



Design and Construction of Metsovitikos Bridge, Greece

Kamran Ahmadi-Kashani
Technical Advisor
KBR (UK)
Ioannina, Greece
kkashani@egnatia.gr
Structural Engineer
BSc, MSc, PhD, MIStructE, MIEI

Panagiotis Papanikolas
Technical Manager
EOAE
Ioannina, Greece
ppapa@egantia.gr
Civil Engineer
BSc, MSc, PhD

Ioannis Rentzeperis
General Manager
EOAE
Thessaloniki, Greece
irentze@egnatia.gr
Civil Engineer
BSc, MSc, PhD

Summary

Metsovitikos Bridge is one of the landmark structures of the Egnatia Motorway project in northern Greece. A pier-less suspension bridge scheme was originally selected for this structure through an international design competition. However, due to geotechnical uncertainties, this scheme was replaced by a balanced cantilever bridge with the main span of 235m which is considered to be the longest span for this of construction in the Balkans. This paper outlines the suspension bridge scheme, and describes the design and construction of the balanced cantilever bridge.

Keywords: Egnatia Motorway; Suspension Bridge; Inclined Hangers; Pierless Bridge; Balanced Cantilever Bridge.

1. Egnatia Motorway

Egnatia Motorway is one of the priority projects of the European Union in the Trans-European Network for Transport which will provide the European Market with an express access to the Middle East [1]. In 1995 the Greek Ministry of Environment, Planning and Public Works established a pseudo private company known as 'Egnatia Odos AE' (EOAE) to manage the design, construction, maintenance, operation and exploitation of the motorway. KBR has acted as the project manager since 1996.

2. Bridge Design Competition

In 1998, EOAE decided to procure two landmark structures to carry Egnatia Motorway within two areas of natural beauty. The county of Epirus in the northwest Greece with its outstanding scenic surroundings provided the most suitable location for these structures. Arachthos and Metsovitikos bridges situated near the villages of Balduma and Metsovo, respectively, were selected as the landmark structures. The latter bridge crosses a steep ravine of Metsovitikos River with a depth of over 145m from the motorway redline, spanning between the portals of Agios Nikolaos and Anilio Tunnels, and connecting the two villages of Metsovo and Anilio.

EOAE commissioned three distinguished international firms of consultants to carry out the architectural and structural study for the two bridges. These included Arup (UK), Leonhardt Andrea & Partners (LAP, Germany), and Christian Menn & Schlaich (CMS, Switzerland), with their respective preliminary designs of a suspension, a balanced cantilever, and a cable stayed bridge for the Metsovitikos Bridge. Due to its elegant appearance and its least disturbance to the surrounding environment, a selection committee recommended the suspension bridge study to proceed to the detail design stage.