**VENUE:** Politecnico di Milano Polo Territoriale di Lecco Via G. Previati 1/c Lecco, Italy

http://cacrcs.cte-eventi.com



ORGANIZED BY







**DEI TECNICI DELLA** INDUSTRIAL 177A710NF ENII 171A

ASSOCIAZIONE ITALIANA CALCESTRUZZO ARMATO F PRECOMPRESSO

FEDERATION FOR STRUCTURAL CONCRETE



# FIFTH EDITION

2025 • Lecco - June 30 / July 3

**CAPACITY ASSESSMENT OF CORRODED REINFORCED CONCRETE STRUCTURES:** FROM RESEARCH TO DAILY **ENGINEERING EVALUATION** 

WITH THE UNCONDITIONAL SUPPORT OF









**Consiglio Nazionale** 

delle Ricerche

UNDER THE PATRONAGE OF

ASSOCIATIONE

PER L'EDILIZIA

TECNOLOGI



ederbeton

# UNIVERLECCO

reluis





**VENUE:** Politecnico di Milano Polo Territoriale di Lecco Via G. Previati 1/c Lecco, Italy

http://cacrcs.cte-eventi.com

# fibCACRCS 2025

INDUSTRIALIZZAZIONE

ASSOCIAZIONE ITALIANA CALCESTRUZZO ARMATO F PRECOMPRESSO

THE INTERNATIONAL FEDERATION FOR STRUCTURAL CONCRETE

# FIFTH EDITION

WITH THE UNCONDITIONAL SUPPORT OF









# UNIVERLECCO COSTRUZIONI GENERALI

UNDER THE PATRONAGE OF



POLITECNICO

**MILANO 1863** 

















# fibCACRCS 2025

# FIFTH EDITION

### CAPACITY ASSESSMENT OF CORRODED REINFORCED CONCRETE STRUCTURES

# TOPIC

The fib**CACRCS 20255th edition** will focus on practical engineering applications achieved through consolidated research on corroded reinforced concrete and prestressed concrete structures. The workshop will cover a range of topics, starting with the definition of corrosion damage indicators and analysis of material characteristics, moving on to the evaluation of the structural behaviour of corroded members, and concluding with the prediction of the remaining service life of corroded structures and intervention strategies.

Case studies on the assessment of deteriorated structures are of particular interest.

Since 2019, the Workshop has attracted participation from experts in the capacity assessment of corroded reinforced concrete structures. Starting in 2025, the CACRCS DAYS Workshop is officially become the fib**CACRCS 2025** Conference, being integrated into fib's global network of conferences and initiatives.

The workshop is open to young researchers, experts, and practitioners.

During the fib**CACRCS 2025**, professional engineers will have the opportunity to connect with a community of experts who can assist in practical problem-solving and optimizing decision-making procedures for the assessment, interventions and maintenance of existing structures. Additionally, a Round Table discussion will be scheduled to stimulate debate on the analysis of available codes and guidelines for the evaluation of deteriorating existing structures affected by corrosion, as well as identify gaps and future research areas based on the contributions submitted to this workshop.



# fibCACRCS 2025

# FIFTH EDITION

### CAPACITY ASSESSMENT OF CORRODED REINFORCED CONCRETE STRUCTURES

# **ORGANIZING COMMITTEE**

Coordinators: **Beatrice BELLETTI** (University of Parma), **Dario CORONELLI** (Politecnico di Milano), **Marco DI PRISCO** (Politecnico di Milano)

Olha Palii (University of Parma) Anna Magri, Ludovica De Cobelli (CTE) David Fernández-Ordóñez (*fib* Secretary General) Luc Taerwe (Ghent University, Editor-in-Chief Structural Concrete Journal) Simone Ravasini, Marco Carlo Rampini, Biagio Calcavecchia, Katherina Flores, Giulio Zani (*fib* Italy Young Members Group) Mitsuyoshi Akiyama (Waseda University), Carmen Andrade (CIMNE - UPC), Véronique Bouteiller (Université Gustave Eiffel), Walter Kaufmann (ETH Zurich), Beatriz Martin-Pérez (University of Ottawa), Elena Miceli (Politecnico di Torino), Jesus Rodriguez (UPM), Takumi Shimomura (Nagaoka University of Technology), Els Verstrynge (KU Leuven University), Joost Walraven (Em. TU Delft), Weiping Zhang (Tongji University)

# **SCIENTIFIC COMMITTEE**

Lucas Adelaide (University Gustave Eiffel), Fabio Bolzoni (Politecnico di Milano), Joan Ramon Casas (UPC), Robby Caspeele (Ghent University), Antoni Cladera (Universitat de les Illes Balears), Matteo Colombo (Politecnico di Milano), Marta Del Zoppo (University of Naples Federico II), Pieter Desnerck (University of Cambridge), Michael Fardis (University of Patras), Severin Häfliger (ETHZ), Rade Hajdin (Infrastructure Management Consultants, Switzerland: IABSE), Chris Hendy (Atkins, University of Cambridge), Christopher Higgins (Oregon State University), Stefania Imperatore (Niccolò Cusano University of Rome), Akio Kasuga (Sumitomo Mitsui Construction), Federica Lollini (Politecnico di Milano), Fausto Minelli (University of Brescia), Boumediene Nedjar (University d'Evry Paris-Saclay), Camillo Nuti (Università degli Studi Roma Tre), Antonino Recupero (University of Messina), Claude Rospars (University Gustave Eiffel), Peter Tanner (IETcc-CSIC), Francesco Tondolo (Politecnico di Torino), Tamon Ueda (Shenzhen University)

http://cacrcs.cte-eventi.com



# fib fibCACRCS 2025

# FIFTH EDITION

### CAPACITY ASSESSMENT OF CORRODED REINFORCED CONCRETE STRUCTURES



The venue of the *fib*CACRCS 2025 will be the Politecnico di Milano Polo Territoriale di Lecco Via Gaetano Previati 1/c, Lecco, Italy

http://cacrcs.cte-eventi.com

ORGANIZED BY



# fibCACRCS 2025

# FIFTH EDITION

### CAPACITY ASSESSMENT OF CORRODED REINFORCED CONCRETE STRUCTURES

#### **CALL FOR ABSTRACTS**

The *fibCACRCS* 2025 welcome all contributions related to the behaviour of reinforced concrete, fibre reinforced concrete and prestressed concrete structures damaged by corrosion, with both numerical and experimental approaches, and including some recommendations for the daily engineering evaluation of corroded structures.

You can submit abstracts and papers to the website of the *fib*CACRCS 2025 event: http://cacrcs.cte-eventi.com

#### PAPER SUBMISSION

Authors willing to present their work at the *fib*CACRCS 2025 are invited to kindly submit an abstract in accordance with the sessions of the workshop.Papers (8 pages long) will be reviewed and will be included in the Proceedings of the Workshop if they will be accepted.The Authors of the paper will be invited to submit a full manuscript to a Special Issue of Structural Concrete.The submission of full manuscripts will undergo the usual peer-review process of Structural Concrete.

In order to promote and facilitate the transfer of knowledge from Research to Daily Engineering Evaluation, the template for extended abstracts contains a paragraph dedicated to a description of the use of the presented results in engineering applications. The template for abstracts and papers is available on the *fibCACRCS* 2025 website (http://cacrcs.cte-eventi.com).

#### **IMPORTANT DATES**

ABSTRACT SUBMISSION	30.06.2024	ABSTRACT ACCEPTANCE NOTIFICATION	30.07.2024
PAPER SUBMISSION	31.12.2024	PAPER ACCEPTANCE	31.01.2025
FINAL VERSION OF THE PAPER SUBMISSION	31.03.2025	AUTHOR'S REGISTRATION	01.04.2025
PRESENTATION SUBMISSION	15.06.2025	ATTENDEES' REGISTRATION	30.06.2025
FULL MANUSCRIPT SUBMISSION FOR A SPECIAL ISSUE OF STRUCTURAL CONCRETE			30.11.2025



# fibCACRCS 2025

# FIFTH EDITION

### CAPACITY ASSESSMENT OF CORRODED REINFORCED CONCRETE STRUCTURES

### **SPONSORS**

Companies interested in supporting the event can contact us by e-mail to **cacrcs@cte-eventi.com**. **SPONSOR FEES** € **1500** + **VAT** including

- Conference registration of 1 person.
- Registration of additional attendees at reduced fee of € 300 each.
- Display of the logo (in alphabetic order for each sponsoring) on program, and all advertising documents delivered by the conference organizing committee.

### AWARDS

Awards will be conferred to the most outstanding paper presented by a young researcher and to the most excellent paper presented in the workshop.

### **REGISTRATION FEES**

are VAT exempted and include participation to the workshop, gala dinner and electronic proceedings.

Standard fee Reduced fee for Young People

 € 600,00 (including CTE membership)
€ 530,00 (valid only for people aged <30 years and including CTE membership)

€ 500,00 (valid only for CTE, *fib*, Member 2025)

You will register directly from the *fib*CACRCS 2025 website (http://cacrcs.cte-eventi.com) and make the payment by credit card or bank transfer to CTE For **Bank Transfer** please indicate:

Name Surname – CACRCS 2025

**Reduced fee for CTE fib Member** 

CTE – Bank Intesa San Paolo IBAN IT59C0306909606100000113883 BIC SWIFT: BC IT IT MM

**PROFESSIONAL CREDITS · CFP:** 3+3+3+3 CFP will be requested to CNI only for Italian Engineers

## CONTACTS

### **Beatrice BELLETTI**

DIA (University of Parma) Tel. +39 0521905930 E-mail: beatrice.belletti@unipr.it

## Dario CORONELLI

Politecnico di Milano Tel. +39 0223994395 E-mail: dario.coronelli@polimi.it

### Marco DI PRISCO

Politecnico di Milano Tel. +39 0223994400 E-mail: marco.diprisco@polimi.it

Secretary of the event E-mail: cacrcs@cte-eventi.com

For more information about the event, please visit the internet website:

http://cacrcs.cte-eventi.com www.cte-it.org



# aicap fib fibCACRCS 2025

# FIFTH EDITION

# DETAILED FINAL PROGRAM

# Monday, June 30th

9:00 (\*CET) OPENING OF THE WORKSHOP

\*Central European Time

Welcome & Introduction

9:15 B. Belletti, D. Coronelli, M. di Prisco, Event Coordinators 9:45 Enrico Nusiner, CTE President 10:00 Luc Taerwe. Editor-in-Chief of Structural Concrete 10:15 Gianluca Cangemi, General Director at Toto Costruzioni Generali 10:30 Massimo Damasio, Owner and Project Manager at Exemplar 10:45 **Íria Doniak**, fib President

#### 11:00-11:30 Coffee Break

#### OPENING KEY-NOTE LECTURES

11:30 Joost Walraven (Em. TU Delft, Delft, The Netherlands) Capacity assessment of existing structures according to fib Model code 2020

12:00 Rade Hajdin (Infrastructure Management Consultants GmbH, Zurich, Switzerland / University of Belgrade, Serbia) Bridge Management Systems – The next generation

#### S1) DAMAGE INDICATORS OF CORROSION IN RC, SFRC AND PC MEMBERS AND MODELS FOR DETERIORATED MATERIALS

#### KEY-NOTE LECTURES

12:30 Edoardo Proverbio (University of Messina, Messina, Italy) Corrosion in PT Tendons: Review of Estimation & Forecasting Models

#### 13:00-14:00 LUNCH

14:30 Carmen Andrade (CIMNE – UPC, Barcelona, Spain) Effect of local climate in the concrete degree of water saturation and on the corrosion rate

#### PRESENTED PAPERS

15:00 Giglio M.\*, Di Vita C.P., Proverbio E. Corrosion induced damage evaluation on post-tensioned reinforced concrete structures

15:15 Russo N., Redaelli E., Lollini F.\* Electrochemical and gravimetric measurement of corrosion rate of steel bars in carbonated concrete

15:30 Belletti B., Bernardi P., Sirico A.\*, Zanotto F., Balbo A., Malcevschi A. Bond performance for uncorroded and corroded steel reinforcement in biochar-added concrete

15:45 Martens C.\*, Caspeele R., Verstrynge E. Exploring the Effects of Mechanical Cracking on the Corrosion Rate in Reinforced Concrete



# fibCACRCS 2025

# FIFTH EDITION

16:00 Imperatore S\*., Nerilli F., Monsef Ahmadi H., Monteleone C., Capozzoli L., De Martino G., Salvia G., Di Gennaro D., Vasanelli E.

Novel NDT methodologies for identifying corrosion damage in reinforced concrete structures

#### 16:15-16:45 Coffee Break

16:45 **Coronelli D., Rosati G.\*** *Calculation of resistance for corroded strands with localized pits* 

# 17:00 Bolzoni F.\*, Brenna A., Beretta S., Diamanti M.V., Paterlini L., Ormellese M., Pedeferri M.P.

*Reinforced concrete structures affected by chloride induced corrosion: effect of preventative methods on service life* 

17:15 **Imperatore S.\*, Monteleone C.** *Corrosion assessment and mechanical characterization of naturally corroded reinforcements* 

17:30 Sirico A., Palii O., Ravasini S.\*, Belletti B., Sánchez J. Pitting morphology of prestressing strands subjected to naturally chloride environment

# 17:45 Flores Ferreira K.\*, Rampini M.C., Zani G., Russo N., Lollini F., Scaccabarozzi D., Zappa E., di Prisco M.

The effects of artificial corrosion on reinforced concrete structures: experimental campaign on small-scale beam specimens

18:00 (\*CET) CLOSING OF THE 1<sup>st</sup> DAY

9:00 (\*CET) OPENING OF THE 2<sup>nd</sup> DAY

# S2) ANALYTICAL AND NUMERICAL MODELS FOR THE CAPACITY ASSESSMENT OF CORRODED RC BEAMS, PC BEAMS AND BRIDGE DECKS COMPONENTS

**Tuesday**, July 1<sup>st</sup>

#### • KEY-NOTE LECTURES

9:00 **Antonino Recupero** (University of Messina, Messina, Italy) Prestressing Concrete in Italian Bridges: Seventy years of light and shadows in a winning challenge

9:30 **Chao Jiang** (Tongji University, Shanghai, China) *Corrosion-induced failure mode change and bearing capacity degradation of RC beams* 

#### • PRESENTED PAPERS

10:00 Ferche A., Habibi S., Vecchio F.\* Modelling of Corroded Rebar in Concrete Members: Scratching the Surface

10:15 de la Fuente A., Oller E., Todisco L., Sosa P.M., Ruiz G., Martínez F., Ribas C., Rodriguez J., Andrade C. ESTRUCOR: The Spanish research network on structural assessment of concrete structures

10:30 **Mezera A.\*, Holý M., Řeháček S.** Assessment of Actual Conditions of Posttensioned Cables for Reliability Analysis of Existing Bridges



# ANIZED BY fibCACRCS 2025

# FIFTH EDITION

10:45 Granata M.F.\*, La Mendola L. Influence of partial bond and degradation on post-tensioned prestressed girders

11:00-11:45 Coffee Break

11:45 Granata M.F.\*, Colajanni P. Structural behaviour of old reinforced concrete bowstring bridges affected by corrosion

12:00 Rinaldi Z., Di Carlo F., Meda A. Analytical modelling strategies comparison to predict the structural behaviour of corroded reinforced concrete beams

12:15 Spinella N.\*, Rossi P.P., Messina D., Recupero A. Modelling at different levels of complexity of RC beams with corroded reinforcing steel

12:30 Anghileri M.\*, Biondini F. Experimental validation of nonlinear structural analysis of RC/PC beams under shear failure

12:45 Galano S., Losanno D., Parisi F.\* Finite element analyses on the flexural response of post-tensioned concrete bridge airders with corroded tendons in different grouting conditions

#### 13:00-14:00 LUNCH

14:00 Torabian Isfahani F., Vittone M., Nava G., Beltrami C. Corrosion rate assessment of bridge deck post-tension cables with different environmental/maintenance and exposure scenarios

14:15 Di Carlo F., Molaioni F., Stella A.\*, Talledo D.A. Analysis of flexural behaviour of corroded RC beams through experimental tests with DIC S3) ANALYTICAL AND NUMERICAL MODELS FOR THE CAPACITY ASSESSMENT OF CORRODED RC COLUMNS, BRIDGE PIERS AND VERTICAL MEMBERS OF STRUCTURES AND INFRASTRUCTURES

#### KEY-NOTE LECTURES

14:30 Stavroula Pantazopoulou (York University, Toronto, ON, Canada) Modelling Parameters for Members with Corroded Bars in Seismic Assessment of Existing Structures

15:00 Mehdi Kashani (University of Southampton, Southampton, United Kingdom) Recent Advances in Modelling Nonlinear Seismic Performance of Corrosion- Damaged RC Bridaes

#### • PRESENTED PAPERS

#### 15:30 Michelini E., Dudziak S.\*, Ravasini S., Belletti B.

Capacity assessment of corroded reinforced concrete frames subjected to differential ground settlements

#### 15:45-16:30 Coffee Break

#### 16:30 Ruta D., Bernardini D.\*, Cardone D.

On the influence of the choice of the steel degradation law on the modeling of corroded Reinforced Concrete structures

16:45 Santarsiero G., Masi A., Gaetano R., Picciano V.\* Seismic behaviour of simply supported reinforced concrete bridges with corroded piers

#### 17:00 Coronelli D.\*, Martinelli L.

Bridge piers load and deformation capacity: tests and numerical modelling





# ib fibCACRCS 2025

# FIFTH EDITION

17:15 Zucca M., Stochino F., Vecchi E., Crespi P.

On the seismic performance of existing RC motorway viaducts subject to corrosion effects

17:30 **Poeta A., Scozzese F., Micozzi F., Dall'Asta A.** Influence of degradation uncertainties on seismic risk of reinforced concrete bridge pier: preliminary investigation

18:00 (\*CET) CLOSING OF THE 2<sup>nd</sup> DAY

**19:00 GALA DINNER** 

## Wednesday, July 2<sup>nd</sup>

9:00 (\*CET) OPENING OF THE 3rd DAY

# S4) ANALYTICAL AND NUMERICAL MODELS FOR THE CAPACITY ASSESSMENT OF CORRODED HALF JOINTS, SQUAT MEMBERS, ETC.

#### • KEY-NOTE LECTURES

9:00 **Marco di Prisco** (Politecnico di Milano, Milan, Italy) The half-joint in the Italian bridges: residual bearing capacity and smart solutions for retrofitting

9:30 **De-Cheng Feng** (Southeast University, Nanjing, China) Integrated model updating, probabilistic assessment, and digital twin of nuclear containment structures considering time-dependent corrosion effects

#### • PRESENTED PAPERS

10:00 Luyten K., Botte W., Caspeele R.

*Effect of time-dependent degradation on the structural reliability of concrete half-joints based on strut-and-tie model calculations* 

10:15 **Pizzini P\*., Di Stefano N., Facconi L., Minelli F., Plizzari G.** *Experimental and numerical analyses of artificially corroded half-joint beams* 

10:30 **Tenca P., Calcavecchia B., Luyten K., Caspeele R., Ravasini S., Bernardi P., Belletti B.\*** *Numerical assessment of the load-bearing capacity of existing bridges with dapped-end beams* 



# aicap fib fibCACRCS 2025

# FIFTH EDITION

10:45 Martinelli P.\*, Colombo M., di Prisco M. Robustness assessment of half-joint RC girder bridges under corrosion

11:00 Flores Ferreira K., Rampini M.C.\*, Zani G., di Prisco M. Analytical investigation on the structural impact of chloride-induced corrosion in reinforced concrete dapped-end beams

#### 11:15-12:00 Coffee Break

#### **S5) VERIFICATION METHODS FOR CORRODED STRUCTURES**

• KEY-NOTE LECTURE

12:00 Alan O'Connor (Trinity College Dublin, Dublin, Ireland) Probabilistic assessment of existing bridges

12:30 Alfred Strauss (University of Natural Resources and Life Science, Vienna, Austria), Helder F. M. Sousa (BRISA Group, São Domingos de Rana, Portugal) *Quality management in concrete structures – from construction throughout the lifetime* 

#### 13:00-14:00 LUNCH

14:00 Mitsuyoshi Akiyama (Waseda University, Tokyo, Japan), Dan M. Frangopol (Lehigh University, Bethlehem, USA) Probabilistic prediction of residual service life of corroded concrete structures

14:30 Lollini Federica (Politecnico di Milano, Milan, Italy) Durability design of tunnels: present and future

#### PRESENTED PAPERS

14:45 Baldassari A., Piemonti A., Plizzari G., Conforti A.\* Influence of pitting corrosion on the flexural behavior of reinforced concrete beams

15:00 Vescovi M.\*, Belletti B., Ferretti D., Pagliari F. Experimental tests on bond-slip of corroded post-tensioning strand

#### S6) MONITORING AND DIGITAL TWINS FOR THE PREDICTION OF THE RESIDUAL SERVICE LIFE OF CORRODED STRUCTURES

#### KEY-NOTE LECTURES

15:15 Javier Sanchez (Institute Edoardo Torroja, Madrid, Spain) Monitoring corrosion in reinforced concrete structures: case studies, results, analysis and outputs

15:45 Mauro Dolce (University Federico II, Naples, Italy) Research on infrastructures deterioration in the ReLUIS project: visual inspections and experimental tests

#### • PRESENTED PAPERS

16:15 Messina D., Galatà C., Venturi V.D., Recupero A., Proverbio E. Analytical and experimental procedure for in situ stress measurements in prestressed concrete structures

16:30-17:00 Coffee Break



# fib fibCACRCS 2025

# FIFTH EDITION

17:00 Jamal J.\*, Carboni B., Quaranta G., Lacarbonara W. Experimental assessment of corroded RC structures using non-contact techniques

# 17:15 Bouteiller V., Bonnet A., Da-Silva V., Marie-Victoire E., Bouichou M., Thauvin B., Queguiner R., Duros E., Villain G., Achenbach R., Raupach M.

Assessment of chloride-induced corrosion of reinforced concrete by non-destructive testing and continuous monitoring

17:30 **Keßler S.\*, Köhncke M.** Enhancing Corrosion Condition Assessment via Digital Modeling

17:45 **Fritz B.\*** Long-term Corrosion Monitoring for Evaluating the Performance of Repair Measures

18:00 (\*CET) CLOSING OF THE 3rd DAY

9:00 (\*CET) OPENING OF THE 4th DAY

# S7) UPGRADING OF DETERIORATED STRUCTURES BY REACTIVE AND PROACTIVE INTERVENTIONS

Thursday, July 3<sup>rd</sup>

#### • KEY-NOTE LECTURES

9:00 **José Matos, Hélder S. Sousa** (University of Minho, Guimarães, Portugal) *The implementation of* reactive *and proactive interventions towards increasing the resilience of reinforced concrete structures* 

9:30 **Steffen Marx** (Dresden University of Technology, Institute for Concrete Structures, DB Netz AG, Germany) *Forensic analysis of the Carola bridge collapse in Dresden* 

#### • PRESENTED PAPERS

#### 10:00 Van Den Hende K.\*, Botte W., Matthys S., Lombaert G., Caspeele R. Optimization of preventive repair strategies for a prestressed concrete girder subjected to chloride-induced corrosion

10:15 **Řeháček S., Citek D., Pokorny P., Krystov M., Citek A.** *Evaluation of Inspected Bridges Built of Prestressed Standardized Precast Girders I-73 After* 

Evaluation of Inspected Bridges Built of Prestressed Standardized Precast Girders I-73 After 40 Years of Use



# fib fibCACRCS 2025

# FIFTH EDITION

#### **S8) CASE STUDIES**

#### • KEY-NOTE LECTURES

10:30 **Mario Petrangeli, Luigi Fieno** (MPA, Roma, Italy) Corrosion effects of post-tensioned strands on the safety of highway viaducts - The case study of mountain viaducts

#### <u>11:00-11:30 Coffee Break</u>

11:30 Joan Ramon Casas (UPC-BarcelonaTech, Barcelona, Spain) Capacity assessment and proactive intervention in damaged bridges: two case studies

#### • PRESENTED PAPERS

12:00 **Bernardini S.\*, Papworth F., Newby R.** Investigation and repair of an immersed concrete box subject to restrained and structural cracking

12:15 **Miceli E.\***, **Gino D.**, **Giordano L.**, **De Iuliis M.**, **Castaldo P.**, **Mancini G.**, **Deiana M.** *Experience from experimental testing of an existing PRC bridge beam* 

12:30 **Newby R., Papworth F., Bernardini S.** *Residual life and repair for an existing concrete wharf* 

12:45 **Khadija A., El Mendili Y., Cherkaoui M.** Mechanical, and electrochemical (EIS) characterization of reinforced concrete by Natural Moroccan Pozzolan and fly ash 14:15 **Newby R., Papworth F., Bernardini S.** *Corrosion Assessment of Post-Tensioned Cables* 

14:30 **Casprini E., Passoni C.\*, Haefliger S., Todisco L.** Defining corrosion parameters from naturally corroded bars: the CORR-DATA database

14:45 **Duarte N., Bairán J.M.** Assessment of corroded prestressed concrete wharves in Catalan Marinas

15:00 **Reale S., Furinghetti M., Pavese A.** *Experimental and Numerical Studies on the Seismic Response of a Corroded RC Bridge* 

15:15 **Lollini F., Carsana M., Gastaldi M., Giannini L., Redaelli E.** *Experimental tests for the evaluation of the durability of a tunnel under construction* 

#### 15:30-16:00 Coffee Break

16:00 Round table on identifying the technical gaps for the structural evaluation of corroded concrete structures for future guidelines and code on short and long-term assessment of corroded structures CHAIR: Walter Kaufmann, ETH Zurich, Switzerland

#### **CLOSING CEREMONY**

17:30 • AWARDS • CONCLUSION OF THE WORKSHOP 18:00 (\*CET) CLOSING OF THE WORKSHOP \*Centre European Time

13:00-14:00 LUNCH