



## The New Coastal Road in La Réunion Island (France): From the Design Process to Construction

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### Abstract

Rock fall was blocking La Réunion main road. The proposed project had four major challenges: collecting geotechnical and geological data; defining foundations; choosing the structure; environmental issues. The design process is explained and the challenges are discussed. An extensive and reliable data base interpreted by experts is essential to the design and the construction needs highly developed industrial methods.

**Keywords:** box girder, cyclone, environment, geology, precast, prestressed concrete, rock fall, ship impact, viaduct.

### 1 Introduction

In France, on the island of La Réunion, located in the Indian Ocean 684 km east of Madagascar, rock fall was disturbing traffic on the major transportation axis and it was taking a human toll. The time had come to grapple with this economic setback and human tragedy. Years of studies revealed the necessity to build a megastructure, a road and viaduct project 12 kilometers long. To do so, a long list of challenges had to be dealt with. Four of them stand out: the collection of robust geotechnical and geological data; the definition of foundations in a maritime site exposed to capricious cyclones; and the choice of the type of structure. In addition, the most majestic sites on the island are protected under the label of UNESCO heritage and therefore extra special attention had to be paid to environmental issues. In this article, the design process is explained and the four major challenges are discussed.

### 2 Project context

The island of the Réunion (Fig.1) remained uninhabited until 1642, the year the French came upon it while sailing the route to the Indies and found it a strategic place to settle.

It is a volcanic island only 2,512 km<sup>2</sup>. It is 75 km long and 55 km wide. The Piton des Neiges Mountain, the highest peak on the island is 3,071 m high.

In 1850 there were 200,000 inhabitants. In 1950 there were 300,000. The last census counted 850,000 inhabitants, indicating a significant increase in population, especially in terms of the island's small size.

The New Coastal Road Project (Fig.2) was envisaged to overcome the rock fall bringing economic and human turmoil to the island (Figs.3-4). It links St. Denis, on the northern coast of the island, and Le Port, located on the western coast. In all, it is 12 km long. The viaduct at the heart of this study represents half of that length.