

## LOAD BEARING CAPACITY ASSESSMENT OF PRESTRESSED CONCRETE COLUMNS USED IN AGRICULTURE

### Goal of the project

The behavior of high span and small cross sections prestressed concrete elements are less studied. Scope of the project was to investigate through laboratory tests the behavior of such specimens used in agricultures.

### Short description of the project

The load bearing capacity and behavior and of prestressed concrete columns used in agriculture were investigated through laboratory tests. Test methods, static schemes and element position in the tests were established previously together with the beneficiary and were correlated with the available norms and codes. There were tested 18 specimens in 2 different static scheme. The investigated parameters were: behavior of columns in the elastic domain; deformations in elastic phase, just before failure and at failure; load values at cracking, at the initiation of failure and in ultimate state; deflection and crack width at every load step.

### Project implemented by

S.C. BAUELEMENTE S.R.L.  
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### Implementation period

05.09.2016 – 05.12.2016

### Main activities

- Design and preparation of the experimental stand based on the needs of beneficiary, correlated with the available norms and codes
- Experimental testing a total of 18 specimens, 3 elements types (4 $\Phi$ /80x85cm, 6 $\Phi$ /80x85cm, 6 $\Phi$ /100x120cm) in 2 static scheme, 3 specimens for every variables.
- Determination of deflections and crack width for every load step.
- Assessment of the behavior based on cracking mode, crack distribution and propagation, as well as failure modes.
- Elaboration of research report.



### Results

The most relevant result consists in:

- Dimensions of the elements are in conformity of the SR EN 12843:2005 code requirements.
- Geometrical deviations of the specimens are within accepted limits.
- Tested specimens behaved as expected compared with similar type of elements.
- Cracking mode of the elements were specific for prestressed elements.
- Test results were uniform from ultimate force and deflection point of view.
- Important differences in ultimate load bearing capacity were observed when a static schemes were modified.

### Applicability and transferability of the results

The experimental results obtained within the project will be introduced in an advanced calculation model for such small cross sections prestressed concrete elements. Results could be used to improve design and construction practice.

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### Research Centre

Research Centre for Retrofitting of Constructions – RECO,  
Politehnica University of Timisoara

### Research team

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