

2014 fib Congress, Mumbai: Improving performance of concrete structures



Dignitaries with the traditional Lamps of Knowledge: R.K. Sanan, S.S. Rathore, C.R. Alimchandani, V.N. Heggade, S.G. Joglekar, Harald S. Müller, Ashok Basa, György L. Balázs, Gordon Clark

Held from 10 to 13 February 2014 in Mumbai, India, the fourth fib International Congress and Exhibition was a memorable event from start to finish, with high level technical presentations, special invited lectures, valuable opportunities for networking and exchanges, as well as a rich offering of cultural activities, culinary delights and a picturesque lake-side venue.

Organised around the theme, “Improving performance of concrete structures”, the Congress focused on the needs of today’s changing society. Topics covered during the four-day event included, among others:

- Existing concrete structures: repair, rehabilitation, retrofitting,
- Model Codes and their influence on national codes,
- Design, construction and maintenance of large and/or innovative structures precast concrete structures,
- Steel-concrete hybrid structures,

- Improvements in prestressing systems,
- Improved understanding of new materials,
- High Performance and Ultra High Performance Concretes.

The Congress commenced on Monday 10 February with the ceremonial lighting of the Lamps of Knowledge. C.R. Alimchandani (Chairman of the Organising Committee and of IMC-fib), Ashok Basa (President of IE(I)), and Gordon Clark (President of fib) conveyed their warm welcomes to the delegates, noting the welcome return of fib to India following the 1986 FIP Congress and 2004 Symposium in New Delhi. Gordon Clark also drew attention to the combined 60-year anniversary of fib-CEB-FIP with a presentation on the history and highlights of the association.

Also present to offer their welcome wishes to the delegates were Immediate Past President of IE(I) S.S. Rathore and the Director General of

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IE(I) Major General (Retired) R. K. Sanan.

After the break, Gordon Clark presented the 2014 Freyssinet Medals to Joost Walraven and Armando Rito and Honorary Memberships to Arnold van Acker (in absentia), Fernando Stucchi and C.R. Alimchandani (see report on pp 107–109). One of the highlights of the inaugural session was the presentation of the 2014 fib Awards for Outstanding Concrete Structures by the jury chairman and Immediate Past President of fib, György L. Balázs. This edition of the prestigious award recognised five winning structures and six special mention recipients; see the December 2013 issue of fib-news (http://www.fib-international.org/fib_news_Dec2013.pdf) for the full results of the competition.

The afternoon sessions were devoted to plenary lectures by Giuseppe Mancini (A sustainable approach to existing structures), Hideki Kimura (Large scale application of HS-HP



Handover of the Congress bell (from left to right: *Stephen Foster, C.R. Alimchandani, S.G. Joglekar*)

FRC in Japan) and *Joost Walraven* (Dealing with the service life of concrete structures – a continuous adventure).

The cultural programme included performances of Indian dance, drama and music held on the Monday and Tuesday evenings, providing festive conclusions to the events of the day. The Gala dinner on Wednesday evening was a sumptuous offering of Indian specialities in the multi-course meal.

From Tuesday to Thursday, over 250 papers were presented in about 50 parallel sessions, in addition to special invited “on forefront of technology” lectures that included reports from selected *fib* Commissions, Special Activity Groups and Task Groups. National reports were also presented by *fib* National Member Groups: Brazil, Czech Republic, Denmark, France, Hungary, India, Japan, Norway, Portugal, Slovakia, Switzerland and the UK.

The valedictory session gave the opportunity for *fib* President *Gordon Clark*, *fib* President-elect *Harald S. Müller*, Organising Committee chairman *C.R. Alimchandani* and selected delegates to give their impressions of this milestone event and congratulate the organisers.

Following a vote of thanks, the traditional *fib* Congress bell was handed over to *Stephen Foster* and *David Millar*, representing the organisers

of the 2018 congress in Melbourne, Australia. Upcoming *fib* events were announced and previewed, the next of which will be the 2015 symposium in Copenhagen (see call for papers announcement on page 112), to be followed by symposia in Cape Town (2016) and Maastricht (2017).

Events continued even after the end of the Congress: three successful workshops on highly relevant topics were held on 13 and 14 February:

- *fib* Model Code for Concrete Structures 2010 short course,
- Workshop on durability,
- Workshop on High Performance Fiber Reinforced Cementitious Composites.

Technical Council, General Assembly and Elections

In conjunction with the Congress, meetings were held by *fib* Commissions and Task Groups, as well as the Technical Council and General Assembly.

The Technical Council approved a major initiative of the Presidium to restructure *fib*'s Commissions and Task Groups. The details of the new structure will be given in an upcoming issue of *fib*-news. The Technical Council appointed new Chairs and Deputy Chairs for 2015–2018 as well as electing their two new Deputy-Chairs, *Stephen Foster* and *Frank Dehn* to represent the Technical Council on the Presidium for the same term.

In addition to the usual business of budget and balance approvals, the General Assembly approved three Honorary Memberships (see next article).

Elections for the next terms were held by secret ballot and the following officers were elected:

- President, 1st January 2015 – 31 December 2016: *Harald S. Müller*;
- Deputy-President, 1st January 2015 – 31 December 2016: *Hugo Corres Peiretti* (Spain);
- Four elected Presidium Members, 1st January 2015 – 31 December 2018: *Josée Bastien* (Canada), *Akio Kasuga* (Japan), *Aurelio Muttoni* (Switzerland), *Tor Ole Olsen* (Norway);
- Honorary treasurer 1st January 2015 – 31 December 2018: *Hans Rudolf Ganz* (Switzerland).

2014 Freyssinet Medals



Awarded every four years at the occasion of an *fib* Congress, the Freyssinet Medal is the highest distinction awarded by *fib*.

It is given “in recognition of outstanding technical contributions in the field of structural concrete”, and is a continuation of the Freyssinet Medals awarded by *fib*'s predecessor FIP (Fédération Internationale de la Précontrainte), since 1970.

The two 2014 Freyssinet Medals were awarded by *fib* President *Gordon Clark* to *Joost Walraven* (the Netherlands) and *Armando Rito* (Portugal) during the inaugural session of the recent 2014 Congress in Mumbai.



Left: Gordon Clark with Joost and Rose Walraven; right: with Isabel and Armando Rito

Joost Walraven received his PhD from the Technical University of Delft, the Netherlands, in 1980. After several years as a design engineer for Corsmit Consulting Engineers, he began his academic career in 1985 as a professor at the Technical University of Darmstadt, Germany. In 1989 he returned to Delft as professor of concrete structures, where he was selected for the “Distinguished Teacher Award” in 2005. He held this professorship until his retirement in 2012, when he became Emeritus Professor.

He is the author or co-author of 400 publications in scientific and professional journals and conference proceedings, and advisor or co-advisor for over 50 PhDs in the Netherlands, Germany, Belgium, Sweden and Norway.

He has been prominently involved in the work of CEB and *fib* for well over two decades as Head of the Dutch National Member group since 1991, member of the CEB and then *fib* Presidium from 1992 to 2006, and President of *fib* from 2000 to 2002. He has been and continues to be a member of numerous *fib* Task Groups and Special Activity Groups in *fib*, contributing to bulletins on service life design, retrofitting of concrete structures, constitutive modeling of HS/HPC, shear and punching shear, and the two editions of the *fib* Structural Concrete textbook.

His most notable contribution in recent years has been as the convener of Special Activity Group 5, New Model Code. In this role he headed, during a period of nearly ten years, the development and drafting of the 2010 *fib* Model Code for Concrete Structures which was approved by the *fib* General Assembly in 2011 and published in hardcover and ebook editions in 2013.

Joost Walraven has been awarded numerous honours and distinctions around the world, including the FIP Medal in 1998.

Armando Rito received his civil engineering degree in 1969 at the Technical University of Lisbon. He founded his design office soon after, in 1971, and devoted his work mainly to bridge design with a focus on simplicity of design and construction, feasibility, functionality, durability, economy and aesthetic value. To date, several hundred of his bridge and viaduct designs have been built, including the Miguel Torga bridge, the Arade River bridge, the Vila Pouca de Aguiar viaduct and the 4th April bridge over the Catumbel river in Angola.

He has introduced and developed several new bridge design concepts that were adopted as standards by Portuguese bridge designers, for example two-beam (Π) decks, the pile/pier where the pier is the natural extension of the pile, the structural and visual continuity between Π

decks in span-by-span construction and box girders of balanced cantilever construction, new cross sections on the designs of high-rise piers, refinements on box girders for the arrangement of prestressing cables.

In addition to his design work, he was an invited professor of bridge design at ISEL – Lisbon Polytechnic Institute and at the Portuguese Catholic University, retired since 2008.

He was an expert member of the “Project Team 2”, EC2 – Part 2: Concrete bridges, member of *fib* Task Group 1.2 “Bridges”, and has published over 70 papers and keynote lectures on the subject of bridge design and construction.

Armando Rito has been lauded through a number of international prizes and honours; he was also awarded the FIP Medal in 1998.

Honorary Memberships

Honorary life memberships are given by the *fib* General Assembly in recognition of significant personal contributions to the work of *fib*. At the 2014 General Assembly, honorary memberships were bestowed on C.R. Alimchandani (India), Fernando Stucchi (Brazil) and Arnold van Acker (Belgium).



C.R. Alimchandani was awarded Honorary Membership in recognition of his invaluable roles as FIP Vice President, Head of the

Indian National Member Group, organiser of the 1986 FIP Congress in New Delhi and of the 2014 *fib* Congress in Mumbai, and member of *fib* Commission 1.

Fernando Stucchi was awarded Honorary Membership in recognition of his invaluable roles as Head



of the Brazilian National Member Group and jury chairman for the 2013 and 2015 editions of the *fib* Achievement Awards for Young

Engineers, as well as his contributions to the *fib* Model Code for Concrete Structures 2010.



Arnold van Acker was awarded Honorary Membership (in absentia) in recognition of his invaluable chairmanship of the Prefabrication Com-

mission for many years, his role as ex-officio member of the *fib* Steering Committee and his authorship of several important *fib* bulletins on prefabrication.

ConLife and 70th anniversary of NIISK

fib President *Gordon Clark* travelled to give presentations in Moscow and Kiev during November and December. He was invited as a keynote speaker at the opening of the conference “ConLife” in Moscow on 27 November, which is an annual 4-day conference and exhibition for the Concrete Industry. After the welcome by an official from the organisation responsible for Russian Building Standards, during which it was announced that Russia have signed an agreement with CENELEC to adapt Eurocodes for use in Russia, he spoke about *fib*, its organisation and activities, and the new Model Code 2010, explaining that it is expected to form the basis for the next revision of the Concrete Eurocode.

In Kiev, *Gordon* was invited by the Ukraine Research Institute for Building Construction “NIISK” to give a welcome and congratulatory speech on the occasion of the 70th Anniversary of their foundation in 1943. The Institute was founded during the Second World War with a remit to set standards and assist in reconstruction of the damaged Infrastructure in the country. Since then it has now taken responsibility in the post-Soviet era for the Ukraine Building Standards and holds the *fib* National Membership. He specially welcomed the long-standing support by the Institute for *fib* and formerly for FIP since the 1960’s. About 200 invited guests were present at the event from across the Ukraine and Russia, as well as other European guests.

fibUK seminar hailed a success

*fib*UK held its first half-day seminar “DISC2013 – Developments in Structural Concrete” on 6th Nov 2013. Such was its success that it will become an annual event, scheduled on the day of the group’s Annual General Meeting.

DISC2013 covered off-site manufacture, service life design, shear in beams and concrete cable stayed bridges. The structure of the afternoon worked well with each of the two sessions consisting of two 30-minute technical presentations and one 15-minute presentation on an aspect of *fib*, followed by time for questions.

Presentations and other useful documents were made available to fee-paying delegates on a *fib*UK branded flashdrive. Members of the UK Group can view videos of the presentations on the group’s website

(www.fibuk.org). An outline of the seminar presentations is given below.

Session 1

Laing O’Rourke’s Dr. *John Stehle* discussed the off-site manufacturing processes at its UK factories and presented two case studies highlighting how complex design and construction issues were overcome by a one team approach.

Prof. *Tom Harrison*, visiting professor at Dundee University, described the challenges and limitations on serviceability design by carbonation, corrosion (chloride induced or otherwise) and chemical attacks. He showed the differences in current requirements in the *fib* model code, ISO16204 & Eurocodes.

fib President *Gordon Clark* briefed the audience on the wide range of *fib* activities, the history of the *fib*’s formation and its achievements.

Session 2

Prof. *Steve Denton* explained how the new CEN/TC250 commission was focussing on ease of use of the Eurocodes for the second generation of Eurocodes.

Dr. *Tony Jones* of Arup presented on shear. He illustrated the shear reinforcement against shear stress for variable strut inclinations and compared this against traditional Vc+Vs. He discussed the effect of pre-stress on shear (benefit/loss) comparing EN1991-1-1 to the model code and identified this as one of the areas for improvement along with shear for circular sections.

David MacKenzie from Flint & Neill argued that the recent developments in concrete cable stayed bridges made them an economic alternative to other materials. He also explained the contribution made by the Model Code in bridge designs.

20th Anniversary of the Czech Concrete Society



In November 2013 the Czech Concrete Society (ČBS), in conjunction with many Czech technical experts, local collaborators and international partners, commemorated the 20th anniversary of its founding. The occasion was an opportunity to recall and pay tribute to twenty years of efforts by ČBS to maintain the excellent level of Czech concrete structures within the local construction market.

ČBS was founded on 8th December 2002, under umbrella of the CSSI (Czech Society of Civil Engineers), by several professionals including both academics and engineers from the Czech construction industry. They formulated three principal goals for ČBS that have determined the character of the Society up to the present: (1) to maintain the traditionally high level of Czech concrete structures; (2) to promote concrete as an efficient building material; (3) to create a social and communication platform for all Czech professionals involved in concrete construction. There were two more key features of ČBS inscribed into its statutes at that time: (a) independence from any commercial

groups on the market, (b) focus on technical matters only.

The first 5-6 years of ČBS' existence was marked by a quest for a stable position, both in terms of financing and production of viable projects. Other significant factors for the period of 1994–1999 were the search for a sound status and significant and sharp changes in ČBS membership. Soon it became obvious that increasing ČBS aspirations and the expectations of its members surpassed the possibilities of its representatives, who were still just volunteers. Despite its non-professional administrative base, ČBS founded and maintained several successful and appreciated projects, namely its annual (Czech) Concrete Day conference, the “Beton a zdivo” (Concrete and Masonry) journal and an Outstanding Concrete Structure Award. Also, multiple contacts and participation in the international activities of IABSE, CEB and especially of FIP/fib were kept and enhanced.

Since 2000 ČBS developed steadily and rapidly, primarily thanks to of increasing Czech construction market and growing economy. A booming government investment into infrastructure at that time generated an abundance of both technical knowledge and business informa-

tion, attracting a huge attendance at ČBS events. But also a brand new ČBS organization and internal regulations focused on financing, division of responsibility, etc., led to quite long period of expansion and growth. A new, professional ČBS office was opened in Prague, and its full-time staff, under the guidance of Dr. *Vlastimil Šrůma*, Managing Director of ČBS, succeeded in managing the expanding portfolio of ČBS projects and events. Consequently both the numbers of ČBS members and participants in ČBS activities expanded substantially between 2000 and 2008.

For the last five years ČBS has been facing bitter impacts of the considerable depression of the Czech construction market. There are also, partly as a consequence of the broader European financial crisis, more general changes in companies' and individuals' behaviour in the construction market and in the spreading of information. As a result of all these impacts, it seems to be almost necessary at least to rethink, and maybe also to redefine, the twenty-year old key principles of the current ČBS. Thus also the Czech Concrete Society is searching again for long-term stability and efficiency for the demanding years to come.

The main celebration of the 20th ČBS anniversary took place in Hradec Kralove on 27–28 November 2013. Among ČBS representatives, ČBS honorary members and numerous leading personalities from the Czech construction industry and technical universities, there were also some close friends and partners of ČBS present from abroad: Mr. *Gordon Clark*, President of *fib*, Prof. *György L. Balázs*, Past-president of *fib*, Dr. *Lars Mayer* and Ing. *Michael Pauser*, directors of concrete/construction societies of Germany and Austria.

Dr. *Vlastimil Šrůma*, ČBS Managing Director



Shortly before the cutting of the 20th CBS anniversary cake: (from the left) *Jirí Kolisko* (CBS President), *György L. Balázs* (*fib* Immediate Past President), *Gordon Clark* (*fib* President), *Milan Kalný* (CBS Past President), *Jan L. Vitek* (CBS Past President), *Pavel Cížek* (first CBS President), *Michael Pauser* (Austrian Concrete Society), *Vlastimil Šrůma* (Director CBS) and *Lars Meyer* (DBV Germany)

Report from the Spanish *fib* Member Group

This report describes the activities of ACHE (Spanish abbreviation for Scientific and Technical Association for Structural Concrete, www.e-ache.com). This association is the result of merging the two parent associations: GEHO (the Spanish subsidiary of CEB) and ATEP (the Spanish subsidiary of FIP). It has over 900 members; most of them are individuals but there is also an important participation of institutions: consulting companies, contractors, fabricators, suppliers, software companies, etc. ACHE's income mainly comes from the member fees and conferences.

Its activities are organized on the basis of three-year terms. At the end of each term a congress is organized (the next is 17–19 June 2014) and half of the Council of the association, including the President, is renovated. The congress is a big event with over 400 participants and about the same number of papers being presented. Every year ACHE also organizes at least one symposium on a specific topic, generally related to the activities of one of its work groups. Finally, ACHE also organizes courses, generally related to the publication of new concrete codes.

The secretariat of ACHE includes one full-time and two part-time positions, but most of its activities are based on voluntary work. The most important results come from the work groups. They are organized in five commissions: design, materials, execution, maintenance and structural elements. Each of these commissions monitors a number of working groups and reports on progress every two months. The total number of working groups which are active at this moment is 26. The activities of each working group end when a monograph is published and distributed among the members of the Association. These activities are the base for interchanging new developments and for including them in future standards. These documents are an im-

portant reference in Spain for the whole concrete related industry.

Among the last monographs which have been published we might mention a compilation of all topics related to the design and construction of high rise buildings (two books of about 500 pages each) which was the result of efforts by many different professionals, as is the case when such a building has to be planned, designed and built. These monographs may also consist of a theoretical development related to concrete such as a recent one on statistical methods or they also may include some contributions to controversial topics which may be debated in international groups such as two recently published monographs on imposed deformations in concrete structures or on shear strength of elements without transverse reinforcement.

A reduced list of active working groups which should end their work in a short delay would include: Graphic representation of concrete structures, Design of concrete structures in seismic areas, Aggregates for structural concrete, Movement of great weights, External aspect of concrete, Systems for increasing the durability of existing structures, Maintenance manuals, Retrofitting of columns, Examples of application of Eurocode 2. Newly formed working groups include the following topics: Nanotechnology, Fibre-reinforced concrete, Materials for thermal insulation, Execution of incrementally launched decks, Self launching gantries and travellers, Inspection and monitoring techniques.

The most significant product of ACHE is the quarterly Journal "Hormigón y Acero" (Concrete and Steel in Spanish) which was founded in 1950. This journal accepts contributions from the industry as well as from the universities and research institutes. Consequently it is usual to see papers on the design and con-

struction of structures along with research papers. This possibility of communication between all the different participants in the construction industry and the researchers of Universities and Institutes is very profitable for all of them and is one of the main assets of the Association and of the "Hormigón y Acero". The journal is published in Spanish although each paper includes an abstract in English. Every issue of the journal includes a first principal paper, which is published in Spanish and in English; this paper generally consists in the presentation of a very relevant project and, as it is only limited to 10000 words, it usually presents many interesting details of the corresponding project. These principal papers are freely accessible through the web (<http://e-ache.com/mod-ules/pd-downloads/viewcat.php?cid=1>). All the details of the journal may be found in <http://e-ache.com/mod-ules/smartsection/item.php?itemid=9>. Beginning in 2014, "Hormigón y Acero" will be edited by Elsevier.



Like other *fib* National Member Groups, ACHE occasionally publishes a national report on the most interesting project that were completed in the corresponding time period. The

last one covers the period between 1998 and 2008; it includes 140 works and was presented at the 2010 *fib* Congress. The projects included show the extraordinary development experienced by Spanish structural engineering in recent years. We wish to spread and share our experience with our colleagues around the world which is why we have provided a bilingual Spanish-English publication. Details on this book may be found at <http://e-ache.com/modules/smartsection/item.php?itemid=119> ACHE is currently making an effort

fib Bulletins

to promote its activities through the web to make all its publications more accessible to foreign individuals and institutions and it also acts as the distribution node for the publications and activities of *fib* to promote the progress of structural concrete in Spain. Foreign engineers and architects are invited to participate in our activities and to publish their work in our Journal or to present it in our Congresses.

Miguel A. Astiz, President of ACHE

2015 symposium: call for papers

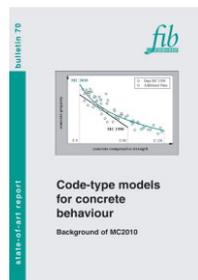
Abstracts are now being accepted for the 2015 *fib* Symposium, taking place in Copenhagen, Denmark, from 18 to 20 May 2015. The abstract text must be max. 500 words with no tables or pictures; the deadline for submission is **1st May 2014**.

The symposium theme is “Concrete: Innovation and Design”, with the following sub-topics:

- Civil works
- Conservation of structures
- Innovation in buildings
- New materials and structures
- Analysis and design
- Modeling of concrete
- Numerical modeling
- Life cycle design
- Safety and reliability

A “case studies” format will be offered for oral presentations of structural concrete projects, under execution or recently completed, without a submitted paper. The PowerPoint presentation is subject to review by the Scientific Committee.

To submit an abstract and for further information about the event, visit www.fibcopenhagen2015.dk.



fib Bulletin 70: **Code-type models for structural behaviour of concrete – Background of the constitutive relations and material models in MC2010.**

State-of-art report, November 2013. 196 pages, ISBN 978-2-88394-110-6, Non-member price: 120 CHF.

The *fib* Model Code for Concrete Structures 2010 (MC2010) represents the state-of-the-art of code-type models for structural behaviour of concrete, providing constitutive relations and material models together with the most important explanatory notes. However the underlying normative work, i.e. the fundamental data as well as the considerations and discussions behind the formulas, could not be given within the Model Code text. Based on experience gained after the publication of Model Code 1990, this will lead to numerous questions arising from Model Code users.

fib Bulletin 70 aims to conquer this general weakness of codes in a way to guard against future misunderstandings of MC2010 chapter 5.1 (Concrete). It discusses the given formulas in connection with experimental data and the most important international literature. The constitutive relations or material models, being included in MC1990 and forming the basis and point of origin of the Task Group’s work, were critically evaluated, if necessary and possible adjusted, or replaced by completely new approaches. Major criteria were physical and thermodynamical soundness and practical considerations like simplicity and operability.

Besides being a background document for Chapter 5.1 of MC2010, Bulletin 70 will provide an important foundation for the development of future generations of code-type mod-

els related to the characteristics and the behaviour of structural concrete.



fib Bulletin 71: **Integrated Life Cycle Assessment of concrete structures.**

State-of-art report, December 2013. 64 pages, ISBN 978-2-88394-111-3, Non-member price: 80 CHF.

Concrete is after water the second most used material. The production of concrete in the industrialized countries annually amounts to 1.5-3 tonne per capita and is still increasing. This has significant impact on the environment. Thus there is an urgent need for more effective use of concrete in structures and their assessment.

The scope of *fib* Task Group 3.7’s work was to define the methodology for integrated life-cycle assessment of concrete structures and to set up basic methodology to be helpful in development of design and assessment tools focused on sustainability of concrete structure within the whole life cycle. Integrated Life Cycle Assessment (ILCA) represents an advanced approach integrating different aspects of sustainability in one complex assessment procedure. The integrated approach is necessary to insure that the structure will serve during the whole expected service life with a maximum functional quality and safety, while environmental and economic loads will be kept at a low level. The effective application and quality of results are dependent on the availability of relevant input data obtained using a detailed inventory analysis, based on specific regional conditions. The evaluation of the real level of total quality of concrete structure should be based on a detailed ILCA analysis using regionally or locally relevant data sets.

Congresses and symposia

Date and location	Event	Main organiser	Contact
12–16 May 2014 Moscow, Russia	3rd All-Russia (International) Conference on Concrete and Reinforced Concrete	Russian Academy of Science and others	http://concrete2014.mgsu.ru
11–13 June 2014 Oslo, Norway	Concrete Innovation Conference (CIC2014)	Norwegian Concrete Association	www.cic2014.com
16–18 June 2014 Wroclaw, Poland	AMCM 2014: Analytical Models and New Concepts in Concrete and Masonry Structures	<i>fib</i> Group Poland	www.amcm2014.pwr.wroc.pl
21–23 July 2014 Quebec, Canada	10th <i>fib</i> International Ph.D. Symposium in Civil Engineering	Université Laval	www.fib-phd.ulaval.ca
24–25 July 2014 Montreal, Canada	2nd FRC Int. Workshop (1st ACI– <i>fib</i> Joint Workshop) on Fibre Reinforced Concrete	ACI– <i>fib</i>	www.polymtl.ca/frc2014
14–17 September 2014 Dresden, Germany	Int. Conf. on Application of superabsorbent polymers and other new admixtures in concrete construction	TU Dresden	conference2014@tu-dresden.de
15–18 September 2014 Beijing, China	10th International symposium on Utilization of HS/HPC	Beijing Jiaotong University	www.hpc-2014.com
21–24 September 2014 Seoul, Korea	6th International Conference of Asis Concrete Federation	Asian Concrete Federation Korea Concrete Institute	www.acf2014.kr
18–20 May 2015 Copenhagen, Denmark	<i>fib</i> Symposium: Concrete – innovation and design	Danish Concrete Society	www.fibcopenhagen2015.dk
24–26 May 2015 Chicago, USA	5th Int. Symposium on Nanotechnology in Construction – NICOM5		www.nicom5.org
5–7 October 2015 Leipzig, Germany	4th Int. Conf. on Concrete Repair, Rehabilitation and Retrofitting (ICCRRR 2015)	MFPA Leipzig GmbH University of Cape Town	dehn@mfpa-leipzig.de
8–9 October 2015 Leipzig, Germany	4th International Workshop on Concrete Spalling due to Fire Exposure	MFPA Leipzig GmbH TU Delft	dehn@mfpa-leipzig.de
21–23 November 2016 Cape Town, South Africa	<i>fib</i> Symposium	<i>fib</i> Group South Africa	To be announced
13–17 June 2017 Maastricht, Netherlands	<i>fib</i> Symposium	<i>fib</i> Group Netherlands	To be announced
6–12 October 2018 Melbourne, Australia	5th <i>fib</i> Congress and Exhibition	<i>fib</i> Group Australia	www.fibcongress2018.com

The calendar lists *fib* congresses and symposia, co-sponsored events and, if space permits, events supported by *fib* or organised by one of its National Member Groups. It reflects the state of information available to the Secretariat at the time of printing; the information given may be subject to change. The calendar of events on the *fib* website (www.fib-international.org/upcoming-event) is updated continuously.

Acknowledgement

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National Member Groups

AAHES, Asoc. Argentina del Hormigón Estructural, Argentina
 CIA - Concrete Institute of Australia
 ÖBV – Österreichische Bautechnik Vereinigung, Austria
 GBB - Groupement Belge du Béton, Belgium
 ABCIC - Associação Brasileira da, Construção Industrializada de Concreto, Brazil
 ABECE - Associação Brasileira de, Engenharia e Consultoria Estrutural, Brazil
fib Group of Canada
 CCES - China Civil Engineering Society
 Hrvatska Ogranak *fib*-a (HOFIB), Croatian Group of *fib*
 Cyprus University of Technology
 CBS - Ceska Betonarska Spolecnost Czech Republic
 DBF - Dansk Betonforening, Denmark
 Suomen Betoniyhdistys r.y., Finland
 AFGC - Association Française de Génie Civil, France
 Deutscher Ausschuss für Stahlbeton e.V. Germany
 DBV - Deutscher Beton- und Bautechnik- Verein, Germany
 FDB - Fachvereinigung Deutscher, Betonfertigteilbau e.V., Germany
 Technical Chamber of Greece
 University of Patras, Greece
 Hungarian Group of *fib*
 The Institution of Engineers (India) Dept. of Technical Affairs
 Iran
 IACIE - Israeli Association of Construction, and Infrastructure Engineers
 Consiglio Nazionale delle Ricerche Italy

JCI - Japan Concrete Institute
 JPCI - Japan Prestressed Concrete Institute
 Lebanese Concrete Society
 Admin. des Ponts et Chaussées, Luxembourg
fib Netherlands
 New Zealand Concrete Society
 Norsk Betongforening, Norway
 Committee of Civil Engineering, Poland
 GPBE - Grupo Português de Betão Estrutural, Portugal
 Society for Concrete & Prefab Units of Romania
 Technical University of Civil Engineering, Romania
 University of Transylvania Brasov, Romania
 ASC - Association for Structural Concrete, Russia
 Association of Structural Engineers, Serbia
 Slovak Union of Civil Engineers
 Slovenian Society of Structural Engineers
 University of Cape Town, South Africa
 KCI - Korean Concrete Institute
 ACHE - Asociacion Cientifico-Técnica del Hormigon Estructural, Spain
 Svenska Betongföreningen, Sweden
 Délégation national suisse de la *fib*, Switzerland
 Université de Tunis El Manar, Tunisia
 ITU - Istanbul Technical University, Turkey
 NIISK - Research Inst. of Build. Constructions, Ukraine
fib UK Group
 ASBI - American Segmental Bridge Institute, USA

PCI - Precast/Prestress. Concrete Institute, USA
 PTI - Post Tensioning Institute USA

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