

BMP 07.00. Contained Silt Control System

DESIGN CONSIDERATIONS

Objectives

The purpose of a Contained Silt Control System is to trap sediment in construction site water and prevent it from being transported out of the project area to another area, or to a water body, while allowing water to flow through the geotextile fabric.

Description

A Contained Silt Control System is a bag made of non-woven geotextile fabric that is attached to a dewatering hose. Construction site water is intercepted, diverted, and pumped or gravity fed into one side of the filtration bag; gravel, sand, silt, and fines are collected in the bag while filtered water percolates through the bag.

Other Names

Gravity Bag Filter, Sediment Filter Bag, Filter Bag, Dirt Bag, Silt Bag, Dewatering Tube, Dewatering Bag

Applicability

Contained Silt Control Systems are applicable for treating sediment-laden water at a construction site. They are often used during excavation dewatering. The filtration bag causes minimal damage to the ground where it is located and requires a small footprint when compared to sedimentation basins.

Selection Considerations

- Contained Silt Control Systems are temporary filtration systems.
- Filtration bags are designed for one-time use.
- Filtration bags are available in an array of sizes and materials depending on site specifics.
- Filtration bags require less space and cause less damage to existing vegetation than sedimentation basins.
- Discharge rates on the filtration bags decrease as the bag collects sediment.
- An equipment access route and space for Contained Silt Control System installation, maintenance, and removal must be available

without encroaching into sensitive areas or off the project limits.

Design

Use manufacturer's specifications to determine the size of the filtration bag appropriate for the flow rate and expected volume. Place the filtration bag on a level, well-drained surface and provide high-flow bypass for the system. If the soil does not allow percolation, provide a non-erodible bed constructed from rock, straw, or other non-erodible material.

After water has percolated through the filtration bag, the filtration bag filled with sediment can be removed and disposed of off-site, or the bag can be cut open and the sediment can be mixed with the on-site soil and seeded for stabilization. The designer should indicate the conditions or restrictions that will be required for locating and removing the bag depending on the project and site.

Relationship to Other Erosion and Sediment Control Measures

Secondary barriers, such as silt fence or fiber rolls, may be placed around the filtration bag to provide additional sediment trapping. When there is limited space available, Contained Silt Control Systems can be used in place of sedimentation basins.

Common Failures or Misuses

- The bag becomes too heavy to remove with available equipment.
- The bag becomes too full to contain silt.
- Improperly sized mesh openings in the bag for the site soils and flow rate.
- Placement on a slope or uneven ground.
- Improperly sized bag for the flow rate.
- Overfilling the filtration bag with sediment.
- Use as a permanent filtration system.
- Reusing a filtration bag.

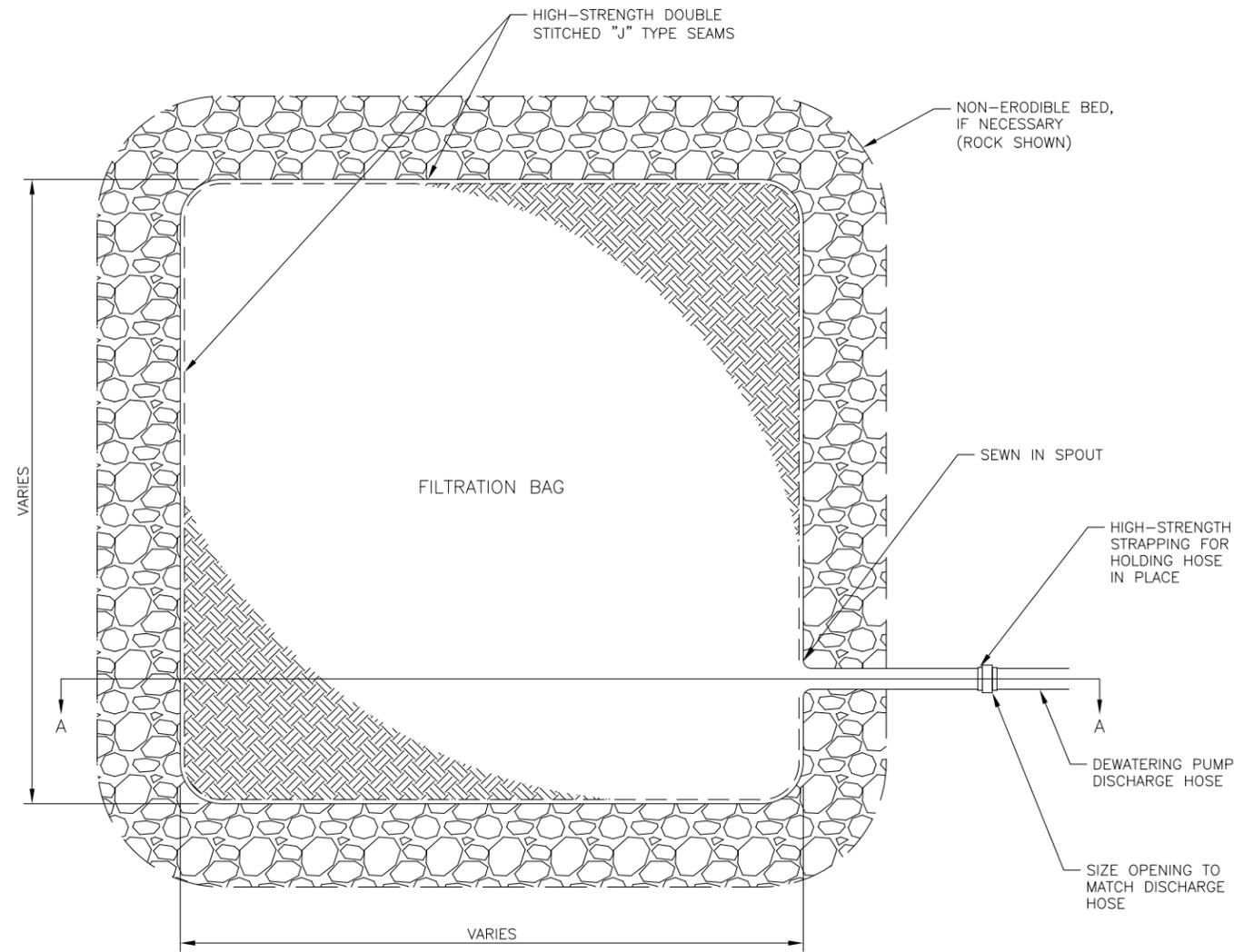
SPECIFICATIONS

Standard Specification

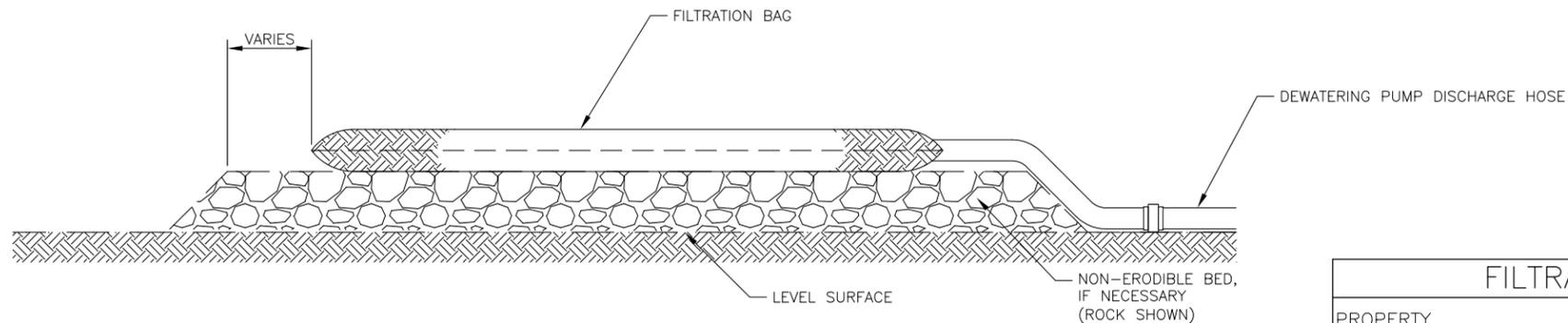
- 666 – Contained Silt Control System

Drawing

- BMP-07.00 Contained Silt Control System



PLAN



SECTION A-A

PUMPED SILT CONTROL SYSTEM
NOT TO SCALE

CONTAINED SILT CONTROL SYSTEM NOTES:
MATERIALS
FILTRATION BAG: SEE FILTRATION BAG REQUIREMENTS TABLE.

DISCHARGE HOSE

STRAPPING: HIGH-STRENGTH STRAPPING TO HOLD HOSE IN PLACE.

NON-ERODIBLE BED: WELL GRADED CLEAN 4-INCH MINUS ROCK, STRAW, OR OTHER NON-ERODIBLE BARRIER.

INSTALLATION

1. PROVIDE A LEVEL AREA SUCH THAT THE DISCHARGE WILL NOT CAUSE EROSION.
2. IF NECESSARY, PLACE A NON-ERODIBLE BED WITH AN APRON ON ALL SIDES OF THE FILTRATION BAG.
3. ENSURE THE AREA DOES NOT HAVE MATERIAL THAT MIGHT PUNCTURE THE FILTRATION BAG.
4. LAY FILTRATION BAG FLAT ON THE GROUND OR BED.
5. SECURE THE DISCHARGE HOSE WITH HIGH-STRENGTH STRAPPING.
6. CONNECT THE DISCHARGE HOSE TO THE FILTRATION BAG.

INSPECTION

3. INSPECT FABRIC FOR TEARS, PUNCTURES, FRAYING, WEATHERING, AND COMPROMISED INTEGRITY.
4. CHECK FOR FABRIC BLOCKAGE, BLINDING OR A REDUCTION IN THE AMOUNT OF CLEAN WATER BEING DISCHARGED.
5. CONFIRM THAT THE HOSE IS SECURE.
6. CHECK FOR SIGNS OF EXCESSIVE LEAKAGE AROUND THE DISCHARGE HOSE.
7. LOOK FOR EVIDENCE OF SEDIMENT OR EROSION AROUND THE SYSTEM.
8. LOOK FOR SIGNS OF INADEQUATE PROTECTION OF OFF-SITE SENSITIVE AREAS DUE TO DISCHARGES FROM THE FILTRATION BAG.
9. CHECK FOR CHANNEL FORMATION AROUND THE SYSTEM.

10. INSPECT THE CAPACITY OF THE FILTRATION BAG.

MAINTENANCE

1. REPLACE DAMAGED FILTRATION BAGS.
2. REPLACE BAG WHEN IT NO LONGER FILTERS SEDIMENT OR PASSES WATER AT A REASONABLE RATE.
3. REPLACE BAG WHEN IT BLINDS OUT AND CLEAN DISCHARGE IS REDUCED BY AN ESTIMATED 50% TO MINIMIZE POTENTIAL FOR PRODUCT FAILURE AND UNPLANNED DISCHARGE.
4. REPAIR EROSION AND CHANNELS AND CORRECT THE SITUATION CAUSING THESE TO OCCUR.

REMOVAL

1. PLACE AN ENERGY DISSIPATION DEVICE PRIOR TO DISCONNECTING THE HOSE.
2. ALLOW THE FILTRATION BAG TO DRAIN AND ENSURE THE PRESSURE HAS DROPPED BEFORE DISCONNECTING INTAKE AND DISCHARGE HOSES AFTER THE DISTURBED AREA IS PERMANENTLY STABILIZED, EXCAVATION DEWATERING HAS CEASED, OR THE PUMPED SILT CONTROL SYSTEM IS NO LONGER NEEDED.
3. EITHER REMOVE THE SEDIMENT LADEN BAG AND DISPOSE OF PROPERLY, OR OPEN THE FILTRATION BAG, SPREAD THE SEDIMENT MIX WITH ON-SITE SOIL AND SEED, AS DIRECTED BY THE PLANS.
4. REGRADE AND SEED OR PERMANENTLY STABILIZE REMAINING DISTURBED AREAS.
5. AVOID DAMAGE TO SENSITIVE AREAS (E.G. WETLAND OR WATERS OF THE U.S.).

FILTRATION BAG REQUIREMENTS

PROPERTY	TEST	VALUE
GRAB BREAKING LOAD, LB, 1-INCH GRIP MINIMUM, IN EACH DIRECTION.	ASTM D 4632	255
WATER FLOW RATE, GAL PER MINUTE/SQ FT MINIMUM AND MAXIMUM AVERAGE ROLL VALUE.	ASTM D 4491	80-200
PERMITTIVITY, SEC-1 MINIMUM.	ASTM D 4491	1
APPARENT OPENING SIZE, INCHES MAXIMUM AVERAGE ROLL VALUE.	ASTM D 4751	0.0083
ULTRAVIOLET RESISTANCE, PERCENT MINIMUM RETAINED GRAB BREAKING LOAD, 500 HOURS.	ASTM D 4355	70

REVISIONS		
Date	Description	By

State of Alaska DOT&PF

CONTAINED SILT CONTROL SYSTEM

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Date 12/2015 X/XX/XX