



Riviera-Marcory viaduct

Civil Engineering Structures

2011 - 2012



IVORY COAST -

Abidjan

Client

BOUYGUES TP

Owner

SOCOPRIM

Highlights

Bridge 1500 m long

30 piers

Foundations on piles 2 m in diameter and up to 80 m long



The Project

The construction of Abidjan's third bridge is without doubt one of the most emblematic projects of the 21st century for Ivory Coast.

This viaduct, 1500 m long on 30 piers, will cross the large Ebrié lagoon, forming part of the overall project to connect the Marcory and Riviera districts. The project lead contractor is BOUYGUES TRAVAUX PUBLICS, and the expressway will be operated by the concession-holder SOCOPRIM, under the terms of a construction/concession contract, with the viaduct as cornerstone.

Key points of our missions

- Soil-testing definition and follow-up
- Geotechnical detailed design of the foundations

Our Services

At the request of BOUYGUES TP, TERRASOL worked upstream of the project on the definition of the geotechnical soil-testing campaign and on on-site follow-up of this campaign in November 2011. We could then carry out the definition and the analysis of the pile static loading tests and the project detailed design.

The soil testing campaign was difficult, because of the depth of the investigations, exceeding 80 m, and because of the lagoon environment. The initial programme including at least one piezocone testing per pier had to be modified, replacing them by destructive and pressuremeter testing.

The viaduct foundations consist of piles 2 m in diameter drilled using a hollow auger to depths exceeding 80 m in the central part of the lagoon, in order to get embedment in a compact sand layer located under a large thickness of clayey-muddy deposits. This compact horizon includes a deep clay layer of lower bearing capacity: its stratigraphy had to be defined very accurately, which was complex due to erratic sedimentation conditions and difficulties encountered during the execution of the investigations.

The validation of the calculation assumptions, and consequently the assessment of the piles bearing capacity, were major issues. Some pile loading tests using Osterberg cells were carried out in order to confirm the assumptions made, particularly with regard to tip bearing capacity, closely related to the construction method including pile tip grouting for re-compacting the soil.