ENVIRONMENTAL CONCERNS

ER-CON TECHNOLOGIES

Premier Erosion Control Installations

SITE SPECIFIC SOLUTIONS TO EROSION PROBLEMS

WHY AN ARTICULATING GROUP MAT?

Our technology is unparalleled in field application. What makes Er-Con unique is our ability to **custom-fit** each mat, making it specific to the site. The process allows us to inflate each mat, minimizing the need for additional machinery (i.e. flatbed trucks required to haul pre -cast mats). This lessens the impact to the access routes, reduces the number of tree removals, minimizes the disturbance to the riparian habitat, expedites the overall process and creates a more environmentally friendly work site and end-product.

Grout is used because of its versatility and, when used properly, is easily controlled and contained during the construction process. Site preparation for fabric-form articulating grout mats is less obtrusive on the environment and offers a more efficient use of concrete and allows us to maintain the natural contours of the waterway.

Without question, the most significant difference is the elimination of the danger of handling 10,000 lb. concrete mats above operating pipelines or the individuals involved in the construction process.

IS THIS JUST A QUICK-FIX SOLUTION?

Our company philosophy is to understand the *cause* of the erosion and offer a viable, proficient design. Our intention is to offer a solution that will address the problem for the long-term. Each of our articulating grout mats has a 3' toe-trench on all sides to address the prevention of future perimeter scour. On the downstream end, where scour is most likely to occur, the toe trench is designed to prevent water from undercutting the articulating grout mat and re-exposing the asset if a future head cut migrates into the cross-section.

The Major Environmental Concerns?

CONCERN 1: What about the Fish?

One of the most commonly asked questions regarding articulating grout mats relates to fish passage up and downstream over the project area. With that in mind, many of our projects integrate a **fish notch** into the project plans. This adaptation addresses the accessibility of fish and other aquatic macro-invertebrates up and downstream over the matted area during low-flows when stream migration is most difficult.

CONCERN 2: Water Pooling

The addition of an articulating grout mat across a pipeline in a water system is likely to raise the elevation of the bed. We fully appreciate the need to avoid such upstream pooling. In a pipeline protection application, under normal circumstances, once inflated, the distance from the top of the pipe to the low point between the grout pillows is approximately 2". Although this does constitute a slight rise in elevation, it minimizes the amount of substantial damming of the upstream waters. This pooling only occurs during low-flow times, and would otherwise not impact water flows (is less evident with the inclusion of a fish notch).

With all of our articulating grout mat constructions, we make adjustments to ensure the cross-sectional area of the water system is maintained. This implementation is necessary in order to ensure zero-rise during peak discharge flow events.

CONCERN 3: Bank Vegetation

The aesthetics of the post-construction job site is another common concern. Our primary goals are to protect the asset and to protect the environment. However, we are very cognitive of the need and desire for immediate bank re-vegetation. As standard practice, the banks of all jobsites are treated with straw mats and natural seed mix to minimize bank erosion. If hydrologic conditions allow, we also offer a System 21™ mat application. This particular mat facilitates the return of natural vegetation **within** the mat system. This product can be used in designs to accommodate the permitting agency's environmental requirements and meet the hydraulic requirements of the site while providing slope protection.

CONCERN 4: Downstream Erosion

Downstream erosion can prove to be a threat to any asset, even after a protective mat has been installed. Our mats typically apply a 10:1 downstream slope, but our versatility allows us to adjust that ratio as needed to match the contours of the system or to meet the needs of government agencies that may have alternative requirements for such construction. Our mats include a 3' toe-trench that minimizes the likelihood of toe-scour as water passes over the downstream end.

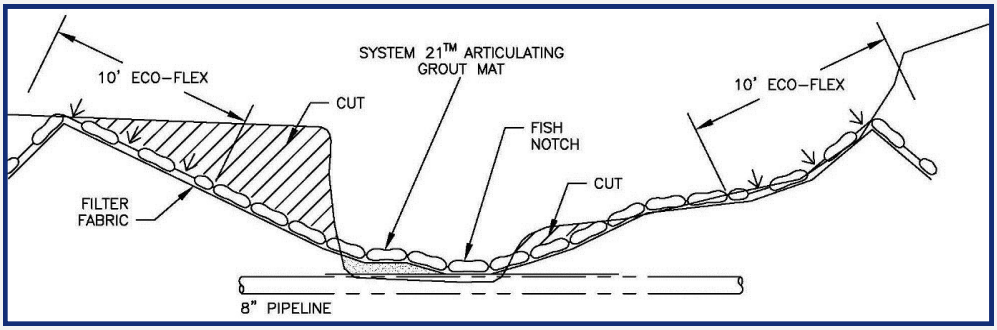


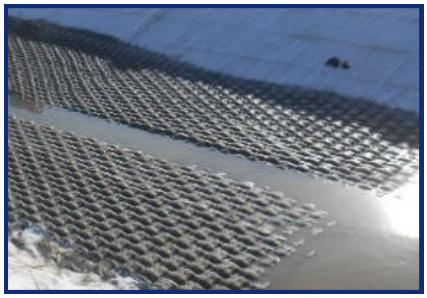
Figure 2: Cross Section of a System 21™ articulating grout mat with integrated fish notch

Our Designs:

Effective & Environmental

HOW ARE SOLUTIONS DESIGNED?

Each design and associated articulating grout mat is *unique* to the work site; this specificity secures the asset while protecting the environment. A site specific design is accomplished by combining several technologies once the hydrology, mechanics and physical aspects of the project site have been properly evaluated by our team. We continue to be devoted to the concept of environmentally sensitive designs and will focus on new developments with a high degree of interest in ecological issues. Er-Con believes industry assets and the environment can be simultaneously protected. As policy, Er-Con makes every possible effort to follow through with this environmental stance.



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