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>>> Handbook on

STRUCTURAL ASSESSMENT OF INDUSTRIAL HERITAGE BUILDINGS

eea grants
eea financial mechanism
iceland liechtenstein norway

NVF Národní vzdělávací fond

norway grants

HANDBOOK

STRUCTURAL ASSESSMENT OF INDUSTRIAL HERITAGE BUILDINGS

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FOREWORD

The project Assessment of historical immovables

Protection, conservation or renewal of historical immovables is becoming an important task for art historians, architects and civil engineers in many European countries. Inevitable part of a preservation of many historical immovables, including heritage structures such as industrial buildings, bridges and folk architecture, is assessment of their reliability and design of adequate repairs taking into account the actual structural conditions and expected performance.

The research project A/CZ0046/2/0013 Assessment of historical immovables is aimed at developing the general methodology for the complex assessment of heritage structures with a particular focus on industrial buildings and bridges. The main goal of the project is to provide operational tools and background information for decision making concerning the protection, conservation, renewal and extended use of historical immovables. The primary target group includes researchers, designers, practicing engineers, cultural heritage management, local authorities and other specialists interested in preservation of industrial heritage. Outcomes of the project include:

- papers in prestigious journals
- active participation in international conferences,
- theoretical background documents for standardisation,
- handbook, seminar and lectures for life-long education
- software products and
- project web sites <www.heritage.cvut.cz>.

In the period 2009-2010 the project is partly supported by the Research Support Fund (EEA Grants / Norway Grants), Czech state budget and by the partners.

Project partners

The project is based on the partnership of the Czech Technical University in Prague - Klokner Institute and the Norwegian University of Live Sciences - Institute for Mathematics and Technology.

Klokner Institute of the Czech Technical University in Prague, leader of the project, is a research institution with an outstanding position in the following fields:

- Theory of structural safety and risk assessment,
- Structural diagnostics based on experimental mechanics, numerical analysis and verification of numerical models,
- Material research of concrete, steel, masonry and composite materials, optimisation of material properties and determination of their functional characteristics,
- Experimental analysis of actual properties of existing construction materials,
- Durability of structures, assessment of environmental degradation processes and optimisation of interventions.

So far the researchers of the Klokner Institute have participated (as leaders or co-leaders) in several international projects in the framework of the Copernicus, Leonardo da Vinci, Jean Monnet and Growth programs, in more than 30 projects supported by the Czech Science Foundation, in 4 research plans of the Ministry of Education, Youth and Sports of the Czech Republic and in several research projects of the Ministry of Transport and Ministry of Industry and Trade of the Czech Republic. More than 800 scientific publications have been elaborated and several patents have been registered in the framework of these projects during the last 5 years. Most of the projects and publications have been evaluated by reviewers as outstanding.

The Norwegian University of Live Sciences (UMB) comprises 8 departments. The University is recognised as a leading international centre of knowledge, focused on higher education and research within environmental- and biosciences. Together with other research institutes established at Aas, UMB provides state-of-the-art knowledge based on a broad range of disciplines. These include Applied Mathematics and Statistics, Physics, Spatial Planning, Environment and Natural Resources, Landscape Architecture, Civil Engineering and Building Science.

In total, UMB has about 2 600 students of which about 300 are PhD students. Annually, the University confers about 40 PhD degrees upon successful candidates. Of the 870 University staff, more than half hold scientific positions. Recent research projects include:

- Rural building heritage – transformation of old rural buildings,
- Building modelling and climatic adaptation of buildings,
- Farm buildings in the arctic – climatic adaptation of farm buildings.

Handbook

The Handbook is focused on the complex methodology for structural assessment of industrial heritage buildings. The following main topics are treated in particular:

- Basis of assessment
- Actions
- Material and geometric properties
- Deterioration models
- Reliability analysis
- Decision on construction interventions.

In addition theoretical procedures are supplemented by several case studies provided in Annex A. Annex B describes basic statistical concepts and techniques. The Handbook is written in a user-friendly way employing only basic mathematical tools.

A wide range of potential users of the Handbook includes practising engineers, designers, technicians, experts of public authorities and students.

Prague, 2010

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