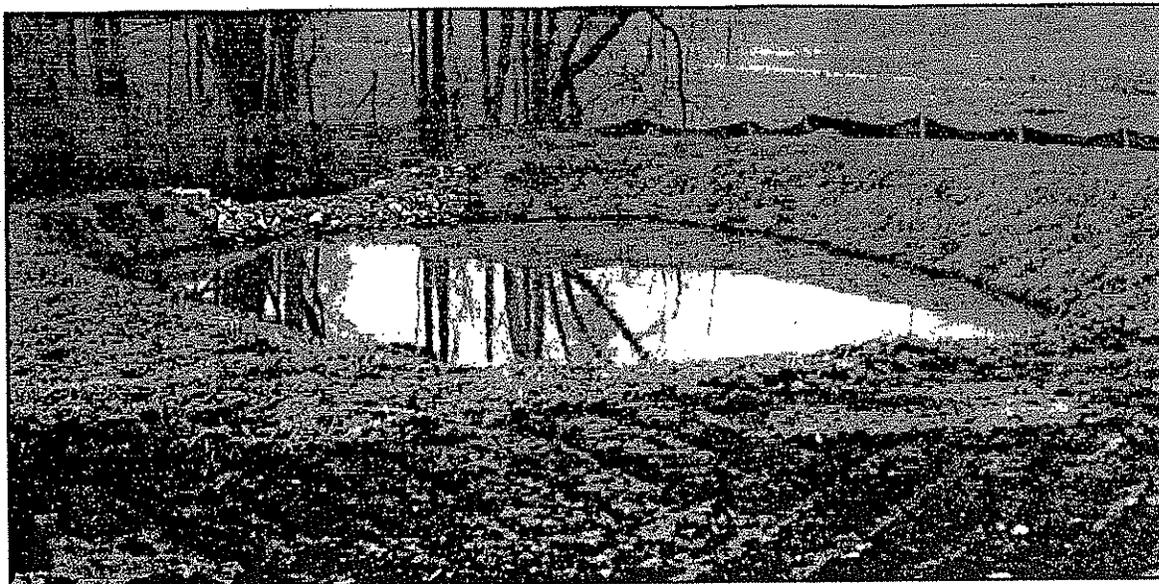


ATTACHMENT D

SEDIMENT TRAP



DESCRIPTION

Sediment traps are temporary settling ponds having a simple spillway outlet structure stabilized with geotextile and riprap.

CONDITIONS WHERE PRACTICE APPLIES

Sediment traps are used where the total contributing drainage area is less than 10 ac. If, however, a sediment trap does not have a dam, but its volume is achieved entirely through excavation, a larger drainage area may be allowed without compromising the stability of the sediment trap. (Also see Specifications for Sediment Basins.)

PLANNING CONSIDERATIONS

Sediment traps are one of the most useful and cost-effective measures for treating sediment-laden runoff. Sediment traps usually are placed near the edge of construction-sites, out of the way of most construction activity. They have relatively good sediment-trapping efficiencies (50-80%) and require little maintenance compared to other practices used to treat sediment-laden runoff.

Timing--Sediment traps, along with other sediment-control practices, must be constructed as a first step in any land-disturbing activity. They must be functional before upslope land disturbance takes place.

Location:

Construction Phases--Sediment traps should be placed so they function through all phases of the site's development, both before and after new drainage systems are constructed.

Diverting Runoff--Temporary diversions at the perimeter of sites often are used to direct runoff to sediment traps (see Temporary Diversion Specifications).

Below Storm Drains--Sediment traps may be placed in drainageways or beyond the ends of proposed storm-sewer systems.

Storm-Sewer Diversions--Storm drains may also be temporarily redirected through sediment traps during construction. After construction, the detours are removed and runoff is allowed to flow through the permanent storm drain as originally intended.

Utilities--Give special consideration to sediment trap location and possible interference with construction of proposed drainageways, utilities and storm drains.

DESIGN CRITERIA

Sediment Trap Size--The volume of a sediment trap must be 67 cy/ac. of total contributing drainage area. The volume must be measured from below the crest elevation of the outlet. The total volume of the ponding area may be achieved by a combination of excavating and/or a compacted embankment.

Embankment--Embankments for sediment traps must not exceed 5 ft. in height. The top width of embankments must be at least 4-ft.-wide and side slopes 2:1 or flatter. The embankment must be compacted by traversing with heavy equipment while it is being constructed.

Excavation--Excavated side slopes must not exceed 2:1 unless a safety fence is constructed around the ponding area. When filled with muddy water, an excavated pond's depth is often unpredictable and deep; consequently, a safety fence is recommended during construction on all temporary ponds where excavation is used to achieve storage requirements.

Shape--It is recommended that the designer of a sediment trap strive to incorporate the following features to increase sediment-trapping efficiencies:

- Length-to-width ratio greater than 2:1, where length is the distance between the inlet and outlet,
- A wedge shape with the inlet located at the narrow end,
- Shallow depth and maximum surface area.

Outlet Width:

Sediment Trap Outlet Sizing	
Drainage Area (ac.)	Spillway Width (ft.)
< 2	4
2 - 5	8
5 - 10	12

The sediment trap's embankment must be at least 1.5 ft. above the outlet crest.

Temporary Storm-Drain Diversion--To redirect a storm drain so that it may temporarily discharge into a sediment trap, an "in-line" diversion at an inlet or manhole may be used. This is achieved by installing a pipe stub in the side of a manhole or inlet and temporarily blocking the permanent outfall pipe from that structure. A temporary outfall ditch or pipe may be used to convey storm flow from the stub to a sediment trap or basin. This method may be used just above a permanent outfall or prior to connecting into an existing storm drain system.

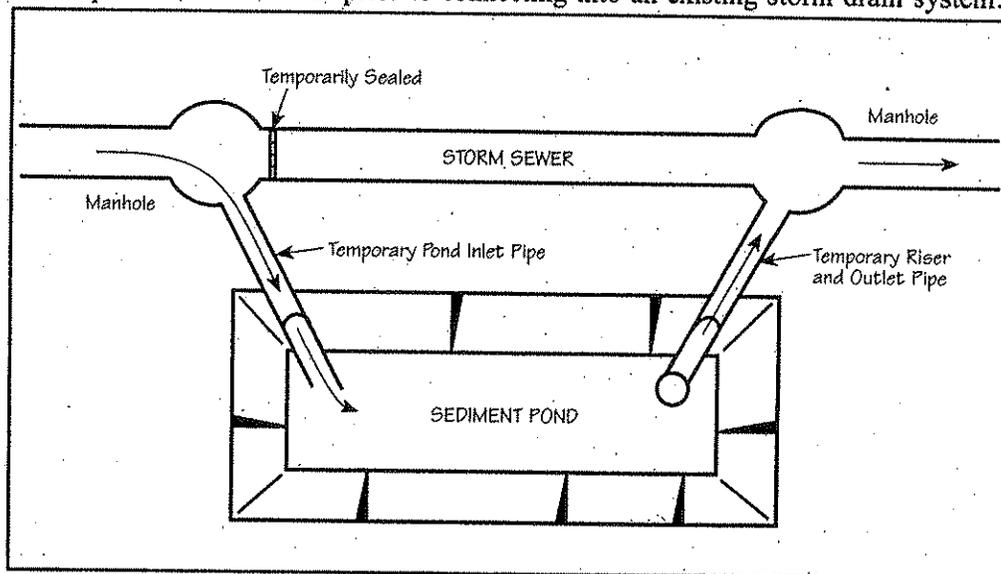


Figure 4-4 Storm drain diversion routing runoff through sediment pond

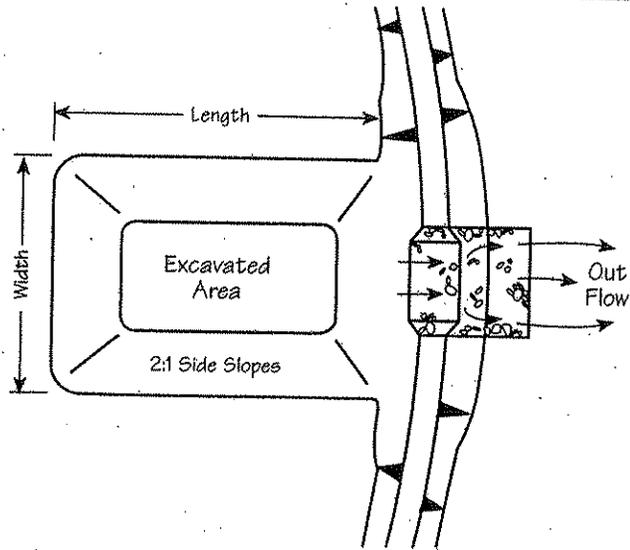
Another option is to delay completion of the permanent storm drain outfall and temporarily divert storm flow into a sediment trap. The trap should be constructed to one side of the proposed permanent storm drain where possible.

Types of Sediment Traps--There are a variety of sediment trap designs. Generally any pond with sufficient storage volume and detention time can be an acceptable sediment trap providing it has a stable outlet structure. One of the most reliable types of outlets is a simple spillway outlet stabilized with geotextile and riprap. Another common design is an excavated sediment trap where the entire required storage volume is achieved by excavation, water is released by simply overflowing to the surrounding ground. If an excavated sediment trap's stability can be demonstrated to the plan approving authority, there is no limit to the size of contributing drainage area.

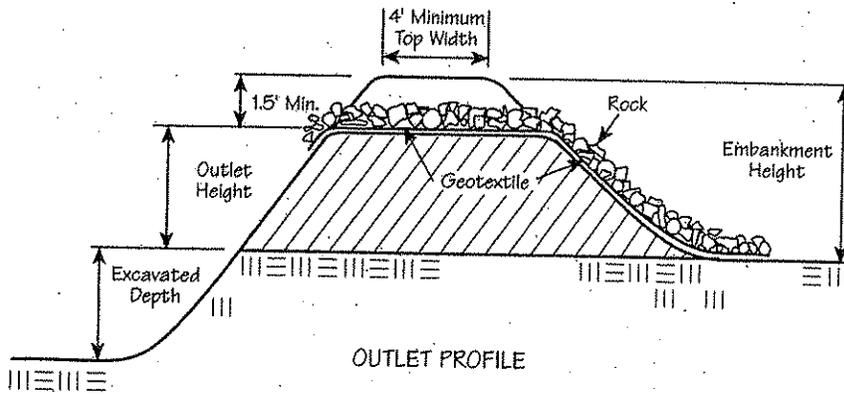
Dewatering Sediment Traps--The standard sediment trap design may be modified to allow partial dewatering between rainfall events. However, designs must not allow rapid dewatering which can severely limit trapping efficiency. Drawdown should take at least 24 hr.

Maintenance--To maintain adequate detention volume and settling efficiency, sediment traps will likely require sediment cleanout one or more times during construction. Sediment cleanout should prevent sediment from ever occupying more than 40% of the pond's volume. Due to the pond's sloping sides, 40% of the pond's volume can be conservatively estimated as one-half the pond's total depth. When sediment is removed, the sediment trap should be restored to its original dimensions. Removed sediment must be deposited in a suitable area and in such a manner that it will not erode.

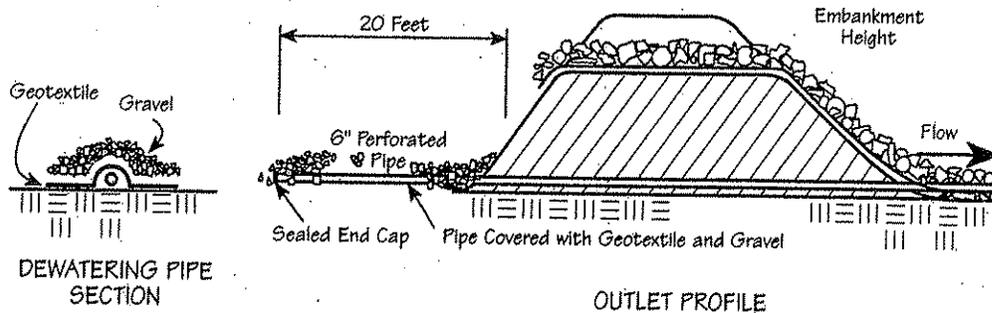
Specifications for Sediment Traps



PLAN VIEW



OUTLET PROFILE



Specifications
for
Sediment Traps

1. Sediment traps shall be constructed and operational before upslope land disturbance begins.
2. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. The pool area shall be cleared as needed to facilitate sediment cleanout.
3. Fill material used for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed. Maximum height of the embankment shall be 5 ft. as measured from the surrounding ground.
4. Cut-and-fill slopes shall be 2:1 or flatter.
5. Dikes directing water to the trap shall be higher than the height of the embankment.
6. Temporary seeding shall be established on all nonsubmerged areas of the sediment trap.
7. The storage volume shall be achieved to the dimensions shown in the plans to achieve 67 cy of storage volume below the crest of the outlet for every acre of contributing drainage area.
8. The outlet spillway shall be constructed to the dimensions shown in the plans.
9. Geotextile shall be placed over the bottom and slopes of the outlet spillway. Geotextile shall continue downstream of the embankment to form an apron on the surrounding ground. To prevent runoff from flowing under the geotextile, the sections placed nearest the front shall overlap following sections. Sections of geotextile shall overlap at least 2 ft.
10. Rock used in the outlet spillway shall be placed 1 ft. thick on the geotextile. The rock shall be between Type C and Type D rock where D_{50} is about 8 in.
11. Sediment shall be removed and the sediment trap restored to its original dimensions when the sediment has filled one-half the pond's original depth. Removed sediment shall be spread in a suitable area and stabilized so it will not erode.
12. The structure and accumulated sediment shall be permanently stabilized when the drainage area has been stabilized.