

Rehabilitation of two bridges in construction in the motorway M-410 in Madrid (Spain)

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ABSTRACT

The new highway M-410 in Madrid has been constructed during the year 2007. This motorway near to Parla city crosses the road A-42 from Madrid to Toledo. To solve this crossing it has been needed to construct three bridges, the central with two spans over the existing motorway and the other two with one span at each side of the previous one. All the bridges has deep foundations with piles of 1,00 m of diameter and separations of 1,25 m each one.

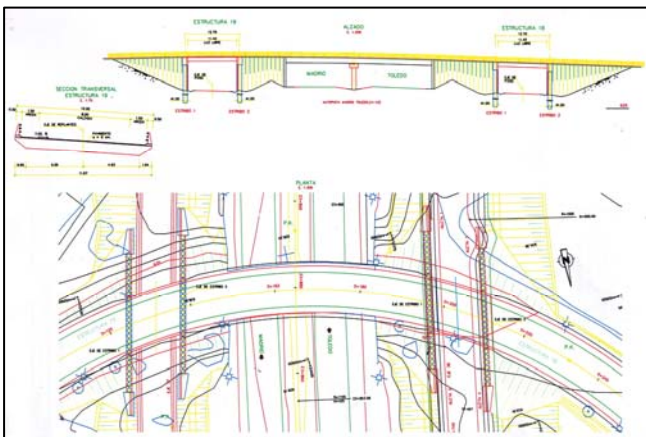


Figure 1. Bridges over motorway Madrid-Toledo M-410

Just after the construction, it has been made sonic transparency essays, which have showed some anomalies on the tip of the piles of the two lateral bridges called PS-18 and PS-19, which implies the necessity of a more deep investigation.

It has been decided to make two boreholes one at each bridge in order to obtain samples of the soil near to the tip of the piles. This investigation has showed that the earth at the level of the tip of the piles, was sandy and with a great water flow, so the conclusion reached is, that it was impossible to retire the earth under the concrete slab on the top, because the piles are not correctly founded



Figure 2. Central and lateral bridges prior the construction

This paper shows the project and the construction of the rehabilitation of bridge, consisting of two sheets of micropiles, deepest at each abutment of the two bridges, to resist all the loads and after this, it would possible to remove the earth under the concrete slab above.

REFERENCES

1. Eurocode 1. "*Bases of project and actions in structures*".
 2. Eurocode 2. "*Project of structures of reinforced concrete*".
 3. Eurocode 3. "*Project of structures of steel*".
- Spanish Ministry of Civil Works. "*Instruction on the actions to consider in the project of bridges of highway. IAP-98*".