



## Case Study

**application** | Dam Overtopping/Spillway  
**location** | Lamoure, ND  
**product** | Mirafi® FW300 & Miramesh® GR

**job owner** | NRCS - Bismarck, ND  
**engineer** | NRCS – Linda McArthur  
**contractor** | Sellin Brothers

TenCate® develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

### THE CHALLENGE

The UltraFlex® Articulating concrete block/mat (ACBM) is being utilized to protect an earthen spillway previously lined with grass. Several recent overtopping events eroded the grass causing significant damage to the existing spillway.

### THE DESIGN/CONSTRUCTION

ACBM systems are commonly used to protect embankment dams or earthen spillways. To increase performance and facilitate construction, an aggregate drainage medium is commonly added as part of the ACBM system. The first material to be installed directly onto the prepared sand bedding was Mirafi® FW300 woven geotextile followed by a 4-6" layer of clean stone measuring 1.0-1.5" diameter. On top of the aggregate bedding layer was a layer of Miramesh® GR, which the UltraFlex® system was placed directly on.

Submar, Inc. began testing Miramesh® GR sandwiched between the tapered UltraFlex system and an aggregate drainage medium at Colorado State University in 2009. The results were very positive. Field installations began shortly there-



UltraFlex® articulating concrete block/mats by Submar, Inc. during installation.



Mirafi® FW300 with stone and Miramesh® GR.



UltraFlex® articulating concrete mats being placed on Miramesh® GR.

**THE PERFORMANCE**

Historically, a plastic geogrid has been used in lieu of Miramesh® GR. Several engineers and contractors complained that the geogrid has a "memory". This makes installation very difficult. The rigidity of the geogrid caused laborers to walk all over the prepared aggregate drainage medium causing footprints and indentations. The flexibility of the Miramesh® GR eliminated this issue.

Another issue with the geogrid occurred when the ACBM systems are backfilled with topsoil and seed. The large open area of the geogrid (approximately 1" x 1") could potentially contaminate the aggregate drainage medium if there was not a gradation or filter layer. MirameshGR effectively solves this problem by retaining the underlying aggregate during a catastrophic event, but also impedes the soil from migrating down through the system.



The overlap of the Miramesh® GR measured 12" and was shingled in the direction of the flow.



When completed the spillway will measure 148' in width and over 1,020' in length.

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