

FUTURE OF DESIGN

19.09.2018

Image:
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ORGANISING COMMITTEE

VICTOR ALVADO BENITEZ | AECOM

XAVIER ECHEGARAY JAILE | RAMBOLL

REBECCA FATHERS | JACOBS

JOAO SERRA | RAMBOLL

KEYNOTE SPEAKERS

HÉCTOR BEADE-PEREDA | KNIGHT ARCHITECTS

SIMON BOURNE | CONSULTANT

MARK BOYLE | ROBERT BIRD GROUP

CHRIS CHURCHMAN | CHURCHMAN LANDSCAPE ARCHITECTS

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GUEST PANELLISTS

KATE YOUNG | TEAM2100

GAVIN WHITE | RAMBOLL UK

COMPETITION JUDGES

HÉCTOR BEADE-PEREDA | KNIGHT ARCHITECTS

SIMON BOURNE | CONSULTANT

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WELCOME

On behalf of the International Association for Bridge and Structural Engineering (IABSE) British Group and the organising committee, we would like to welcome you to the Future of Design London 2018 conference.

The Future of Design conference is a highlight of the IABSE British Group calendar, and the premiere conference for young design professionals and students to engage with leading lights in the engineering profession. Throughout the day conference at Imperial College, keynote presentations will allow inspiring individuals to pass on their experience and advice, and you will be offered a unique platform to engage with influential individuals through a discussion panel. There will be ample opportunity to expand your professional network throughout the day and at the evening reception to be held at the Millennium Gloucester Hotel.

Throughout history, engineering has enabled and fuelled the development of societies across the globe. The work of engineers, architects and many others within the construction industry has shaped the world of today and will continue to shape our societies in the future. The designs of the future are an opportunity to showcase the ingenuity and transformational power of engineering. That opportunity is open to the delegates of today's conference. The speakers here today will provide their experience on design challenges they have faced, how they overcame them, and their insight into the design challenges that we may face in the future.

We have also given the opportunity for young designers (aged 35 and under) to showcase their talent. Five teams of designers submitted proposals for a landmark structure to mark the 2022 Commonwealth Games in Birmingham. These submissions are available to view. A further 11 individuals submitted one-page papers of their innovative work or research. Six have been shortlisted and will be presenting at today's conference. Prizes for both competitions will be awarded at the end of the conference. Delegates can also vote for their 'audience favourites'.

We hope that you find Future of Design London 2018 an inspiring event and enjoy the day.

Organising Committee, IABSE Future of Design London 2018



Image: Antonio Violi

KEYNOTE SPEAKERS

HÉCTOR BEADE-PEREDA | KNIGHT ARCHITECTS



Héctor Beade-Pereda is a bridge designer and associate at Knight Architects. During his almost 20-year long career, he has had the opportunity to be directly and meaningfully involved in every stage of the bridge project lifecycle, from conception to construction completion. Thanks to such extensive expertise, combined with his commitment to beauty and excellence, interest in geometry, care for detail, and his academic background in structural engineering, he has been responsible for the conception of numerous bridges that meet all the project requirements whilst simultaneously adopting an aesthetically and structurally holistic approach to design. Most of these projects, which range from small footbridges to world-record HSR viaducts, are innovative solutions and award-winning designs.

Bridges will be crossed by countless people during their centennial lives. Their experience will be determined by the quality of the designer's work. For this reason, it's Héctor's belief that every bridge should be designed with sensitivity, professionality, and honesty. Héctor was awarded the IABSE Prize 2016 in recognition of his approach to bridge design.

SIMON BOURNE | BRIDGE CONSULTANT



Simon worked for Benaim for 30 years, specialising in the design of major bridges for contractors. He sold Benaim in 2011 and now operates as an independent consultant.

He is a recognised leader in the industry for the design of major bridges and has written many papers on bridge design and construction. He won the IABSE Milne Medal in 2012 - summarised by a paper in *The Structural Engineer* in 2013 (*Prestressing - Recovery of the Lost Art*). He was also the author of 12 articles on *Concrete Bridge Design and Construction* that were published in *The Structural Engineer* in 2014. Simon has also written two recent CBDG Technical Guides - *Best Construction Methods for Concrete Bridge Decks* and *Bridge Replacement Guide*.

He has a particular interest in buildability and speed of construction, and how to add value to schemes. He has expertise in the design of major marine bridges, urban viaducts and major bridges around railways. He has designed many award-winning bridges, which have been recognised for their elegance, ecenomy and innovation, including the Clackmannanshire Bridge across the Firth of Forth.

MARK BOYLE | ROBERT BIRD GROUP



Mark is a widely experienced structural engineer with a background in construction and a particular interest in design-led engineering and digital design. Relishing a variety of engineering challenges, he continues to design projects of vastly differing type and scope. These include mixed use developments, sports and leisure projects, historic structures, transport facilities, educational establishments, and residential projects.

In the course of his career, Mark has developed expertise in a number of specialist areas such as non-conventional reinforced concrete, lightweight steel and long span structures including stadiums and oversite station developments, deep basements, volumetric and modular construction. He is a valuable contributor to the development of difficult urban sites.

Mark has a passion for digital design and sees the application of technology to both help the creative process and facilitate the delivery and assurance of projects as a long overdue in the construction industry and ultimately something which will transform and modernise the industry.

CHRIS CHURCHMAN | CHURCHMAN LANDSCAPE ARCHITECTS



Chris is the Founding Director of Churchman Landscape Architects and a Fellow of the Landscape Institute. Before establishing his own consultancy he ran the landscape group within HLM Architects for 10 years, becoming a main board Director of this multidisciplinary company at the age of 33. This background of collaboration with architects and engineers helped to shape Chris' approach to his work. His company has developed a strong focus around environmental issues, many of the company's projects containing areas of research and experimentation.

Chris' best known scheme is the National Maritime Museum in Greenwich but more recent projects and current commissions are likely to raise the company's profile, including South Park, Elephant and Castle, one of the HS2 stations and Birmingham University's Green Heart. This last project has provided Chris with a vehicle to pursue an interest in the use of Green Infrastructure to tackle poor air quality. Working with academics, he has been assessing the facts, myths and misunderstandings concerning the ability of trees to absorb pollutants.

KEYNOTE SPEAKERS

CATO DØRUM | NORWEGIAN PUBLIC ROADS ADMINISTRATION



Cato Dørum is Senior Principal Engineer at the Norwegian Public Roads Administration, and holds a PhD degree in Structural Engineering from The Norwegian University of Science and Technology (NTNU) in Trondheim, Norway. Cato has almost 20 years of experience in structural design and analysis from both the research section as well as the industry. He has been working with the development of methodologies for testing, modelling and numerical simulation of steel and aluminium structures subjected to accidental loads.

Since 2016, Cato has worked for the Norwegian Public Roads Administration on the extreme bridges for the Fjord Crossings on the Coastal Highway Route E38 Project. Cato is also an Adjunct Professor at CASA (Centre for Advanced Structural Analysis, NTNU) since 2016, a research centre for multi-scale testing, modelling and simulation of materials and structures for industrial applications.

KATE HALL | HS2 Ltd.



Kate is the Design Director at High Speed Two Limited (HS2), leading the expert teams responsible for the specification, assurance and provision of expert design guidance across the portfolio of Design, Architecture and Civil Engineering to deliver the high-speed railway. Kate's portfolio also includes leadership of the Design team and Independent Design Panels, custodian of design quality, leading the design vision and creating and embedding a vibrant design culture.

Previously she was Director and Infrastructure Executive at Arup. Her background in civil engineering includes 24 years' experience of both large infrastructure and international projects in Hong Kong, Australia, New York, Ireland and the UK, including 5 years in Hong Kong on design and site supervision for Hong Kong International Station. She also led Arup's 400-strong Olympic Park Infrastructure Design Team for the London 2012 Olympic Park and was the infrastructure Practice Leader for the Midlands, responsible for over 200 engineers based in Solihull and Nottingham offices.

Kate has also worked to drive initiatives on diversity, gender balance and inclusion in engineering. In 2010 she was awarded "Professional of the Year" by Women in Construction. Kate has an Honours degree in Civil and Structural Engineering and is a Fellow of both the Institution of Civil Engineers and the Charered Institution of Highways & Transportation.

STUART MARSH | SOM



Stuart Marsh helps lead the SOM London Structural Engineering team to develop and deliver structural designs and documentation for a wide variety of commercial and residential projects. This involves, amongst other things, overseeing and conducting architectural and services coordination to ensure complete integration of the structural design concepts within project requirements.

Stuart's diverse project history includes a range of commercial, residential and academic developments, and cultural and artistic installations throughout the United Kingdom, Europe, Australia and South-East Asia.

MICHAEL THOROGOOD | EADON CONSULTING



Michael Thorogood is a Chartered Mechanical Engineer and a Fellow of the Institute of Mechanical Engineers. He is a founding member of, and Director at Eadon Consulting. With almost 20 years' experience in the moving bridge and bespoke moving structure sectors Michael has worked on prestigious and award-winning projects throughout the UK and abroad.

Michael's particular area of expertise is in moving structures including bridges, buildings and bespoke construction equipment. He has extensive experience in the design of the mechanical, electrical and hydraulic operating equipment and systems for all sizes and virtually all types of moving bridge.

He has worked on projects on behalf of clients, contractors, consultants and fabricators through all stages from initial design competitions and concept design to delivery, commissioning, and handover. The majority of his projects involve close collaboration with architects and other engineers.

His current work includes projects in the UK, Bermuda and Copenhagen.

PROGRAMME

08:30 - 09:00	Registration
SESSION 1	
09:00 - 09:05	Opening Address
09:05 - 09:35	Collaboration in Construction
09:35 - 10:15	The Route to Good Bridge Design
10:15 - 10:25	Q&A
10:25 - 10:40	Coffee Break
SESSION 2	
10:40 - 11:10	Modular, the future of design: Is the future of design volumetric?
11:10 - 11:40	Bridge Research and Extreme Fjord Crossings
11:40 - 12:10	What 90's rapper Vanilla Ice can remind Engineers and Architects
12:10 - 12:20	Q&A
12:20 - 12:30	IABSE British Group Announcements
12:30 - 13:30	Lunch
SESSION 3	
13:30 - 13:40	Paper Competition Presentation 1
13:40 - 13:50	Paper Competition Presentation 2
13:50 - 14:00	Paper Competition Presentation 3
14:00 - 14:10	Paper Competition Presentation 4
14:10 - 14:20	Paper Competition Presentation 5
14:20 - 14:30	Paper Competition Presentation 6
14:30 - 14:45	Q&A and Audience Vote
SESSION 4	
14:45 - 15:45	Discussion Panel ***Innovation in Construction: Why is the construction industry so behind the curve and how can we move forwards?***
15:45 - 16:05	Coffee Break
SESSION 5	
16:05 - 16:35	Today's Norm is Yesterday's Experiment
16:35 - 17:05	TBC
17:05 - 17:35	Bridges for Structural Engineers
17:35 - 17:45	Q&A
17:45 - 18:00	Closing Address and Awards
19:00 - 19:45	Drinks Reception
19:45 - 23:00	Evening Dinner

CHAIRED BY IAN FIRTH

IAN FIRTH | IABSE BRITISH GROUP

STUART MARSH | SOM

HÉCTOR BEADE-PEREDA | KNIGHT ARCHITECTS

CHAIRED BY DAVID KNIGHT

MARK BOYLE | ROBERT BIRD GROUP

CATO DØRUM | NORWEGIAN PUBLIC ROADS ADMINISTRATION

MICHAEL THOROGOOD | EADON CONSULTING

DAVID KNIGHT / KIRSTIN WALLING

CHAIRED BY ED DABLIN

YOUNG DESIGNER 1

YOUNG DESIGNER 2

YOUNG DESIGNER 3

YOUNG DESIGNER 4

YOUNG DESIGNER 5

YOUNG DESIGNER 6

CHAIRED BY ANTONY OLIVER

MARK BOYLE | ROBERT BIRD GROUP

KATE YOUNG | TEAM2100

GAVIN WHITE | RAMBOLL

KATE HALL | HS2 Ltd.

CHAIRED BY ANGUS LOW

CHRIS CHURCHMAN | CHURCHMAN LANDSCAPE ARCHITECTS

KATE HALL | HS2 Ltd.

SIMON BOURNE | BRIDGE CONSULTANT

MILLENNIUM GLOUCESTER HOTEL

DISCUSSION PANEL

Alongside keynote speakers Mark Boyle and Kate Hall, we are joined by the following guest panellists:

GAVIN WHITE | RAMBOLL UK



Gavin leads the timber engineering team within Ramboll UK and has written papers and presented internationally on the subject. He has worked on over 50 timber buildings ranging from Churches and museums, to schools and conference centres.

He is a driven engineer with a keen eye for detail. He relishes problem solving and the opportunity to develop innovative engineering solutions and has been integral in the development of offsite construction techniques at Ramboll, such as Offsite Ready Reviews. He has a proven ability to deliver large projects to the agreed timescales as evident in Dalston Works, the largest Cross Laminated Timber (CLT) project globally, using more timber than any other scheme in the world by volume.

Gavin's keen interest in sustainability and his approach to R&D and collaboration has resulted in pioneering industry research. Partnering with University of Cambridge, Bath University, Imperial College London and TRADA on various research projects, Ramboll has been able to drive this sustainable construction material into the mainstream.

KATE YOUNG | TEAM2100 / JACOBS



For over 10 years Kate has held joint, complementary roles in technology leadership and asset management. Her technical experience encompasses both strategic and operational asset management as well as key support areas such as risk management and sustainability, while her technology leadership has allowed her to work with academic and industry partners to integrate learnings and help push the industry forwards through groups such as the cross-sector Infrastructure Industry Innovation Platform (i3P) Development Leadership Group.

Most recently she has brought these two roles together within the £300m, 10 year TEAM2100 Programme as both Innovation Lead and Asset Management Technical Manager for the Major Barriers. Kate is a Chartered Mechanical Engineer and holds a DPhil from the University of Oxford, with research focusing on the area of cross-sector, long-term decision making for infrastructure projects, particularly focusing on active, flexible approaches to planning, such as Real Option Analysis and pathways methods

DISCUSSION PANEL

To chair the discussion panel, we are delighted to welcome

ANTONY OLIVER | DISCUSSION PANEL CHAIR



Antony works with a range of clients across the infrastructure sector to boost communication and marketing strategies and to stimulate discussion and action in the industry. He spent the last two decades working as a journalist and editor with New Civil Engineer magazine, and most recently was creator of the website Infrastructure Intelligence. He is a chartered civil engineer and Fellow of the Institution of Civil Engineers and started his career with Owen Williams and Partners and Balfour Beatty. He is a member of the Construction Leadership Council's communications and strategy groups, assists the Green Construction Board's Infrastructure Working Group and is a Trustee of the Built Environment Trust.

ORGANISING COMMITTEE

VICTOR ALVADO BENITEZ | AECOM



Victor is a Chartered Engineer with the Spanish Institution of Civil Engineers (CICCP), a member of the Spanish Structural Concrete Technical and Scientific Association (ACHE), a graduate member of IStructE and has over four years of professional experience in the AEC Industry. He holds MEng and MSc degrees in civil and structural engineering from Cantabria University and Madrid Polytechnic University. Victor has worked on a broad range of projects, from arch bridges constructed by means of cable-stayed cantilevers, to buried structures. Currently he is working as a structural engineer in the Bridges & Structures team at AECOM on the Thames Tideway project.

XAVIER ECHEGARAY JAILE | RAMBOLL



Xavier is a Chartered Engineer with the Spanish Institution of Civil Engineers (CICCP) and has over 4 years of professional experience in the AEC Industry. He graduated with an MEng (Hons) in Civil and Structural Engineering from UPC Barcelona Tech. A self-driven and capable consultant, Xavier has worked as both Technical Lead and Project Manager on remarkably complex projects that range from cable-stayed architectural footbridges to prestressed concrete and composite viaducts.

Xavier is especially proud of having led a Ramboll partnership with the award-winning charity Bridges to Prosperity. After securing funds for the project, Xavier travelled to Uganda to direct a team of highly-motivated Ramboll volunteers in delivering the first sponsored suspended footbridge in the country. This was a unique opportunity to give back to society by connecting the last rural mile.

ORGANISING COMMITTEE

REBECCA FATHERS | JACOBS



Rebecca graduated with an MEng in Engineering Science from the University of Oxford in 2014, having completed a thesis on origami structures for use in high-performance impact applications.

For the past 4 years she has worked in the Bridges team in Swindon for CH2M (now Jacobs). She has gained a wide range of experience including working on steel footbridges, composite highway bridges and a range of complex structures including a self-anchored suspension bridge and long-span cable stayed bridge. This work ranged from inspection and assessment, to options studies, detailed design and independent checks. In 2016, she also undertook the role of NEC Supervisor for construction of a new composite overbridge crossing the M32 motorway.

As well as proven technical capability, Rebecca is also a serial volunteer, involved with EDI and professional networks at CH2M as well as being a STEM ambassador.

JOAO SERRA | RAMBOLL



Joao studied in Tecnico Lisboa, where he concluded with distinction his MSc in Bridge Engineering in 2014. As astudent he joined several international mobility programmes, namely the IAESTE (Macao, 2012), Athens (Delft, 2013) and Brasil (Brazil, 2013). Besides school, Joao is a travel lover and played roller hockey for 13 years, having been national champion for 3 times.

After graduation, Joao worked in LCW Consult, one of the leading bridge consultancies in Portugal and winner of the Innovation in Bridges Award in 2015 by Bentley. In 2016, he decided to embrace a new project and joined Ramboll as part of the Major Crossings team.

Joao developed a high level of technical knowledge in the fields of concrete and steel structures, seismic analysis and structural dynamics of bridges under high-speed trains.

In 2017 he received two 5000€ SECIL Universities Awards. The awarded academic works refer to the initial design of an extradosed bridge and to the development of beam models to perform dynamic analyses of bridge girders considering cross-sectional warping.

PAPER COMPETITION

The Young Designers' paper competition is always a highlight of the Future of Design conference. We asked young designers' (under 35) to submit a one-page paper on any topic to showcase their innovative work or research. The 6 entries shortlisted based on these papers will give 10-minute presentations at today's conference, on which final judging will be based.

Eleven designers submitted a paper this year:
SUJITH MANGALATHU | UNIVERSITY OF CALIFORNIA
JOHANNES SCHORR | UNIVERSITY OF STUTTGART
LAURA BELLAMY | IMPERIAL COLLEGE
GRZEGORZ KOPEC | TONY GEE AND PARTNERS LLP
CHRIS SELF | BURO HAPPOLD
ZEINA AL-NABULSI | UNIVERSITY OF WARWICK
CHARLIE CORNISH | EXPEDITION ENGINEERING
BOB BROWNE | JACOBS
PAUL JEFFRIES | RAMBOLL
WILLIAM GEORGE | JACOBS
EDDIE KEEGAN | JACOBS

Many thanks to the following people who volunteered their time to shortlist and judge this year's competition:
SIMON BOURNE | CONSULTANT
ANGUS LOW | ARUP
STUART MARSH | SOM

TEAM DESIGN COMPETITION

We challenged teams of up to 4 young designers to propose a landmark structure for the 2022 Birmingham Commonwealth Games, inspired by the success of the ArcelorMittal orbit in the London 2012 Queen Elizabeth Olympic Park. The brief stated that the structure should reflect the heritage of both Birmingham and the Commonwealth Games, and be a permanent structure with legacy beyond the games. The site for the structure is Victoria Square in Birmingham city centre.

Submissions in the form of A2 presentation boards were judged based on the following criteria:
- Structural feasibility
- Innovation
- Suitability to site
- Adherence to design brief
- Consideration of buildability and ongoing maintenance
- Financial sustainability

The entries are available to view in the registration area. Please take a look and vote for your favourite. The following teams took part:
CHRIS BALL, NIKOS ZARKADOULAS | TONY GEE AND PARTNERS LLP
BOB BROWNE, WILLIAM GEORGE, TOM HUGHES, EDDIE KEEGAN | JACOBS
THOMAS HESSLENBERG, STEPHEN KING | ELLIOTT WOOD
STUART NASH | ARUP
REBEKAH CHEAH, KIERON CUNNINGHAM, RAMSHA SALEEM, TARA SANDIFORD | TONY GEE AND PARTNERS LLP

Many thanks to the following people who volunteered their time to judge this year's competition:
HÉCTOR BEADE-PEREDA | KNIGHT ARCHITECTS
NEIL KITCHING | JACOBS
DAVID KNIGHT | CAKE INDUSTRIES

IABSE BRITISH GROUP

The International Association for Bridge and Structural Engineering (IABSE) is a scientific and technical Association comprising members in 100 countries and counting 51 National Groups worldwide. Founded in 1929 it has its seat in Zurich, Switzerland. The President of IABSE (2016-2019) is Fernando Branco, Portugal.

IABSE deals with all aspects of structural engineering: the science and art of planning, design, construction, operation, monitoring and inspection, maintenance, rehabilitation and preservation, demolition and dismantling of structures, taking into consideration technical, economic, environmental, aesthetic and social aspects. The term 'Structures' includes bridges, buildings and all types of civil engineering structures, composed of any structural material. The aim of the Association is to exchange knowledge and to advance the practice of structural engineering worldwide in the service of the profession and society.

The Association operates locally through individual National Groups. The British Group, founded in 1930, organises meetings, lectures and site visits, as well as conferences such as Future of Design.

GET INVOLVED

The Future of Design conference has been running in its current format since 2012, as an annunal conference in London until 2015, and binannually since, with one conference held in London and one elsewhere. Spring 2019 will see Future of Design go to Birmingham. Each conference is organised by a group of young engineers on a voluntary basis. The speakers, sponsors and everyone else involved in the conference also contribute voluntarily. This is what makes the event so special - a room full of people with a passion for their profession and a wide range of experience come together to share ideas and form relationships, all to inspire our delegates, the 'Future of Design'.

Organising the conference is not only a fantastic career development opprunity, it also allows you to expand your network and make friends from across the industry. It's great exposure, but also a lot of hard work. If you think you might be up to the challenge, please get in touch with Ed Dablin (ed.dablin@dyse.com) or Elina Efthymiou (Eleftheria-Anthi.Efthymiou@city.ac.uk).



Image: Miguel Daza

THANKS TO

This event would not have been possible without the support of our sponsors:

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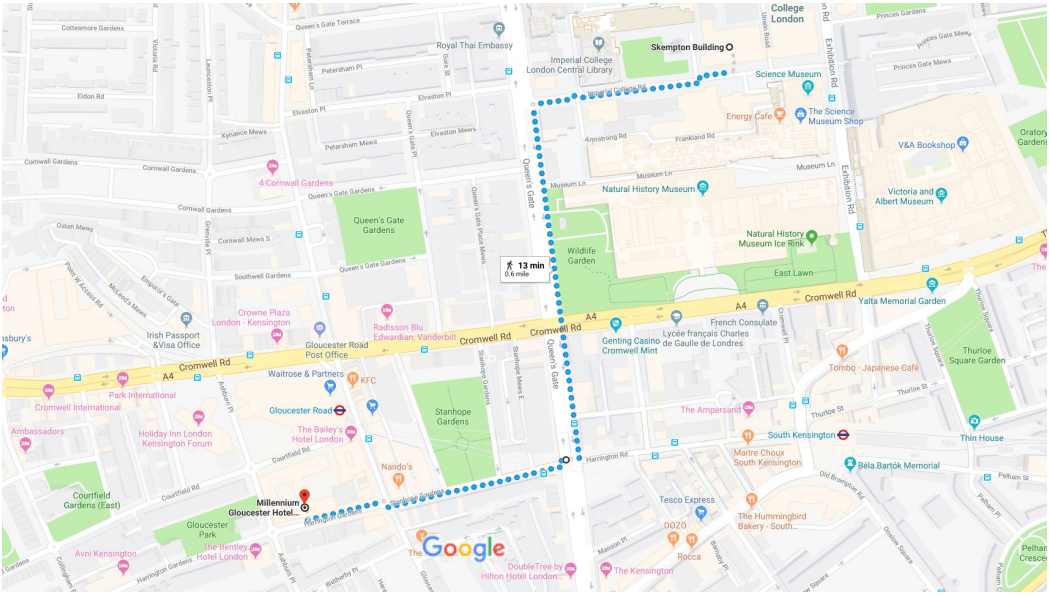
COWI

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Thanks must also go to Imperial College London and the Millennium Gloucester Hotel for their hospitality, the organising committee for their commitment, and the IABSE British Group executive committee for their guidance and support.

EVENING DINNER

The evening dinner will be held at the Millennium Gloucester Hotel..





Welcome to the Future of Design - the British Group of IABSE's flagship event for young people. This is now the eleventh time we have held the event in the current format, and we are excited about what we have on offer this time around. I hope that, like those who have been previously, you will find the day to be a source of inspiration, opening your mind to some of the amazing stuff going on in our world of design and construction, as well as to some of the essential research that underpins so much of what we do. But it is also a day for meeting other like-minded enthusiasts, sharing knowledge and ideas, and learning from one another about exciting projects and opportunities around the world.

IABSE is, of course, an international association, and in these days of global collaboration and international team worrking, it is the essential organisation to be part of for tomorrow's designers. So join up, engage with what we do, and use your brilliant engineering and design skills to help us collectively make the world a better place.

Ian Firth
Chairman, British Group of IABSE

Image: Knight Architects & Arup