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Concrete Cloth (TM) GCCM

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CONCRETE CLOTH™ GCCM

THE NEED

The deployment of materials for controlling stormwater has gained greater emphasis as municipalities and civil works groups look to cope with increasing climate variables. The effects of erosion and water loss, especially in areas that are not readily accessible, have led to increased costs to these groups. Many of these systems and structures have been in place for decades, with concrete structures for water distribution and metering utilized since the beginning. These systems are a combination of earthen ditches intermixed with flumes, and concrete connection and distribution basins between ditches. Over time these structures have sustained damage from use and are in need of repair or replacement.

FIGURE 1 CONCRETE CLOTH BEING DEPLOYED

THE TECHNOLOGY

ASTM has defined a new group or classification of materials as Geosynthetic Cementitious Composite Mats or GCCMs. This new material classification has been used initially at industrial sites, at power plants, within road right-of-way, along railroad corridors, at airports, at landfills and other organizations looking for hard armor erosion control solutions, vegetation suppression, or challenging infrastructure repair.

Concrete Cloth™ geosynthetic cementitious composite mats (GCCM) are a groundbreaking material technology that makes it possible to use concrete on slopes, in water, and in other hard-to-reach locations, without forms or mixing and minimal equipment requirements. An engineered concrete in roll form, Concrete Cloth GCCM is fabricated with a three-dimensional structure that reinforces the concrete, providing strength and durability. Concrete Cloth GCCM can be quickly cut and secured in place, making it ideal for reinforcing or rehabilitating a culvert or drainage ditch, abutment, berm or other structure. Once hydrated, the cloth cures quickly to form a rigid, durable and water-resistant 5,000 psi armor. The cloth remains flexible for up to two hours and is easily manipulated to fit the contours of irregular installations.

FIGURE 2 CONCRETE CLOTH SLOPE PROTECTION

Concrete Cloth material's innovative structure and performance helps extend the ability of cities and transportation departments to economically and effectively repair infrastructure. Compared to traditional concrete repair and construction methods, Concrete Cloth cementitious composite mats dramatically reduce the need for heavy machinery and consequently lessens traffic disruption in busy areas. Less material and simple installation means accelerated project completion and reduced costs, easing the strain on limited infrastructure budgets.

APPLICATIONS

Channel Lining

Concrete Cloth™ GCCM can be rapidly unrolled to form a ditch or channel lining. When comparing erosion control methods, it is a cost-effective alternative to riprap, cement stabilized soil, plastic inserts, and shotcrete.

Culvert Protection

As a protective wear surface in metal culvert applications, Concrete Cloth GCCM is a cost-effective alternative to topical invert coatings and relining systems. Additionally, it can be used at the headwall, inlet and outfall to prevent erosion and undermining of the existing structure.

Slope Protection

Concrete Cloth GCCM can be used to protect slopes as a replacement for shotcrete, riprap, and other hard armor systems. The material is easy to install, requiring limited equipment, and can be used by standard maintenance crews.

Berm Protection

Compared to poured or sprayed concrete, Concrete Cloth GCCM is a cost-effective alternative for lining secondary berms. Its ability to be installed quickly reduces time on site, while the availability of man-portable rolls allows for installation in areas with reduced access.

Other Applications

- Geosynthetic liner
- Irrigation
- Mining vent/blast walls
- Concrete Remediation

THE BENEFITS

- Minimizes installation time by eliminating the need to build forms and support structures
- Conforms to ditch, slope, and berm geometry
- Lowers total project cost by using local labor
- Requires no specialized equipment – available in man portable or bulk roll configurations
- Can be placed in rainy weather, providing maximum schedule flexibility
- Can be installed at a rate of 20,000 sf per day team
- Acts as an effective weed suppressant

STATUS

Concrete Cloth™ GCCM is available through erosion product distributors throughout the U.S. and Canada. Milliken Infrastructure works directly with asset owners , engineers, and contractors to determine if Concrete Cloth material is a suitable solution for their problem.

BARRIERS

The product is continually being accepted, though it is a new technology with a limited track record. The use of vegetative erosion products, as well as sprayed shotcrete systems, have hindered the widespread use of this technology.

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REVIEWERS

Peer reviewed as an emerging construction technology

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