

Oversikt over internasjonalt komitearbeid med tema innenfor miljø

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1 *fib* – the International Federation for Structural Concrete, <https://www.fib-international.org/>

ATG1.5 - Structural sustainability

Recently, sustainability has been discussed with regard to materials, recycling and so on, relating to the reduction of CO2 emissions. However, sustainability has another aspect, for example, the structure, design and construction, which can lead to reducing energy consumption and non-renewable resources over the course of the full life-time of a structure. Minimising energy consumption and non-renewable resources, will be discussed in the context of environmental, social and economic aspects in order to provide sustainable solutions for our society. These discussions will be key for developing sustainable structures. This philosophy is defined as “Structural Sustainability”.

The aim of this Task Group is to focus on minimising energy consumption and non-renewable resources during the life-time of structures from the structural point of view. Basically, the structures built using current specifications are durable. Therefore, structural sustainability should be defined as the difference from existing technologies to new ones in order to make structural sustainability clear. Examples of structural type, detailing, design, special construction techniques and so on for structural sustainability will be collected to publish a state-of-the-art report.



Convener Akio Kasuga

TG6.3 - Sustainability of structures with precast elements

Sustainability is considered a main aspect for the future of construction therefore for prefabrication as well. COM6 and PCI have had a close cooperation since 2008 on issues of mutual interest, with the comparison of respective approaches and the

development of common publications. PCI has produced various works dealing with sustainability of precast structures and is currently developing a large investigation program on this subject. The *fib* has also developed a large amount of work on sustainability. Presently, the work regarding sustainability is being developed in COM7.

The first activity of TG6.3 will be the study of the most recent work developed on sustainability and in particular Life Cycle Assessment regarding structures where precast concrete elements are used. The elements developed by PCI and the *fib* as well as by other organisations will be shared.

The final objective will be the drafting of recommendations regarding the study and assessment of precast concrete elements and structures, with respect to sustainability. They will cover all aspects regarding this kind of structures, from planning, design, execution, use, maintenance and remedial activities, up to dismantling, reuse and recycling.



Convener David Fernández-Ordóñez



Co-Convener Albert de la Fuente

TG7.1 - Sustainable Concrete - general framework

Affordability, availability and variability of concrete in connection with strength and durability has made concrete the most used construction material in the world. Use of advanced concrete structures represents important potential in the way towards sustainability of built environment. Concrete and concrete structures should contribute to the development of a sustainably built environment in a socially, environmentally and economically responsible manner.

Definition of a basic framework of sustainable concrete design and an assessment considering environmental, economic and social aspects. The framework will focus on different types of concrete structures - buildings, bridges, roads, water structures

etc. and their construction and operation in various specific regional conditions. The entire life cycle will be considered.



Commission Chair Petr Hájek

TG7.3 - Concrete made with recycled materials – Life cycle perspective

The objective of TG7.3 is to collect statistical data on concrete production, waste generation and those related to resource recycling in the world. The objective also includes an investigation of:

- the properties of recycled materials for concrete made from waste and by-products,
- the properties of concrete with recycled materials and their applications
- concrete recycling technologies, and
- the environmental impact caused during recycling of concrete waste.

Finally, TG7.3 will publish a state-of-the-art report on concrete with recycled materials such as demolished concrete, ceramics, glass, ashes, organic waste, etc. and to propose the ideal future for recycling concrete resources considering aspects of durability and recyclability of concrete, and minimising the environmental impact in the life cycle.



Convener Takafumi Noguchi

TG7.4 - Sustainable civil structures

The different phases of a civil structure project, from planning to end of service life, demand different methodologies. The phases include the feasibility phase, conceptual design, detailed design, construction, operation and maintenance and end of life/re-use. In the feasibility phase, for instance, different alignments are

possible as well as different structural solutions (different tunnel and bridge solutions). The possibility of influencing the construction costs and environmental impact lies mainly in the feasibility phase.

The objective of the task group is to develop a methodology for optimising the design process leading to lower life cycle cost and more environmentally friendly civil structures. The way of doing this is to apply life cycle costs and life cycle assessment tools in the civil structure design process.



Convener Alena Kohoutková

TG7.5 - Environmental product declarations (EPD) and equivalent performance of concrete

The objective of Task Group 7.5 will be two-fold:

- to recommend preferred approaches (road maps) for establishing "equivalent performance" of low environmental impact concrete typically containing high amounts of supplementary cementitious materials and therefore in terms of composition falls outside the prescriptions found in existing standards/regulations. By equivalent performance is understood that the concrete has acceptable production, structural and durability properties for its intended use. Clear road maps for establishing equivalent performance are a prerequisite and will likely act as a catalyst for increased use of such lower environmental impact concrete compositions to the benefit of the global community.
- to establish best available technologies for Environmental Product Declarations (EPDs) on concrete compositions (mix designs). EPDs are an emerging means, which, if performed on a common basis, allow a comparison of the environmental impact of different concrete compositions/products. As such, EPDs may be used by the consumer (end-user) to make a qualified decision concerning the choice of concrete, e.g. as requirements to the environmental performance can be verified and therefore also specified.



Convener Costantino Menna



Co-Convener Ladin Camci

TG7.6 - Resilient structures

The objective of this task group is to highlight criticalities in current structural design practice and to provide fundamentals to address the design, the maintenance and the retrofit principles towards resilient structures in sustainable urban systems, and more broadly, in view of smart cities.

TG7.6 aims to develop guidelines to help diverse stakeholders involved within such processes to face resilience issues through a multiscale approach.

These guidelines will approach resilience issues according to a multiscale approach, starting from the single building scale. Structural design principles are rethought from the point of view of the practicality, reparability, robustness and serviceability in the aftermath of a catastrophe. Particularly, performance goals are recognised to define new resilience-based limit states, in order to enhance disaster preparedness and response of urban structures. Innovative and novel standards and metrics are implemented within the guidelines, as a support to the development of post-event strategic intervention, protection and response technologies and recovery strategies.



Convener Domenico Asprone

Norsk kontakt: Jochen Köhler, NTNU

2 RILEM - International Union of Laboratories and Experts in Construction Materials, Systems and Structures, <https://www.rilem.net/>

TC 263-EEC, Environmental evaluation of concrete structures toward sustainable construction

Chair: Prof. Amnon KATZ

Deputy Chair: Prof. Guillaume HABERT

Activity starting in: 2012

The committee will focus on the environmental impact of concrete structures based on the principles listed in ISO 14040-14044 as well as the future ISO standards made under the ISO/TC71/SC8. The objective of this committee is to highlight the main parameters which have a critical influence on the results and are therefore fundamental to pay attention to during an environmental evaluation. This TC will allow strengthening the LCA results of in order to help environmental evaluation to be used in public decisions. The focus of the committee will be on the concrete structure rather than the whole building in view that the concrete structure serves as a sustained platform for other components/systems that change during its life.

Construction waste comprises a significant part of the solid waste worldwide. Aspects related to the environmental impacts of demolition waste from concrete structures with respect to optional uses (e.g. recycled aggregates, raw material for cement production, landfilling) will be dealt with as well. Carbonation rate and resulting corrosion resistance of concrete during its service life and the CO₂ sequestration potential of the concrete debris after demolition is also an area of concern.

The TC will work on data quality. In particular, it will work on their variability due to the processes involved and

Finally, a last task of the TC will be a study of the environmental indicators as proposed by the different problem and/or damage oriented impact methods. The objective is not to define a set of indicators that would be more adapted than others, but rather to identify what aspect of the life cycle of a concrete structure is controlling each indicator. The only impact where concrete materials would need a specific indicator, different from the commonly used environmental indicators, is for the recycling and more generally for the use of natural resources such as sand and gravel. The impact of the consumption of virgin materials is not accurately quantified with currently available indicators.

Since these structures usually contain reinforcing steel, the environmental impact of the latter will also be included in the study.

Among the different aspects that influence the result of an LCA study, a particular attention will also be paid to the sensitivity of the LCA to allocation. Whenever a process produces more than one end-product, the overall impact should be properly divided over all end-products. This partitioning can be done based on the mass or the economic value of the different end-products.

The committee will publish recommendations for the accurate way of performing LCA on concrete structure. Thanks to the work of the committee more reliable information will be available for the professionals in this field. It will enable an identification of the major and minor influencing parameters, and thus a more accurate environmental assessment of concrete structures. The committee will propose recommendations on the way to perform environmental evaluation and more specifically on the parameters that should be taken into account and the assessment method. All the data gathered will provide a very useful database that will serve as a reference in the field of concrete LCA.

3 ACI – the American Concrete Institute, <https://www.concrete.org/>

130 - Sustainability of Concrete

Committee Mission: Develop and report information on the sustainability of concrete.

Goals: To produce relevant and timely educational products and sessions covering the three pillars of sustainability (environmental, social and economic.)

Chair: Sean Monkman

TAC Contact: Tracy Marcotte

Upcoming Open Meetings:

ACI Fall Convention 2019 - 10/21/2019 2:00 PM-5:00 PM - C- 262, Cincinnati, OH

ACI Fall Convention 2019 - 10/22/2019 11:00 AM-1:00 PM - C-236, Cincinnati, OH

Upcoming Convention Sessions:

Concrete and Sustainability - High Performance City

ACI Spring Convention 2020 - Rosemont, IL

Published Committee Documents:

[130R-19: Report on the Role of Materials in Sustainable Concrete Construction](#)

SUBCOMMITTEES (8)

- [130-0A - Materials](#)
- [130-0B - Production/Transport/Construction](#)
- [130-0C - Structures in Service](#)
- [130-0D - Rating Systems/Sustainability Tools](#)
- [130-0E - Design/Specifications/Codes/Regulations](#)
- [130-0G - Education](#)
- [130-0H - Climate Change Impacts on the Sustainability of Concrete](#)
- [130-0L - Liaison Subcommittee](#)

350 - Environmental Engineering Concrete Structures

Committee Mission: Develop and report information on environmental engineering concrete structures, excluding nuclear structures.

Goals: 1) Complete draft of new version of Code Requirements for Environmental Engineering Concrete Structures (ACI 350-06) and of Seismic Design of Liquid-Containing Concrete Structures (ACI 350.3-06) by Spring 2016, 2) Update committee documents ACI 350.2R, ACI 350.4R, and ACI 350.5.

Chair: M Reza Kianoush

TAC Contact: Carl Larosche

Upcoming Open Meetings:

ACI Fall Convention 2019 - 10/23/2019 8:30 AM-4:00 PM - C- 206, Cincinnati, OH

Published Committee Documents:

[350-06 Code Requirements for Environmental Engineering Concrete Structures](#)

[350.1-10 Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures & Commentary](#)

[350.1M-10 Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures & Comm \(Metric\)](#)

[350.2R-04: Concrete Structures for Containment of Hazardous Materials](#)

[350.3-06 Seismic Design of Liquid-Containing Concrete Structures and Commentary](#)

[350.4R-04: Design Considerations for Environmental Engineering Concrete Structures](#)

[350.5-12 Specifications for Environmental Concrete Structures](#)

[350.5M-12 Specifications for Environmental Concrete Structures \(Metric\)](#)

[350M-06 Code Requirements for Environmental Engineering Concrete Structures & Commentary \(Metric\)](#)

SUBCOMMITTEES (12)

- [350-0A - General and Concrete](#)
- [350-0B - Durability](#)
- [350-0C - Reinforcement and Development](#)
- [350-0D - Structural](#)
- [350-0E - Precast - Prestress](#)
- [350-0F - Seismic Provisions](#)
- [350-0G - Tightness Testing](#)
- [350-0H - Editorial](#)
- [350-0J - Education](#)
- [350-0K - Hazardous Materials](#)
- [350-0L - Specification](#)
- [350-0S - Steering](#)