

## Expression of interest for research cooperation

### Description of institution

Interested institution:	Cracow University of Technology
Department carrying out the proposed research	<b>Reinforced Concrete Structures Division</b> Institute of Building Materials and Structures Faculty of Civil Engineering
Address and webpage	24 Warszawska Street , 31-155 Kraków, POLAND <a href="http://i-15.pk.edu.pl/index.php/en/">http://i-15.pk.edu.pl/index.php/en/</a>
Contact person (name, e-mail address, phone)	Andrzej WINNICKI, <a href="mailto:andrzej@hypatia.i5.pk.edu.pl">andrzej@hypatia.i5.pk.edu.pl</a> , +48 126282373

### Research offer

#### Brief description of the department (key research facilities, infrastructure, equipment)

(up to 1000 characters)

Equipment for testing (destructive and non-destructive) of concrete and masonry structures, professional codes for analysing concrete and masonry structures: DIANA, Abaqus, Atena, in-house own developed programs in Mathcad for analysis of stress-strain state in RC cross-sections and RC beams under fire loading

### Scientific area

<input type="checkbox"/> Chemistry	<input type="checkbox"/> Social Sciences and Humanities
<input type="checkbox"/> Economic Sciences	<input type="checkbox"/> <b>Information Science and Engineering</b>
<input type="checkbox"/> Environment and Geosciences	<input type="checkbox"/> Life Sciences
<input type="checkbox"/> Mathematics	<input type="checkbox"/> Physics

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**Research field**

(up to 500 characters)

Experimental testing and numerical analysis of RC structures including bond properties for HPC and high strength steel, cracking and deflection of RC elements made of HPC and high strength steel, biaxial bending of slender columns made of HPC, Alkali-silica reaction (ASR) in concrete elements – numerical modelling, fire design of RC structures – analytical and numerical models.

Diagnostic of historical masonry structures. Design of research programs and testing of masonry in existing buildings. In-situ tests on masonry, non-destructive tests (NDT), minor-destructive tests (MDT), tests on large samples cut from masonry structures. Evaluation of the technical condition of historical buildings. Strengthening of historical structures with new generation materials.

**The proposed research/project description**

(up to 1000 characters)

Numerical investigation of concrete structures durability under composed action of mechanical loading and ASR – refinement of existing material model, its numerical calibration, validation for wide range of concrete elements; development of analytical models for fire design of RC structures, extension of in-house developed FE program for fire loading of RC beams taking into account geometrical non-linearity and axial forces; full-scale tests of RC beams made of HPC and high strength steel – cracks and deflection contro

**Additional information (key Persons and Expertise; additional trainings, research programme, other)**

(up to 1000characters)

Andrzej Winnicki, Krzysztof Chudyba, Szymon Seręga – analytical and numerical modelling of fire loading and ASR for concrete elements

Piotr Matysek, Łukasz Hojdys, Piotr Krajewski, Dawid Łątka – diagnosis, testing and modelling of masonry structures