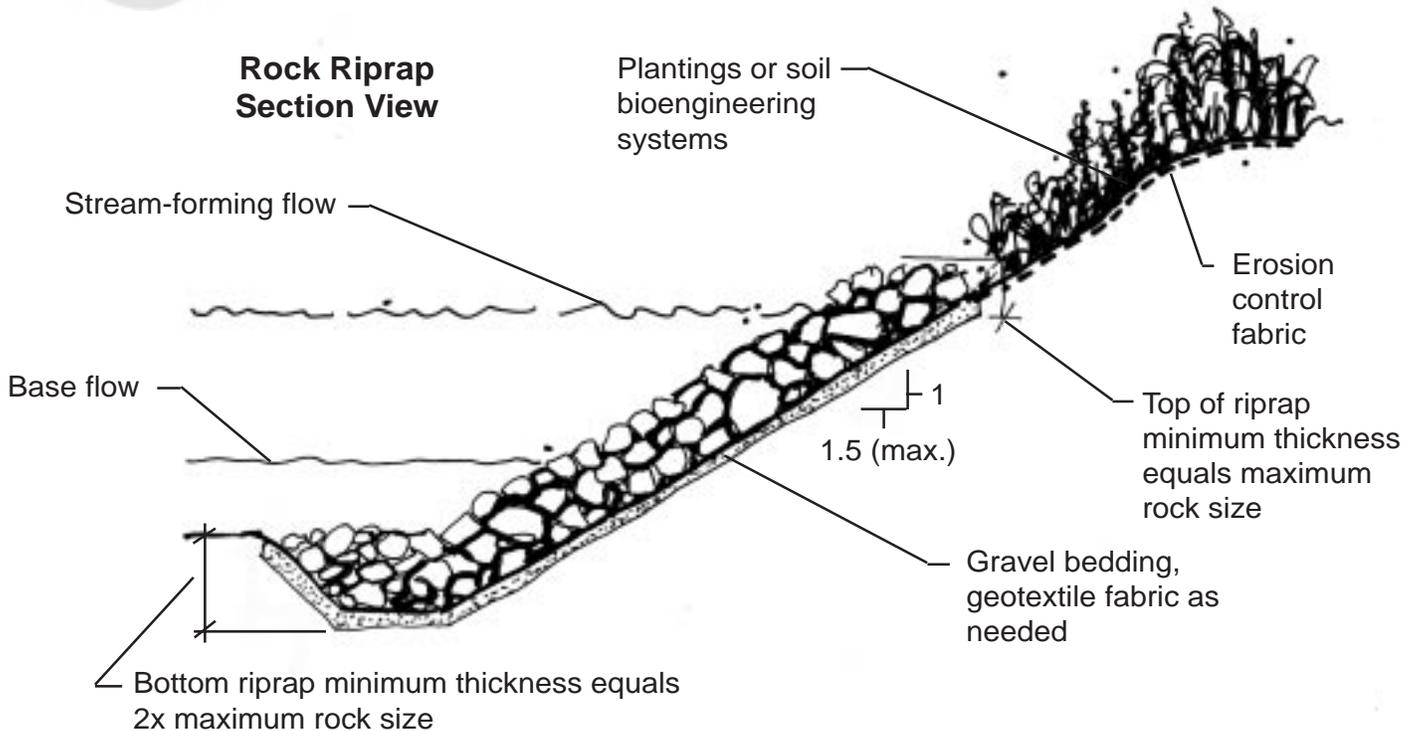
ADDITIONAL USES: Improve habitat for aquatic plants and animals, and contribute to food web dynamics.

ROCK RIPRAP

What is it? Riprap is a blanket of graded rock placed on a shaped streambank surface which provides structural slope protection so that erosion can be slowed or stopped. This will allow for the eventual recovery of natural vegetation.

Purpose

Riprap is a very durable treatment technique for banks that are exposed to high velocity conditions. It will last indefinitely if it is properly designed and installed on a streambank that is not expected to degrade. It can also be designed to self-adjust to eroding foundations which cannot be stabilized.



Limitations

Hydrologic and hydraulic analyses of the affected stream reach by an engineer are required. Heavy equipment is necessary for installation. The costs of quarrying, transporting, and placing the stone are typically very high.

Materials

Suitable pit run rock will be angular, dense, durable and sound ranging in diameter from 4-32 in (102-813 mm) with at least 50% being in the 6-24 in (152-610 mm) size range, a color which matches existing channel materials, and free of toxic substances. Filter material to protect against erosion of bank soil materials beneath the riprap is also required.

Installation

Minimize disturbance to the stream and adjoining areas by scheduling the work when it will interrupt aquatic plants and animals the least. Determine the size distribution, thickness and height of riprap that will be needed from standard methods for riprap protection. Determine if an underlying filter material will be needed. Arrange for integration of vegetation and soil bioengineering both in the rock riprap and upslope of it. Operate from top of bank wherever possible. Smooth the top to join with the existing bank. Install tiebacks into the streambank at the upstream and downstream ends.

Source: [Stream Corridor Restoration Handbook](#), USDA; [Engineering Field Handbook](#), NRCS.