

cte organizes

PRELIMINARY PROGRAM

1-4 DECEMBER
2020

WORKSHOP ONLINE

CACRCS DAYS 2020

*Capacity Assessment of Corroded
Reinforced Concrete Structures*

with the support of



For any information about the event, please visit the website: www.cte-it.org

4° ANNOUNCEMENT



Collegio dei Tecnici della Industrializzazione Edilizia

Organizes

CACRCS DAYS 2020 Capacity Assessment of Corroded Reinforced Concrete Structures

1-4 December 2020

Venue: ON LINE

PRELIMINARY PROGRAM

with the support of



Fédération International du Béton



fib Italy Young Member



Associazione Italiana Calcestruzzo
Armato Precompresso

TOPIC

The capacity assessment of corroding reinforced concrete, fibre reinforced concrete and prestressed structures has become a most relevant engineering task with significant social and economic impact. The need to develop codes for use in the practice spurs the research community to establish and share methods to determine material deterioration and mechanical properties, member resistance and structural capacity.

Special sessions are organised during the workshop. Authors are kindly invited to select the session at which they will present their papers. At the beginning of each session, chairpersons prepare two education presentations: the first one illustrates the fundamental, while the second one the research challenges of the topic treated in the session. Therefore, the virtual workshop offers a didactic material for engineers, practitioners and a forum for scientists, concrete technologists, researchers, academics to improve knowledge about corrosion of reinforced concrete structures

ORGANIZING COMMITTEE

Coordinator: **Beatrice Belletti, Dario Coronelli**

Anna Magri, *CTE*

David Fernández-Ordóñez, *Secretary General*

Luc Taerwe, *Editor-in-Chief Structural Concrete Journal*

Marta del Zoppo, Francesca Vecchi, Isabella Giorgia Colombo, *fib Italia Young Member*

SCIENTIFIC COMMITTEE

Carmen Andrade, Fabio Biondini, Fabio Bolzoni, Robby Caspeele, Airong Chen, Hugo Corres, Edoardo Cosenza, Marco di Prisco, Pawan Gupta, Mehdi Kashani, Federica Lollini, Karin Lundgren, Stuart Matthews, Camillo Nuti, Giovanni Plizzari, Zila Rinaldi, Jesús Rodríguez, Francesco Tondolo, Joost Walraven

CALL FOR ABSTRACT

The CACRCS DAY welcome all the contributions related to the behaviour of reinforced concrete, fibre reinforced concrete and prestressed structures damaged by corrosion both with numerical and experimental approaches.

PAPER SUBMISSION

Authors willing to present their work at the CACRCS DAYS 2020 are kindly invited to submit an abstract in accordance with the sessions of the workshop. The abstract should not exceed 750 characters.

Accepted papers will be included in the Proceedings of the Workshop that will be sent to Scopus-Database.

The template for abstract and paper is available on the CTE website (www.cte-it.org).

AWARDS

Awards will be made to the most outstanding paper presented by a fib young member and to the most excellent paper presented in the workshop. will be awarded.

IMPORTANT DATES

abstract submission <u>EXTENDED</u>	12.09.2020
abstract acceptance notification	19.09.2020
full paper submission	19.10.2020
full paper acceptance	03.11.2020
final paper submission	15.11.2020
author's registration	15.11.2020
presentation submission	22.11.2020

VIDEO

As a speaker, You will present **in streaming** on Zoom from anywhere in the world. Anyway you will be invited to record your presentation and send it to the Organising Committee within 22.11.2020.

We will use the registration only in the case, for any reason, you are unable to connect to zoom at the time scheduled for your presentation.

The author will have to sign an authorization document in order to grant the use of the videos by the organizing committee for the purpose of the event.

The authorization document will soon be available on the website www.cte-it.org.

Recording/downloading of your video by other participants is strictly forbidden.

PRELIMINARY PROGRAM

Tuesday 1 December

12:00 *CET OPENING OF THE WORKSHOP

*(Italy Local Time)

Welcome and Introduction

12:00 **B. Belletti, D. Coronelli**, Coordinator Event

12:15 **C. Failla**, CTE President

12:30 **David Fernandez Odonez**, fib Secretary General

INTRODUCTIVE KEY NOTES

13:00 **Airong Chen**

Disease inspection and performance evaluation of concrete components in bridges: engineering practices in China

13:30 **Stuart Matthews**

fib Model Code 2020 and the life-cycle management of existing concrete structures

A1) CORROSION INDUCED DAMAGE IN MATERIALS

KEY-NOTE LECTURES

14:00 **Carmen Andrade**

Advances in the description of corrosion induced cracking

14:30 **Fabio Bolzoni**

Experimental evaluation of rebars corrosion rate in concrete

PRESENTED PAPERS

15:00 **F. Lollini, E. Redaelli**

Effect of environmental exposure conditions on the corrosion rate of carbon steel bars in carbonated concrete

15:20 **G. Scionti, D. Messina, A. Recupero, E. Proverbio**

Issues in identifying damage progression in corroded PT concrete beams under flexural loads by Acoustic Emission technique

15:40 **A. Sirico, F. Zanotto, F. Vecchi, A. Balbo, P. Bernardi, B. Belletti, A. Malcevski, V. Grassi, C. Monticelli**

Mechanical properties and durability of reinforced concrete containing biochar

16:00 **F. Freddi, L. Mingazzi**

Phase-field simulations of cover cracking in corroded RC beams

16:20 **N. Russo, E. Rossi, T.G. Nijland, R. Polder, F. Lollini, S. Garcia, J. Bijleveld**

Corrosion products resulting from carbonation acting upon chloride-induced corrosion in 22 years old blast furnace slag concrete

A3) MECHANICAL PROPERTIES OF CONCRETE AND STEEL, BOND - SLIP RELATION IN THE CASE OF CORROSION

17:00 CET KEY-NOTE LECTURES

17:00 **Karin Lundgren**

What do we know about concrete, steel, and bond-slip relation for corroded bars?

17:30 **Francesco Tondolo**

Research developments on bond between corroded steel and concrete

PRESENTED PAPERS

18:00 **A. Benenato, B. Ferracuti, S. Imperatore, M.Kioumarsi**

Experimental tests on the bond performance of corroded plain steel bars

18:20 **S. Robuschi, K. Lundgren, I. Fernandez**

Corrosion of naturally corroded, plain reinforcing bars

18:40 **K. Koulouris, M. Basdeki, C. Apostolopoulos**

Influence of stirrups spacing on bond behaviour of corroded reinforced concrete elements

19:00 **H. Nasser, R. Vrijdaghs, C. Van Steen, L. Vandewalle, E. Verstrynghe**

Effect of corrosion damage on the tension-stiffening effect: A numerical investigation of the RC tension bar

19:20 **S. Haefliger, D. Yilmaz, U. Angst, W. Kaufmann**

Corroded Tension Chord Model (CTCM) for Concrete Structures with locally corroded reinforcement

19:40 **A. Soraghi, Q. Huang**

Prediction model RC bond strength and bond peak slip considering bond failure mode

Wednesday 2 December

A2) In Situ Inspections in the Case of Corrosion

13:00 CET KEY-NOTE LECTURES

13:00 **Pawan Gupta**

Evaluation and Restoration of Severely Damaged Unbonded Post-Tensioned Structures"

13:30 **Giovanni Plizzari**

Design Aspects and Chloride-Induced Corrosion Behaviour of Fibre Reinforced Concrete Structures

PRESENTED PAPERS

14:00 **C. Andrade**

In-situ measurements of corrosion rate: methods and observed values

14:20 **C. Van Steen, H. Nasser, R. Vrijdaghs, E. Verstrynghe**

Upscaling of acoustic emission source characterisation from laboratory experiments to on-site application

14:40 **A. Benenato, B. Ferracuti, S. Imperatore, G.P. Lignola**

The surface crack width: an index to evaluate the stress state around the corroded reinforcement

15:00 **N. Di Stefano, E. Faccin, S. Giuseppe Mantelli, F. Minelli**

Evaluation of reinforcement corrosion in reinforced or prestressed concrete bridges: the Province of Brescia case study

15:20 **A. Abdel-Mohti, S. Rupakheti**

Monitoring Thermal Resistance of Concrete Slab

B1) Experimental Tests on Corroded RC and PC Structures

16:00 CET KEY-NOTE LECTURES

16:00 **Zila Rinaldi**

Failure mechanisms in corroded RC and PC elements

16:30 **Jesús Rodríguez**

Some thoughts on structural performance of corroded concrete structures coming from past experimental results

PRESENTED PAPERS

17:00 **A. Celik, H. Yalciner, A. Kumbasaroglu, A.I. Turan**

Cyclic Loading Test on Highly Corroded Reinforced Concrete Columns

17:20 F. Vecchi, B. Belletti, L. Franceschini, C. Andrade, J. Rodriguez, J.S. Montero

Flexural Tests on Prestressed Beams Exposed to Natural Chloride Action

17:40 D. Messina, G. Scionti, A. Recupero, E. Proverbio

Failure behaviour of post-tensioned concrete beams with different corrosion damage in prestressing tendons

18:00 A. Benenato, B. Ferracuti, S. Imperatore, M. Kioumarsis, S. Spagnuolo

Behavior of corroded prestressed concrete beams damaged by corrosion

18:20 A. Al-Bayti, H. Almansour, M. Saatcioglu

Coupled Effect of Reinforcement Corrosion and Loading on the Structural Behaviour of Reinforced Concrete Beams

Thursday 3 December

C2) Implementation of the Effect of Reinforcement Corrosion in Models for the Determination the Bearing Capacity

12:00 CET KEY-NOTE LECTURES

12:00 Marco di Prisco,

Design approaches concerning SLS and ULS in corroded structural elements

12:30 Joost Walraven

Significance of reinforcement corrosion for modelling the behaviour of existing structures

PRESENTED PAPERS

13:00 N. El-Joukhadar, S. Pantazopoulou

Assessment Procedures for Corroded Structures

13:20 A. Marí, J. Bairán, E. Oller, N. Duarte

Simulation of the structural effects of corrosion and strengthening interventions on reinforced and prestressed concrete frames using a nonlinear step by step analysis model

13:40 P. Anaya, J. Rodriguez, B. Martín-Pérez

Simplified expressions for the determination of transmission length in corroded prestressing steel

14:00 G. Campione, F. Cannella

Analytical prediction of flexural response of prestressed concrete beams with corroded strands and loss of bond

14:40 M. Del Zoppo, M. Di Ludovico, A. Prota

Effect of corrosion of the fragility assessment of RC buildings under tsunami loads

15:00 A. Castel, D. Coronelli, K. Zandi

Structural modelling of the Response of Deteriorated RC and PSC members: Levels of Approximation for Model Code 2020

C1) Case Study of Existing Structures and Infrastructures

16:00 KEY-NOTE LECTURES

16:00 Hugo Corres Peiretti

What do we need to understand in order to inspect, assess and design interventions in concrete structures affected by corrosion?

16:30 Edoardo Cosenza

Safety and Durability of RC and PC Italian Bridges: A New Guideline

PRESENTED PAPERS

17:00 M.F. Granata, D. Messina, A. Recupero

Case-studies of corroded reinforced concrete bridges in Sicily

17:20 M. Minotto, T. Serrapica, A. Contin, E. Viviani, L.

Casarin, M. Cavetti, A. Mardegan

Static Safety Assessment of Existing Prestressed Concrete Bridges: Case Studies

17:40 J. Wang, B. Joshi, M. Masud, Y. Lin, Y.L. Mo, T.T.C. Hsu

Structural Performance of Corroded Bridge Column and Drilled Shaft Connections with Non-Contact Lap Splices

18:00 B. Bissonnette, D. Coronelli

A tale of two bridges: half joint failure and deterioration processes

18:20 M.J. Osmolska, T. Kanstad, M.A.N. Hendriks, G. Markeset

Corrosion assessment and effect on the structural performance of pretensioned bridge girders in coastal climate

18:40 S. Zaghian, B. Martín-Pérez, H. Almansour

The Effect of Corrosion and Traffic Loads on Bridge Columns Using Three-Dimensional Non-Linear Finite Element Analysis

Friday 4 December

C2) Performance of Corroded Reinforcement Concrete Structures in Seismic Situations

12:00 CET KEY-NOTE LECTURES

12:00 Mehdi Kashani

Seismic Performance of Corrosion-Damaged RC Bridges: Current Trends and Future Demands

12:30 Camillo Nuti

Bridge Pier Corrosion in Seismic Areas: Forecasting and Future Behaviour and Assessment

PRESENTED PAPERS

13:00 M.F. Granata, B. Fontana, G. Culotta

Seismic assessment and retrofit of a concrete building highly damaged by reinforcement corrosion

13:20 M. Bartolozzi, J.R. Casas, M. Domaneschi

Seismic performance of deteriorated concrete bridges: bonding failure effects

13:40 M. Felitti, F. Oliveto in collaboration with STACEC

Influence of localized degradation by corrosion of reinforcement on the static and seismic vulnerability of structures

14:00 F. Vecchi, B. Belletti

Parametric analysis of corroded reinforced concrete columns subjected to cyclic loading

14:20 E. Erduran, E. Martinelli

Some remarks on the seismic assessment of RC frames affected by carbonation-induced corrosion of steel bars

14:40 S. Caprili, F. Mattei, W. Salvatore

Incremental Dynamic Analyses and Expected Annual Loss evaluation: a comparison between Reinforced Concrete-B450C and Reinforced Concrete-Dual Phase buildings in reference and corroded conditions of rears

C3) Robustness and Resilience Issues of Corroded RC and PC Structures. Predictive Estimation of the Residual Life and Effects of Repairing Actions

15:30 KEY-NOTE LECTURES

15:30 Fabio Biondini

Life-Cycle Risk, Reliability, Robustness, and Resilience of Corroding RC/PC Bridges and Bridge Networks

16:00 Robby Caspeele

Time-Dependent Structural Resistance, Reliability and Robustness Assessment of Degrading Reinforced Concrete Structures Under Uncertainty: Recent Developments and Future Challenges

PRESENTED PAPERS

16:30 C. Andrade, D. Izquierdo

Statistical considerations of corrosion initiation and propagation

16:50 B. Belletti, H. Corres Peiretti, C. Andrade, M. Ghiretti, L. Franceschini, F. Vecchi

Evaluation of The Residual Life of Prestressed Concrete Beams Subject to Corrosion

17:10 E. Casprini, C. Passoni, A. Marini, G. Bartoli, P. Riva

Effects of natural corrosion on the behaviour of existing structures: Corrosion Risk Scenarios and equivalent parameters

17:30 D. Yilmaz, S. Haefliger, W. Kaufmann, U. Angst

New conceptual approach combining the probabilistic nature of chloride-induced, localized rebar corrosion and the structural load-deformation behaviour

17:50 R. Vrijdaghs, C. Van Steen, H. Nasser, E. Verstryngne

Efficiently assessing the structural reliability of corroded reinforced concrete bridge girders

18:10 Discussion and Conclusion of the workshop
with Beatrice Belletti e Dario Coronelli

REGISTRATION FEES

are VAT exempted include participation to the virtual workshop, proceedings in electronic format. The membership to CTE or fib or aicap is required to participate.

Cte fib aicap Member

Registration fee **€50,00**

If you are not a member 2020 CTE or fib or aicap,

New CTE Member

Registration fee **€150,00**

Included the CTE Membership valid only for year 2021

Ordinary Member CTE fib aicap Member

Registration fee **€350,00***

Included the CTE fib aicap Membership valid only for year 2021

*The registration fee included the CTE fib aicap Membership valid **only** for year 2021 as Ordinary Member fib and individual member of aicap and CTE 2021

Payment

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CONTACTS

Beatrice Belletti DIA - University of Parma
Tel. +390521905930
E-mail: beatrice.belletti@unipr.it

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

For more information about the event, please visit the internet website www.cte-it.org

REGISTRATION FORM

Before the end of July it will be possible to **register** directly from the **CTE website** (www.cte-it.org) and make the payment by credit card or bank transfer.

Otherwise you can fill in the registration form and send it to info@cte-it.org with the copy of bank transfer

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