Commission 2 Analysis and design

Chair:

Vitek	Metrostav a. s.	Czech Republic

Co-Chair:

Bayrak	University of Texas at Austin	USA

Members:

Balázs	Budapest Univ. of Techn. & Economics	Hungary
Eligehausen	IWB, Universität Stuttgart	Germany
Foster	UNSW Australia	Australia
Hallgren	Tyréns AB	Sweden
Høj	HØJ Consulting GmbH	Switzerland
Kaufmann	ETH Zurich	Switzerland
Kollegger	Technische Universität Wien	Austria
Monti	Sapienza Università di Roma	Italy
Muttoni	EPF Lausanne	Switzerland
Ozcebe	TED University	Turkey
Pecce	Università del Sannio	Italy
Plizzari	University of Brescia	Italy
Sigrist	Lucerne School of Engineeering & Architecture	Switzerland

Corresponding members:

Braestrup	Rambøll	Denmark
Cairns	Heriot-Watt University	United Kingdom
Curbach	Technische Universität Dresden	Germany
Darwin	University of Kansas	USA
Filippou	Universtiy of California	USA
Maekawa	University of Tokyo	Japan
Mancini	Politecnico di Torino	Italy
Vecchio	University of Toronto	Canada
Walraven	Delft University of Technology	Netherlands

(*fib* members are listed in **bold**)

Recent meetings:

Lausanne (June 2015)

Terms of reference

Motivation/background (in brief)

Analysis and design are understood as core tasks of structural engineering. In this field, nine areas of interest have been identified; hence, nine task groups form the basis of the new structure of Commission 2. Today, the analysis - i.e. the detailed investigation of the stress and strain state - has gained in importance, and consequently refined and physically based models and calculation procedures are required. On the other hand, the design of new structures (comprising conception, dimensioning and detailing) still is fundamental for practicing engineers. In general, the respective approaches should be one and the same for the two levels of detail, but more practical and easier to apply for the latter case. Commission 2 supports and follows this line of development of structural engineering.

Scope and objective of technical work

The scope of Commission 2 is to develop models and calculation procedures for the analysis and design of structures and structural members under short term and long term static loading as well as under fatigue, fire and extreme events. Serviceability limit states and ultimate limit states and their interaction are considered, and both, research results as well as recommendations for the practical application shall be presented.

Description of workflow and timeline

The Task Groups and Working Parties have been established according to the main areas of interest (for details see below). They will screen and evaluate the available information by preparing state-of-the-art reports and/or presentations of new research and important applications. The material produced should be a reference for research reports, text books as well as for regional and international codes and standards.

The Task Groups and the associated Working Parties are established to work for a certain period of time and to achieve specific goals. Within the Task Groups the work is either divided into concerted ranges of subject or organized as separate contributions. After the agreed term, scope and objective are individually discussed and might be adjusted or changed.

Task Group 2.1: Serviceability models

Convener:

Vitek	Metrostav a.s.	Czech Republic

Members:

Balázs	Budapest Univ. of Techn. & Economics	Hungary
Bisch	Egis Industries	France
Borosnyói	Budapest Univ of Techn. & Economics	Hungary
Burns	Walt & Galmarini AG	Switzerland
Debernardi	Politecnico di Torino	Italy
Eckfeldt	TU Braunschweig	Germany
El-Badry	University of Calgary	Canada
Fehling	IBB Fehling + Jungmann GmbH	Germany
Gardner	Cardiff University	United Kingdom
Gribniak	Vilnius Gediminas Technical University	Lithuania
Guiglia	Politecnico di Torino	Italy
Kaklauskas	Vilnius Gediminas Technical University	Lithuania
Kohoutkova	Czech Technical University - CVUT	Czech Republic
Lark	Cardiff University	United Kingdom
Lorrain	INSA de Toulouse	France
Mari Bernat	Uni. Politéc. Catalunya	Spain
Perez Caldentey	FHECOR Ingenieros Consultores	Spain
Sellin	CEREMA	France
Taliano	Politecnico di Torino	Italy
Tkalčič	Civil Engineering Institute of Croatia	Croatia
Torrenti	IFSTTAR	France
Torres	University of Girona	Spain
Vráblík	Czech Technical University	Czech Republic
Wendner	Universität für Bodenkultur	Austria

Corresponding Members:

Burdet	EPF Lausanne	Switzerland
Ceroni	Universitá di del Sannio	Italy
Cervenka	Cervenka Consulting	Czech Republic
Chiorino	Politecnico di Torino	Italy

Ghali	University of Calgary	Canada
Ozbolt	Universität Stuttgart	Germany
Pecce	Università del Sannio	Italy
Toutlemonde	IFSTTAR	France
Ueda	Hokkaido University	Japan

(*fib* members are listed in **bold**)

Recent meetings:

Turin (January 2015); Prague (July 2015)

Terms of reference

Motivation/background (in brief)

Serviceability limit states (SLS) determine the applicability of concrete structures. When these criteria are met, the concrete structure can function properly during its service life. Correct design according to serviceability limit states is therefore essential for the construction of durable, robust and valuable structures. Violation of the SLS criteria leads to structures that do not function properly and/or to reduced durability, the consequences of which can be recognized very quickly. Therefore, the models for verification of the expected criteria are of primary importance.

Scope and objective of technical work

The activity of the group is focused on the development of models for analysis of cracks and deformations of concrete structures. Beside the numerical models, engineering practice requires simplified approaches, which are applicable in codes and in preliminary design stages when important decisions on the conceptual design are accepted.

Description of workflow and timeline

The summary of activities over the last few years will be published in bulletins in the near future. Future activity will be focused on the performance of more complex structures (e.g., those with restrained deformations or locally supported slabs) and on extending the serviceability limit states in the area of innovative materials (high performance concrete, fibre-reinforced concrete, structures with non-metallic reinforcement, etc.) and on specific applications such as bridges or watertight structures.

Collaboration with other groups

Collaboration with commissions dealing with materials (COM4 and COM5), durability (COM8) and within COM2 with T2.4, T2.5, T2.6, and T2.8 is expected, since their activities are closely related to the field of interest of T2.1.

Collaboraton with RILEM (e.g. new creep models TC 242-MDC) and with institutes working in areas concerned.

Target Audience

Practicing engineers, contractors and also researchers

Expected outcome and delivery dates

Bulletin: Background of the SLS according to the MC 2010 (end of 2015)

Bulletin: Long-term behaviour of large prestressed concrete bridges (end of 2016)

Working Party 2.1.1: Long-term behaviour of prestressed concrete bridges

Convener:

Vitek	Metrostav a.s.	Czech Republic

Members:

Balázs	Budapest Univ. of Techn. & Economics	Hungary
Burdet	EPF Lausanne	Switzerland
Chiorino	Politecnico di Torino	Italy
El-Badry	University of Calgary	Canada
Lark	Cardiff University	United Kingdom
Mari Bernat	Uni. Politéc. Catalunya	Spain
Perez Caldentey	FHECOR Ingenieros Consultores	Spain
Vráblík	Czech Technical University	Czech Republic

(*fib* members are listed in **bold**)

Some concrete bridges suffer from deflections that are larger than expected. The objective of WP2.1.1 is to explain possible reasons of this phenomenon, to identify factors and finally to propose recommendations for the design of new bridges or for the rehabilitation of existing bridges.

Working Party 2.1.2: Restrained and imposed deformations

Convener:

Vitek (ad interim)	Metrostav a.s.	Czech Republic

Members:

Bajo Pavia	Ferrovial Agromán S.A.	Spain
Câmara	Inst. Superior Tecnico – DECivil	Portugal
Corres Peiretti	FHECOR Ingenieros Consultores	Spain

(*fib* members are listed in **bold**)

The main objective of Working Party 2.1.2 is to present practical recommendations for the design of reinforced and post-tensioned concrete structures to accommodate the effects of restrained and imposed deformations. This involves looking into the causes of internally-induced and externally-imposed deformations and point out their different influences on the structural behaviour. The WP will assess various effects that may affect the degree of restraint such as superimposed loading and presence of prestressing, and propose modifications to existing design criteria where relevant. Guidance will be given on the use of nonlinear response analysis for rigorous response prediction.

Expected outcome: Technical report on design for restrained and imposed deformations, to be delivered at the end of 2016.

Task Group 2.2: Ultimate limit state models

Convener:

Sigrist	Lucerne School of Engineering & Architecture	Switzerland

Members:

Bentz	University of Toronto	Canada
Bayrak	University of Texas at Austin	USA
Denton	Parsons Brinckerhoff Ltd	United Kingdom
di Prisco	Politecnico di Milano	Italy
Fernández Ruiz	EPF Lausanne	Switzerland
Foster	UNSW Australia	Australia
Hegger	RWTH Aachen	Germany
Kuchma	Univ. of Illinois at Urbana-Champaign	USA
Lourenço	JSJ Consultoria e Projectos Lda	Portugal
Minelli	University of Brescia	Italy
Muttoni	EPF Lausanne	Switzerland
Vollum	Imperial College London	United Kingdom

Corresponding Members:

Walraven	Delft University of Technology	Netherlands

(*fib* members are listed in **bold**)

Terms of reference

Motivation/background (in brief)

Task Group 2.2 was established to evaluate and develop models for the conception, design and analysis of concrete structures. Topics within the scope of the work may include models that deal with the ultimate limit state and with ductility as to their affect on peak and post peak behaviours.

Scope and objective of technical work

The objective of T2.2 is to synthesize available results from research, testing and design experience. Therefore, research and development in this field is monitored, documented and evaluated. For the time being, the work is focused on the behaviour of slabs and beams in shear, shear aspects in the design of members reinforced with steel bars, steel fibres or a combination of steel fibres and bars and the punching behaviour of slabs. Moreover, strut-and-tie modelling is treated as a specific method to capture ultimate limit states. In addition to the state-of-the-art documentation, special attention is paid to:

- the comparison of predictions and experimental data;
- the influence of geometric and static constraints;
- ductility considerations in design and analysis;
- the effectiveness of different reinforcing elements; and
- the design for cyclic loads.

Description of workflow and timeline

Four working parties have been formed: WP2.2.1 Shear in beams, WP2.2.2 Shear in members reinforced with steel fibres, WP2.2.3 Punching and shear in slabs, and WP2.2.4 Strut and tie modelling. Each of these subgroups will develop an individual working programme by 2015. Within the next four years, three reports will be prepared which include comparisons of code provisions to experimental data and updates of the state of the art (shear and punching). The work on the design of fibre-reinforced concrete members will be coordinated with the activities of T4.1.

Collaboration with other groups

- ACI Committee 445, "Shear and Torsion"
- CEN TC 250/SC 2/WG 1/TG 4, "Shear, punching, torsion"
- German Committee for Structural Concrete (DAfStb)

Target Audience

Academia, consultants, authorities/governmental institutions, producers

Expected outcome and delivery dates

Bulletins will be issued as listed below under their respective working parties.

Working Party 2.2.1: Shear in beams

Convener:

Bayrak	University of Texas at Austin	USA

Members:

Bentz	University of Toronto	Canada
Belletti	Univ. degli Studi di Parma	Italy
Cladera	University of Balearic Islands	Spain
Fernández Ruiz	EPF Lausanne	Switzerland
Hegger	RWTH Aachen	Germany
Hong	Seoul National University	Korea
Huber	TU Wien	Austria
Kaufmann	ETH Zürich	Switzerland
Kuchma	Univ. of Illinois at Urbana-Champaign	USA
Muttoni	EPF Lausanne	Switzerland
Sagaseta	University of Surrey	United Kingdom
Sigrist	Lucerne School of Engineering & Architecture	Switzerland
Uzel	Yeditepe University	Turkey

Corresponding Members:

Foster	UNSW Australia	Australia
Vollum	Imperial College London	United Kingdom
Walraven	Delft University of Technology	Netherlands

(*fib* members are listed in **bold**)

WP2.2.1 will prepare a bulletin about shear design and analysis models for beams (physical basis and experimental validation), to be published by 2016. Several aspects are considered to be treated in the report, including the influence of the member size or of point loads near supports, clear definitions of failure modes, strut-and-tie modelling or nonlinear calculation procedures.

Working Party 2.2.2: Shear in members with steel fibres

Convener:

di Prisco	Politecnico di Milano	Italy

Members:

Foster	UNSW Australia	Australia
Minelli	University of Brescia	Italy

(*fib* members are listed in **bold**)

WP2.2.2 will start its activities in 2015 and invite further experts to participate.

Working Party 2.2.3: Punching and shear slabs

Convener:

Muttoni	EPF Lausanne	Switzerland

Members:

Bayrak	University of Texas at Austin	USA
Feix	Universität Innsbruck	Austria
Fernández Ruiz	EPF Lausanne	Switzerland
Hallgren	Tyréns AB	Sweden
Halvonik	Slovenska Technicka Univerzita, Bratislave	Slovakia
Hegger	RWTH Aachen	Germany
Hoang	Technical Univesity of Denmark	Denmark
Hueste	Texas A&M University	USA
Kueres	RWTH Aachen	Germany
Laaksonen	A-Insinoorit Oy, Tampere	Finland
Orlando	Università degli Studi di Firenze	Italy
Ospina	Berger/Abam Engineers Inc.	USA
Park	Seoul National University	South Korea
Parra-Montesinos	University of Michigan	USA
Polak	University of Waterloo	Canada
Ramos	Universidade Nova de Lisboa	Portugal
Rombach	Techn. Univ. of Hamburg-Harburg	Germany
Sagaseta	University of Surrey	United Kingdom
Sales Melo	Universidade de Brasilia	Brazil
Vill	University of Applied Sciences	Austria
Vollum	Imperial College London	United Kingdom
Walkner	Universität Innsbruck	Austria
Walraven	Delft University of Technology	Netherlands
Yang	Delft University of Technology	Netherlands

(*fib* members are listed in **bold**)

WP2.2.3 will prepare a state-of-art report on punching and shear in slabs, to be published by 2016.

Working Party 2.2.4: Strut and tie modelling

Convener:

Lourenço	JSJ Consultoria e Projectos Lda	Portugal

Members:

Almeida	Instituto Superior Tecnico	Portugal
Bousias	University of Patras	Greece
Corres Peiretti	FHECOR Ingenieros Consultores	Spain
Fernández Ruiz	EPF Lausanne	Switzerland
Haugerud	Dr.techn. Olav Olsen	Norway
Kuchma	Univ. of Illinois at Urbana-Champaign	USA
Palmisano	PPV Consulting	Italy

Corresponding Members:

Sigrist	Lucerne School of Engineering & Architecture	Switzerland

(*fib* members are listed in **bold**)

WP2.2.4 will address topics such as ordinary and more refined models, the level of approximation concept, an update of the MC2010 provisions, reversal loading and 3D models.

Task Group 2.3: Fire design of concrete structures

Convener:

Høj	HØJ Consulting GmbH	Switzerland

Members:

Bamonte	Politecnico di Milano	Italy
Boström	SP Sveriges Tekniska	Sweden
Breunese	Efectis Netherland B.V.	Netherlands
Dehn	MFPA Leipzig GmbH	Germany
Denoel	Febelcem	Belgium
Felicetti,	Politecnico Milano	Italy
Franssen	Université de Liège	Belgium
Gambarova	Politecnico di Milano	Italy
Jansson	SP Sveriges Tekniska	Sweden
Khoury	Imperial College	United Kingdom
Klingsch	ETH Zürich	Switzerland
Lennon	BRE	United Kingdom
Lottman	TU Delft	Netherlands
Lublóy	Budapest Univ. of Techn. & Economics	Hungary
Matthews	Building Research Establishment Ltd	United Kingdom
Meda	University of Rome “Tor Vergata”	Italy
Ozbolt	Universität Stuttgart	Germany
Riva	University of Bergamo	Italy
Robert	CERIB	France
Rodrigues	University of Coimbra - Polo II	Portugal
Taerwe	Ghent University	Belgium
Taillefer	CSTB	France
Wetzig	Versuchs Stollen Hagerbach AG	Switzerland

Corresponding Members:

Anderberg	FSD Fire Safety Design International	Sweden
Balázs	Budapest Univ. of Techn. & Economics	Hungary

Behloul	Lafarge	France
Biondini	Politecnico di Milano	Italy
Branco	University of Coimbra	Portugal
Diederichs	Universität Rostock	Germany
Huismann	Bundesanstalt für Materialforschung und -prüfung	Germany
Jelcic	Unviersity of Zagreb	Croatia
Kodur	Michigan State University	USA
Korzen	Bundesanstalt für Materialforschung und -prüfung	Germany
Li	Hong Kong Univ. of Science & Tech.	China
Majorana	University of Padua	Italy
Ota	Ota Engineering	Japan
Phan	NIST	USA
Richter	TU Braunschweig	Germany
Walraven	Delft University of Technology	Netherlands

(*fib* members are listed in **bold**)

Terms of reference

Motivation/background (in brief)

Task Group 2.3 welcomes active members with expertise in theory and practice in relation to fire design of concrete structures. The scope of T2.3 comprises a discussion of theoretical and practical problems in relation to fire design and the development of the state-of-the-art and best practices for fire design of concrete structures. It is the goal that the results of the task group will not only serve as a reference for the experts within the topic of fire design, but also will be helpful for the members of the *fib* in general.

Scope and objective of technical work

The scope of T2.3 is based on the previous achievements, which include the bulletins 38 and 46 on fire design of concrete structures: materials, modelling, structural behaviour and assessment, as well as contributions to the model code and various workshops and special sessions on these topics.

In the next phase, T2.3 will concentrate on a number of topical issues within fire design, with the objective of providing general engineering guidance within these fields. The work is organized into three working parties, with the following titles and scope:

Working Party 2.2.1 Spalling design: The goal is the preparation of a technical report which focuses on the link to structural engineering. The report shall provide guidance to the practice on how to treat spalling in the structural response and consequently in the structural design.

Working Party 2.3.2 Performance-based fire design: The objective is to summarize the international state-of-the-art and to discuss it specifically in relation to concrete structures, with the goal of achieving a proposal for its practical application.

Working Party 2.3.3 Fire resistance of concrete tunnels: The aim is to prepare a Technical Report concerning structural engineering aspects of fire in tunnels The main topics that will be discussed are: Design of concrete tunnels exposed to fire, fire scenario for different tunnels, material for concrete tunnels, and design supported by testing.

Description of workflow and timeline

The three working groups are each expected to prepare a bulletin with content as described in the scope. The work with the topics started 2012 and the bulletins are expected during 2015.

The task group and the working parties meet in connection with the *fib* symposia and at specific meetings one to three times per year in between the symposia.

Collaboration with other groups

The activities in T2.3 has interaction with various other commissions and task groups. In particular WP2.3.1 has strong interaction with COM4 *Concrete*, WP2.3.3 has strong interaction with COM3 *Existing concrete structures*, T1.4 *Tunnels*, and WP2.3.2 has interaction with T2.8 *Safety and performance concepts*. The collaboration with these commissions and task groups is ensured by involving members who are active in both groups.

For WP 2.3.1 collaboration has been arranged with RILEM, which has a group dealing with the topic of concrete spalling. The activities have been defined in a way that the RILEM activities focus on material aspects of the state-of-the-art of the research on spalling, whereas the *fib* report concentrates on the structural aspects of the phenomena and the consequences for the designers.

For WP 2.3.2, collaboration with Joint Committee of Structural Safety (JCSS) is relevant.

For WP 2.3.3, collaboration with International Tunnelling Association (ITA) is relevant.

For the collaboration with other organisations, members are involved for liaison purposes.

Target Audience

The target audience shall be not only experts within the topic of fire design, but also members of *fib* in general, which only occasionally encounter the topic of fire design.

Expected outcome and delivery dates

Three new bulletins are expected within the next 2 years, approximately.

Other activities

A number of workshops (as well as special sessions in symposia) dedicated to the topic of fire design of concrete have been arranged in the past.

These workshops and symposia are considered an integral part of the work process of discussion and establishment of best practices.

Such workshops (which may be arranged in collaboration with other *fib* commissions/task groups or other organisations) are expected approximately once a year.

Working Party 2.3.1: Spalling design

Convener:

Klingsch	ETH Zürich	Switzerland

Members:

Dehn	MFPA Leipzig GmbH	Germany
Felicetti,	Politecnico Milano	Italy
Høj	HØJ Consulting GmbH	Switzerland
Jansson	SP Sveriges Tekniska	Sweden
Lublóy	Budapest Univ. of Techn. & Economics	Hungary
Lennon	BRE	United Kingdom
Taillefer	CSTB	France

(*fib* members are listed in **bold**)

WP2.3.1 aims to produce a Technical Report focusing on the link with structural engineering. The report will provide guidance on how to treat spalling in structural response and consequently in structural design.

Working Party 2.3.2: Performance-based fire design

Convener:

Tan	Nanyang Technical University	Singapore

Members:

Franssen	Université de Liège	Belgium
Høj	HØJ Consulting GmbH	Switzerland
Lennon	BRE	United Kingdom
Riva	University of Bergamo	Italy
Taerwe	Ghent University	Belgium

(*fib* members are listed in **bold**)

WP2.3.2 aims to summarise, in a Technical Report, the international state-of-the-art and to discuss it specifically in relation to concrete structures, with the aim of achieving a proposal for its practical application.

Working Party 2.3.3: Fire resistance of concrete tunnels

Convener:

Meda	University of Rome “Tor Vergata”	Italy

Members:

Gambarova	Politecnico di Milano	Italy
Bamonte	Politecnico di Milano	Italy
Felicetti,	Politecnico di Milano	Italy
Lilliu	Carpitech	Switzerland
Dehn	MFPA Leipzig GmbH	Germany
Pichler	TU Wien	Austria
Taillefer	CSTB	France
Rodrigues	University of Coimbra - Polo II	Portugal
Vermeer	efectis	Netherlands
Canisius	Scott Wilson	United Kingdom
Moreau	CETU	France
Høj	HØJ Consulting GmbH	Switzerland

(*fib* members are listed in **bold**)

The aim of WP2.3.3 is to prepare a Technical Report concerning structural engineering aspects of fire in tunnels. The main topics that will be discussed are design of concrete tunnels exposed to fire, fire scenario for different tunnels, material for concrete tunnels and design supported by testing.

Task Group 2.4: Computer-based modelling and design

Convener:

Monti	Sapienza Università di Roma	Italy

Members:

Bayrak	University of Texas at Austin	USA
Bentz	University of Toronto	Canada
Blaauwendraad	Delft University of Technology	Netherlands
Cervenka	Cervenka Consulting	Czech Republic
Curbach	Technische Universität Dresden	Germany
Foster	UNSW Australia	Australia
Ishida	University of Tokyo	Japan
Jirasek	Czech Tech. Univ. in Prague	Czech Republic
Kaufmann	ETH Zurich	Switzerland
Kollegger	Technische Universität Wien	Austria
Kuchma	Univ. of Illinois at Urbana-Champaign	USA
Lowes	University of Washington	USA
Mazars	INP Grenoble	France
Ozbolt	Universität Stuttgart	Germany
Pantazopoulou	Demokritus University of Thrace	Greece
Polak	University of Waterloo	Canada
Preisinger	Technische Universität Wien	Austria
Spacone	Università G. D'Annunzio	Italy
Tailhan	IFSTTAR	France
Vecchio	University of Toronto	Canada

(*fib* members are listed in **bold**)

Terms of reference

Motivation/background (in brief)

In order to bridge the gap between complex and advanced analyses and practical design applications, Task Group 2.4 (T2.4) aims at developing guidance documents on the application of linear and non-linear computer-based methods to the analysis and design of concrete structures.

Scope and objective of technical work

The scope and objectives of T2.4 are to:

- discuss the application of computer-based procedures to the solution of practical design questions such as minimum reinforcement, ductility, crack widths, etc.;
- provide guidance on the application of finite element procedures to post-construction assessments, forensic engineering, and rehabilitation work relating to concrete structures;
- propose criteria for calibrating or validating computer-based procedures;
- review appropriate constitutive models and analysis methodologies;
- work towards an integration of continuum mechanics and fracture mechanics based approaches; and
- discuss the extension of computer-based procedures to fibre-reinforced concrete and composite structures.

Description of workflow and timeline

At present, two working parties are/will become active: WP2.4.1 *Non-linear dynamic analysis (NLDA) for seismic evaluation of RC frames* and WP2.4.2 *Modelling of fibre-reinforced concrete*.

Target audience

Reports will be written primarily for the benefit of the practising engineer, rather than as a state-of-art for researchers. They are intended to provide a diverse and balanced portrayal of the technical knowledge while avoiding biased or skewed representation of the work of committee members.

Expected outcome and delivery dates

A first draft of approximately 100 pages of the WP2.4.1 bulletin has been circulated among the participants. It is planned to submit it for publication by 2015.

Working Party 2.4.1: Nonlinear dynamic analysis for seismic evaluation of RC frames

Convener:

Monti	Sapienza Università di Roma	Italy

Members:

Barbato	Louisiana State University	USA
Cervenka	Cervenka Consulting Ltd	Czech Republic
Foster	UNSW Australia	Australia
Guner	Morrison Hershfield Ltd	Canada
Kunnath	University of California at Davis	USA
Lucchini	Sapienza University of Rome	Italy
Mollaioli	Sapienza University of Rome	Italy
Saatci	Izmir Institute of Technology	Turkey
Scott	Oregon State University	USA
Spacone	Università G. D'Annunzio	Italy
Valipour	UNSW Australia	Australia
Vecchio	University of Toronto	Canada

(*fib* members are listed in **bold**)

The work of WP2.4.1 currently covers the following aspects: seismic action, modelling and analysis of cyclic behaviour, and case studies.

Task Group 2.5: Bond and material models

Convener:

Plizzari	University of Brescia	Italy

Members:

Aiello	University of Lecce	Italy
Alander	Celsa Steel Service Oy	Finland
Balázs	Budapest Univ. of Techn. & Economics	Hungary
Cairns	Heriot-Watt University	United Kingdom
De Lorenzis	University of Lecce	Italy
Eligehausen	IWB, Universität Stuttgart	Germany
Metelli	University of Brescia	Italy
Muttoni	EPF Lausanne	Switzerland
Pantazopoulou	Demokritus University of Thrace	Greece
Pellegrino	Università di Padova	Italy
Williamson		United Kingdom
Zandi Hanjari	Tech Research Inst of Sweden (SP Group)	Sweden

Corresponding Members:

den Uijl	Delft University of Technology	Netherlands
Engström	Chalmers University of Technology	Sweden
Gambarova	Politecnico di Milano	Italy
Genesio	IEA GmbH & Co. KG	Germany
Jirsa	University of Texas	USA
Lundgren	Chalmers University of Technology	Sweden
Ueda	Hokkaido University	Japan
Wildermuth	University of Stuttgart	Germany

(*fib* members are listed in **bold**)

Recent meetings:

Milan (December 2014)

Terms of reference

Motivation/background (in brief)

The overall motivation of Task Group 2.5 (T2.5) is to advance theoretical and practical developments in topics related to bond and anchorage of reinforcing and prestressing materials, and to present these developments in an understandable and code-type formulated manner.

The objective of WP2.5.2 is on standardizing the testing procedures of bond and hence, to support the manufacturing industry as well as the design engineering community. The results may be used for establishing: (a) acceptance criteria of new reinforcing products, (b) detailing rules for different limit states (serviceability criteria, criteria for strength and criteria for deformation capacity), and (c) for analysis (simulation) of structural response.

Scope and objective of technical work

T2.5 undertakes activities which stimulate and advance modelling of the influence of bond and anchorage of reinforcement on structural performance, and to the development of design provisions related to bond behaviour and to detailing of laps and anchorages.

The work of WP2.5.2 *Standard method of test for bond*, will assess the available experimental literature, maintain and enhance the already assembled databases from various types of bond tests and conduct a comparative evaluation of the experimental quantifiers of bond and parametric sensitivity thereof, as these prevail from the experimental evidence; the objective is to establish modifiers to properties obtained from different types of setups (as the use of any given test arrangement is often limited by the equipment and capabilities of the individual manufacturers or research investigators), so as to enable a common baseline for comparison of obtained values and adjustment depending on the intended use. This will include targeted simulation studies carried out by members of the WP, to enable comparison and normalization of bond values through the underlying mechanics of the stress states modelled through the individual types of experiments.

Description of workflow and timeline

T2.5 has recently completed contributions to the *fib* Model Code for Concrete Structures 2010, and published *fib* Bulletin 72 in the summer of 2014.

Working parties are currently addressing two topics as described below.

T2.5 is also willing to review outputs from other task groups/commissions that fall within its scope.

Collaboration with other groups

Working Party 2.5.1 will feed into the activity of COM3 *Existing Concrete Structures* as well of T2.2 *Ultimate Limit State Models*. The work of T2.5 currently addresses steel reinforcement, but links exist with T5.1, FRP reinforcement for concrete structures.

Working Party 2.5.2 is liaising with RILEM on proposals for a standard method of test for bond, which might replace the current RILEM test specifications.

Target audience

Academia, consultants, authorities, governmental/design code institutions, manufacturing industries, code writing bodies.

Expected outcome and delivery dates

Bulletin or paper in the *fib* journal *Structural Concrete* on "Bond and anchorage of plain round bars - a reevaluation" in 2015. Proposal for a standard method of test for bond of reinforcement in 2015.

Other activities

It is intended to organise a two-day conference on "Bond in Concrete" in 2017.

Working Party 2.5.1: Bond of plain reinforcement

Convener:

Plizzari	University of Brescia	Italy

Members:

Cairns	Heriot-Watt University	United Kingdom
Feldman	University of Saskatchewan	Canada

(*fib* members are listed in **bold**)

WP2.5.1 is reviewing data on bond and anchorage of plain round bars. Although such bars are rarely used in new construction, the growing need to assess existing structures means there might be benefits from updating design rules from earlier codes, taking account of more recent developments in the understanding of bond behaviour. The bulletin is planned to be published as a technical report, perhaps in combination with work of other subgroups contributing to COM3 on assessment of existing concrete structures.

Working Party 2.5.2: Standard method of test for bond

Convener:

Pantazopoulou	Demokritus University of Thrace	Cyprus

Members:

Alander	Celsa Steel Service Oy	Finland
Eligehausen	IWB, Universität Stuttgart	Germany
Plizzari	University of Brescia	Italy
Metelli	University of Brescia	Italy

(*fib* members are listed in **bold**)

A first step is to define intermediate milestones and assign the work to the individual members of the WP. Assembling the relevant databases as a basis for assessment of the test types, and conducting preliminary finite element simulations to illustrate the effect of support conditions on the test output would be necessary background work to be carried out by the individual members of the WP in their own research establishments. A draft of the document is intended to be prepared by the second half of 2015. After that point, revisions will aim for consistency of interpretation and calibration with the derived modifiers for normalization of results.

Task Group 2.6: Composite steel-concrete construction

Convener:

Pecce	Università del Sannio	Italy

Co-Convener:

Bilotta	University of Naples Federico II	Italy

Members:

Amadio	University of Trieste	Italy
Bertagnoli	Politecnico di Torino	Italy
Corres Peiretti	FHECOR Ingenieros Consultores	Spain
Dezi	University of Marche	Italy
del Prete	BuroHappold Engineering	UK
di Sarno	University of Sannio	Italy
Fabbrocino	University of Molise	Italy
Faella	Università degli Studi di Salerno	Italy
Lam	University of Bradford	UK
Leoni	University of Camerino	Italy
Mancini	Politecnico di Torino	Italy
Martinelli	University of Salerno	Italy
Napoli	Politecnico di Torino	Italy
Nigro	Università di Napoli Federico II	Italy
Perez Caldentey	FHECOR Ingenieros Consultores	Spain
Wang	University of Manchester	UK
Wendner	BOKU	Austria
Zandonini	University of Trento	Italy

Corresponding Members:

Elghazouli	Imperial College of London	UK
Triantafillou	University of Patras	Greece

(*fib* members are listed in **bold**)

Terms of reference

Motivation/background (in brief)

Steel-concrete composite construction allows various structural solutions that optimize the performances of the two-component materials through a well-assessed design that takes into account all the particularities of steel and RC constructions as well as interaction problems.

The motivation of fib TG 2.6 is to identify the meaningful characteristics of composite steel-concrete structures with respect to typical aspects of RC structures in order to provide technical knowledge and design provisions. Scope and objective of technical work

Scope and objective of technical work

Usually the design of the composite structures is approached from the point of view of steel design. The purpose of TG2.6 is focusing on the structural aspects related to the RC parts and analysing their effect on the composite system.

The main technical issues are catalogued as general, typical of bridges end typical of buildings.

The general issues are:

- evaluation of stress variation in the upper flanges near the zero-bending moment region taking into account the cracked and uncracked state (proposal to perform experimental tests using imposed deformations);
- harmonization of the sectional approach for bending response between EC2 and EC4;
- sustainability of composite constructions;
- shear connection and shear interaction between concrete and steel: general problems and models; ULS and SLS; shear connection in classical composite slab and beams and innovative types; quasi-static and cyclic behaviour;
- time-dependent behaviour of composite structures: creep and shrinkage models useful for composite members; effects on bending moment, stress and deflection in SLS; global behaviour; phased constructions;.

The issues for bridges are:

- fatigue problems related to concrete slabs (tensile resistance and assessment models) in the hogging regions;
- cracking phenomena for bi-dimensional systems, e.g. concrete slabs;
- durability of region of hogging moments due to the evolution of cracks;
- endogenous cracking effects (from casting to final stage: how to evaluate and control);
- combination of thermal cracking with other effects in concrete slabs;
- shear resistance of concrete slabs cracked in two directions;
- connections of precast slabs in longitudinal and transverse directions;
- the prestressing to improve the behaviour of composite bridges (isostatic concrete bridges, continuous composite bridges with slab only in the top chord and continuous with two slabs);
- •corrugated webs: design (buckling phenomena also in combination with longitudinal shear and transverse bending moment) and technological issues for applications;
- design guidelines for trussed composite bridges, especially webs, connections and durability.

The specific issues for buildings are:

- resistance and ductile behaviour of composite structures: beams (specific and innovative types, e.g. truss composite beams); columns (high performance concrete and steel); composite joints (beam-to-column joints; base column joints; improvements of models); composite slabs (improvement of models); rotational capacity of beams and columns; provisions for seismic behaviour;
- hybrid structures and members;
- fire behaviour of composite structures; and
- effects of localised fires on the robustness of composite structures.

Description of workflow and timeline

The activities are now finalized to publish a bulletin on composite structures.

The first draft was already prepared by the TG members in the last two years.

Next deadlines are:

Second draft (July 2016)

Review of the second draft (November 2016)

Collaboration with other commissions and task groups

T2.1 Serviceability models

Collaboration with other groups

- Evolution Group of EN 1994-1-1

- Evolution Group of EN 1994-1-2
- ECCS-TC 11
- ACI Italy Chapter

Target audience

Academia, consultants, authorities/governmental institutions, producers (concrete, construction steel, steel concrete connectors), contractors.

Expected outcome and delivery dates

Preparation of a technical report: Steel-concrete composite structures (expected delivery date: March 2017).

Task Group 2.7: Design for extreme events

Convener:

Ozcebe	TED University	Turkey

Members:

Bonelli	Univ. Tecnica Federico Santa Maria	Chile
Calvi	Universita degli Studi di Pavia	Italy
Carvalho	Gapres SA	Portugal
Elnashai	University of Illinois at Urbana-Champ.	USA
Fardis	University of Patras	Greece
Franchin	Sapienza University di Roma	Italy
Garcia	Universidad de Los Andes	Colombia
Hiraishi	Building Research Institute	Japan
Kahan	Setec TPI	France
Kappos	Aristotle University of Thessaloniki	Greece
Kawashima	Tokyo Institute of Technology	Japan
Kowalsky	North Carolina State University	USA
Mitchell	McGill University	Canada
Moehle	University of California at Berkeley	USA
Mosalam	University of California at Berkeley	USA
Nakano	University of Tokyo	Japan
Pampanin	University of Canterbury	New Zealand
Pantazopoulou	Demokritus University of Thrace	Greece
Priestley	ROSE School	Italy
Rodriguez	National University of Mexico	Mexico
Tanaka	Kyoto University	Japan

Corresponding Members:

Pinto	Sapienza Universita di Roma	Italy
Watanabe	Takenaka Corporation	Japan

(*fib* members are listed in **bold**)

Terms of reference

Motivation/background (in brief)

The motivation for the work of Task Group 2.7 (T2.7) is the promotion of the use and improvement in safety of concrete structures under accidental (e.g. seismic) actions and/or in exposed regions worldwide.

Scope and objective of technical work

For the time being, within T2.7 two main fields of activity are being developed further.

These fields are being addressed by Working Party 2.7.1, Seismic design of buildings and bridges where it plans to contribute to:

- the methods of seismic assessment and retrofit of existing concrete structures;
- the procedures for displacement-based or, in general deformation-controlled seismic design and assessment;
- guidelines for performance-based seismic design;
- the development of new concepts and rules for the seismic design of new concrete structures and for the improvement of seismic safety of existing structures; and
- the harmonisation and improvement of seismic design standards worldwide.

On the other hand, the scope of Working Party 2.7.2, Protective concrete structures, is to:

- document the ability of concrete structures to protect people and environment against extreme hazards, i.e. accidental fires, impact, blast, cryogenic loads, and seismic actions;
- systematically survey and evaluate the knowledge on extreme loads and engineering solutions to cope with these loads; and
- develop new concepts and rules for the design of new concrete structures and for the improvement of existing structures.

Target audience

Academia, consultants, authorities/governmental agencies, institutions, contractors.

Task Group 2.8: Safety and performance concepts

Conveners:

Bergmeister	Universität für Bodenkultur	Austia
Taerwe	Ghent University	Belgium

Members:

Anton Corrales	Universidad Politécnica de Madrid	Spain
Campos e Matos	Univ. of Minho	Portugal
de Chefdebien	LB7	France
Graubner	Technische Universität Darmstadt	Germany
Hoffmann	Mageba	Switzerland
Joglekar	STUP Consultants P. Ltd	India
Lehky	Brno University of Technology	Czech Republic
Maier		Switzerland
Meager	Worley	Australia
Paeglitis	Riga Technical University	Latvia
Proske	Universität für Bodenkultur	Austria
Recupero	R & S Engineering	Italy
Strauss	Universität für Bodenkultur	Austria
Suzuki	Tohoku University	Japan
Wendner	Universität für Bodenkultur	Austria
Zilch	Technische Universität München	Germany

Corresponding Members:

Alcocer	Univ Nacional Autónoma de México	Mexico
Bucher	Technische Universität Wien	Austria
Calavera	INTEMAC	Spain
Fernández Gómez	INTEMAC	Spain
Frangopol	Lehigh University	USA

Novak	Technical University of Brno	Czech Republic
Nowak	University of Nebraska	USA
Santa	KlimaHaus Agentur	Italy

(*fib* members are listed in **bold**)

Terms of reference

Motivation/background (in brief)

The overall motivation of Task Group 2.8 (T2.8) is based on the fact that structural systems are typically designed to stay in service for at least several decades. This implies that proper attention must be given to structural performance under various actions, both man-made and environmental, to the methodology of structural analysis and assessment, to material properties, to the inverse identification and monitoring of structural resistance among others. The main focus is on existing structures, such as concrete buildings and bridges.

Scope and objective of technical work

The objective of T2.8 is to provide a comprehensive overview of the theoretical and practical developments in the area of structural safety, serviceability and reliability, to promote understanding of advanced methodology including probabilistic methods, inverse analyses techniques, monitoring methods, and encourage application of these methods to improve structural performance and minimize life-cycle cost.

The areas of technical work and interest for T2.8 are:

- performance-based design requirements ensuring the life cycle;
- general principles for the reliability assessment of structures;
- fundamental methods of structural reliability;
- safety formats;
- testing for assessment and design;
- inspection and monitoring;
- maintenance of structures;
- structural identification methods;
- probabilistic based models for material degradation processes;
- case studies.

One of the major objectives for the future activities is to support other task groups and commissions (e.g. *fib* Commission 3 *Existing Concrete Structures*) with the outcomes and results, and to focus on system robustness, redundancy and gradient reliability assessment of concrete structures.

Description of workflow and timeline

After having finished the contributions to the state-of-art report, the task group is now focusing on the finalization of documents for "Safety and performance concepts of concrete structures". Working parties associated with system robustness, system redundancy, and gradient reliability assessment concepts are to be developed taking into account new topics and coordinated with other technical bodies.

Target audience

Academia, consultants, authorities/governmental institutions, contractors, engineering offices

Expected outcome and delivery dates

State–of-the-art report "Safety and performance concepts; Reliability assessment of concrete structures"

Other activities

IABMAS2014: Bridge performance assessment and prediction using monitoring (mini symposium)

Task Group 2.9: Fastenings to structural concrete and masonry

Convener:

Eligehausen	IWB, Universität Stuttgart	Germany

Members:

Akiyama	Tokyo Soil Research CO., LTD	Japan
Asmus	IEA GmbH & Co. KG	Germany
Bergmeister	Universität für Bodenkultur	Austria
Block	Technische Universität Dortmund	Germany
Bucher	fischerwerke GmbH & Co. KG	Germany
Buhler	Adolf Würth GmbH & Co KG	Germany
Cook	University of Florida	USA
Elfgren	Luleå University of Technology	Sweden
Genesio	IEA GmbH & Co. KG	Germany
Grosser	Hilti AG	Liechtenstein
Guillet	Centre Scientifique et Techinque du Batiment	France
Hofmann	IWB, Universität Stuttgart	Germany
Lange	Deutsches Institut für Bautechnik	Germany
Li	Dr. Li Anchor Profi GmbH	Germany
Lotze	MPA Uni Stuttgart, Otto-Graf-Institut	Germany
Mallee	Consultant	Germany
Matsuzaki	Science University of Tokyo	Japan
Mattis	CEL Consulting	USA
Muciaccia	Politecnico di Milano	Italy
Nakano	University of Tokyo	Japan
Randl	Carinthia Univ. of Applied Sciences	Austria
Rutz	MKT Metall-Kunststoff-Technik GmbH	Germany
Schätzle	fischerwerke GmbH & Co. KG	Germany
Sharma	IWB, Universität Stuttgart	Germany
Silva	Hilti Inc.	USA
Sippel	Verein zur Förderung und Entwicklung der Befestigungs-, Bewehrungs- und Fassadentechnik	Germany
Stochlia	ICC Evaluation Service	USA
Stork	Private	Germany
Vintzileou	National Technical University Athens	Greece
Wall	Hilti AG	Liechtenstein
Wendner	Universität für Bodenkultur	Austria
Yamamoto	GAL Building Consultant Office	Japan

Corresponding Members:

Bergkivist	Vattenfall	Sweden
Davis	Milwaukee School of Engineering	USA
Fletcher	LiteSteel Technologies	Australia
Fuchs	IWB, Universität Stuttgart	Germany
Gerber	IAPMO	USA
Häusler	Halfen GmbH	Germany
Hoehler	National Institute of Standards and Technology	USA
Hordijk	Adviesbureau Hageman	Netherlands
Hosokawa	The Tokyo University	Japan
Julier	Jordahl GmbH	Germany
Kinnunen	Peikko Group	Finland

Kolden	Element Materials Technology	USA
Kuhn	Adolf Würth GmbH & Co KG	Germany
Kummerow	Deutsches Institut für Bautechnik	Germany
Mahrenholtz, C.	Jordahl GmbH	Germany
Mahrenholtz, P.	Stanley Black & Decker Deutschland GmbH	Germany
Michler	Technische Universität Dresden	Germany
Olsen	Powers Fasteners Inc.	USA
Pimienta	Centre Scientifique et Technique du Batiment	France
Pinoteau	Centre Scientifique et Technique du Batiment	France
Rieder	Brenner Base Tunnel BBT SE	Austria
Roistand	Spit	France
Silverman	ICC-Evaluation Service	USA
Spieth	Private	Germany
Strater	Chemofast Anchoring	Germany
Takahashi	Hilti Japan	Japan
Thiele	Technische Universität Kaiserlautern	Germany
Turley	Simpson Strong Tie Company, Inc.	USA
Wendt	Simpson Strong Tie Company, Inc.	Germany
Wiewel	Consultant	USA
Zhao	University of Wisconsin-Milwaukee	USA
Ziegler	Powers Fasteners Inc.	USA

(*fib* members are listed in **bold**)

Recent meetings:

Washington (April 2015); Dresden (October 2015); Milan (May 2016)

Terms of reference

Motivation/background (in brief)

Modern fastening technique is employed extensively for the transfer of concentrated loads into concrete and masonry structures. Cast-in-place anchors, placed in the formwork before casting of the concrete, as well as post-installed anchors and reinforcing bars, which are installed in hardened structural concrete or masonry, are equally common. Loads are transferred into the concrete or masonry by mechanical interlock, friction, bond or a combination of these mechanisms. However, independent of the load-transfer mechanism, all anchorages rely on the tensile strength of the concrete or masonry, a fact which must be taken into account in both assessment and design. Despite the widespread use of cast-in-place as well as post-installed anchors and reinforcing bars in construction, the overall level of understanding in the engineering community regarding their behaviour remains quite limited.

Scope and objective of technical work

In order to improve the general state of knowledge in this field, Task Group 2.9 *Fastenings to Structural Concrete and Masonry* (the former Special Activity Group 4) was formed.

The aim of T2.9 is to collect and discuss the latest research results in the field of fastening technology, to identify new areas of research and to synthesize the research results in harmonized provisions for the design of fastenings.

Description of workflow and timeline

T2.9 meets annually to discuss the latest research results as well as to present the activities of the working parties. The working parties have usually additional meetings once or twice a year.

Collaboration with other groups

fib Task Group 2.5 Bond and material models

ACI Commissions 318, 349 and 355

CEN, TC250/SC2/WG 2 "Design of fastenings in concrete"

EOTA, Working Group "Anchors"

Target audience

Researchers, consultants, approval bodies, manufacturers, designers

Expected outcome and delivery dates

Continuous revision of the *fib* Bulletin 58 "Design of anchorages in concrete" with regular output every two to three years based on the work of the working parties. Single topics will be treated in specific *fib* documents. A new general "Design Guide" will be issued in approximately five to six years.

Working Party 2.9.1: Review of current *fib* model with a view to Model Code 2010 and model for anchor reinforcement

Convener:

Hofmann	IWB, Universität Stuttgart	Germany

Members:

Asmus	IEA GmbH & Co. KG	Germany
Elfgren	Luleå University of Technology	Sweden
Eligehausen	IWB, Universität Stuttgart	Germany
Genesio	IEA GmbH & Co. KG	Germany
Silva	Hilti Inc.	USA
Sippel	European Engineered Construction Systems Association	Germany
Zhao	University of Wisconsin-Milwaukee	USA

(*fib* members are listed in **bold**)

Revision of the design model for anchorage reinforcement in respect to bond provisions of the *fib* MC 2010

Working Party 2.9.2: Open topics in the current design guide

Convener:

Wall	Hilti AG	Liechtenstein

Members:

Bucher	fischerwerke GmbH & Co. KG	Germany
Buhler	Adolf Würth GmbH & Co. KG	Germany
Li	Dr. Li Anchor Profi GmbH	Germany
Mallée	Consultant	Germany
Pregartner	Stanley Black & Decker Deutschland GmbH	Germany
Stork	Private	Germany
Wendt	Simpson Strong Tie Company, Inc.	Germany

(*fib* members are listed in **bold**)

Review of the design provisions for anchorages in respect to inconsistencies and new research results and development of improved design provisions

Working Party 2.9.3: Shear lugs

Convener:

Cook	University of Florida	USA

Members:

Eligehausen	IWB, Universität Stuttgart	Germany
Michler	Technische Universität Dresden	Germany
Silva	Hilti Inc.	USA
Stork	Private	Germany

(*fib* members are listed in **bold**)

Development of provisions for the design of shear lugs

Working Party 2.9.4: Fatigue loading

Convener:

Block	Technische Universität Dortmund	Germany

Members:

Bucher	fischerwerke GmbH & Co. KG	Germany
Hofmann	IWB, Universität Stuttgart	Germany
Li	Dr. Li Anchor Profi GmbH	Germany
Lotze	MPA Uni Stuttgart, Otto-Graf-Institut	Germany
Sippel	European Engineered Construction Systems Association	Germany
Wall	Hilti AG	Liechtenstein

(*fib* members are listed in **bold**)

Review of the existing simplified design provisions for anchorages under fatigue loading and development of less conservative design provisions

Working Party 2.9.5: Bonded anchors under sustained load

Convener:

Cook	University of Florida	USA
Hofmann	IWB, Universität Stuttgart	Germany

Members:

Eligehausen	IWB, Universität Stuttgart	Germany
Guillet	Centre Scientifique et Techinque du Batiment	France
Schätzle	fischerwerke GmbH & Co. KG	Germany
Wall	Hilti AG	Liechtenstein

(*fib* members are listed in **bold**)

Review of research results on bonded anchors under sustained load and development of provisions for the design of anchorages with bonded anchors and connections with post-installed reinforcement to take into account the negative influence of sustained load

Working Party 2.9.6: Post-installed reinforcement - Harmonization of rules for reinforced concrete and anchorages with bonded anchors and post-installed reinforcement

Convener:

Silva	Hilti Inc.	USA

Members:

Eligehausen	IWB, Universität Stuttgart	Germany
Mahrenholtz	Jordahl GmbH	Germany

(*fib* members are listed in **bold**)

Development of a harmonized design concept for connections with bonded anchors and post-installed reinforcement under static and seismic loading

Working Party 2.9.7: Splitting of bonded anchors

Convener:

Asmus	IEA GmbH & Co. KG	Germany

Members:

Bucher	fischerwerke GmbH & Co. KG	Germany
Cook	University of Florida	USA
Guillet	Centre Scientifique et Techinque du Batiment	France
Kummerow	Deutsche Institut für Bautechnik	Germany

(*fib* members are listed in **bold**)

Development of design provision for bonded anchors to prevent splitting of the concrete member during pretensioning and loading which shall replace the currently required approval tests

Working Party 2.9.8: Required stiffness of baseplates

Convener:

Li	Dr. Li Anchor Profi GmbH	Germany

Members:

Cook	University of Florida	USA
Eligehausen	IWB, Universität Stuttgart	Germany
Kummerow	Deutsche Institut für Bautechnik	Germany
Mallee	Consultant	Germany
Stork	Private	Germany
Thiele	Technische Universität Kaiserslautern	Germany
Wall	Hilti AG	Liechtenstein

(*fib* members are listed in **bold**)

In general anchorages are designed under the assumption that the baseplate is stiff. However, no criteria are given in the *fib* Design Guide to assure a stiff baseplate. These provisions will be developed.

Working Party 2.9.9: Fire Resistance of anchors and post-installed reinforcement

Convener:

Guillet	Centre Scientifique et Techinque du Batiment	France

Members:

Eligehausen	IWB, Universität Stuttgart	Germany
Hofmann	IWB, Universität Stuttgart	Germany
Lange	Deutsches Institut für Bautechnik	Germany
Pimienta	Centre Scientifique et Techinque du Batiment	France
Pinoteau	Centre Scientifique et Techinque du Batiment	France
Silva	Hilti Inc.	USA
Stochlia	ICC Evaluation Service	USA
Takahashi	Hilti Japan	Japan

(*fib* members are listed in **bold**)

Development of more refined provisions for the design of anchorages with all types of anchors and of connections with post-installed reinforcement under fire exposure