

Monitoring, instrumentation and recalculation of the VIPP of la Siagne

A8 motorway



Client:

ESCOTA

Project manager:

ESCOTA

Contractors:

Not applicable

Years:

Planning: 2011 - 2012
Works: /

Principal features:

VIPP central span of 40 m.
Reinforced concrete approach spans of 12.50 m

Background

The viaduct of la Siagne is located at the *point de référence* (reference point) PR 157+600 on the A8 motorway (OA (or engineering structure) 1576), connecting Aix-en-Provence and Nice. It is viaduct with three independent spans whose central span alone is made out of post-tensioned prestressed concrete beams (VIPP). The approach spans are made out of reinforced concrete. The structure has two unconnected decks, one per direction of travel. It was built in 1959 and widened in 1990. The widening was secured using prestressed tubes.

The existing structure is part of the generation of VIPPs built before 1965, whose technology is rather deficient in the following respects:

- Poor – even inexistent - injection into the conduits,
- Absence of watertight membranes,
- Use of prestressing steel susceptible to cracking under pressure or to hydrogen embrittlement,
- Insufficiency of vertical stirrups at the extremity of beams in areas of shear force,
- The very low percentage of longitudinal passive reinforcements,
- Lack of structural ductility before fracture.

DIADES' task

ESCOTA tasked DIADES with:

- monitoring the cracks in the structure, using customised instrumentation,
- carrying out regulatory checks to the structure in service. In order to do this, the structure was recalculated using PYTHAGORE software,
- Feasibility study into the shifting of all traffic to one single deck in the event that a bridge deck suffers a load-bearing capacity problem. This task is additional to the task relating to the replacement of a deck by a mixed isostatic bridge in the event of a load-bearing capacity problem in one of the existing decks.

Monitoring cracks, recalculation of an operational VIPP and assuming that traffic is shifted to one single deck

Specific monitoring of cracks in a VIPP.

Recalculation of a VIPP-type deck, complete modelling of the structure, carrying out checks under normal and tangential forces

diadès

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