Introduction and Problem

In early 2010, designing firm JLI Design Associates, Inc., contacted Maccaferri Puerto Rico to evaluate a design for the riverbank protection of the Jacaguas River near the Villalba Recreation Area in Villalba, Puerto Rico. Through repeated flooding, the river bank had suffered extreme erosion that was threatening the Municipality’s Recreational Facilities, as well as various residences and Albizu Campos Street that gave them access.

Solution

Through cooperation with the Owner and Designer, the proposed solution of the construction of three separate gabion walls was evaluated and selected. The Jacaguas is a steady flowing river subject to frequent high waters, causing much erosion and scouring in its path. The use of gabion structures offered an efficient and affordable solution, due to the presence of nearby quarries.

Construction Details

The proposed walls had a uniform height of 21 feet, and a combined length of approximately 250 feet. The first 2 courses were 12’ and were buried to account for future scouring. Because of frequent flooding by the Jacaguas, speed was of the essence to avoid the construction site being affected during any flood event.

Construction began on the first wall in March 2011. By late April, all three walls had been completed. The contractor, Santiago Electric, used a white/rose colored stone from a local quarry, that made the wall more noticeable in comparison to the typical gray/blue stone that is used island wide for gabion structures.

Results

Shortly after their completion the walls were put to the test when a week of continuous rainfall filled the Jacaguas River. Water levels rose to within 7 feet from the walls’ top, evidenced by the mark of sediment left along the gabion walls.

Much to the Municipality’s satisfaction, the segments protected by the gabion walls suffered no damage during
this event and various others that have since then occurred. With 2011 being a record breaking rainfall year for Puerto Rico, these walls have passed with flying colors.

The walls were constructed on time and within budget. Because of such a positive outcome, the Municipality of Villalba is currently preparing a second phase for the extension of these walls, as well as the construction of other similar structures at various locations along the Jacaguas River.

Owner

MUNICIPALITY OF VILLALBA, PR

Main Contractor

SANTIAGO ELECTRIC

Design

JLI DESIGN ASSOCIATES, INC.

Products Used

MACCAFERRI GALVANIZED GABIONS AND MACTEX NON WOVEN GEOTEXTILE

Date of Construction

APRIL 2011