

# Bridge

DESIGN & ENGINEERING

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## Iraq's first cable-stayed bridge nears deck closure

Central closure of the deck of a new cable-stayed bridge in southern Iraq is due to take place this month (August). The 1,188m-long cable-stayed bridge and viaduct is being built over the Shatt Al-Arab River in Basrah and is expected to reach full completion in early 2017. The bridge is part of a new link which will connect Basrah in southern Iraq to the Iranian motorway network, and will provide an efficient connection between the two countries, alleviating congestion in the district of Shatt Al-Arab. Officially named the Mohammed Al Baquir Bridge, it is also intended to create a new landmark – for Basrah province, being the first of its kind in Iraq.

Both the 288m-long cable-stayed structure and the 900m-long viaducts are steel-concrete composite structures with a constant horizontal curvature in plan; the cable-stayed structure has a main span of 150m and a 21.5m-wide deck, while the viaduct has spans ranging in length from 69m to 39m and a 18m-wide deck. The deck is wider over the cable-stayed structure to accommodate the towers and cables which are located in the central axis.

The steel towers of the cable-stayed span rise to 40m above the top of the deck, and each tower has 14 stay cables – seven supporting the main span and



seven in the lateral span.

The construction method involves the assembly of 10m to 12m-long segments of the steel deck on the ground, on provisional blocks with rollers on top; the segments are mounted with the help of a gantry crane on rails. Then the deck is launched longitudinally over the concrete piers, which are equipped with rollers on top; this is done by use of a strand-jacking system. Launch of the cable-stayed bridge spans involves use of an additional mounting system for the towers and the stays: each mast is mounted horizontally on the deck, then a provisional steel truss structure is mounted on the tower. A strand-jacking system is used to rotate the tower is

rotated by 90° to reach its final vertical position.

At this point additional provisional steel structures are mounted in front and at the back of the tower to create a trussed structure that integrates the deck and the tower. This makes it possible to carry out the longitudinal launch of the tower in the final position together with the rest of the deck.

The front and rear parts of the deck are hinged during launching, in order to enable partial realignment of the profile of the bottom flanges, which in service will have a different vertical curvature. The bridge is being launched from both banks. This construction

method was chosen in order to keep all the assembly works within a specific yard, protected and assisted by a gantry crane, and close to the job site facilities. It also minimises all work at height and over the channel, improving quality and making construction faster and safer.

The bridge owner is the Province of Basra and the design, as well as the construction method and construction engineering is being carried out by consulting engineer De Miranda Associati. Italian contractor Maeg Costruzioni began construction work in August 2014.

*There will be a full article on this project in the next issue of Bd&e*