

“TECHNOLOGY APPLIED TO THE ASSEMBLY OF REINFORCEMENT OF REINFORCED CONCRETE STRUCTURES IN HIGH SEISMIC RISK AREAS”



Unión Europea

Project ATARCHER

Project co-financed by the EUROPEAN REGIONAL DEVELOPMENT FUND FEDER with the aim of promoting technological development, innovation and quality research.

The main objective of this project is to improve the quality and sustainability of reinforcement designs used in concrete structures in the construction market in areas of high seismic risk.

Project objectives

- Development of a new method to evaluate the use of spirals or hoops in the transverse reinforcement of reinforced concrete.
- Development and validation of new mechanical splices and design of a new system for their placement and quality control.
- Validation of new cage with asymmetrical longitudinal reinforcement vs. piles with symmetrical longitudinal reinforcement.
- New methods for calculating asymmetric cage deflections.

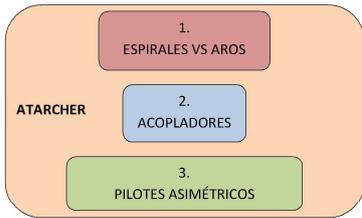


Fig.1: Project developments



Equipment used in the project:

Fig.5: Testing Machines type Ibertest

R&D for "Couplers":

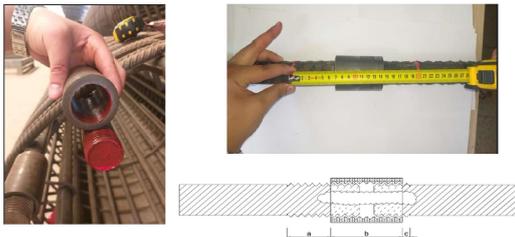
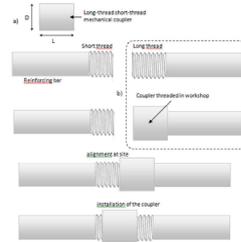


Fig.2: Coupler LTST



ERSI is currently looking for new highly reliable mechanical couplers and is developing new couplers and control systems. The project has also addressed the testing of these new systems for coupling installation and control.

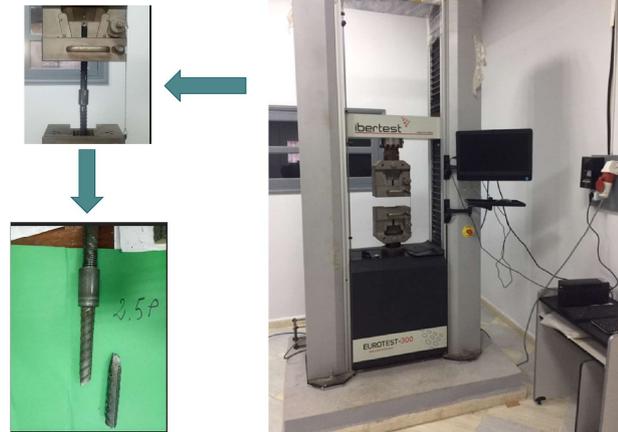


Fig.6: Capacity of Ibertest machine 300KN



Fig.3: overview of couplers

Analytical and numerical model:

An analytical model was established with the **Mathematica** program, then a numerical model was established with the **Abaqus** software and then these models will be carried out in the laboratory.

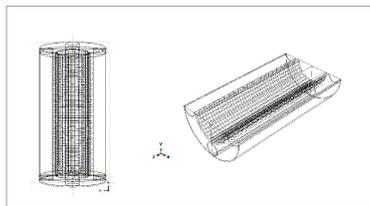
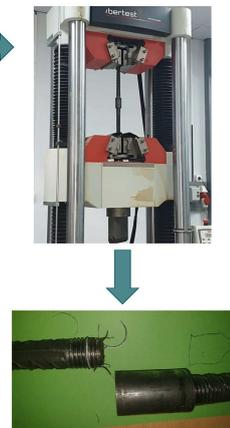


Fig.4: Numerical simulation of the model



Fig.7: Capacity of Ibertest 1000KN



Consortium



Results

1. Spirals vs hoops: The use of spirals instead of hoops has been shown to have better structural performance. This will help ERSI in the commercialization of its pilots.
2. Couplers: the results have exceeded expectations and a patent will be filed for a rebar, not a connector.
3. Asymmetric cages: with the help of these results, ERSI will try to obtain an approval for the use of asymmetric piles in Algeria.