BMP: Riprap RR

DESCRIPTION:

Riprap is a permanent, erosion-resistant protective layer made of loose stones. It is intended to protect soil from erosion in areas of concentrated runoff. Riprap may also be used to stabilize slopes that are unstable because of seepage problems.

APPLICATION:

- ► Riprap is normally used at locations where erosive forces from water flow exceed the ability of the soil or vegetative cover to resist those forces.
- ► Riprap can be used for pipe outlet protection, channel lining, scour protection, etc.
- ► Riprap is commonly used for wave protection on lakes.

INSTALLATION/APPLICATION CRITERIA:

- ► For slopes steeper than 2:1, consider using materials other than riprap for erosion protection.
- ► If riprap is being planned for the bottom of a permanently flowing channel, the bottom can be modified to enhance fish habitat. This can be done by constructing riffles and pools which simulate natural conditions.
- ► When working within flowing streams, measures should be taken to prevent excessive turbidity and erosion during construction. Bypassing base flows or temporarily blocking base flows are two possible methods. Work should be done during a period of low flow.

In designing riprap consider the following:

- ► Use durable rock, such as granite, and a variety of rock sizes.
- ► The thickness of riprap layers should be at least 1.25 times the max. stone diameter.
- ► Filter material is usually required between riprap and the underlying soil surface.

LIMITATIONS:

- ► Riprap may be unstable on very steep slopes.
- ► The placement of a riprap in streams requires a state stream alteration permit.

MAINTENANCE:

- ► Riprap should be inspected annually and after major storms.
- ► If riprap has been damaged, repairs should be made promptly to prevent a progressive failure.
- ► If repairs are needed repeatedly at one location, the site should be evaluated to see if original design conditions have changed.

CONSIDERATIONS

- ☒ Soils
- ☒ Area Required
- ☒ Slope
- ☐ Water Availability
- ☒ Aesthetics
- ☐ Hydraulic Head
- ☒ Environmental Side Effects

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TARGETED POLLUTANTS

- ☒ Sediment
- ☐ Nutrients
- ☐ Heavy Metals
- ☐ Toxic Materials
- ☐ Oxygen Demanding Substance
- ☐ Oil & Grease
- ☐ Floatable Materials
- ☐ Bacteria & Viruses

- ■ High Impact
- ☒ Medium Impact
- ☐ Low or Unknown Impact

IMPLEMENTATION REQUIREMENTS

- ☒ Capital Costs
- ☒ O&M Costs
- ☒ Maintenance
- ☐ Training

- ■ High
- ☒ Medium
- ☐ Low