

PROJECT PROFILE



Project Basics

Project Name: Sioux River Bank Stabilization Project, Structure 103/4

Agency: Western Area Power Administration, Fort Randall, Sioux City, Iowa

Installation Date: 2014

Product Type: Western Excelsior Xtreme Armor System™ (XAS) utilizing PP5-Xtreme with Percussion Driven Anchors

Project Overview

When erosion along the banks of the Sioux river started to encroach on the stability of the power grid, it was time to seek a solution. The original design for bank stabilization included the use of articulated concrete block. However, due to cost, location, and the risk of installation in and between the transmission line structures, the Western Area Power Administration, along with U.S. Department of Energy under Homeland Security, sought an alternative solution. The Western Excelsior Xtreme Armor System was selected as that alternative based on its ability to offer high-strength, long-term protection of the river banks.

Installation

The highly eroded banks were cut back to a more manageable 3:1 (H:V) slope grade. The High-Performance Turf Reinforcement Mat (HPTRM) was installed down the slope banks over a prepared and seeded soilbed. Once in place, the HPTRM was secured by PDAs and washer pins at a staggered spacing. Together, the HPTRM and PDAs form a system that offers strength and support, resistance to storm surge waters, and reinforcement of the vegetation stems and roots. In addition to the XAS system, a rock toe was installed at the normal waterline. The goal of the rock toe was to dissipate scour potential in areas that would not promote long-term vegetation establishment.

Performance

Within weeks, the Xtreme Armor System begun establishing vegetation. By the end of the growing season, the vegetation had developed into a fully supported system. The XAS offered a cost-effective, green alternative solution to the originally specified concrete block, while providing a high-strength system to withstand the shear stress potential along the Sioux River.



The highly eroded banks along the Sioux River (top) needed an overhaul. XAS in conjunction with PDAs (middle), protected the soils and vegetation. One year later the site remains stabilized (bottom).

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