

Runoff Reduction Plan

Long Lake

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This runoff reduction plan includes instructions for installing rock infiltration to capture runoff water from the roof/west side of the cabin.

Design Calculations¹:

Cabin roof ($216\text{ft}^2 + 162\text{ft}^2 = 378\text{ft}^2$)

Runoff volume with 1 inch rain: 31.5ft^3

Rock volume needed: 78.75ft^3

The soil profile from the soil map indicates that a depth of 4.5 feet would be appropriate for the rock pit to reach sand and gravel for better infiltration. The pit should be located below the lowest downspout – perhaps where the wood pile is currently located.

Since there is a slope in this area (about 25%), and the bottom of the pit should be flat, the uphill side will need to be excavated to about 5.5 feet deep.



Approximate Rock Infiltration Location

A 4 foot deep pit (rock volume) would need a surface area of 20ft^2 , so it might be 4ft X 5 ft. To minimize the difference in excavated depth, the narrower dimension would be placed parallel to the lot line as shown. (You could also use a 3 X 7 for less change in elevation and a bit more capacity.)

Quantities Rock Infiltration #1

$\frac{3}{4}$ " – 2" clean sewer rock: 3.4 yards

Topsoil: 1/2 yard

Filter fabric: 110+ ft^2 (approx.)

(6' width X 20' to allow for overlap and some extra)

4" inlet PVC pipe: 20 feet? (depends upon location selected)

4" outlet PVC pipe: 5 feet

Downspout collection box

Outlet pipe screen

Shady grass seed

Straw blanket, Silt fence

¹ Program standards allow for installation of an infiltration system to capture a 1-2" rain event, depending upon space available and desired budget.

Utility lines were marked and found to be clear of the proposed construction area. However, private lines may not be captured with this marking.

A permit will likely be required from the Polk County zoning office for the rock infiltration.

Silt fence must be in place below excavation area before project begins.

Any changes to this project would need to be approved by Harmony Environmental on behalf of the Long Lake Protection and Rehabilitation District.

Instructions:

1. Dig a pit of the specified size as shown on site diagram. The bottom of the pit should be flat. Extra rock volume is need because of the slope.
2. Install a collection box that will serve as a sump to screen and collect debris from the downpout. The collection box will also provide a separation to prevent freezing up the downpout. (See illustrations on following page)
3. Connect the pipe from the box to the pit. The pipe will enter near the top of the rock on the uphill side of the pit, so the top of the pipe will begin about 8 inches below the surface (underneath the filter fabric). Solid PVC is preferred to the corrugated HDPE pipe shown in the illustration.
4. Construct an outlet for the rock chamber with a 4" PVC pipe installed on the downhill side of the rock chamber. The PVC pipe will outlet at the surface of the slope in a well-vegetated area. A screen is installed on the end of the outflow pipe to prevent animals from entering it.
5. Line the sides only of the pit with filter fabric allowing for pipe to enter and exit the rock chamber of the pit. NOTE THE BOTTOM OF THE PIT IS NOT LINED TO PREVENT CLOGGING OF THE FILTER FABRIC.
6. Fill the pit with clean, $\frac{3}{4}$ to 2 inch washed rock, stopping approximately 6 inches from the top.
7. Add a horizontal layer of filter fabric on top of the rock.
8. Cover the filter fabric with topsoil to the surface.
9. Plant grass seed and cover with erosion control fabric.



Installed collection box

