

Slope stabilization Urbanization Alfamar, Granada (Spain)



TERRATEST
FOUNDATIONS NIGERIA

Client: Ministry of Public Works
Main Contractor: TERRATEST CIMENTACIONES
Date of execution: May 2012 - July 2014

Because of the hard rain occurred in the first half of 2010 in the province of Granada, which was attributed a period of return exceeding 50 years. Relevant incidents that affected significantly Network State Highways occurred the province of Granada. Therefore, a geological-geotechnical campaign was made during the fall of 2010 in several slopes where certain instabilities were observed. Among these slopes the one of the N-340 was recognized between the PK 321 + 500 and 321 + 850.

Given the magnitude and extent of the area affected by the process of instability between the PK 321 + 321 + 500 and 850 of the N-340, an extension of the campaign geotechnical investigation was conducted by running additional surveys (while the periodic auscultation of inclinometers was made, available since October 2010).

Starting from the elaborated geotechnical profiles, taking into account all the data and observations available, geomorphological geological, and kinematics of instabilities, we proceeded to define actions and the dimensioning of the elements in order to restore the slope and road conditions acceptable in terms of stability. From this analysis it turned out that getting the stabilizing forces it was necessary to execute:

1. Pile wall located on the outer edge of the road (sea side).
2. Pile wall located inside roadside (landside)
3. Anchored wall above the current anchored wall (landside)
3. Micropile wall inside the urbanization.

Descripción de los Trabajos

Between January 31 and May 10, 2013, the first execution of piles, which consisted of 74 piles 1250 mm in diameter and 28.5 m depth, was finished, obtaining an average production rate of 40.84 ml/day.

B500SD 553.79 tons of steel and concrete HA25 3299 m³ / L / 20 Ila were used in the piles.

In the in situ concrete beam, 26.8 Tn of reinforced steel 395 m³ of concrete HA25 / B / Ila 20 were used.

The total length of the concrete beam was around 55.1 ml.

All piles were executed with temporary casing.

Between June 25, 2013 and May 22, 2014, the second pile wall was made, which consisted of performing 229 piles of 1250 mm diameter and different depths depending on the area where they were located, obtaining an average production rate of 39.38 ml/day. Several Piles included inclinometers.

For this second phase, 1474.31 tons of reinforced steel B500SD type, 15,118.5 m³ of concrete type HA25 / L / 20 Ila were used in the piles. 113.3 tons of reinforced steel, concrete HA25 1589.5 m³ / B / 20 Ila type was used in the concrete beam, being the total length of the concrete beam of 330.65 ml. All piles were performed in dry and drilled with temporary casing.



Exp. B-11-590-1