CASE STUDY

Rion - Antirrion Bridge

K.LIAROMATIS

STRUCTURAL STEELWORK

DESCRIPTION

The Greek company Gefyra S.A. was founded in 1995 by the French VINCI and six Greek construction companies for the Rion-Antirion bridge. The total construction period was 7 years (1998-2004).

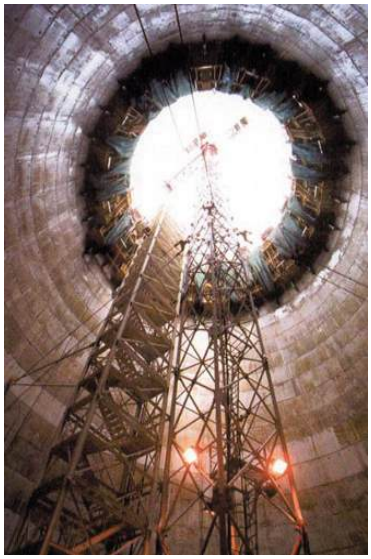
The critical factor for the design of the bridge lays was in the seismic approach, where the Greek State has imposed stringent design seismic loading: a peak ground acceleration equal to 0.48 g and a maximum spectral acceleration equal to 1.20 g between 0.2 and 1.0 second.

The bridge also can sustain the impact of an 180,000-ton tanker sailing at 18 knots as well as with the most powerful winds. The bridge covers a distance of 2.5000m and consists of a 2.252 meter long, 4 pylon cable-stayed bridge with a span distribution equal to 286 meters, 560 meters, 560 meters, 560 meters and 286 meters, two approach viaducts, with 392 meters on Rion side and 239 meters on Antirion side.

The deck is 27.2 meters wide with two traffic lanes plus safety lane and a pedestrian walkway in each direction. The pylons are of typical structure 220 meters high from sea bottom to pylon head. The piers are lying in around 60 meters in water. Pylon bottom is from 25 meters to 45 meters (for the two central pylons) above sea level, leaving a shipping clearance below the deck of 52 meters in the middle of the strait. Pylons rise by 115 meters to a maximum height of 160 meters above sea level. Manufactured projects at Rion - Antirion bridge concerned mainly specialized steel constructions.

PARTICULARITIES OF THE BRIDGE

1. Allocates Four Pylons.
2. Steps in the seabed of the sea at depths from 45m till 65m.
3. Continuous length of Deck 2.252m.
4. Cables of suspension with a total length of 63 km.



QUALITY CONTROL

The company used experienced certified personell for weldings and carried out Non Destructive Tests with Ultrasonic and Dyes Penetration.

All fillet welds controlled by visual examination and by dye penetrate tests.

In all cases certificates for materials and records of Quality system were required.

SPECIALIZED STEEL CONSTRUCTIONS

SHOOTBLASTING & PAINT SYSTEM

All materials are protected against corrosion by shoot blasting of type SA 2.5 with a painting system constituted from primer 60μm and dye of 2 layers of 120μm.

The requested average warranty period was 15 months after delivery.

SPECIALIZED STEEL CONSTRUCTIONS

Steel Retaining Wall

Metal construction for the prevention of water penetration at the first stage of pylons construction with diameter of 90m, height of 5,5m and total weight of 360tn. Techniques of waterproof connections with special requirements for welding and dyes were required.

Staircases of Pylons

Vertebrate staircase construction of 15 parts with total height per pylon of 55m. The dimensions of each one of them are: Length 4060mm, Width 2100 mm, Height 3600mm and Weight of 2,7tn..

Support Beams

Fabrication of (2) pieces of support beams from stainless steel grade S 355 JO, with dimensions: Length 2700mm, Width 850mm, Height 815mm and weight of 1550kg.

Lifting Lugs

Fabrication of (8) pieces of lifting lugs from stainless steel grade S 355 JO, with dimensions: Length 960mm, Width 600mm Height 500mm and weight of 446kg.

Rigidness Beams

Two pieces in each pylon at the shaft of abudtment box type with dimensions Length 19,6m and weight of 15tn including, a 5tn perimetric platform for visits.

Skid shoes for segment on Pylon

Specialized parts (12) from stainless steel grade S 355 JO - 42 CR MO4 with dimensions: Length 1020mm, Width 800mm Height 572mm and total weight of 8280kg.

Spreader Beam

They were constructed for lifting precasted items.

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