

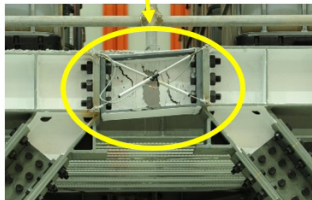
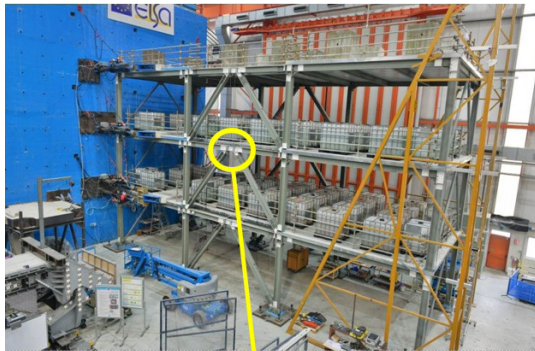
VALORIZATION OF INNOVATIVE ANTI-SEISMIC DEVICES (INNOSEIS)

Goal of the project

As a result of three RFCS-, one EU- and two nationally funded research projects, 12 innovative replaceable steel-based devices have been developed that improve the response of structures during earthquakes by enhancing their energy dissipation capacity. This project aims at transferring the relevant knowledge from research to practice by the production of several documents and the organization of seminars and workshops.

Short description of the project

UPT is responsible for valorization of removable bolted links and replaceable shear panels concepts.



Project implemented by

NATIONAL TECHNICAL UNIVERSITY OF ATHENS (NTUA) – coordinator
UNIVERSITATEA POLITEHNICA TIMISOARA (UPT)
POLITECNICO DI MILANO (POLIMI)
UNIVERSITA DEGLI STUDI DI NAPOLI FEDERICO II. (UNINA)

UNIVERSITA DI PISA (UNIPI)
RHEINISCH-WESTFAELISCHE TECHNISCHE HOCHSCHULE AACHEN (RWTH)
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UNIVERSITET PO ARCHITEKTURA STROITELSTVO I GEODEZIJA (UACEG)
UNIVERSITEIT HASSELT (UHasselt)
MAURER SOHNE ENGINEERING GmbH & CO KG (MSE)
EUROPEAN CONVENTION FOR CONSTRUCTIONAL STEELWORK (ECCS)

Implementation period

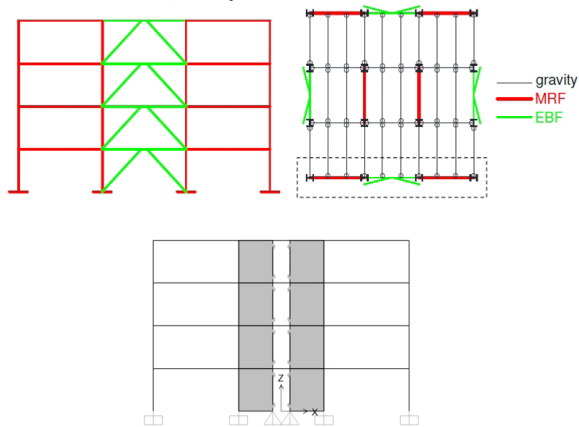
01.07.2016 – 31.12.2017

Main activities

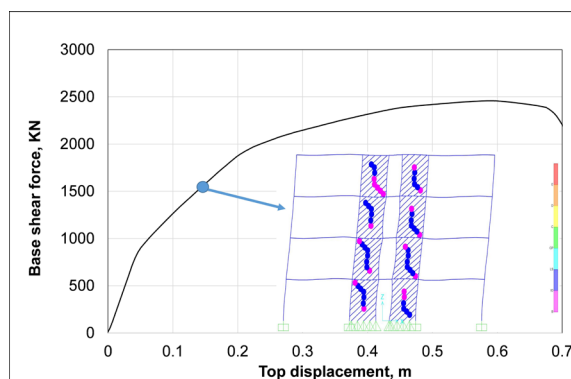
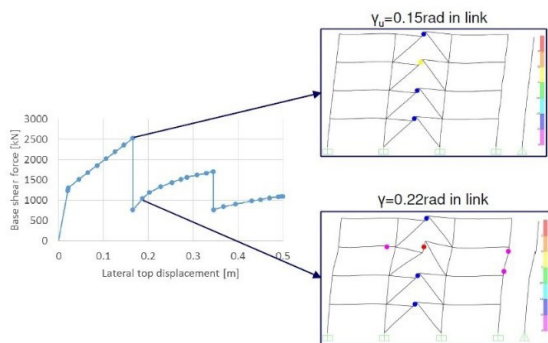
- Collection and critical review of materials available for the anticipated devices. Information brochures were produced separately for each innovative device and then put together to form a single volume.
- Production of a document that defines a methodology for reliably quantifying values of the behavior factors q for use in seismic design.
- Clarification of cases in which devices must be qualified in accordance with EN 15129 for anti-seismic devices.
- Detailed case studies of buildings in which the innovative devices are employed.
- Seminars, workshops and other dissemination actions.

Results

Four stories buildings, in which replaceable bolted links and replaceable shear panels are employed, were designed by UPT, in two different design cases: moderate seismicity case considering Medium Ductility Class and high seismicity case considering High Ductility Class.



In order to verify the re-centering capability and to assess the seismic performance and feasibility of these structures, static nonlinear (pushover) analyses were performed.



Technical documentations that describe 12 innovative systems and design guidelines to apply them were developed within the project, emphasized by case studies. These documents were distributed during the project workshop organized within 15CONMET (Iasi, Romania) and are also available on the project website (<http://in-noseis.ntua.gr/>).



Applicability and transferability of the results

- Promotion of innovation in the design of buildings in seismic areas
- Enhancement of structural safety against the governing natural hazard in large parts of Europe.
- Improvement in life cycle costs and sustainability due to the reduction of seismic losses.
- Contribution to the increase in market share for steel, especially in areas of moderate to high seismicity where steel is underrepresented.
- Provision of more alternatives for architectural and structural design of new and existing buildings by increasing the number of code-approved structural systems for steel and composite structures.

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Research Centre

The Research Centre for Mechanics of Materials and Structural Safety – CEMSIG

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