



Construction and instrumentation the Llobregat River Mouth Bridge

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Summary

Llobregat River's last bridge (placed in El Prat de Llobregat, Barcelona) is in construction. The bridge will be a landmark in the area, the total length is 304 m, the main span is 150 m and deck is 29 m wide. But the singular point is the structural scheme, a complex combination of frame and half-through arch.

During the construction process the structural scheme changes several times, this evolutionary process establish the final forces and stresses in the bridge, in other words, the construction is bonded to the final result. In order to verify all the construction phases the structure has been monitored in real time. The instrumentation combined with the usual control allows us to evaluate the structure stress state and compare with the models, as well as verify the correct building or adjust the process in next phases.

Keywords: Singular Bridge, Concrete, Post-tensioning, Cables, Instrumentation, Monitoring, Arch, Rigid frame, Inclined piers

1. Introduction to the project

The bridge is placed very close to the Llobregat River Mouth and is the last one before it flows into the sea. The location is between the Barcelona Port and the Prat Airport, the bridge will link the two infrastructures close to the protected natural area of the Llobregat delta, where there are a great biological diversity, specially birds. Also limits with the agrarian fields that survive despite the urban pressure.



Fig. 1: Aerial view of the area

In the Barcelona Port extension the riverbed was diverted, due to this actuation the Pratenc industrial area was nearly isolated from the Prat town. The new bridge the direct access is restored and improves the connection with the ZAL (the intermodal logistics platform of the Port of Barcelona), which is growing with big investments at midterm. When the bridge and the ring road were finished there will be direct connection with the main motorways in the area (A-2, C-31 and C-32) the heavy traffic will be distributed lightening the current infrastructures which are saturated.

The new bridge stands out among the other bridges of Llobregat River and the Catalan area. The main span (150 m) is the third of Catalonia, equalled with the Riba-roja Bridge over the Ebre River, the first and the second still are