STANDARD FOR DEWATERING

Definition

The removal and discharge of sediment-laden water from an excavated area, construction site or sediment basin.

Purpose

To properly remove suspended sediments and water from excavated areas through filtration and/or settlement prior to discharging water to a receiving water course or body.

Conditions Where Practice Applies

During construction excavated facilities need to be dewatered to facilitate or complete the construction process. The water pumped out of the excavated areas contain sediments that must be removed prior to discharging to receiving bodies of water. This standard does not address the removal of ground water through well points etc.
This standard describes the following practices for the removal of sediment laden waters from excavation areas: removable pumping stations, sump pits, portable sedimentation tanks and silt control bags.

Water Quality Enhancement

Water discharged from excavated areas on construction sites may be a significant contributor of sediment to surface waters during construction. Water must be removed and disposed of in order for construction to move forward. Typically, water is pumped or containment berms are breached and sediment laden waters are permitted to flow uncontrolled into surface waters such as streams or lakes. By employing practices described in this standard, the majority of sediment suspended in waters may easily be removed prior to leaving the site. Filters and materials described herein are readily available and are easy to install and maintain.

Design Criteria

1. Removable Pumping Stations are used when long durations of pumping are required. The number of removable stations and their locations shall be shown on the plans and shall conform to detail 14-1. Water pumped from the station shall be discharged into a sediment basin or suitable filter area.

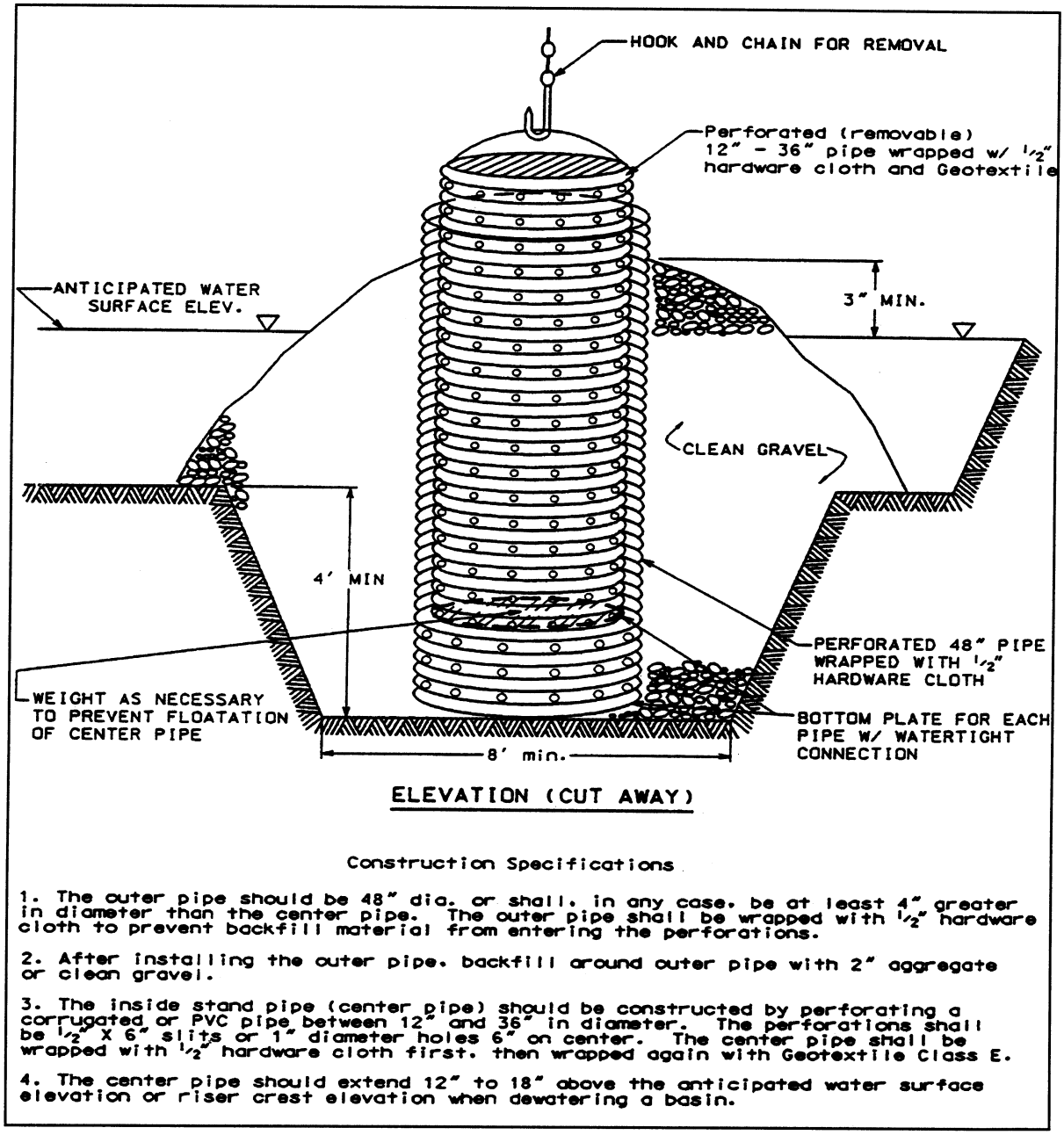
Construction Specifications

A. The suction hose from the pump shall be placed inside the inner pipe to begin dewatering. The discharge hose shall be placed in a stabilized area downslope of unstabilized areas to prevent erosion.

B. Maintenance- The inner pipe can easily be removed to facilitate changing the geotextile when it clogs. Maintenance must be performed when the pump runs dry and backed up water remains.

C. See Detail 14-1 for additional specifications.

Detail 14-1 Removable Pumping Station



Construction Specifications

1. The outer pipe should be 48" dia. or shall, in any case, be at least 4" greater in diameter than the center pipe. The outer pipe shall be wrapped with 1/2" hardware cloth to prevent backfill material from entering the perforations.

2. After installing the outer pipe, backfill around outer pipe with 2" aggregate or clean gravel.

3. The inside stand pipe (center pipe) should be constructed by perforating a corrugated or PVC pipe between 12" and 36" in diameter. The perforations shall be 1/2" X 6" slits or 1" diameter holes 6" on center. The center pipe shall be wrapped with 1/2" hardware cloth first, then wrapped again with Geotextile Class E.

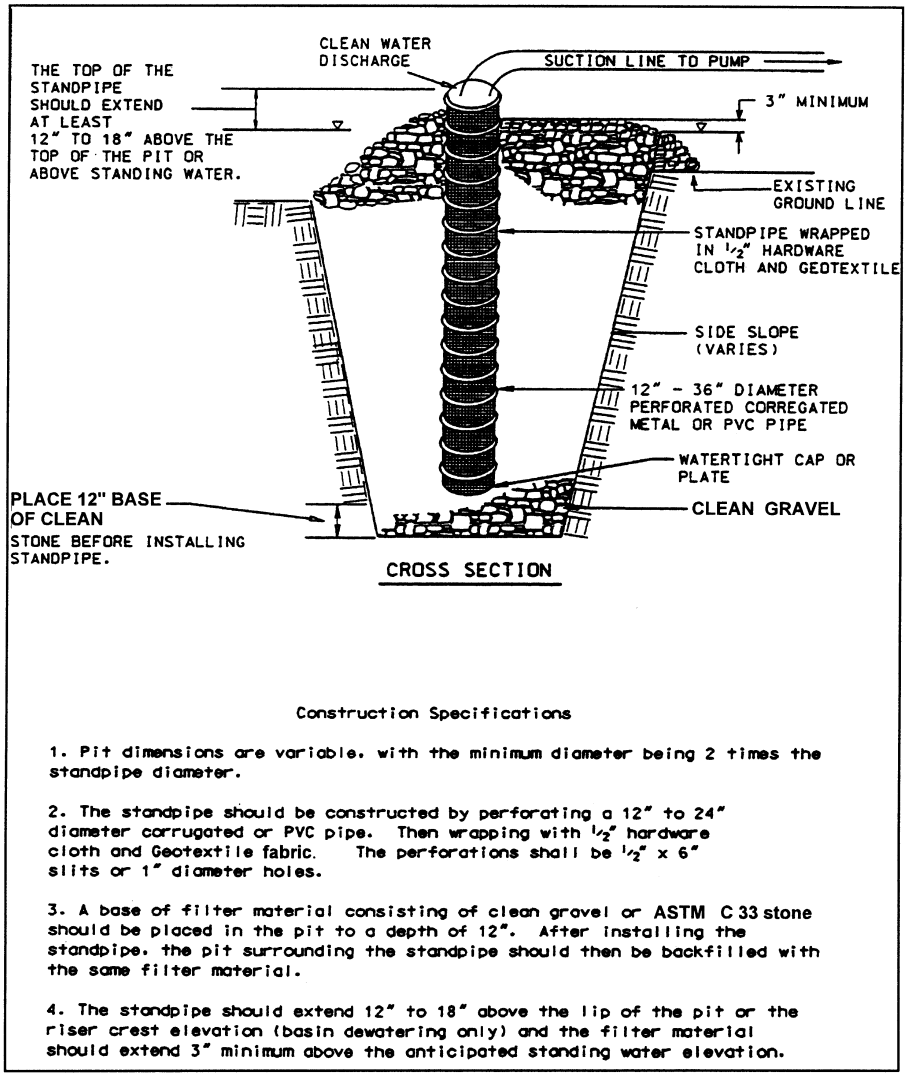
4. The center pipe should extend 12" to 18" above the anticipated water surface elevation or riser crest elevation when dewatering a basin.

Source: USDA NRCS 1994

2. Sump Pits are temporary pits which are used to remove excess water while minimizing sedimentation. The number of sump pits and their locations shall be included on the plans. Pits may be relocated to optimize use but discharge location changes must be coordinated with the local conservation district. The design must conform to the general criteria outlined on detail 14-2.

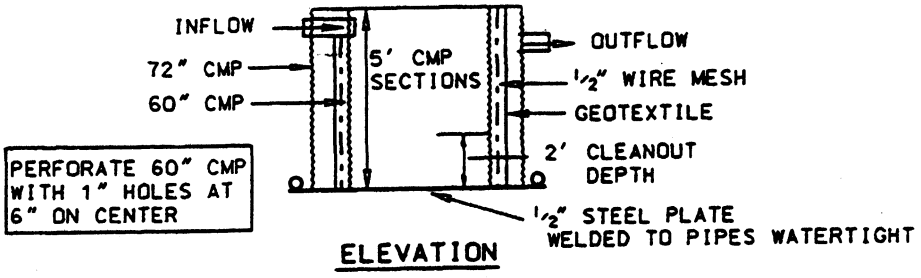
   A perforated vertical standpipe is wrapped with 2" hardware cloth and geotextile fabric then placed in the center of an excavated pit which is then backfilled with filter material consisting of anything from clean gravel (minimal fines) to ASTM C 33 stone (1 2" maximum diameter). Water is then pumped from the center of the standpipe to a suitable discharge area such as into a sediment basin or suitable filter.

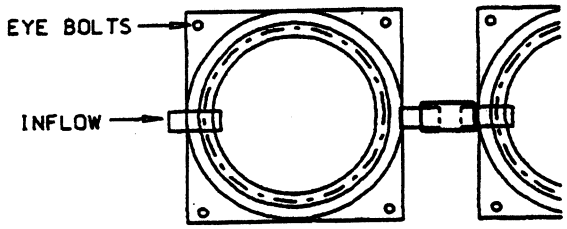
Detail 14-2: Sump Pit



Source: USDA NRCS 1994

Detail 14-3 Portable Sediment Tank





Construction Specifications

1. The following formula should be used in determining the storage volume of the sediment tank: 1 cubic foot of storage for each gallon per minute of pump discharge capacity.

2. An example of a typical sediment tank is shown above. Other container designs can be used if the storage volume is adequate and approval is obtained from the local conservation district

3. Tanks may be connected in series.

Source: USDA NRCS 1994

3. Sediment Tank / Silt Control Bags are containers through which sediment laden water is pumped to trap and retain the sediment. A sediment tank or a silt control bag is to be used on sites were excavations are deep, and space is limited and where direct discharge of sediment laden water to stream and storm drainage systems is to be avoided.

Construction Specifications

A. Location. Containers (tanks or bags) shall be located for ease of clean-out and disposal of the trapped sediment and to minimize interference with construction activities and pedestrian traffic. Bags shall not be place directly into receiving waters.

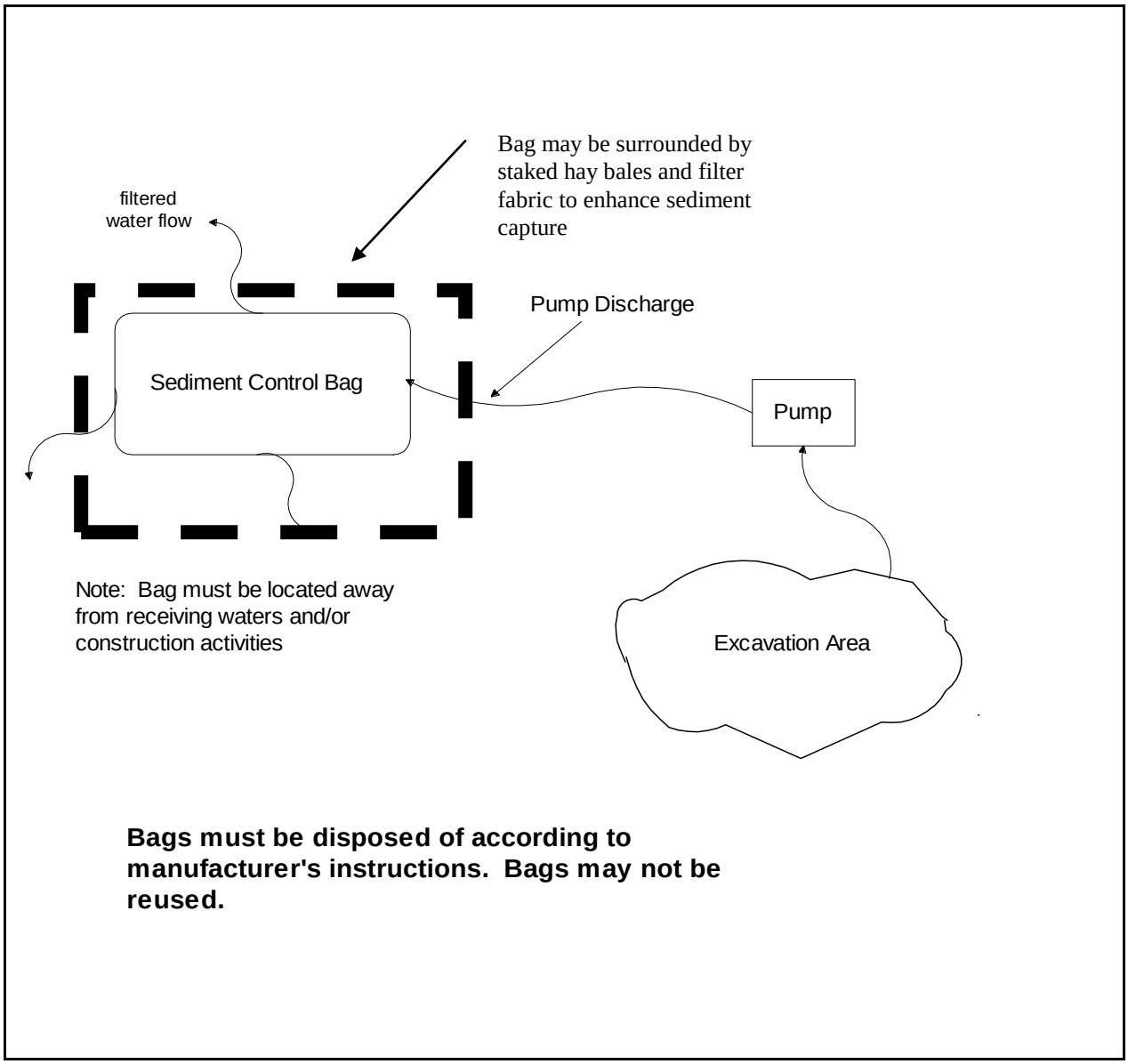
B. Tank size. The following formula should be used in determining the storage volume of the tank: 1 cubic foot of storage for each gallon per minute of pump discharge capacity. Typical tank configuration is shown on Detail 14-3. Tanks may be connected in series to increase effectiveness.

C. Tanks consist of two concentric circular pipes (CMP), attached to a watertight baseplate. The inner CMP is perforated with 1" holes on 6" centers and is wrapped with geotextile and hardware cloth. Pumped water is discharged into the inner CMP where it flows through the geotextile into the space between the two CMP=s. A discharge line is attached to the outer CMP and draws filtered water from the annulus between the two concentric CMP=s. The discharge line may be connected to another tank where it drains to the inner CMP of the second tank. This series connection may be continued indefinitely.

D. Sediment Control Bags must be located away from receiving waters and disposed of according to manufacturer's instructions. See Detail 14-4. Bags may be combined with temporary filters (item 4, following) for enhanced filtration.

4. Temporary filters for small impoundments For small quantities of ponded water such as may be found in shallow excavations (small trenches, manhole installations etc.) a sediment filter may be constructed using combinations of hay bales, small clean stone and filter fabric. This method is limited to small quantities of trapped surface water (pumping of well points is excluded from this standard) and where sediments are not highly colloidal in nature.

Detail 14-4 Sediment Control Bag for Dewatering



Bags must be disposed of according to manufacturer's instructions. Bags may not be reused.