Flotation Silt Curtain

BENEFITS

	L	M	H
Flow Control			
Erosion Control			
Sediment Control	■	■	
Runoff Reduction			
Flow Diversion			

Description: A flotation silt curtain (also called a turbidity curtain) consists of a geosynthetic fabric that is suspended vertically in a body of water. The top of the curtain is attached to floats, and the bottom is weighted.

Typical Uses: Flotation silt curtains are used when construction occurs in a water body or along a stream bank or shoreline. Flotation silt curtains prevent sediment, which is stirred up during construction, from migrating out of the work area and into the rest of the water body.

Advantages:
- Allows for containment of sediment-laden water within a water body.
- Protects contained water from turbulence, allowing particles to fall out of suspension.

Limitations:
- Limited to use only in areas where other erosion and sediment control practices cannot be used.
- Cannot stop the flow of a significant amount of water.
- Must not be used to filter entire stream flow.
- Difficult to remove fine silt and clay particles.

Longevity: One construction season (do not leave in place during winter)

SUDAS Specifications: Typically, flotation silt curtains are only used in special circumstances and therefore have not been included in SUDAS Specifications

A. Description/Uses

A flotation silt curtain, also called a turbidity curtain, consists of a heavy geosynthetic fabric that is suspended vertically in a water body, with floats at the top, and weights at the bottom. The purpose of the curtain is to act as a divider, preventing sediment laden-water from migrating to the rest of the water body.

Flotation silt curtains are commonly used when construction is required near or within a water body, where other erosion and sediment control practices cannot be used. This may include dredging operations, stream bank improvements, bridge pier construction, etc.

B. Design Considerations

For ponds or other relatively still water bodies, which do not have significant inflow into the containment area, the flotation silt curtain consists of a relatively impermeable membrane that provides a barrier between clean water and sediment-laden water. The barrier creates a containment basin, in which sediment is trapped and allowed to fall out of suspension. Runoff into this type of curtain should be minimized, as the available volume is limited.

For situations that have moving water, such as lakes or streams, a provision must be made to allow water to flow through the curtain. This is normally accomplished by constructing part of the curtain from heavy filter fabric. The filter fabric allows water to pass through the curtain, maintaining equilibrium, but retaining sediment particles. While these curtains are designed to allow for some water movement, they do not have high flow-through rates, and should not be installed across a channel. When used in a stream, channel, or other body of moving water, the flotation silt curtains must be placed parallel to the direction of flow.

Unless the water body is subject to wind or wave actions, the curtain should extend the entire depth of the water, and rest on the bottom. The weighted bottom of the curtain needs to maintain contact with the bottom of the water body in order to keep sediment from flowing under the curtain. In order to do this, enough slack must be provided to allow the curtain to rise and fall as the depth of the water varies, without breaking contact with the bottom of the water body.

In situations where there is significant wind or wave action, the weighted end of the curtain should not extend to the bottom of the water body. Wind/wave action on the flotation system can cause movement of the lower end of the curtain, causing it to rub against the bottom, stirring up additional sediment. In these situations, a minimum 1 foot gap should be provided between the lower end of the curtain and the bottom of the water body. In addition, it is not practical to extend the curtain deeper than 10 or 12 feet. Deeper installations can be affected by the moving water, stressing the material, and causing the bottom of the curtain to be pushed around, billowing up toward the surface.

When determining the required length of the flotation silt curtain, an additional 10 to 20% should be included over the straight-line measurements. This allows for easier installation and reduces stresses caused by high winds and wave action.

Once the curtain has been positioned within the water body, the top is held in place by connecting it to anchors that are installed at regular intervals. The ends of the curtain (both upper and lower) should be extended to the shoreline, and anchored to a stable object, such as a tree.

C. Application

Flotation silt curtains are divided into three types, Type I, Type II, and Type III, based upon the flow conditions within the water body. The information provided here applies to minimal and moderate flow conditions, where the velocity of flow is 5 feet per second or less. For situations where the flow is greater than this, additional investigation is required, and a qualified manufacturer should be consulted.

The three types of silt curtains are differentiated by the strength and flow through rate of the fabric, and the strength of the connecting materials used:

1. Type I curtains are considered light-duty and are intended for areas where there is no current, and where the area is protected from wind and wave action.

2. Type II curtains can be used in areas with moderate running current (up to 3.5 fps), or where wind and water currents can affect the curtain.

3. Type III curtains are used in areas with considerable current (up to 5 fps), or where the curtain is subject to more severe wind and wave action.

D. Maintenance

A decision must be made on how to handle the accumulated sediment. Unless the accumulation is significant, consideration should be given to leaving this sediment in place. The process of removing the sediment can re-suspend the particles. Regardless of whether or not the accumulated sediment is removed, suspended sediment should always be allowed to settle for a minimum of 24 hours prior to removal of the silt curtain.

Once they are suspended in the water, clay and silt particles are difficult to remove by settling methods alone. For waters contaminated with clay or fine silts, the addition of a flocculent to the containment area may be considered prior to removal of the silt curtain. Care must be taken when selecting a flocculent as some are detrimental to water bodies and should not be used. See Section 7E-28 for additional information on flocculents.

E. Time of Year

Sediment curtains should not be left in place during winter months, as ice can cause the curtain to rip or be torn from its shoreline supports.