

Correction of one unstable embankment in Spain

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ABSTRACT

During the years 1992 - 1996 a climatic change took place in the Iberian Peninsula, changing from dry years to humid years, giving place to numerous and abundant rainfalls that, in the zone of Andalusia caused enough problems in embankments of the roads. Especially, in the National Road IV numerous slides took place from the end of 1996 to the beginning of 1997, giving place in some cases, slides of embankments as the one that is the object of this communication, placed in the kilometre point 385+750, with a length of approximately 350 m. and a height of 14 meters.

As consequence of the slide, happened during the year 1996, it was tried first, the correction of the slide by means of the construction of a network of ditches of drainage in the head of the embankment, complemented with other transversal ditches to intercept and evacuate the water.

Initiated the execution of the ditches during the summer of 1997, it was necessary to interrupted it, due to the collapse of the walls of the ditches before completing the excavation and filling the ditch with the filtering material, in spite of the works were realized in dry season, as consequence of the existing groundwater level.

As initial measure to the final solution, it was realized a campaign of recognition, by means of 6 mechanical soil boring of rotation with inclinometers in two of them and 9 tests of dynamic penetration Borros type in order to define the characteristics of the area of the embankment slid.

In parallel with the above mentioned recognition a topographic survey of the embankment was realized, to define with the maximum accuracy the solution of correction that was going to be projected.

As a result of the analysis made it was proposed the adoption of a rock wall on the foot of the embankment and the restoration of the slope surface using gravels.

The works were realized during the summer of 1998 with satisfactory result up to now.



Figure 1. Sliding embankment of the CN-IV in P.K. 385.750