PROJECT PROFILE

Project Basics

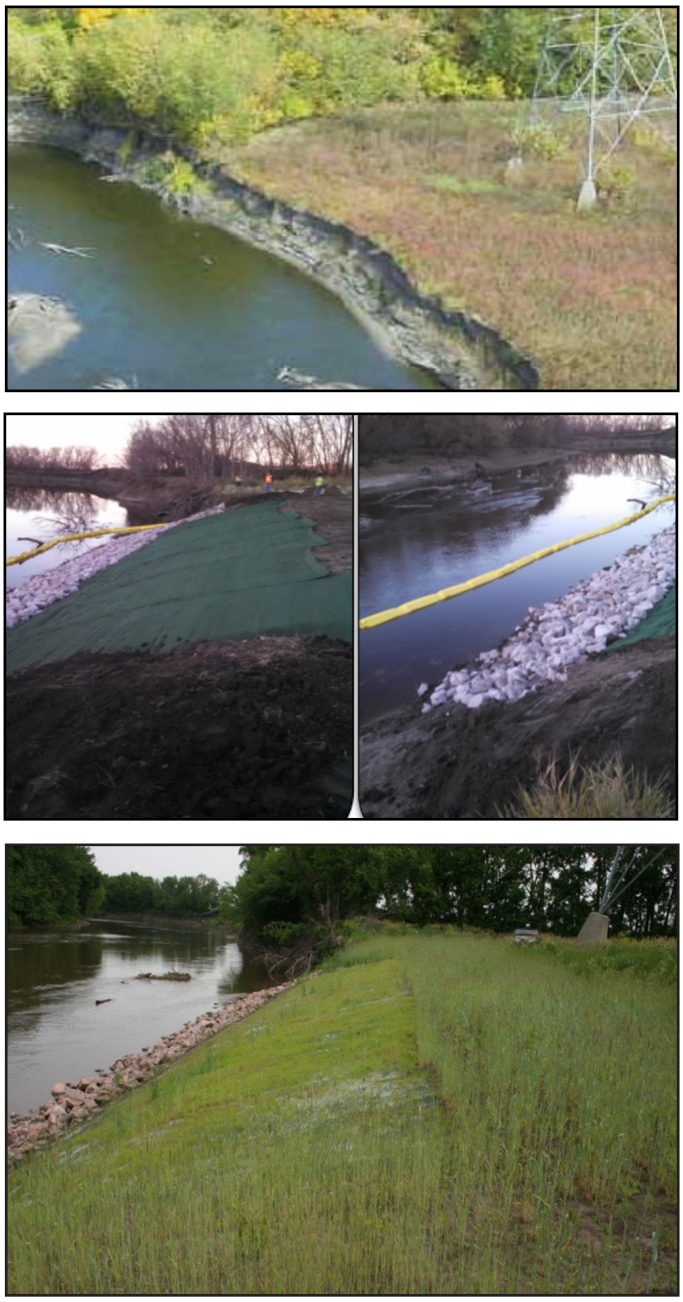
Project Name: Sioux River Bank Stabilization Project, Structure 103/4
Agency: Western Area Power Administration, Fort Randall, Sioux City, Iowa
Installation Date: 2014
Product Type: Western Excelsior Xtreme Armor System™ (XAS) utilizing PP5-Xtreme with Percussion Driven Anchors

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 articilated 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-strenth, long-term protection of the river banks.

Installation

To begin 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), PP5-Xtreme, was installed down the slope banks over a prepared and seeded soilbed. Once in place, the HPTRM was secured by Percussion Driven Anchors (PDAs) and washer fabric pins at a staggered spacing. Together, the HPTRM and PDAs form a system that offers strength and support to the surface and subsurface soils, forms a resistance against erosion from storm surge waters, and reinforcement of the vegetation stems and roots as the vegetation establishes within the HPTRM. 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. For this project the XAS system was only installed along the waterfront property infront of the transmission line structure, this was due to budgetary concerns. Ideally, the XAS system would have been extended along a broader section of the river bend.

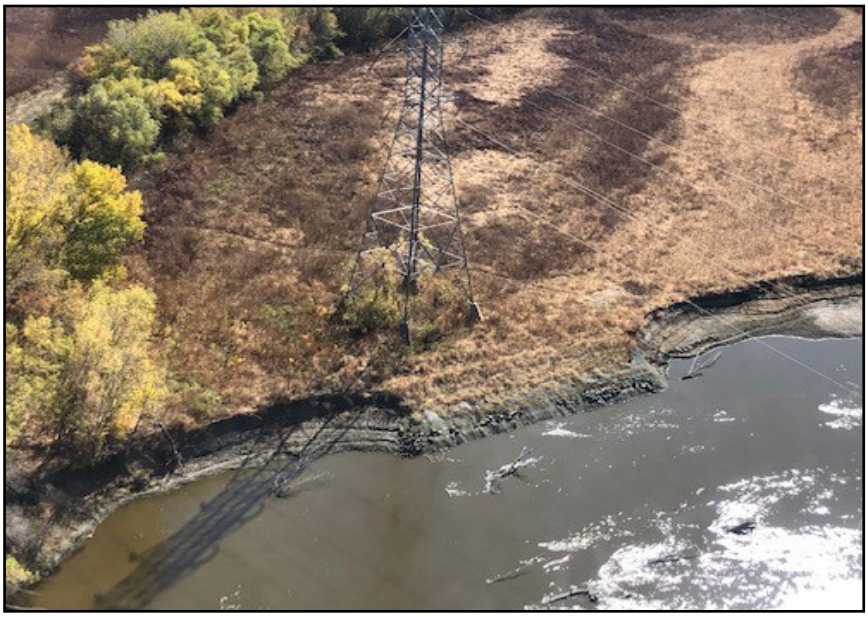


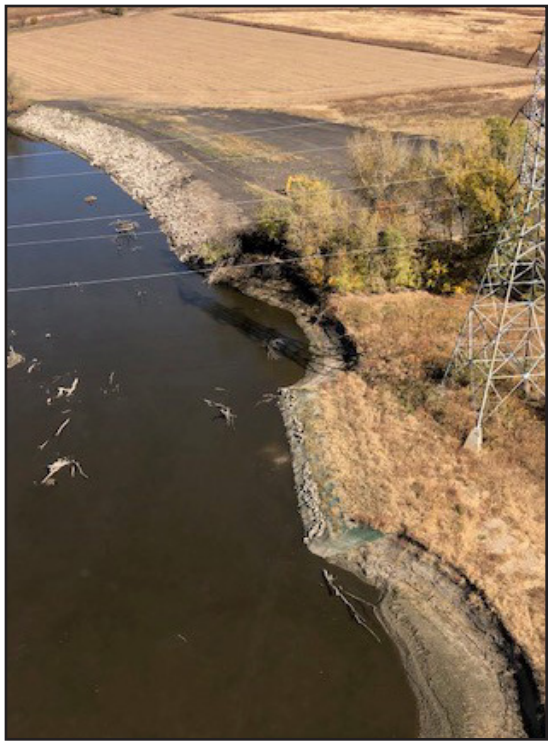
The highly eroded banks along the Sioux River (top) needed an overhaul. XAS in conjunction with PDAs (middle), protected the soils and vegetation. One year later the site remains stabilized (bottom).

PROJECT PROFILE cont.

Performance

Within weeks, the Xtreme Armor System begun establishing vegetation. By the end of the first growing season, the vegetation had developed into a robust and resilient system (shown on previous page). After several years of installation, the long-term performance of the XAS system can be seen from the arial photos shown below. In the six years since installation, the channel banks upstream and downstream of the XAS stabilized reach have severely eroded, claiming farmland and again threatening infrastructure. It is clear from the photos, the bank protected with riprap and XAS remain stable and resilient. The unprotected areas are scalloped and eroding. The XAS is providing equal protection at a lower cost and greener footprint, compared to the riprap. This project offers a keen focus on the suitability of the XAS system for these types of applications, with a direct comparison to traditional methods. XAS will be protecting the power grid for years to come, the advantages could not be clearer.





Arial shots taken of the project area 6 years after installation, show the performance of the XAS system which was installed directly infront of the transmission tower. Non-protected areas adjacent to the XAS installment have continued to show extreme riverbank erosion.

Western Excelsior
4609 E. Boonville-New Harmony Rd., Evansville, IN 47725
(866) 540-9810 | www.westernexcelsior.com