Installing Sediment Traps and Basins

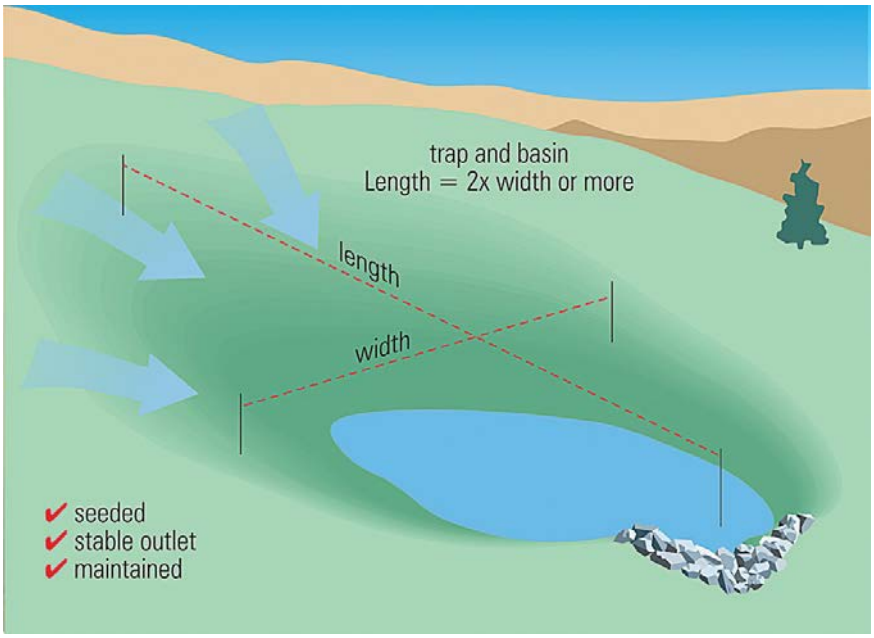
The purpose of a trap or basin is to provide an area where muddy runoff is allowed to pool, so sediment will settle out. Sediment traps and basins are installed in natural drainage areas before excavation or fill work begins. **Do not depend on sediment traps and basins alone to control sediment loss from your construction site.** Other uphill controls on bare areas, slopes, and in ditches and channels are needed to prevent overloading traps and basins.

Containment for the pooling area can be an excavated hole or a dike made of earth or stone. Straw bales and silt fencing are not approved use as containment for concentrated runoff flows.

Locations for traps and basins

Low-lying sites on the downhill side of bare soil areas where flows converge are ideal places to install temporary sediment traps and basins. In general, sediment traps are designed to treat runoff from about 1 to 5 acres. Sediment basins are larger and serve areas of about 5 to 10 acres. Basins draining areas larger than 10 acres require engineered design, and often function as permanent storm water treatment ponds after construction is complete.

Do not put sediment traps or basins in or next to flowing streams or other waterways. Make sure pooled water does not flood buildings, roadways, or other structures.



Sediment traps

Any depression, swale or low-lying place that receives muddy flows from exposed soil areas can serve as a sediment trap. Installing several small traps at strategic locations is often better than building one large basin. The simplest approach is to dig a hole or build a dike (berm) of earth or stone where concentrated flows are present. This will help to detain runoff so sediment can settle out. The outlet can be a rock-lined depression in the containment berm.

Sediment basins

Sediment basins are somewhat larger than traps, but the construction approach is the same. Sediment basins usually have more spillway protection due to their larger flows. Most have risers and outlet pipes rather than rock spillways to handle the larger flows.

Sediment basins are often designed to serve later as stormwater treatment ponds. If this is the case, agreements are required for long-term sediment removal and general maintenance. Construction of a permanent, stable outlet is key to long-term performance.

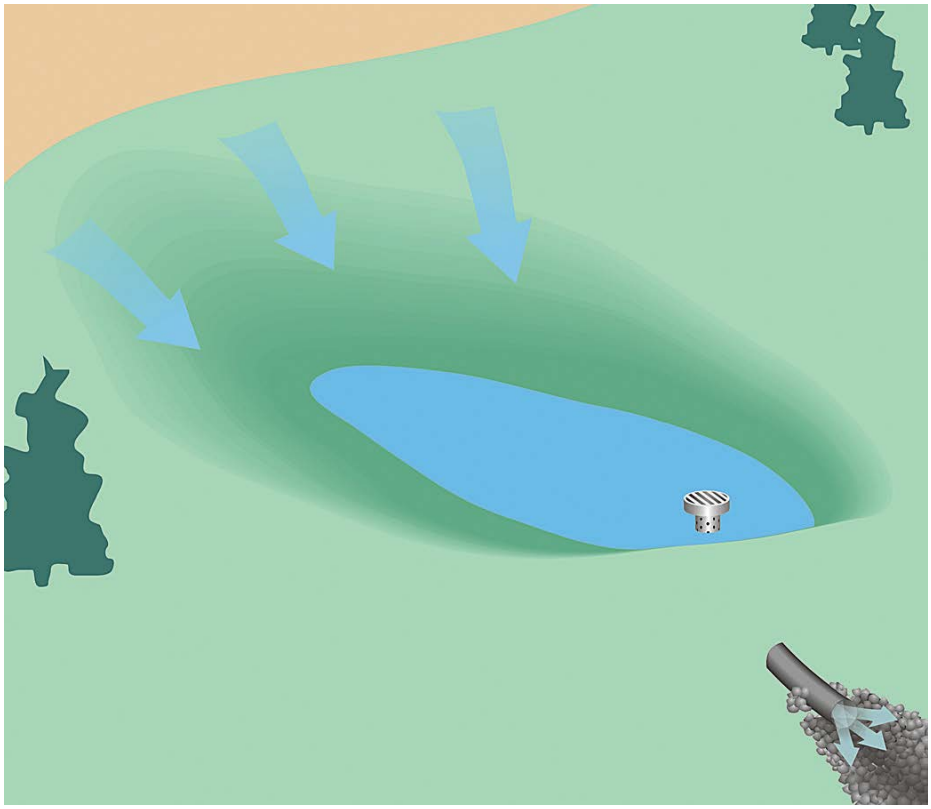
Sizing and design considerations

A minimum storage volume of 134 cubic yards per acre of exposed soil drained is required for basins and traps. Traps and basins are designed so that flow paths through the trap or basin are as long as possible, to promote greater settling of soil particles. Sediment basin length must be twice the width or more if possible – the longer the flow path through the basin, the better.

Side slopes for the excavation or earthen containment berms are 2:1 or flatter. Berms are made of well-compacted clayey soil, with a height of 5 feet or less. Well mixed rock can also be used as a containment berm for traps. Place soil fill for the berm or dam in 6” layers and

compact. The entire trap or basin, including ponding area, berms, outlet and discharge area, must be seeded and mulched immediately after construction (see Using Silt Fence and Other Sediment Filters).

An overflow outlet can be made by making a notch in the containment berm and lining it with rock. Rock in the notch must be large enough to handle overflows, and the downhill outlet should be stabilized with rock or other flow dissipaters similar to a culvert outlet. Overflow should be at an elevation so dam will not overtop. Allow at least one foot of freeboard. Outlets must be designed to promote sheet flow of discharges onto vegetated areas if possible. If the discharge will enter a ditch or channel, make sure it is stabilized with vegetation or lined (see Stabilizing Drainage Ditches).



Sediment basins often have pipe risers, but well-constructed rock overflow outlet notches in the dam or retaining berm are acceptable if the overflow area is protected from erosion.

If used, outlet risers and discharge pipes must be 12 inches diameter or larger. Corrugated metal pip works best for risers. Plastic or other pipe can also be used for temporary applications. Risers should be topped with trash racks and anti-vortex baffles and have ½-inch holes every 3 to 6 inches. Large holes or slots, if used, should not appear in the lower two-thirds of the riser. Risers should be anchored to a concrete base and should be bedded in a pile of 1- to 5-inch rock to a height of at least 2 to 3 feet to promote sediment filtration during draindown. Riser tops must be at least 2 feet below the top of the containment berm or dike. If risers or outlet pipes that do not comply with these design criteria are used for temporary applications, inflows must pass through a filter made of mixed rock piled around the pipe. Rock should be removed after upland area is well vegetated.

Skimmers may also be installed in basins to intake water after sedimentation allowing cleaner water to enter the local stream. They may also be used to reduce the amount of built-up sediment and the maintenance post-construction.

Inspection and maintenance

Inspect inlets, berms, spillway and outlet area for erosion after each rain exceeding 0.5 inch. Repair gullied areas and any upslope areas contributing large volumes of sediment. Clean trash and plugged areas from the riser pipe. Repair and reseed bare areas. Ensure that downstream receiving area is stable. Remove sediment before it fills half the trap or basin volume.

	Good sediment pond with overflow. Note the two silt fences below overflow and above the stabilized drainage ditch.
	Fair installation of two traps above small pond. Dikes are a little too small; placement is too close to pond. Area needs seed and mulch.

	Fair sediment trap construction. Rock dike is undersized and lacks a defined overflow notch. Poor maintenance attention. Silt fence beyond rock dike is not needed—silt fence should not be used across flow channels.
	Good sediment trap installation, but poor maintenance has caused trap to fill and bypass to occur. Remove sediment before trap is half full. Make sure containment dike has an overflow notch to control the discharge location.
	Fair to poor trap installation. Dike overflow notch is too deep; basin is too small. No seed or mulch covering bare soil areas.

	Poor sediment trap construction. Dike is poorly built, without an overflow notch. Placement is too close to pond. No seeding or mulching evident in drainage area.
	Good design of sediment basin, but the improper placement of check dams is causing water to bypass the dams. Additionally, the lack of seeding has created gullies and sediment is rapidly filling the basin.

Resources

EPA Sediment Basins and Rock Dams

EPA Sediment Traps

EPA Sediment Filters and Sediment Chambers

Minnesota Stormwater Manual - Sediment Traps and Basins

Warren County, Ohio SWCD - Skimmers