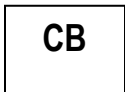


Sediment Control Practices	SMP-02 Rock Filters and Continuous Berms
-----------------------------------	---



Symbol



Description Filters, brush and berms are used to dissipate sediment in construction runoff by anchoring rock deposits, rolls of fabric and/or brush barriers. These barriers are constructed of rocks $\frac{3}{4}$ to 5 inches in diameter that make up a berm to be placed along a contour. Brush wrapped in filter cloth and anchored to the toe of the slope creates a brush barrier, which acts as another trapping method. Additionally, a continuous roll of fabric that captures sand, rock or native soil is an example of one more method to capture sediment. This BMP is used for sediment trapping and velocity reduction that will aid in significantly reducing sediment.

- Application**
- Rock filters should be applied near the toe of the slope, along the site perimeter, stream channels, spoil areas, small cleared areas, sediment traps
 - Rock filters may also be used as check dams with temporary roads

Design A filter berm can often be constructed from natural materials, such as brush or rocks. This is generally an efficient operation for the site contractor if these materials are already present on the project site, both timewise and in terms of installation cost. Brush and rock filter berms can also be installed with a geotextile fabric to increase sediment removal filtration and the overall stability of the berm. Wire netting (such as poultry fencing) can also be used to increase the stability for brush or rock berms. Gabions and other wire mattresses can also be used as a rock filter for erosion control.



Design (cont'd) Both types of filter berms are placed along a level contour. Common applications are along the edge of a gravel roadway or 5 to 7 feet beyond the toe of a slope, where overland sheet flow can be detained and ponded. They should not be used in ditches, channels, or streams unless they can withstand predicted flows. Brush or rock filter berms slow the velocity of overland runoff, allowing sediment to settle out or become trapped in the filter. In this manner, the brush and rock filter berms are very similar in function to SMP-01, Check Dams, except that filter berms handle overland sheet flow and check dams handle stormwater runoff channels.

Brush and rock filter berms both contain materials (dirt, leaves, dust, silt) which could potentially cause more pollution than they might remove. These measures should be constructed and managed carefully in order to become effective BMPs. A silt fence or straw bale barrier may be needed as a secondary measure to control dirt and leaves.

- Place filter on downhill edge of bare soil areas.
- Make sure the filter catches all the muddy runoff.
- Turn the ends of the barrier uphill to prevent bypasses
- The goal is to pond runoff, to filter and settle it out
- Install multiple sediment filters on long slopes
- Spacing on long slopes is every 50 to 100 feet
- **Brush Filter (F-B)**

A brush filter berm is composed of brush, small tree limbs, rootmat, grass and leaves, or other material which is commonly generated as waste during the clearing and grubbing stage. The brush filter berm is constructed by piling these materials into a continuous and compacted mound along a level contour which is downhill from a disturbed area. Large logs or tree stumps should generally be avoided as part of the brush filter berm; they cause large voids or gaps in the berm and so defeat the purpose of detaining stormwater. However, large logs by themselves can be used to slow stormwater runoff in wooded areas, along paths and trails, or at the bottom of slopes.

A brush filter berm height of approximately 2-5 feet is recommended to slow or detain stormwater. The minimum height of 2 feet may be used for short slopes less than 100 feet long. A corresponding width is generally 4 to 10 feet, with a shape that can either be triangular or somewhat rounded. Standard dozers or other grading equipment are used to compact and shape the brush filter berm to be more dense. Use rope or sturdy string to shape the brush filter berm and to hold it together.



**Design
(cont'd)**

A geotextile fabric can be used to increase the sediment retention or to provide a more stable brush filter berm. Install the filter fabric into a trench 6 inches deep immediately uphill from the formed berm. Then lay the filter fabric over the front face of the brush filter berm. Secure the filter fabric using staples, stakes, ropes or wires so that the fabric will not be uplifted by winds or storms. Overlap edges of filter fabric by 6 inches.

Brush filter berms are generally not used in developed areas or wherever aesthetics will be of concern. Brush filter berms may also be unpredictable in terms of performance. Since they are composed of natural materials, they may or may not need to be removed after the uphill sites are stabilized. Brush filter berms may provide a habitat for various types of desirable wildlife, or they could harbor pests and rodents in areas where these problems are known to exist.

➤ **Rock Filter (F-R)**

A rock filter berm can be created from natural gravel or rock at the project site, or from imported gravel and rock. It is placed and compacted along a level contour, where sheet flow may be detained and ponded to promote sedimentation. Some type of geotextile fabric or wire screen is recommended to keep the berm shape intact. A gabion or wire mattress may be used to construct a rock filter berm, provided that the gabion wire spacing is compatible with size of aggregate or rock.

Rock filter berms can be used along the downslope edge of roadways or 5 to 7 feet beyond the toe of a slope. Longer rock berms constructed as sheet runoff sediment barriers should be 18" to 30" in height and consist of stone 2-6 inches in diameter. Rock filter berms can also be incorporated as part of a gravel road and other type of unpaved traffic area, in order to prevent stormwater from flowing into paved roads.

Construct a rock filter berm by first placing larger rocks as a base. If available, smaller rocks or gravel are placed on the uphill side of the larger rocks to form a natural filter. Geotextile filter fabric can be underneath the rock filter berm itself, which would adequately anchor the fabric. For areas where concentrated flows may occur, use larger rock without any dust or fine material, placed in a gabion or other type of staked woven-wire mattress.

Maintenance

- Daily Inspection is required when installing in stream beds
- After each heavy rainfall inspect berms
- Maintain berms to guarantee proper utilization
- Inspect for sediment accumulation removing when depth reaches $\frac{1}{4}$ of berm height or 9 inches
- Look for signs of bypassing along the sides, undercutting below the barrier, overtopping, or blowout.
- Make required repairs immediately
- Remove berms upon completion of the project

Inspection

- Sufficient space for ponded water.
- Brush filters are performing.
- Drainage to structure does not exceed 5 acres.