Seawater & Marine Concrete Seminar

SEAWATER & MARINE CONCRETE,
TOWARDS SUSTAINABLE CONSTRUCTIONS

Free Seminar

18 October 2018
Agora Room, Building B3
Campus Nord-UPC
Barcelona

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UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH

ATEM - Structural and Materials Technology
(Research Group)

In collaboration with

Japan Concrete Institute

IECA

ENGINYERIA REVENTOS

BASF We create chemistry

SEAWATER & MARINE CONCRETE TOWARD A SUSTAINABLE CONSTRUCTION

The sustainability of marine concrete structures should be focused in two main aspects: Firstly, the sustainable use of natural resources in their production, probably one of the major challenges of our current society; secondly, the durability of built structures, achieving their design service life.

Nowadays the construction sector is responsible for 16% of the global consumption of water, that is why any action taken to minimize the use of resources will have a direct environmental impact of the construction industry. Employment of seawater for concrete production will cover the water resource management as well as improving energy saving and transport.

The second aspect, but not less irrelevant, is how to design durable concrete structures for marine environment. Corrosion damage is one of the highest risk damage suffered by reinforced concretes because of the chloride ions present in environment or concrete mix. In order to control this damage, besides the efficient design and construction of the structures, adequate concrete mixing design as well as the use of appropriate type of reinforced bars or fibres is necessary.

The main objective of this “Seawater and marine concrete” SEMINAR is focused on increasing our knowledge and discuss about:

- The influence of employment of seawater on the properties of concrete production.

- Real scale cases of concrete elements produced employing seawater and secondary aggregates.

- The analysis of corrosion risk reduction of reinforced concretes by using:
    - Different types of cements
    - Inhibitors or chemical admixtures
    - Different types of reinforced bars and fibres

- Analysis of the deterioration state of several real structure located in Barcelona region.

-Design and Construction of real durable concrete structures for marine environment.

AIGUA DE MAR & FORMIGÓ MARI, CAP A UNA CONSTRUCCIÓ SOSTENIBLE

La sostenibilitat de les estructures de formigó marí ha de centrar-se en dos aspectes principals: Primer, l'ús sostenible dels recursos naturals en la seva producció; en segon lloc, la durabilitat de les estructures construïdes, aconseguint la seva vida útil de disseny.

Actualment, el sector de la construcció és responsable del 16% del consum mundial d'aigua, per la qual cosa qualsevol acció presa per minimitzar l'ús dels recursos tindrà un impacte ambiental directe de la indústria de la construcció. L'ocupació de l'aigua marina per a la producció de formigó cobrirà la gestió dels recursos hídrics, a més de millorar l'estalvi d'energia i el transport.

El segon aspecte, però no menys irrellevant, és com dissenyar estructures de formigó duradores per al medi marí. El dany per corrosió és un dels danys de major risc que pateixen els formigons reforçats a causa dels ions clorurs presents en el medi ambient o la barreja de formigó. Per controlar aquest dany, a més del disseny i la construcció eficients de les estructures, és necessari disseny adequat de mescla de formigó així com l'ús de tipus adequat de barres reforçades o fibres.

L'objectiu principal d'aquest SEMINARI "Concordances marines i marins" es centra en augmentar el nostre coneixement i discutir sobre:

- La influència de l’aigua marina sobre les propietats del formigó.

- Casos d'elements de formigó real produïts amb aigua de mar i àrids secundaris.

- L'anàlisi de la reducció del risc de corrosió dels formigons reforçats mitjançant l'ús de:
    - Diferents tipus de ciments
    - Inhibidors o additius químics
    - Diferents tipus de barres reforçades i fibres

- Anàlisi de l'estat de deteriorament de diverses estructures reals situades a la regió de Barcelona.

- Disseny i casos de construcció d'estructures de formigó durables per al medi marí.

PROGRAM(Tentative schedule). Thursday, 18 of October

08:45 - 09:00. Opening & Introduction

Prof. Climent Molins, Head of Technology of Structures, Materials and Construction section, Department of Civil and Environmental Engineering. Member of ATEM.

and Prof. Miren Etxeberria, International Member of "Use of Seawater in Concrete". Member of ATEM.

09:00 - 09:10. "Short Introduction of Japan Concrete Institute"

Prof. Hidenori Hamada, Professor, Kyushu University, Head of JCI committee

09:10 - 09:40. "Possibility of Sea-water Utilization in Concrete Production, Mixing water and Curing Water and Introduction of JCI Activity"

Prof. Hidenori Hamada, Professor, Kyushu University, Head of JCI committee

09:40 -10:10. "Lifetime Prediction of Reinforced Seawater Concrete Mixed with Fly ash Produced in Japan and Philippines against Chloride Attack"

Prof. Nobuaki Otsuki, Professor emeritus, Tokyo Institute of Technology, Head of Tokyo Tech Thailand office, Ex-head of JCI committee

10:10 - 10:40. "Influence of Reducibility Environment around Steel Bars on Steel Corrosion in Concrete"

Prof. Takahiro Nishida, Associate Professor, Kyoto University.

10:40 - 11:10. "Corrosion of Steel Bars in Concrete Mixed with Aerobic Microorganism"

Dr. Keiyu Kawaai, Assistant Professor, Ehime University

11:10 - 11:45. COFFEE BREAK

11:45 - 12:10. "Influence of chemical inhibitors on corrosion of reinforced concrete",

Eng. Carles Cots, BASF Construction Chemicals Espana S.L

12:10 - 12:35. "Employment of different type of cements for marine concrete production in Spain"

Eng. Sergio Carrascon, Instituto Español del Cemento y sus Aplicaciones (IECA).

12:35 - 13:00. "Sustainable concrete production employing secondary aggregates and seawater. Dyke blocks construction in Barcelona".

Prof. Miren Etxeberria , Associate Professor, UPC.

13:00 - 13:25. "Service-Life Assessment of Existing Precast Concrete Structure Exposed to severe marine conditions"

Dr. Ignacio Segura, Researcher, UPC

13:30 - 14:45. LUNCH BREAK

15:00 - 15:25. "Assessment of corrosion state and service life of prestressed concrete wharves in some Mediterranean ports",

Prof. Jesús Bairan, Associate Professor, UPC.

15:25 - 15:50. "Corrosion of concrete structures in Mediterranean marinas, and its effects in management."

Eng. Oriol Garcia, Enginyeria Reventos S.L.

15:50 - 16:15. "Specific concretes for breakwater's construction. Lessons learned"

Eng. Jorge Gutierrez, Enginyeria Reventos S.L.

16:15 - 16:45. "High strength and durable concrete solutions that enhance the biological and ecological value of urban, coastal, and marine infrastructure"

Shimrit Perkol-Finkel Ecocretech, CEO at ECOncrete Tech LTD

16:45-17:15. Technical discussion (all the speakers of the seminar)

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