



Check Dams

Check dams are low barriers within a drainage ditch, enhanced swale, or berm and swale complex. These dams sit perpendicular to the flow of water, with the intention of backing water up, to allow for infiltration and sediment removal. Check dams retain some porosity allowing for water to leak through the stones and vegetation.

THINGS TO CONSIDER

- Slope of property and stormwater features
- Do not design within 10 feet of foundation
- Do not back water up against buildings or foundations
- Be creative

Typically check dams are constructed of rock with mixed vegetation to enhance stabilization and filtration. Check dams are designed primarily to provide erosion control, sediment control and remove suspended solids from runoff. Secondarily, they can provide a small amount of pollution removal.



<http://www.lakesuperiorstreams.org/stormwater/toolkit/images/checkDams.jpg>

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Check Dam Design



Check Dams are used to attenuate flow within a area of concentrated flow, such as an enhanced swale or a berm and swale complex. Often in this area, we have land that slopes steeply enough to create erosive velocities in concentrated flow, like in our swales. Check Dams can be used to extend the use of swales to areas with greater than a 4% slope, but should not be used without professional consulting in areas with slopes greater than 8%.

Advantages:

- Extends use of swales past 4% slope.
- Relatively inexpensive and easy to construct
- Reduces sedimentation
- Can be more easily used higher in the watershed

Disadvantages:

- Maximum slope of swale with a check dam is 8% without professional assistance.
- Moderate maintenance needed
- Can be breeched when flow volumes and/ or velocities are high during certain storm events

Design Considerations:

- Using an erosion control blanket will help stabilize a new check dam. This material will eventually biodegrade.
- Using in a swale with a slope greater than 6%, you will need to flatten the slope above the check dam to provide enough ponding space during rain events.
- Rocks are the typical material for permanent check dams, although there is a multitude of materials such as corb fiber logs available from companies specializing in erosion and sediment control management.
- A mixture of rock sizes is preferable. Size of rock will depend on the slope of the drainage and drainage area.
- Locate in generally straight areas of the drainage, and space as suggested above based on slope of drainage and modify based on height of check dam.
- Check dams should occur within the limits of the drainage, but can be used as secondary crossings if necessary, although additional drainage might be needed.
- Planting around the edges assists in the long term stabilization.



Check Dam Implementation



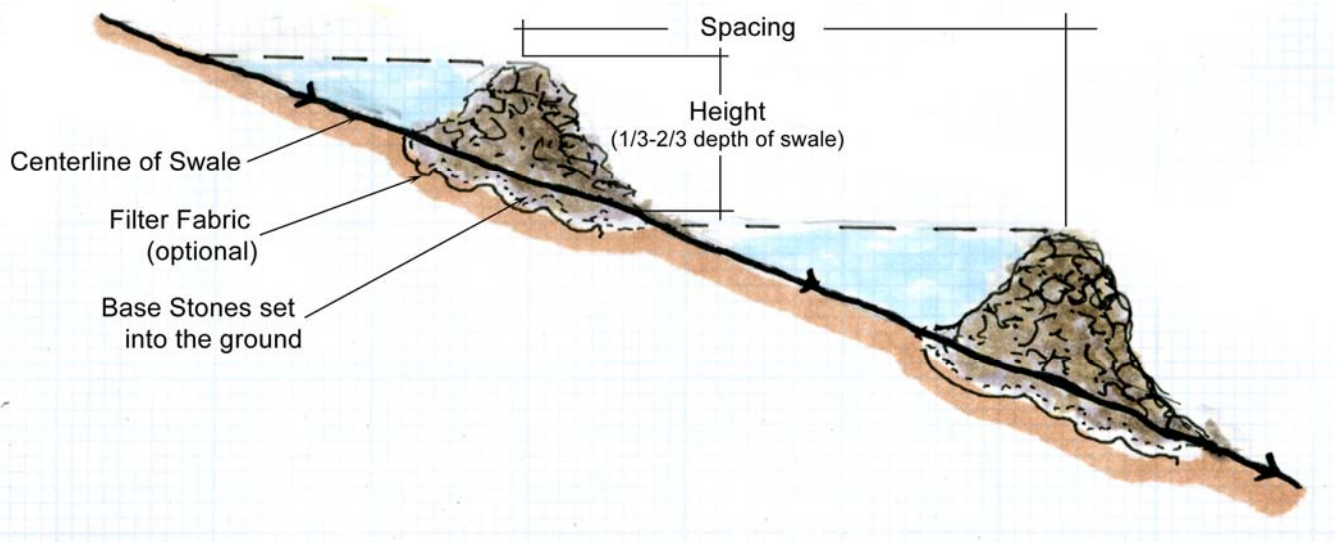
Designing:

1. Begin by reviewing your overall site analysis to determine, based on the design considerations, advantages and disadvantages to locations of the check dams.
2. Determine spacing and sizing on the slope of the drainage and height of the check dam.
3. In selecting stones for the check dam, the size of the stones will need to increase as the volume of water and slope increase and soils stability decreases. The largest stones should be used as the base rocks.
4. Excavate a trench into the banks and bed of the swale in order to anchor the base rocks. The trench should be dug both in the bed of the drainage and in the stabilized side slopes of the swale. Optional: Place geotextile-fabric in the trench to help stabilize the check dam against large storm events.
5. Place heavier stones in the base and on the downstream side of the check dam.
6. Secure the base stones firmly in position.

Slope of Drainage %	Spacing ft.
1	200
2	100
4	50
6	33
8	25

MATERIALS

- Site Analysis
- Site Map
- Site Plan Schematic
- Calculator
- A-frame Level
- Flagging or Marking materials
- Stone
- Wheelbarrow
- Shovel
- Hard Rake
- Mattock
- Plants—Vegetation
- Filter fabric (optional)
- Corb fiber matting (optional)



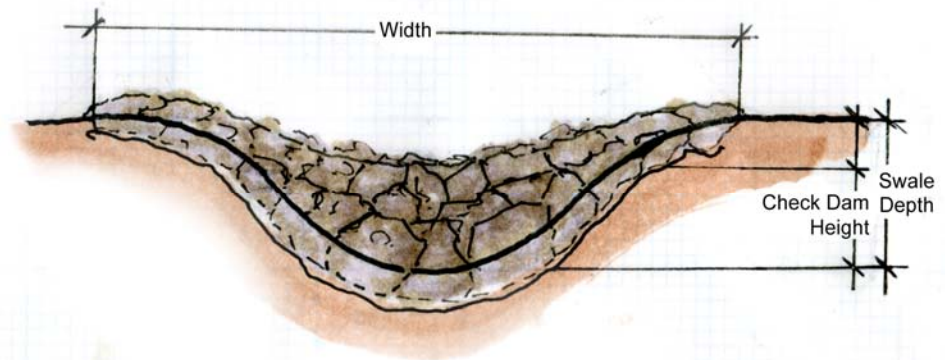


Check Dam Implementation



Designing:

7. Place smaller stones around the larger stones as their weight and placement help these be stable and secure as possible. The slope of the upstream and downstream faces of the check dam are determined by the angle repose. This is the ability for the stones to stay securely in place base



on their, size, shape and weight. The upstream face should be more gradual (approximately 66% or 1.5-2:1) than the downstream face.

8. The top of the check dam should be concave, as the height should be no more than 1/2-1/3 of the swale depth.

Regulations:

- Check dams can only be placed in drainage ditches, swales or berms and swale complexes.
- Any drainage starting above your property could be a stream managed by the Army Corps of Engineers (ACOE). Construction within the stream requires a permit for the ACOE.
- These streams are typically shown as blue lines on the USGS map, yet this varies in different states and municipalities.

Maintenance:

1. Keep free of weeds
2. Inspect for damage after storm events, specifically moderate to large storm events
3. Remove sediment collected within the pools on the upstream side of the check dam, as needed.
4. Add or remove rock as needed to maintain stability.
5. Maintain plantings