

RESTORATION OF SAN TELMO BRIDGE (SEVILLE)

Main data:

- ✓ Location: Seville
- ✓ Scope of Works: Inspection and Restoration Project
- ✓ Structural type: Lateral arched spans of reinforced concrete and central tri-articulated portico
- ✓ Overall length: 183,5 m
- ✓ Spans: 44,0+50,0+44,0+9,80 m
- ✓ Deck width: 19,45 m
- ✓ Deck maximum height: 8,0 m

Summary:

The San Telmo Bridge is one of the oldest bridges in the city of Seville. Its origins can be traced back to 1912. The project was done by José Eugenio Ribera and included 2 top deck lateral spans 45 m long with lightened tympana made of reinforced concrete and a hinged central span 50 m long made of metal to allow the passage of vessels up to the Triana Bridge. In 1964 Agromán carried out the reconditioning of the bridge and substituted the hinged metallic span for 2 tri-articulated porticoes.

At present the San Telmo Bridge is made up of two lateral arched spans of reinforced concrete with an unsupported span of 44 m, a central span of two tri-articulated porticoes made of prestressed concrete of 50 m and a straight stretch of 9,8 m on the left bank of the river. The deck is 19,45 m wide and capable of carrying a four lane road of 14,09 m wide plus pavements. The total length of the bridge is 183,5 m.

It was observed that the arches and uprights showed signs of localised non-mechanical cracking. Some localised flaking and chipping was also detected which left parts of the trusses and frames open. Salt deposits were also observed. The structure of the slabs was one of the most affected elements, fundamentally because of the filtration of water. The exterior transversal prestressing ribs showed serious deterioration, even the breakage of some wires.

The slabs of the central section, made up of prestressed beams, were in acceptable condition with the exception of the ties that coincided with the central articulation and the two expansion joints.

After the evaluation of the critical sections of the beams of the arched stretches and given the uncertainty of the existence or position of supports the decision was taken to include reinforcement in the sections nearest to the embedment of the beams using high strength bars.

In the central span the proposal was to inject directly into the cracks on the underside of the porticoes. Having discarded, a priori, deterioration in the resistant capacity it was prudent to monitor the activity of the cracks by means of calibrated glass measurers and in case of necessity apply reinforcement with carbon fibre laminate stuck using epoxy resin.

The restoration of the bridge also took into consideration the auxiliary elements needed for the

correct functioning of the bridge and avoid their deterioration from climatic conditions.

Apart from the integral treatment of all the surfaces, the project also covered the tasks of substituting systems of containment, lighting, drainage, waterproofing and surfacing.

