MACCAFERRI

CASE HISTORY

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KILLARNEY STORM WATER CHANNEL

JOHANNESBURG, GAUTENG , SOUTH AFRICA

Longitudinal Protection

Problem

The Killarney Golf Course is situated parallel to the M1 highway, which has a storm water network running through it. This is one of the catchments for Parktown, Killarney and Houghton (Johannesburg). The rapid urbanisation of these areas resulted in an increase in impermeable surfaces which has led to a higher volume of water flowing through the storm water channel. This caused extensive erosion on the banks and multiple failures of earth-retaining structures implemented within the channel. The client required a sustainable solution that could effectively manage the surge in storm water flow while preserving the natural beauty of the golf course.

Solution

Maccaferri designed, supplied, and supervised the construction of a 175m channel to contain a 1:10 year flood discharge of 85 cu m. Gabion side banks, of 2-3m, were designed using a 1m rapid draw down water table. To address the high velocity of the water and prevent scour, the channel bed was constructed with concrete capped gabions. Gabion anchors were implemented at ±20m intervals to prevent outflanking. It was advised that continuous maintenance was to be carried out to minimize the vegetation growth within the channel as this would decrease its discharge capacity.
Stepped weirs, of 1m, were strategically placed along the first 100m of the channel to decrease the water velocity by reducing the channel bed gradient. Maccaferri worked closely with the consulting engineers and contractors from conception to implementation. The design of the gabion retaining structures were analysed using the limit equilibrium analysis through MacStars W* to check stability of the system. The channel and weirs were designed using steady flow analysis through MacRa Studio* and MacRa 2* software.
The gabion baskets used in the project were manufactured with hexagonal woven galfan wire mesh, coated in Polimac to achieve an anticipated working life of 120 years according to EN 13383 and ASTM D6711.

• Macstars W, MacRa Studio and MacRa 2 are in house software which allows the user to check the stability, erosive effects and discharge variations, and weir properties respectively within a hydraulic solution.

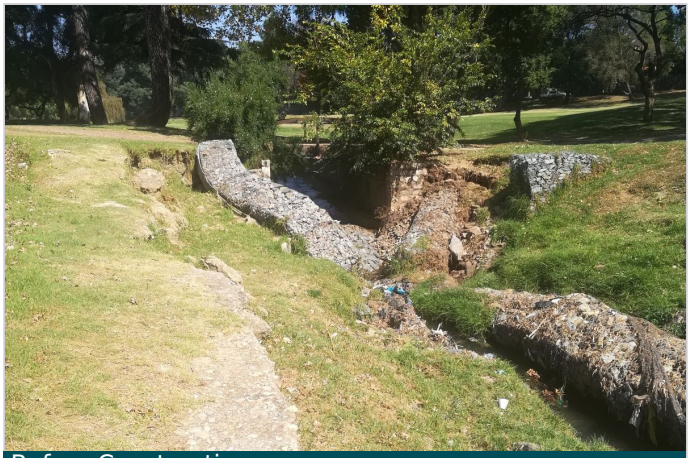
Client: JOHANNESBURG ROADS AGENCY
Designer / Consultant: BMK Consulting Engineers (JHB)
Contractor: Uyapo Engineering Projects CC
Products used (Qty.)
- Gabions 1850 cu m

Date of construction: 07/2021 - 06/2022
Google Maps Google Earth

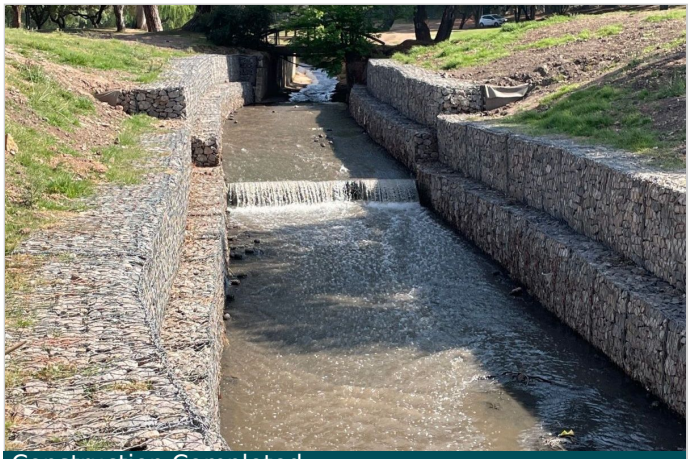

Before Construction


Before Construction

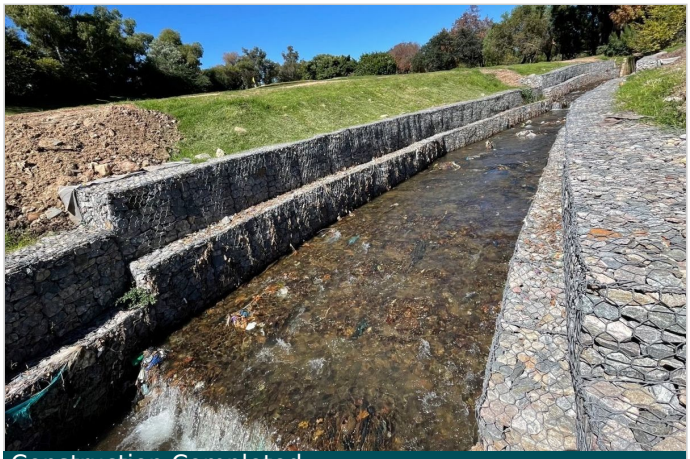
Before Construction



Before Construction



Construction Completed



Construction Completed

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