

3.17 SEDIMENT BASIN

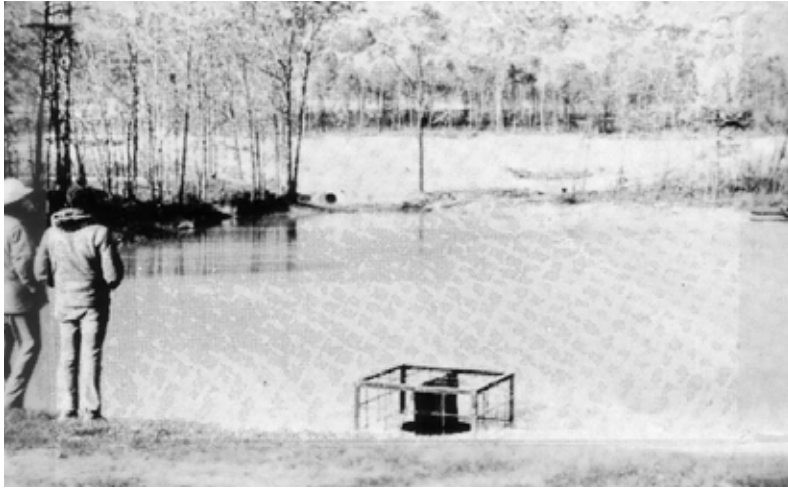


Figure 3.30. Sediment basin (Source: Department of Civil, Construction, and Environmental Engineering, Iowa State University)

Overview

Description: A basin created by building a dam across a waterway, excavating a basin, or a combination of both. A sediment basin usually consists of a dam, a pipe outlet, and an emergency spillway. Sediment basins are much larger than sediment traps, serving drainage areas up to 100 acres.

Problem identification: All surface water runoff from a construction site should have all sediment removed before the water exits the construction site.

Design purpose: To collect runoff in a manner that will allow the sediment to drop to the bottom of the containment device and clear water to exit the site.

Associated practices: A sediment basin is appropriate in critical areas where physical site conditions, construction schedules, or other restrictions prevent the installation of other erosion control measures that would adequately control runoff, erosion, and sedimentation.

Installation: The sediment basin should be located to allow maximum storage for the site, ease of cleanout, and disposal of the trapped sediment. The basin should be located where it will minimize interference with construction activities. When possible, the basin should be located so that storm drains can be diverted into the basin. Basins should be built in existing drainage ditches and constructed before grading begins.

The size of the sediment basin, as measured from the bottom of the basin to the principal spillway, should provide at least 3,600 cu ft of storage per acre of drainage. This provides storage equal to 1 in. of runoff per acre. Likewise, 1,800 cu ft amounts to 1/2 in. of sediment per acre. The basin should be cleaned when the volume of sediment reaches 900 cu ft per acre. At this time, the cleanout shall be performed to restore the original design capacity of the basin. At no time should the sediment level be permitted to build higher than 1 ft below the principal outlet.

The length of a sediment basin should be more than twice the width of the basin. The length is considered to be the distance between the inlet and the outlet.

The principal outlet should consist of a vertical pipe or box-type riser connected to a pipe that extends through the embankment and outlets beyond the downstream toe of the fill. The minimum capacity of the outlet pipe should be 0.2 cfs per acre of drainage area.

It is recommended that a qualified professional designs the sediment basin.

The next installation regulations should be followed:

1. Drainage area to the basin is 10 acres or less.
2. An emergency outlet is required.
3. One anti-seep collar shall be used and placed 25 ft from the riser.
4. Watertight bands should be used.
5. All pipe material should be good quality with no holes.
6. Volume of storage computed as 3,600 cu ft. per acre of drainage area.

Maintenance/inspection: Inspect daily for damage caused by rodents or soil erosion. The basin should be maintained until the disturbed areas are protected against erosion by permanent stabilization. The sediment shall be removed when it reaches the cleanout level. The sediment shall be spread on the construction site in such a location that it does not reenter the sediment basin.

When the structure has served its intended purpose and the contributing drainage has been stabilized, the embankment and sediment deposits should be disposed of in an approved method, and the area should be seeded.

Design Life: Eighteen months; can be converted to permanent.

Estimated Cost: Costs vary with size of the basin and size of dam construction.