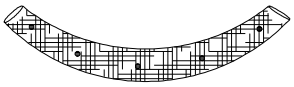
Sediment Tubes

Plan Symbol



Description

Sediment tubes are elongated tubes of compacted geotextiles, curled excelsior wood, natural coconut fiber or hardwood mulch. Straw, pine needle, and leaf mulch-filled sediment tubes are not permitted.

When and Where to Use It

Install sediment tubes along contours, in drainage conveyance swales, and around inlets to help reduce the effects of soil erosion by energy dissipation and retaining sediment.

Materials

Sediment tubes for ditch checks and Type A Inlet Structure Filters exhibit the following properties:

- Produced by a Manufacturer experienced in sediment tube manufacturing.
- Composed of compacted geotextiles, curled excelsior wood, natural coconut fibers, hardwood mulch or a mix of these materials enclosed by a flexible netting material.
- Straw, straw fiber, straw bales, pine needles, and leaf mulch are not allowed under this specification.
- Utilizes outer netting that consists of seamless, high-density polyethylene photodegradable materials treated with ultraviolet stabilizers or a seamless, high-density polyethylene non-degradable materials.
- Diameter ranging from 18-inches to 24-inches.
- Curled excelsior wood, or natural coconut rolled erosion control products (RECPs) that are rolled up to create a sediment tube are **not** allowed under this specification.
- Select applicable Sediment Tubes from the SCDOT approved products list.

Installation

Proper site preparation is essential to ensure sediment tubes are in complete contact with the underlying soil or underlying surface. Remove all rocks, clods, vegetation or other obstructions so installed sediment tubes have direct contact with the underlying soil or surface.

Install sediment tubes by laying them flat on the ground. Construct a small trench to a depth that is 20% of the sediment tube diameter. Lay the sediment tube in the trench and compact the upstream sediment tube soil interface. Do not completely bury sediment tubes during installation. Review all project specifications for special installation requirements. Install sediment tubes so no gaps exist between the soil and the bottom of the sediment tube. Lap the ends of adjacent sediment tubes a minimum of 6-inches to prevent flow and sediment from passing through the field joint. Never stack sediment tubes on top of one another.

Avoid damage to sediment tubes during installation. Should the sediment tube become damaged during installation, place a stake on both sides of the damaged area terminating the tube segment and install a new tube segment. Perform field monitoring to verify that installation procedures do not damage sediment tubes. Replace all damaged sediment tubes damaged during installation as directed by the Inspector or Manufacturer's Representative at the contractor's expense.

Install sediment tubes in swales or drainage ditches perpendicular to the water flow and extend them up the side slopes a minimum of 1-foot above the design flow depth. Space sediment tubes according to the following table.

Slope	Maximum Sediment Tube Spacing
Less than 2%	150-feet
2%	100-feet
3%	75-feet
4%	50-feet
5%	40-feet
6%	30-feet
Greater than 6%	25-feet

Install sediment tubes using wooden stakes (2-inch x 2-inch) or steel posts (standard "U" or "T" sections with a minimum weight of 1.25 pounds per foot) a minimum of 48-inches in length placed on 2-foot centers. Intertwine the stakes with the outer mesh on the downstream side, and drive the stakes in the ground to a minimum depth of 24-inches leaving less than 12-inches of stake above the exposed sediment tube.

An acceptable alternative installation is driving stakes on 2-foot centers on each side of the sediment tube and connecting them with natural fiber twine or steel wire to inhibit the non-weighted sediment tube from moving vertically. Sediment tubes can also be secured by installing the stakes on 2-foot centers in a crossing manner ensuring direct soil contact at all times.

Select the sediment tube check length to minimize the number of sediment tubes needed to span the width of the drainage conveyance. If the required length (perpendicular to the water flow) is 15-feet, then one 15-foot sediment tube is preferred compared to two overlapping 10-foot sediment tubes.

Install sediment tubes for ditch checks over bare soil, mulched areas, or erosion control blankets. Keep sediment tubes for ditch checks in place until fully established vegetation and root systems have completely developed and can survive on their own.

Inspection and Maintenance

- Inspect sediment tubes after installation for gaps under the sediment tubes and for gaps between the joints of adjacent ends of sediment tubes.
- Inspect every 7-days and within 24-hours of a rainfall event of 0.5-inches or greater.
- Repair all rills, gullies, and undercutting near sediment tubes.
- Remove all sediment deposits that impair the filtration capability of sediment tubes when the sediment reaches 1/3 the height of the exposed sediment tube.
- Remove and/or replace installed sediment tubes as required to adapt to changing construction site conditions.
- Remove sediment tubes from the site when the functional longevity is exceeded as determined by the Engineer, Inspector or Manufacturer's Representative. Gather sediment tubes and dispose of them in regular means as non-hazardous, inert material.
- Prior to final stabilization, backfill all trenches, depressions and other ground disturbances caused by the removal of sediment tubes.

Sediment Tube Check Dam

Sediment Tube Check Dam

Preventive Measures and Troubleshooting Guide

Field Condition	Common Solutions
Too much sediment has accumulated.	Remove accumulated sediment to recover holding capacity. Remove accumulated sediment from the upstream side of the sediment tube when the sediment has reached a height of approximately one-third the original height of the tube (measured at the center).
There is insufficient ponding area.	Space sediment tubes farther apart or increase the sediment tube diameter.
Sediment tube washes away.	Use larger sediment tubes. Decrease post spacing, and add more posts. Install posts on both the upstream and downstream sides of the sediment tube. Decrease sediment tube spacing by adding more sediment tube check dams.
Other application used instead of sediment tubes	Do not use straw bales or silt fence as sediment tube check alternatives. In some situation rock check dams may be used as a sediment tube alternative.
Wrong type of materials or wrong type of sediment tube utilized.	Straw, pine needle and leaf mulch-filled sediment tubes are not permitted. Curled excelsior wood, or natural coconut rolled erosion control products (RECPs) that are rolled up to create a sediment tube are **not** permitted. Do not use straw bales or silt fence for checks.