



Open-top Culverts and Rock Aprons

Controlling water runoff

Lake friendly living
means using lakeshore
BEST MANAGEMENT
PRACTICES

BMP

Open-top Culverts

STANDARDS

Driveway

- No erosion
- Runoff channeled away from the lake

LAKE BENEFITS

Open-top culverts and rock aprons reduce erosion of the road surface, preventing nutrients and sediment entering the lake.

MATERIALS

Culvert

- 2" x 6" pressure treated lumber for the sides (twice the total length as that for the bottom)
- 2" x 8" pressure treated lumber for the bottom
- Galvanized nails (approximately 3") to secure the base to the sides of the structure
- Spacers to maintain the structure of the culvert (spikes, washers/bolts/nuts, pipe, or 1" pieces of wood and galvanized nails)

Rock Apron

3"-16" rock

Open-top Culvert

Description: Open-top culverts are inexpensive to build and relatively easy to install. They can be built from lumber with common hand tools. They can also be used on seasonal camp roads and driveways that receive little or no winter plowing.

Purpose: Open-top culverts collect and divert water off a camp road or driveway and discharge it to a vegetated swale or other stable area. By getting stormwater off the road, open-top culverts reduce erosion of the road surface, while allowing easy movement of vehicles across the structure in addition to keeping dirty runoff from the lake.

How to: Open-top culverts can be constructed of pressure treated lumber or cedar timbers. Using pressure treated lumber will considerably extend the life of the structure. Spacers placed in the open-top culverts will hold the shape of the culvert and strengthen the structure.

Open-top culverts will vary in length, depending on the width of your road. When sizing an open-top culvert, remember that it should be installed at an approximate 30° angle down slope. Take this added length into consideration when purchasing materials.

Install the culvert flush with the surface of the road. If placed too high, stormwater will not enter the structure; if placed too low, it may quickly fill with road material and sediment loosened during installation. The outlet of the open-top culvert should extend beyond the edge of the road. Remove any plowing berms or other debris that could interfere with water flowing from the outlet. Diverted water

should flow into a stable area away from the road or open water to allow for infiltration. A stone-lined outlet or vegetated area is an acceptable way of reducing erosion at the culvert outlet.

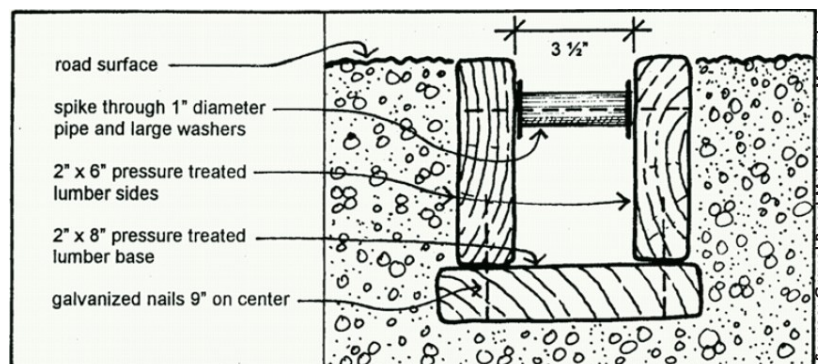
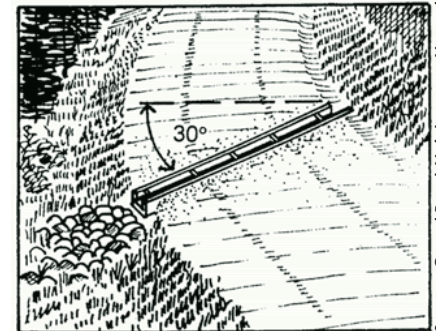


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Source: Gravel Road Maintenance Manual

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Maintenance: Open-top culverts need to be cleaned regularly to remove sediments, gravel, leaves, and twigs. Check after storm events for accumulated sediment. A child's toy hoe fits easily into the culvert and can be used for cleaning.

Open-top culverts are not generally recommended for camp roads that get plowed in the winter. Winter snowplowing can easily destroy this type of culvert and result in even greater erosion problems in the spring. However, some people have had success with open-top culverts if the road is not plowed until the ground is frozen and have an attentive plow driver. If you choose to plow a road with an open-top culvert, you may want to flag both ends of the culvert to alert the snow plow drivers.

Rock Apron

Description: An area lined with riprap used to discharge water from culverts or ditches to existing ground. (Basically, a shallow, small, rock lined settling pond)

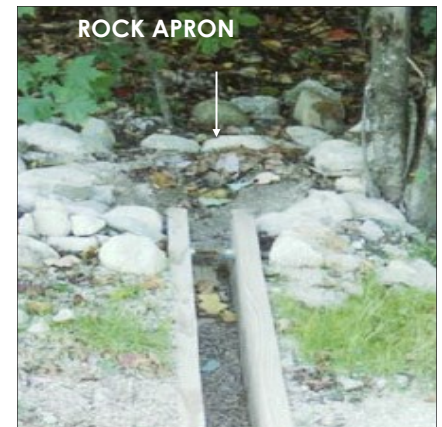
Purpose: To protect the outlet area of a waterbar or culvert from erosion. Rock aprons reduce the water velocity, preventing channelized flow and promoting sheet flow.

Application & Installation:

- Use only where there is an adequate vegetative filter strip to capture the runoff once it leaves the apron area.
- Discharging of a culvert down a steep slope (especially with fill) will require a conveyance channel (rock lined pathway) before the water reaches the rock apron.
- Size and placement of riprap in the apron is dependent upon the diameter of the culvert as well as on expected water flow through it.



Source: Maine DEP



ROCK APRON

