CONCRETE SOLUTIONS SINCE 2003

2003 SAINT-MALO (FRANCE)
2006 SAINT-MALO (FRANCE)
2009 PADUA (ITALY)
2011 DRESDEN (GERMANY)
2014 BELFAST (NORTHERN IRELAND)
2016 THESSALONIKI (GREECE)
2019 CLUJ-NAPOCA (ROMANIA)

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Introduction

The Seventh International Conference on Concrete Repair, (ICCR2019) was held in Cluj Napoca, Romania from the 30 September to the 2 October 2019. The Conference was the latest in a sequence of ICCR International Conferences (St. Malo, 2003 and 2006; Padova, 2009; Dresden 2011; Belfast 2014; Thessaloniki 2016). The organization was a collaborative venture between GR Technologie Ltd (Concrete Solutions) and the Technical University of Cluj Napoca in Romania.

The estimated cost to repair reinforced concrete structures has been said to be some €175 per square meter of exposed surface. In the United States alone, the annual direct cost of corrosion in highway bridges alone is roughly €7.3 billion, including maintenance, repair, replacement, and the cost of capital. Indirect costs, including traffic delays and lost productivity, may run 10 times that number.

But corrosion is more than an economic issue. In June 1983, a 100-foot section dropped out of the Mianus River Bridge in Greenwich, Connecticut, U.S.A., killing three motorists and critically injuring three others. The steel pins that joined sections of the bridge had decayed. In May 2000, in Concord, North Carolina, U.S.A., more than 100 people were injured when steel strands corroded in a prestressed concrete pedestrian bridge and the structure collapsed onto the highway below. In 2006, The De La Concorde Overpass near Montreal collapsed. The collapsed section crushed two vehicles under it, killing five people and seriously injuring six others who went over the edge while travelling on the overpass. More recently in Italy in August 2018, a partial collapse of the Ponte Morandi Bridge in Genova was blamed on corrosion in the cable stays and killed 43 people who were crossing the bridge at the time. The disaster caused a major political controversy about the poor state of infrastructure in Italy and raised wider questions about the condition of bridges across Europe.

So the problems of dealing with maintenance and repair of structures are not just financial, they affect people’s lives too!

Concrete Solutions has historically developed a name as a conference that brings together researchers from the Academic world with Engineers and Scientists who are practitioners in the field of concrete repair. These vary from Owners and Specifiers, to Engineers and Technicians, but include Architects and those engaged in preserving historic structures. The conference has received excellent support by researchers and practitioners from around the world, with authors being drawn from numerous research and industrial organisations from 22 countries for this 7th Conference. These Proceedings contain papers presented at the conference, classified into a total of 11 themes:

- Self-healing Concrete
- Patch Repair
- Electrochemical Repair
- Strengthening Materials and techniques/Repair with Composites
- Surface Protection Methods and Materials
- NDT and Diagnosis of Problems
- Repair and Preservation of Heritage Structures
- Service Life Modelling
- Whole Life Costing
- Case Studies
- Sustainable Repair

Only original contributions were considered for inclusion in the conference proceedings and all papers submitted were subjected to a full process of peer review. The review of manuscripts was
undertaken by members of the International Scientific Advisory Board and other identified leading experts, acting independently on one or more assigned manuscripts. This invaluable assistance, which has greatly enhanced the quality of the Proceedings, is gratefully acknowledged. The full conference papers are published by MATEC Web of Conferences, a provider of open-access proceedings in Materials Science, Engineering and Chemistry. This was done in order to give the papers better accessibility in the international research and industry communities. This hard copy of the proceedings contains abstracts of all accepted papers, in order to provide an overview on the topics covered and to guide conference participants in selecting technical sessions that are of most interest to them.

Concrete Solutions and the Technical University of Cluj-Napoca are pleased to acknowledge the support and sponsorship of the following organisations:

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- INCD URBAN INCERC Romania

Finally, the editors wish to give special thanks to the authors for their efforts at producing and delivering some excellent and thought provoking papers of a very high standard. We are sure that these Proceedings will be used by many working in this critical field, and that the papers and the discussions at the Conference will form a suitable base for discussion and provide suggestions for future development and research.

Michael Grantham
Călin Mircea

*Editors*

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