Preface

"Designing and Building with UHPFRC" has been the main subject addressed by UHPFRC 2009 and 2013 international symposiums that were organized in Marseille (France) by AFGC, the French Association for Civil Engineering, under the auspices of *fib* (the international federation of structural concrete) and RILEM (The International Union of Laboratories and Experts in Construction Materials). In addition to traditional academic aspects of Research and Development, these events have contributed to the synthesis of the know-how concerning design and building of actual structures made of Ultra-High Performance Fibre-Reinforced Concrete (UHPFRC) since the late 1990s. More than 320 attendees at each time, with varied professional roles, appreciated the scientific and technical exchange.

The year 2013, associated to the revised edition of AFGC Recommendations on UHPFRC, has constituted a significant milestone for these materials in France. Two major projects associated to urban renovation, the MuCEM in Marseille and the Jean Bouin Stadium in Paris, had been completed, having led to widened awareness of technical and architectural capabilities of these "new concretes" both among professional (architects and engineers) and for the public, including clients of constructions. Technical acceptance of the design, industrial processes and details associated to these projects, as well as previous satisfactory 15 years-experience of building components and bridges made of UHPFRC, has made it possible to launch the standardization process in France. This has resulted in the elaboration of three complementary standards, related to UHPFRC structural design, material production and control, and execution of structures. The first two documents have been published in French and English in 2016, the latter one should be finalized end of 2017, as well as updating of the standard "common rules" for precast concrete products.

Since 2013, international recognition especially within ACI Excellence in Concrete Construction Awards program has been gained not only for the MuCEM and for the Jean Bouin Stadium in 2015, but also for the "Ring of Memory" at International Memorial of Notre-Dame de Lorette in 2016. Noticeably enough, due to optimization in conceptual design, UHPFRC has made possible competitive solutions in France and Europe not only for tailor-made projects, but also for typical bridge situations. In Switzerland with the iconic example of Chillon viaducts, in the US with the Pulaski viaduct restoration, and for a lot of smaller projects, bridge deck repair or protection using UHPFRC has deserved increasing interest. Repair solutions, for buildings also, are increasingly considering UHPFRC due to specific versatility, structural and durability performance and weight savings, which results in cost-efficiency despite a possibly still high unitary material cost. However, the driving field of UHPFRC application in France has concerned cladding and roofing panels, for buildings (like "La Mantilla" buildings) and for large infrastructure projects (e.g. Montpellier high speed railway station). UHPFRC solutions based on ultra-thin, highly transparent and architecturally appealing elements have thus been made possible in a cost-efficient way due to the lightness of these secondary elements.

End of 2017, projects and constructions using UHPFRC have thus definitely gained a growing importance in Europe as well as in Asia and North America, as demonstrated by the organization of conferences in 2016 in Kassel (Germany), Des Moines (Iowa - USA) and

Changsha (China). Even if organized less than 12 to 18 months later, "UHPFRC 2017" has been able to collect 106 scientific and technical contributions from 20 countries, updating and complementing experience gained in the knowledge and use of UHPFRC, based on recent research, design studies, process optimization, standards elaboration and real implementation. Each of these contributions has been selected and reviewed by two independent experts. It becomes clear that authors and reviewers constitute a growing international UHPFRC community: 36 papers come from France, 22 from North America, 20 from Asia and Australia, 28 from Europe except France. Besides, 31 papers deal with realizations (monographs and/or series of applications) and 20 with prospective studies for UHPFRC projects and R&D associated to processes of UHPFRC production; 31 deal with research concerning UHPFRC mix-proportioning and material properties, structural behavior and properties of composite structures comprising UHPFRC; and 24 are related to tests and material characterization, constitutive modelling and standardization.

The symposium is hosted in one of the nicest cities in Southern France, for a unique opportunity to visit the iconic technical and architectural UHPFRC achievements of Pont de la République, La Mantilla buildings and the new high speed railway station (about 80 x 100 m² UHPFRC roofing with 17 m-span palm-shaped elements, presently under completion). The ambition of these Proceedings, as part of the RILEM collection, which include a presentation of these UHPFRC works, is to constitute a new milestone and reference source of technical and scientific knowledge for all people involved in UHPFRC application whether in research, design, building art or practice.

We have been proud and honoured to collect and highlight the high-quality information provided by numerous researchers, architects, design engineers, technical managers, namely colleagues from this growing number of countries. We sincerely thank the more than fifty reviewers of the scientific committee who tried to ensure giving these proceedings a significant archival value, and the members of organizing and supporting committees, for their great contribution towards a successful UHPFRC 2017.

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Chairman of the Scientific Committee

Jacques Resplendino
Chairman of the Organizing Committee

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