

Approval for this bulletin

Subject to priorities defined by the Technical Council and the Presidium, the results of the *fib*'s work in commissions and task groups are published in a continuously numbered series of technical publications called *bulletins*. The following categories are used:

Category:

Technical report
State-of-the-art report
Manual / Guide to good practice / Recommendation
Model code

Approval by:

Task group and chairpersons of the commission
Commission
Technical Council
General Assembly

Any publication not having met the above requirements will be clearly identified as a preliminary draft.

fib Bulletin 109 was approved as a state-of-the-art-report by the *fib* Technical Council in June 2023.

The *fib* Task Group 3.3 - "Existing concrete structures: life management, testing and structural health monitoring" includes the following members:

Convenor: Keßler, Sylvia.

Co-Convenor: Limongelli, Maria Pina.

Technical Secretary: Apostolidi Eftychia.

Members: Ahrens Alexander, Andrade Carmen, Bartolac Marko, Basheer Muhammed, Bergmeister Konrad, Bertagnoli Gabriele, Bien Jan, Bouteiller Veronique, Braml Thomas, Carroza-Diaz Marta, Casas Rius Joan, Caspeele Robby, Castagone Adriano, Celebi Mehmet, Chatzi Eleni, De Azua Ruiz, De Roeck Wojciech, Dieteren Gerrie, Duvnjak Ivan, Elfgren Lennart, Eustáquio Elsa, Górski Marcin, Gulikers Joost, Hansen Michael, Hendy Chris, Holicky Milan, Kainz Christian, Keuser Manfred, Küttenbaum Stefan, Kuźawa Mieszko, Lavorato Davide, Lehky David, Ley Urzaiz Jorge, Lombaert Geert, Lu Xilin, Maack Stefan, Maas Stefan, Mancini Giuseppe, Marsili Francesca, Matthews Stuart, Matos José, Meda Alberto, Monti Giorgio, Moon Franklin, Moreira de Sousa Hélder Filipe, Novak Drahomir, Nuti Camillo, Oliveira Santos Luis, Petraschek Thomas, Pielstick Brett, Popescu Cosmin, Prieto Miguel, Ptacek Lisa, Rafiq Imran, Ralbovsky Marian, Ribeiro Diogo, Rosko Peter, Schmidt Franziska, Shan Jiazeng, Silva Sousa Hélder Manuel, Strauss Alfred, Tanner Peter, Thöns Sebastian, Tondolo Francesco, Torrent Roberto, Verstrynge Els, Volpatti Giovanni, Vorwagner Alois, Wenzel Helmut, Zonta Daniele.

Corresponding members: Aktan Emin, Bastidas-Arteaga Emilio, Catbas Necati, Duprat Frédéric, Dyson Jonathon, Godart Bruno, Hoffmann Markus, Lorenzen Steven, Sykora Miroslav, Ueda Tamon, Zabel Volkmar, Zimmert Florian.

Cover images: Combe Maran viaduct in St. Ursanne (CH), credit photo Hoffmann, M. (2021) created on the basis of publicly available UAV/UAS data of the Combe Maran viaduct in St. Ursanne (CH) created with Agisoft Metashape and 3DFlow Zephyr.

© Fédération internationale du béton (*fib*) 2023.

Although the International Federation for Structural Concrete / Fédération internationale du béton (*fib*) does its best to ensure that all the information presented in this publication is accurate, no liability or responsibility of any kind, including liability for negligence, is accepted in this respect by the organisation, its members, employees or agents.

All rights reserved. No part of this publication may be reproduced, modified, translated, stored in a retrieval system or transmitted in any form or by any means – electronically, mechanically, through photocopying, recording or otherwise – without prior written permission from the *fib*.

ISSN 1562-3610

ISBN 978-2-88394-171-7

<https://doi.org/10.35789/fib.BULL.0109>

Layout by Corinne Bottollier (*fib*).

Printed by P+K Solutions GmbH & Co. KG

Acknowledgements

This state-of-the-art-report was drafted by Task Group 3.3 - "Existing concrete structures: life management, testing and structural health monitoring" within the *fib* Commission 3 *Existing concrete structures*.

Authors:

Keßler, Sylvia (Convener/Editor)

University of the Federal Armed Forces Hamburg, Germany

Limongelli, Maria Pina (Editor)

Politecnico di Milano, Italy

Apostolidi Eftychia (Technical Secretary)

Technical University of Darmstadt, Germany

Andrade Carmen

CSIC, Spain

Bartolac, Marco

University of Zagreb, Croatia

Braml, Thomas

University of the Bundeswehr Munich, Germany

Cigada, Alfredo

Politecnico di Milano, Italy

Duprat, Frederic

LMDC, University of Toulouse, INSA-UPS, France

Gentile, Carmelo

Politecnico di Milano, Italy

Kainz, Christian

University of the Bundeswehr Munich, Germany

Küttenbaum, Stefan

Bundesanstalt für Materialforschung und -prüfung,
Germany

Lehky, David

Brno University of Technology, Czech Republic

Maack, Stefan

Bundesanstalt für Materialforschung und -prüfung,
Germany

Matos, José

University of Minho, Portugal

Novák, Drahomir

Brno University of Technology, Czech Republic

Rasol, Mezgeen

Univ Eiffel/MAST/EMGCU, France

Santos, Luís

LNEC, Portugal

Shan, Jiazeng

Tongji University, China

Sousa, Helder S.

University of Minho, Portugal

Ballio, Francesco

Politecnico di Milano, Italy

Bień, Jan

Wroclaw University of Science and Technology,
Poland

Chatzi, Eleni

ETH Zürich, Switzerland

Darò, Paola

Politecnico di Milano, Italy

Elfgren, Lennart

Lulea University of Technology, Sweden

Górski, Marcin

Silesian University of Technology, Poland

Keuser, Manfred

University of the Bundeswehr Munich, Germany

Kuzawa, Mieszko

Wroclaw University of Science and Technology,
Poland

Ley, Jorge

INTEMAC, Spain

Mancini, Giuseppe

Politecnico di Milano, Italy

Mendler, Alexander

Technical University of Munich, Germany

Oliveira, Sergio

National Laboratory for Civil Engineering, Lisbon,
Portugal

Ryjáček, Pavel

Czech Technical University in Prague, Czech
Republic

Schmidt, Franziska

IFSTTAR, France

Sousa, Helder

University of Surrey, UK

Strauss, Alfred

University of Natural Resources and Life Sciences,
Vienna, Austria

Torrent, Roberto
Materials Advanced Services Ltd.

Verstrynge, Els
KU Leuven, Belgium

Zimmert, Florian
University of the Bundeswehr Munich, Germany

Ueda, Tamon
Shenzhen University, China

Zabel, Volkmar
Bauhaus University Weinmar, Germany

Contact details of Working Party members can be found in the members only section of the *fib* website, www.fib-international.org.

DOI by chapter

Chapters	Authors	DOI
1	Andrade, Apostolidi, Chatzi, Duprat, Keßler, Lehky, Limongelli, Novák, Sousa*, Strauss.	https://doi.org/10.35789/fib.BULL.0109.Ch01
2	Bartolac, Bieñ, Górski, Keßler*, Küttenbaum, Kuzawa*, Ley, Maack, Mender, Ryjáček, Santos, Verstrynge.	https://doi.org/10.35789/fib.BULL.0109.Ch02
3	Andrade, Chatzi*, Darò, Gentile, Górski, Limongelli*, Oliveira, Mancini, Shan, Sousa, Ueda, Verstrynge, Zabel.	https://doi.org/10.35789/fib.BULL.0109.Ch03
4	Andrade, Apostolidi, Duprat, Lehky, Matos, Novák, Sousa*, Sousa S, Strauss*.	https://doi.org/10.35789/fib.BULL.0109.Ch04
5	Braml*, Kainz, Keuser, Zimmert*.	https://doi.org/10.35789/fib.BULL.0109.Ch05
6	Ballio, Chatzi*, Cigada, Darò, Elfgren, Gentile, Górski, Küttenbaum, Limongelli*, Mancini, Oliveira, Rasol, Schmidt, Shan, Sousa, Torrent, Ueda, Verstrynge.	https://doi.org/10.35789/fib.BULL.0109.Ch06