

Preface

The launch of the first edition of ICSA, The International Conference on Structures and Architecture in 2010 was driven by the ambition to cultivate a serious, strong, and open community for nurturing the synergetic potentials of architecture and structural engineering towards a betterment of the built environment.

With the first three editions of ICSA held in the formative historical setting of Guimarães in 2010, 2013, and 2016, this community has grown a solid foundation thanks to a continuously expanding core group of highly committed colleagues with a background in architecture and/or structural engineering. The cohesiveness of this group, and its dynamic ability to attract new talents in a constant search for new grounds and directions intersecting structures and architecture, has progressively made ICSA become the world's leading event bridging the gap between structures and architecture.

With the establishment of IASA, the International Association of Structures and Architecture in 2016, the ICSA community has acquired a permanent plural and transparent platform to further cultivate the international exchange of knowledge and foster cooperation across structures and architecture. Today, the association counts more than 230 members across all continents. The full potential of this platform has yet to be explored and developed as a highly effective organization making a noteworthy contribution to the fields of structures and architecture through principles of integrity, credibility, plurality and diversity, mutual respect, transparency and accountability, enhanced cooperation, and free development of ideas. The launch of the new Springer journal *Architecture, Structures and Construction* in 2021 marks a first step in this direction, by providing an interdisciplinary international publication outlet to maintain and expand our exchange of knowledge also in between ICSA conferences. You are all invited to join this exploration by taking on an active role in the association.

Based on the trajectory of ICSA and IASA, and the roots in Portugal, 2022 marked the beginning of an international journey towards further development of the community of ICSA and its contributions to a betterment of the built environment. As announced at the closing ceremony of the fourth edition of ICSA held in Lisbon in 2019, this journey has started in Aalborg, Denmark, the location of ICSA2022.

A viable urban perspective?

The breadth of the United Nation's 17 Sustainable Development Goals visualizes how solutions to the intertwined social, economic, and environmental challenges facing us relies on an increased understanding of our individual responsibilities and actions towards a betterment for the collective. Within the fields of structures and architecture, this entails questioning the way we work as well as the quality and value of the works we do in the intersection of the social, economic, and environmental dimensions of architecture and structure. As stated by Japanese architect Fumihiko Maki at the first edition of ICSA in 2010 with reference to his concept of 'collective form'; *'the question is not about sustainability of each individual building, but also how we can create a more sustainable community and environment at the urban scale. I think, even in modest scale, the collective form can have an important place as an object where planners, architects, engineers, and others might be able to work together in a more creative way addressing this challenge. It is less a question of independent effort, somehow the situation suggests something collaborative that we still have not explored fully'* (Maki

2010, 00:16:00. Record of panel discussion on ‘Mega Structures’ at the First International Conference on Structures & Architecture, Guimarães, Portugal).

Inspired in Maki’s call, ICSA2022 was dedicated to stressing and investigating the commitment and responsibility of structures and architecture as drivers of a viable urban development.

Collective potentials

Since the first ICSA conference in 2010 it has been a central ambition of the conference to join research, education, and cooperation into the cross-field of structures and architecture. Following this ambition, the planning of ICSA2022 aimed to maintain, develop, and further expand ICSA’s highly qualified existing scientific program based on traditional Research Papers, while simultaneously introducing a novel practice-oriented research format entitled Critical Practices. Critical Practices is a hybrid format employing the submission, exhibition, and presentation of physical prototypes as research output in combination with shorter reflection papers in an attempt at bridging research across academia and practice. At ICSA2022 this orientation towards practice was likewise evident in an effort to open the conference doors for practitioners and students in order to increase the range and impact of the research and development presented at the conference as sparks for new collaborations across academia and practice.

In the 3 years-planning process leading up to ICSA2022, the cohesiveness of the ICSA community proved its strength and collective potential in this matter. As results hereof, over 40 key researchers within the fields have joined across institutions in the formulation of a series of groundbreaking research themes for 3 mini-symposia and 14 special sessions hereby attracting a large group of new authors to the community, 6 internationally acknowledged keynote lecturers generously accepted to spend time to take part in the discussions with participants at the conference, the body of the International Scientific Committee was expanded to over 100 committed colleagues, over 400 abstracts were initially submitted of which 220 contributions were finally accepted for publication and presentation at the conference, a panel of acknowledged practitioners generously contributed to the development of the new Critical Practices format and joined the Critical Practices Panel Discussion. Finally, yet other capacities within the community joined to facilitate a series of workshops associated with ICSA, herein a highly ambitious design and build workshop entitled Ephemeral Permanence exploring the circular potentials of structures and architecture made from reclaimed components in a viable urban perspective on site in Aalborg. All despite COVID-19 keeping us at a distance!

This volume, **Structures and Architecture –A viable urban perspective?** contains the Research Papers and the contributions to the new Critical Practice format presented at the Fifth International Conference on Structures and Architecture that was held in Aalborg, Denmark 6-8 July 2022. The volume also contains a USB flash card with the full texts of the lectures presented at the conference. Of the 220 accepted peer reviewed contributions, 168 are regular Research Papers presented with an Extended Abstract of two-pages in print and the Full Paper of eight-pages on the USB flash card. An additional 17 contributions, each marked with * in the list of contents are Critical Practices presented with a Reflection Paper of three pages in print.

Finally, 35 contributions are Extended Abstracts corresponding to papers published in the special issue ‘Structures and Architecture – Joining Forces’ of the new Springer journal *Architecture, Structures and Construction*. Based upon the review by ICSA2022 International Scientific Committee of the submitted abstracts, approximately 50 authors were invited to submit the corresponding full papers to the journal, strictly following the journal’s peer-review process. The 35 Extended Abstracts, each marked with ** in the list of contents, represent the papers that were finally accepted for publication in the journal after having successfully completed this process. Hence, the Special Journal Issue serves the dual purpose of cultivating the community of the new journal *Architecture, Structures and Construction* as an international and interdisciplinary platform while simultaneously raising the level of publications associated with ICSA conferences to a new level adding to the strong foundation of the conference proceedings *Structures and Architecture – A viable urban perspective?* contained within this book.

Summarizing, this set of book and USB flash card is intended for a global readership of researchers, practitioners, and students, including architects, structural and construction engineers,

builders and building consultants, constructors, material suppliers, planners, urban designers, anthropologists, economists, sociologists, artists, and product manufacturers, and other professionals involved in the design and realization of architectural, structural, and infrastructural projects. We hope that it will be applicable in growing the ICSA community aiding new interdisciplinary collaborations towards increasingly collective structural and architectural forms.

We would like to take this opportunity to express our sincere gratitude to all authors, organizers of mini-symposia and special sessions, keynote lecturers, panel members and participants for their valuable contributions to the Conference. Our special thanks go to the members of the Local Organising Committee and the International Scientific Committee for their committed work and for the time and effort they have devoted to making ICSA2022 a successful event. A special gratitude also to Research Assistant Rasmus Nyborg Andersen, for his tireless help with the final preparation of the manuscripts for this publication, and to all colleagues and students at the Department of Architecture, Design and Media Technology at Aalborg University for your engagement in the realization of ICSA2022. Last, but not least, we would like to express our sincere gratitude to all the sponsors of ICSA2022 for their support and trust.

Aalborg & Guimarães, April 2022
Marie Frier Hvejsel & Paulo J.S. Cruz (Conference Chairs)