

- T1.4: Tunnels, convened by *Alberto Meda*
- T1.5: Structural sustainability, convened by *Akio Kasuga*
- T1.6: History of concrete structures, convened by *Manfred Curbach*
- T1.7: Construction of concrete structures, convened by *Aad van der Horst*

All of these groups and the commission itself enjoy a truly international membership, starting with the chair and the seven task group conveners, who are from eight different countries.

Each task group operates as a sub-commission and, in most cases, organizes working parties devoted to specific issues.

Task Group 1.1 'Bridges' is about to issue a state-of-the-art report on corrugated-steel-web bridges, prepared under the direction of *Akio Kasuga*, and has two other active working parties, one devoted to high-speed railway bridges, convened by *Stef-fen Marx*, and the other to integral bridges, convened by *Damien Dreier*. Three other topics are under consideration: loads for long span bridges, light-rail bridges and the structural design of cable-system anchor zones.

Task group 1.2 'Concrete structures in marine environments' produced Bulletin 50 'Concrete structures for oil and gas fields in hostile marine environments' in 2009 and has just started two new working parties, one on floating concrete structures and the other on submerged floating tunnels. Another topic under consideration is flood barriers, an application of structural concrete that is currently being widely developed.

Task Group 1.3 'Buildings' published Bulletin 73 'Tall Buildings' in October 2014. The group is now in the process of identifying other

issues to be investigated in the field.

Task Group 1.4 'Tunnels' was created in 2013 and has set up its first working party on tunnels in fibre-reinforced concrete, whose main scope is to support designers in their use of the *fib* Model Code for Concrete Structures 2010 (*fib* MC2010)



*fib* Bulletin 50 'Concrete structures for oil and gas fields' and *fib* Bulletin 73 'Tall buildings' were produced by Commission 1

for tunnel design. Explanations on how to deal with aspects not explicitly covered by *fib* MC2010 will also be developed.

Task Group 1.5 'Structural sustainability' will have its inaugural meeting in Copenhagen. It aims to produce a state-of-the-art report on how to minimize energy consumption and non-renewable resources during the lifetime of concrete structures, from a structural design point of view.

Task Group 1.6 'History of concrete structures' had its first meeting in Dresden, in June 2014. It has set itself ambitious goals, namely to prepare a textbook on the history of concrete structures along the lines of a semester master's course, with a collection of acclaimed published texts about structural concrete by eminent engineers, and to promote history sessions on structural concrete at *fib* Congresses and Symposiums.

Task Group 1.7 'Construction of concrete structures', former Commission 10 'Construction', is about to publish a bulletin about the design and construction of precast segmental bridges, which is an obvious anticipation of the wider scope of the new commission.

With the recent creation of several new task groups and the merger with former Commission 10, Commission 1 is now well set to cover most types of issues related to concrete structures, from design to construction and operation. It will, however, continue to observe the world of construction and to identify new developments that may justify further collaborative work.

*Michel Moussard*  
Chair of *fib* Commission 1

## A first for FRP in Ghent

The first international training school on 'Reinforcing and strengthening of structures with FRP reinforcement' took place at Ghent University, Belgium, on 27 to 30 January 2015, and attracted more than 45 participants from 18 different countries. This intensive course, which is fully accredited by the University of Ghent, was jointly organized by *fib* Task Group 5.1 'FRP reinforcement for concrete structures' and Commission 9 'Dissemination of knowledge', the EU funded Marie Curie ITN endure and COST action TU1207, and supported by the Belgian Concrete Society, the Engineering Society ie-net and the Institute for Post-Academic Education of Ghent University.

Participants had the opportunity to interact with experts in the field and discuss design issues, applications and future developments in the use

of composite reinforcements for new construction and rehabilitation solutions.

Professor *Stijn Matthys*, Scientific Coordinator of the training school and Chairman of *fib* Task Group 5.1, opened the event and examined in detail the unique material properties of composite reinforcements and their past and current uses in construction applications, and engaged with the participants in an interesting discussion on future trends and exciting opportunities for innovation.

Dr *Christoph Czaderski* of EMPA, Switzerland, discussed the importance of material testing and quality control. He further examined the bond behaviour of externally bonded FRP reinforcement and addressed all of the critical design aspects.

Professor *Renata Kotynia* of Lodz University of Technology, Poland,

advocated the use of prestressed FRP reinforcing solutions in new and existing structures and discussed design issues and applications, highlighting current innovations in the field and technological challenges.

Professor *Lluis Torres* of the University of Girona, Spain, and Dr *Maurizio Guadagnini* of the University of Sheffield, UK, Chairman of the MC ITN endure and COST Action TU1207, introduced the use of composite reinforcement as an alternative, more durable solution for new concrete structures.

Professor *Valter Carvelli* of the Politecnico di Milano, Italy, gave a comprehensive overview of the superior durability offered by FRP reinforcement and examined long-term related issues, such as creep and fatigue, as well as the effect of exposure to a variety of different environments and how to design for it.

Composite materials are rapidly becoming the solution of choice for strengthening and rehabilitation solutions. Professor *Matthys* and Dr *Czaderski* introduced the fundamental aspects of design, including the initial assessment of existing structures, choice of strengthening strategies, practical issues and quality control.

Professor *Joaquim Barros* of the University of Minho, Portugal, examined the benefits of different shear-strengthening solutions, including the use of externally bonded, near-surface-mounted and deep-embedded reinforcement. He also discussed the use of advanced numerical methods for the analysis and design of optimal strengthening solutions.

Professor *Thanasis Triantafyllou* of the University of Patras, Greece, concluded the session on strengthening with an in-depth discussion on confinement and seismic retrofitting, and examined both technological aspects and practical design solutions.

The training school concluded with a hands-on laboratory session, during which participants also had the opportunity to manufacture their own composite plates, and a site visit was conducted to witness the results of a large strengthening job on an underground parking structure.

Follow-up events include a laboratory competition at EMPA on 2 July 2015. Because of the FRP training school's success, a new session is planned for 2016.

*Stijn Matthys*  
Chairman of *fib* Task Group 5.1

*Maurizio Guadagnini*  
Coordinator of the MC ITN endure  
Chair of COST Action TU1207



Course participants work on FRP wraps in the laboratory

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