

LOADTEST O-cell® Technology in CFA Piles-Italy



Client:

Piaggio Aero Industries

Foundation Contractors:

Intergeo Perforazioni

Consulting Engineer:

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Airport at Villanova D'Albenga



Reinforcing cage, O-cell and instrumentation ready for installation



Installation of the single O-cell in a 450 mm pile



Test in progress

The first CFA bi-directional pile test in Europe was performed in Villanova D'Albenga, Northern Italy. Although the loads achieved were not record breaking, proving the system could be used for small piles was an achievement Loadtest are very proud of. The installation of the single O-cell within a 450 mm diameter CFA pile was performed with simplicity and ease. The fact that the site is located in Italy, the homeland of the two major CFA equipment suppliers in Europe made the test all the more pleasing.

Project:

Piaggio Aero is building a new state-of-the-art manufacturing facility in Villanova d'Albenga, about 70 kilometers west of Genoa. Designed around the principles of lean manufacturing technologies, this plant will allow Piaggio to significantly increase production capacity, efficiency and optimize workflow. This new facility will position Piaggio Aero to meet the challenges of the market and respond to the demands of future growth.

Piaggio Aero Industries is one of the world's leading aerospace companies. The Company designs, develops, constructs and maintains aircraft, engines and aircraft structural components. Improving technology used in the aero industry is one key role in the activities of the company.

The site is located within the grounds of the airport of Villanova D'Albenga. Opened in 1922, the airport now boasts a runway of 1429 metres long and 45 metres wide. Although quiet and with little traffic during the winter months, the airport becomes a thriving gateway for the Summer visitors to the Italian Riviera. It also serves as a terminal for the export of fresh cut flowers to Italy and across Europe.

Bi-directional load test arrangement:

A single O-cell was chosen for the desired loads of up to 3 MN. To assist installation of the cage, a grout mixture was used for the test pile as it would facilitate insertion of the cage and O-cell assembly. To check that the cementitious mix was suitable, a 'dummy' O-cell arrangement of identical cross section mounted in the same manner in a similar cage was inserted in an adjacent bore.

Once confirmation from the CFA rig electronic instrumentation was obtained, indicating that the construction was satisfactory, insertion of the O-cell cage was carried out. One 230 mm O-cell was welded inside the 10 m CFA cage, 0.5 m above the toe. Two levels of Geokon sister bar strain gauges were positioned along the cage to assist in the determination of the unit skin friction.

Pile Testing:

The test was successfully carried out. Due to small size of the pile, it was not considered necessary to use a reference beam. An alternative arrangement of monitoring the pile head automatically with two independent Leica precision electronic levels was used.

Summary:

Installation and testing of the first bi-directional O-cell test in Europe was successfully achieved.

