



Engineering Structures for Life



TRANSPORTS - ROADWAYS

## Third Ring Road of Tripoli

### ABOUT

The Third Ring Road is the touchstone of the renovation taking place in the capital of Libya and aims to solve the significant existing traffic problems.

The Third Ring Road of Tripoli will have three traffic lanes per each carriageway and approximately 24 km of extension and aims to connect with the Second Ring Road on the west side of Tripoli and Al Fatah Road, a peripheral road in the north-east of Tripoli. The existent roadway has 2x3 lanes, making a total of 30,60 m wide.

The initial scope of work consisted in coordinating and reformulating the previous detailed design, in its different design disciplines, in order to optimize solutions in terms of economy, feasibility and functionality. Among the changes proposed, we highlight the reformulation of the viaducts and unlevelled passes design to incorporate the use of concrete prefabricated elements, and the use of alternative systems for the earth retaining structures.

#### Structural solutions for the viaducts and unlevelled passes

The viaducts and the unlevelled passes have different structural solutions: The unlevelled passes are composed by three or four spans and rectangular columns, constant in height. The deck is composed by I160 or I190 prefabricated and pre-stressed reinforced concrete beams, with spans up to 30 m and prefabricated pre-slabs. The viaducts also use prefabricated solutions for the deck and the number of spans range

### FACTS

**Year:** 2007-2011

**Client:** LBCD – Libyan-Brazilian Construction & Development (Odebrecht and UDHC)

**Services:** Detailed design, Structural Engineering, Foundations design, Bridge and Viaduct Engineering, Roadway design, Pavement design, Signalling design, Lighting design, Geotechnical Engineering, Geological and geotechnical studies, Excavations and earthworks design, Coordination of the engineering disciplines, Consulting and on-site technical support

### TEAM

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### LOCATION

between seven and eleven spans, with continuity applied in the prestressed beams. The columns assume a unique geometry, specifically developed to provide a common mark throughout the project. The foundations are always deep foundations, with the execution of reinforced concrete piles.

Tripoli, Libya

The IC12 and IC13 interchanges which connect to the access road of the airport, as well as the section which links them, are elevated above ground and required an area of about 100.000 m<sup>2</sup> for the viaducts' deck, distributed over multiple structures. The viaduct IC13-2, with 7 spans and 334 m of extension, stands out from the rest due to the use of box girders placed *in situ*, with spans up to 52 m.

The importance of the TRR unevenness with the access road of the airport was highlighted by a particular aesthetic solution for the columns.

All the concrete prefabricated elements were produced at the construction site on a space specifically built for this purpose.

#### MORE IMAGES

