Case Studies

WOKA Whitewater Park Water Cutoff Project

Polyurethane injection created a reliable water cutoff, sealing limestone fractures to prevent water intrusion and providing bulkhead stabilization.

About The Project

Contractor	Location	Product Used
Foundation Specialties Geostructural Construction		Terra-Lok™ 24-120

Learn More About Terra-Lok™ 24-120

Project Overview

The **WOKA Whitewater Park**, located in the scenic Ozark Mountains, features a 1,200-foot-long and 100-foot-wide channel with eight drop features and was designed to provide an exceptional experience for whitewater enthusiasts. However, during construction, water leaks through cracks and voids in the limestone bedrock posed a significant challenge, requiring an innovative water cutoff and bulkhead stabilization

solution to ensure the project's success. Through creative geotechnical methods, Foundation Specialties Geostructural Construction (FSGC) addressed these obstacles and delivered a stable foundation for this national-caliber whitewater park near the Arkansas-Oklahoma border.

Problem

Constructing the whitewater park along a river presented unique challenges, particularly in managing water intrusion and ensuring the stability of structural elements. During the excavation of the whitewater channel, significant water flow was encountered through cracks and voids in the limestone bedrock. Despite an extensive sheet pile wall built to protect the area from high water levels, an unexpected flooding event in April 2021 submerged the construction site, further complicating efforts to maintain a dry work environment and secure foundational stability.

Solution

To address these challenges, FSGC implemented multiple geostructural solutions, including the use of Terra-Lok™ 24-120:

To combat water flowing from the river through limestone fractures into the excavation area, FSGC applied NCFI's Terra-Lok™ 24-120 foam to create an effective water cutoff. The polyurethane was injected directly into the existing rock bulkhead, infiltrating fractures and voids within the limestone. Once injected, the foam expanded to fill these crevices, forming a robust, watertight seal that effectively stopped underground water intrusion. This precise sealing process ensured that even the smallest fractures in the limestone were addressed, preventing any pathways for water seepage, reinforcing the structural integrity of the bulkhead itself, and preventing erosion.

The Terra-Lok™ polyurethane's rapid reaction time was critical in achieving immediate water stoppage, allowing the seal to form quickly upon contact with moisture in the

limestone. As the foam expanded, it adhered to both porous and non-porous surfaces within the rock formation, creating a continuous barrier that adapted to the irregular contours of the bulkhead. This adaptability ensured that the seal was comprehensive and long-lasting, even in areas with significant geological variation.

Results

The application of polyurethane grouting played a critical role in stabilizing the rock bulkhead at WOKA Whitewater Park. By reinforcing fractures and voids in the limestone bedrock, the polyurethane injections added strength and durability to the bulkhead, enabling it to withstand increased river flow and the demands of regular use. NCFI's Terra-Lok™ 24-120 foam provided a reliable solution for enhancing the structural integrity of the bulkhead, ensuring the site's long-term stability and resilience. Today, WOKA Whitewater Park benefits from a robust foundation and durable infrastructure, supporting its continued role as a premier destination for whitewater activities.

Project Gallery