Installation Effects on Performance of Sediment Control Barriers

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The number one reason why any best management practice (BMP) fails in the field is due to improper installation. BMPs such as straw bales and silt fence are losing favor with regulatory agencies and design professionals due to high incidence of failure, often due to improper installation of these sediment control barriers. Filtrexx® SiltSoxx™ offer an alternative that is easy to install and can be accompanied by a Trained and Certified Filtrexx® Installer. Research and field evidence is showing that SiltSoxx™ have a much lower incidence of field failure, and even when the BMP does fail (nothing works 100% of the time), the failure is minimal relative to the catastrophic failures exhibited by silt fence failure.

Research was conducted at San Diego State University's (SDSU) Soil Erosion Research Laboratory to evaluate the performance of SiltSoxx™, silt fence, and straw wattles under various installation scenarios. Sediment control barriers were installed at the base of the slope and exposed to experimental conditions using a modified ASTM 6459 standard test method typically used for erosion control blankets. The sediment control barriers

were installed on a loamy sand soil at the base of a 3:1 slope with an exposed soil and drainage of area of 2 meters wide by 8 meters long. The design storm utilized for this research project used a Norton Ladder Rainfall Simulator developed by the USDA ARS National Soil Erosion Research Laboratory and was programmed for an intensity and duration of 2 in (5 cm)/20 minutes followed by 4 in (10 cm)/30 minutes. Average peak runoff rate exposed to the sediment control barriers was 28.4 liters/min, average runoff volume was 986 liters, average sediment concentration was 460,000 mg/L, and average sediment load was 385 kg. Experimental runs were conducted in triplicate to obtain statistical means.

The sediment control barriers were installed correctly, according to specification, and incorrectly, subjectively determined to represent typical field installation. SiltSoxx™ were installed according to Filtrexx® standard specifications (including prepared surface, staking, and backfill) and were also installed on the soil surface without surface preparation, staking, and backfill (incorrect installation). Silt fence was installed correctly, according to staking, trenching, and backfill compaction specifications; and incorrectly, using staking, minimal trenching, and backfilling. Straw wattles were installed correctly, according to staking and trenching specifications; and incorrectly, with staking and without trenching.

According to this study by SDSU the SiltSoxx™ performs better than silt fence and straw wattles in both correctly and incorrectly installed applications. This means that whether installed by a certified professional or by an untrained contractor the Filtrexx® SiltSoxx™ will perform better than other products in this market category, which means less regulatory issues, cleaner construction sites, and most importantly cleaner water.

Table 1. Average sediment load (kg) and sediment removal efficiency (%) for each sediment control barrier at both levels of installation.

Treatment	Sediment Load	Removal Efficiency
SiltSoxx™ installed correctly	87 kg	77%
SiltSoxx™ installed incorrectly	254 kg	34%
Silt fence installed correctly	109 kg	72%
Silt fence installed incorrectly	254 kg	31%
Straw wattle installed correctly	159 kg	59%
Straw wattle installed incorrectly	268 kg	30%

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