

STEEL-EARTH - STEEL-BASED APPLICATIONS IN EARTHQUAKE-PRONE AREAS

Goal of the project:

- Steel-earth project aim to develop practical tools and documents for engineers, standardization bodies and construction companies in order to exploit at best the results obtained in previous RFCS research projects dealing with different open problems of seismic design, i.e. OPUS, STEELRETRO and PRECASTEEL.

Short description of the project:

Steel-earth disseminate the results obtained in OPUS (Optimizing the seismic performance of steel and steel-concrete structures by standardizing material quality control), STEELRETRO (Steel solutions for seismic retrofit and upgrade of existing constructions) and PRECASTEEL (Prefabricated steel structures for low-rise buildings in seismic areas).

Project implemented by

- The Research Centre for Mechanics of Materials and Structural Safety – CEMSIG, Politehnica University of Timișoara.

Implementation period:

Main activities:

- Harmonization of design and production standards (i.e. Eurocodes and Euronorms on steel products like EN 10025, EN 210210 and EN 10219) in order to optimize steel performance for structural ductile design overcoming the actual contradictions of available standards.
- Seismic rehabilitation of existing masonry and reinforced concrete buildings by means of steel-based solutions including innovative solutions based on enhanced dissipative systems.
- Seismic design of steel and steel-concrete industrial and commercial buildings for which suitable pre-designed solutions were individuated, including innovative solutions using enhanced dissipative systems or using alternative bracing system as precast double-slab wall, and collected in a properly developed software available online.



Results:

- Technical sheets and working examples describing the related prefabricated steel or steel-concrete composite solutions for realizing single-storey industrial and low-rise commercial buildings in seismic prone areas and concerning the rehabilitation of existing buildings have been prepared. Pre-normative documents related to harmonization of design and production standards and some contributions for Eurocodes are available.
- In order to make available aforementioned results to engineers and construction companies and to national and European standardization bodies of relevant commissions and working groups of CEN/TC250, ECCS and CEN-ECISS, all documents will be disseminated all over Europe together with the software developed in PRECASTEEL project, translated in different European languages.

Applicability and transferability of the results:

- Two training courses, five conferences and several workshops in locations cover both high and medium seismicity areas (Italy, Finland, Slovenia, Spain, Germany, Belgium, Romania, Portugal and Greece) are organized in order to disseminate the results.
- Particular attention will be paid to the exploitation of innovative constructional solutions and design rules for the design of new industrial and commercial buildings and for the seismic retrofit of existing ones.

Financed through/by

Research Fund for Coal and Steel (RFCS) - total budget of "Steel-Earth" project: 1.045.186 € and budget of the Politehnica University of Timisoara: 35.314 €

Research Center

The Research Centre for Mechanics of Materials and Structural Safety – CEMSIG, Politehnica University of Timisoara.

Research team

The partnership is composed by industries, companies, research and academic institutions:

- University of Pisa
- RIVA Acciaio SpA
- University of Camerino
- Ferriere Nord S.p.A
- University of Rome
- University of Parma
- Coordinamento Sismico Regione Toscana
- Centro Europeo di Formazione e Ricerca in Ingegneria Sismica (Italy)
- Hasselt University
- European Convention for Constructional Steelwork (Belgium),
- University of Thessaly,
- Shelter S.A. (Greece)
- Rheinisch-Westfälische
- Technische Hochschule Aachen (Germany),
- INSAR- INSA deã
- Rennes (France),
- VTT - Technical Research Centre (Finland)
- Politechnic University of Timisoara (Romania).

Contact information

Acad. Prof. Dan DUBINĂ, PhD
Member of Romanian Academy
Department of Steel Structures and Structural Mechanics
Address: Str. Ioan Curea, No. 1, RO300224, Timisoara
Phone: (+40) 256 403 920
Fax: (+40) 256 403 917
E-mail: dan.dubina@upt.ro