IZMIT BAY BRIDGE: THE WORLD’S FOURTH LONGEST SUSPENSION BRIDGE DESIGNED BY COWI

COWI’s world leading bridge specialists provide state-of-the-art bridge solutions. We have profound experience with all phases of large-scale and complex infrastructure projects, from initial planning, design and construction to operation and maintenance, and we offer a ‘one-stop-shop’ service.

We are proud to be the bridge engineer for Izmit Bay Bridge in Turkey.

Read more at cowi.com
WORDS OF WELCOME

It is with great pleasure that we welcome you to the 19th Congress of IABSE at the City Conference Centre (CCC) in Stockholm, September 21–23, 2016. The theme of the congress is “Challenges in Design and Construction of an Innovative and Sustainable Built Environment”. On the following pages you will find the programme with all sessions and a list of more than 350 papers to be presented and discussed.

The Congress aims to inspire structural engineers and infrastructure managers to help forming and maintaining an innovative and sustainable built environment. The enormous impact and long-time effect of the built environment motivates us to catch the opportunities that we have in front of us and helps us ensure the best decisions by politicians and other decision makers.

The Congress format is chosen to facilitate debates and discussions. Each session will be actively lead and animated by Session Facilitators. Participants will explicitly have the possibility to mutually interact productively via session styles that will encourage interaction.

Valuable results identifying new subjects for further research and debates will be identified by the Session Facilitators and the Scientific Committee for further consideration by IABSE’s Technical Committee. New collaborations may be suggested to bring identified subjects forward in the coming years. It is hoped that active congress participants will return home enriched by substantial more knowledge and as part of a global network of experts in structural engineering.

We give special thanks to the Members of the Organising and Scientific Committees, who have made significant efforts to improve the scientific and technical content of the congress and who have guaranteed its scientific quality.

Mats Karlsson  
Chair, Organising Committee

Lennart Elfgren  
Chair, Scientific Committee

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We would like to thank our sponsors of the 19th IABSE Congress Stockholm

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ABOUT IABSE

IABSE is a fellowship of structural engineers operating on a worldwide basis, with interests in all types of structures, in all materials.

It acts to improve our knowledge and understanding of the performance of structures. Its members represent structural engineers of all ages, employed in design, academia, construction, regulation and renewal. Many IABSE members occupy senior roles based on a history of personal achievement.

The mission of IABSE is to exchange knowledge and to advance the practice of structural engineering worldwide in the service of the profession and society.

IABSE’s objectives are:

• to promote cooperation and understanding among all those concerned with structural engineering and related fields by a worldwide exchange of knowledge and experience

• to encourage awareness and responsibility of structural engineers towards the needs of society

• to encourage actions necessary for progress in structural engineering

• to improve and foster cooperation and understanding between organisations having similar objectives.

To fulfil its mission, IABSE organises conferences, publishes a high quality journal, Structural Engineering International (SEI), publishes books reflecting the work of its Technical Groups, creates Working Groups as required by new needs and technological progress, offers activities within the National Groups of IABSE, supports engineers at the beginning of their careers with a Young Engineers programme, and presents annual Awards in recognition of outstanding contributions in the field of structural engineering.

IABSE

c/o ETH Zurich
Hoenggerberg HIL E 21.3
8093 Zurich
SWITZERLAND

Phone: +41-44-633 2647
Fax: +41-44-633 1241
E-mail: secretariat@iabse.org
COMMITTEES

Organising Committee
Mats Karlsson, Trafikverket (Chair)
Lahja Rydberg-Forsbeck, Trafikverket (Secretary)
Magnus Alfredsson, NCC
Ronny Andersson, Cementa
Peter Collin, Ramböll
Thomas Darholm, COWI
Mats Emborg, Luleå Tech. University
Sara Haasmark, Samhällsbyggnarna
Mikael Hallgren, Tyréns
Hans Hedlund, SKANSKA
Olof Johansson, Samhällsbyggnarna
Martin Laninge, ATKINS
Oskar Larsson, Lund Tech. University
Marie Siedberg Hjärne, CBI
Peter Utgenannt, CBI

Scientific Committee
Lennart Elfgren, Sweden (Chair)
Johan Jonsson, Sweden (Secretary)
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Andreas Andersson, Sweden
Mustafa Aygül, Sweden
Ane de Boer, Netherlands
Annette Bögle, Germany
Mikael W. Braestrup, Denmark
Eugen Brühwiler, Switzerland
Alp Caner, Turkey
Joan R. Casas, Spain
Christian Cremona, France
Jose Antonio Crespo-Martinez, Spain
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Robert Hallmark, Sweden
Chris Hendy, United Kingdom
Stephen Hicks, New Zealand
Daniel Honfi, Sweden
Dongzhou Huang, USA
Jens Jacob Jensen, Norway
Vesa Järvinen, Finland
Niels J. Gimsing, Denmark
Anna Kadefors, Sweden
Mats Karlsson, Sweden
Raid Karoumi, Sweden
Martin Kirk, United Kingdom
Steve Kite, Hong Kong
Andreas Lampropoulos, United Kingdom
Tobias Larsson, Sweden
Oskar Larsson, Sweden
David MacKenzie, United Kingdom
Jonas Magnusson, Sweden
Jose Romo Martin, Spain
Andrew Martin, Denmark
Johan Mäljaars, Netherlands
Kristina Mjörnell, Sweden
Tomonori Nagayama, Japan
Balthasar Novak, Denmark
Alan O’Connor, Ireland
Thomas Oflofsson, Sweden
Erik Olsson, Sweden
Tor Ole Olsen, Norway
Costin Pacoste, Sweden
Fabrizio Palmisano, Italy
Rasmus Rempling, Sweden
Nils Erik Anders Rönquist, Norway
Mike Schlaich, Germany
Peter Simonsson, Sweden
Thomas Spuler, Switzerland
Marja-Kaarina Söderqvist, Finland
Anders Spåls, Sweden
Håkan Sundquist, Sweden
Per-Ola Svahn, Sweden
Sven Tehlerdrosson, Sweden
Ana Maria Ruiz Teran, United Kingdom
Joseph Tortorella, USA
Rob Vergoossen, Netherlands
Robert Ratay, USA
GENERAL INFORMATION

Venue
City Conference Centre
Folkets Hus
Barnhusgatan 12 - 14
111 23 Stockholm

IABSE Desk opening hours
Monday September 19 07:30 - 18:00
Tuesday September 20 07:30 - 18:00
Wednesday September 21 08:00 - 18:00
Thursday September 22 08:00 - 18:00
Friday September 23 08:00 - 17:00

Registration desk opening hours
Tuesday September 20 16:00 - 18:00
Wednesday September 21 07:00 - 20:00
Thursday September 22 07:30 - 18:00
Friday September 23 08:00 - 16:00

Exhibition opening hours
Wednesday September 21 08:30 - 20:00
Thursday September 22 08:30 - 17:00
Friday September 23 08:30 - 17:00
Catering
Refreshments will be provided in the exhibition area during official catering breaks. Lunch will be served in Restaurant Cabaret, please follow the signs.

Certificate of attendance
Certificate of attendance will be sent to you by email after the congress.

Congress report
All delegates will receive a USB-stick with all congress papers, together with their name badge, upon arrival at the congress. Congress report will also be available on the official website of IABSE after the congress www.iabse.org.

Congress secretariat
MCI Nordics I Stockholm Office
Attn: IABSE 2016
P.O. Box 6911
102 39 Stockholm
Sweden
T: +46 8 5465 1500
E: confirmation@mci-group.com

Delegate badge
Admission to the IABSE Congress is by badge only. Carrying the badge is mandatory for all participants. No one will be allowed admission to sessions, exhibition area or social events without a badge.

Host
The 19th Congress of IABSE will be hosted by the Swedish Group of IABSE in cooperation with the Swedish Transport Administration and The Swedish Professionals for the Built Environment.

Internet
Complimentary Wi-Fi is provided at the venue for all delegates attending the congress.
Username: CCC Guest HIGH SPEED
Password: 20162016

Mobile phones
As a courtesy to all presenters and attendees, please turn off the signal on your mobile phone while attending sessions.

Mobile app
Get all the information you need at your fingertips with the IABSE 2016 Mobile Application. It is available for free on Apple store and Google Play.

Mobile app contains, among other things, abstract papers, biographies of keynote speakers, more information about sponsors and exhibitors as well a list of participants.

Official congress language
The official language of the congress is English. No simultaneous translation will be provided.

Social media
All participants are encouraged to join the online conversation to get the most out of the congress.
@IABSEHQ  @IABSE
The official hashtag is #IABSE

Stockholm
We are delighted to welcome you to Stockholm, the beautiful capital of Sweden! The city is built on 14 islands connected by 57 bridges. The beautiful preserved buildings of the Old Town, the greenery, the fresh air and the proximity to water are distinctive traits of this city. The Royal National City Park – the first National City Park in the world – is a green space that offers a welcome escape from the rush of the capital.

With its 750-year history and rich cultural life, Stockholm offers a wide selection of world-class museums and attractions. Most of the city’s attractions can be reached on foot, but public transportation is smooth and efficient.

SL - Stockholm Public Transport, www.sl.se
Stockholm’s extensive public transportation system makes the city and its surroundings particularly accessible. SL is responsible for buses, underground trains, commuter trains, trams and certain ferry lines within Stockholm County. You can buy tickets and passes at SL counters, ticket machines at metro stations, and Pressbyra kiosks. Tickets cannot be bought on buses. Refillable SL travel cards can be loaded with single-trip or unlimited-travel credit.

Taxi
Stockholm’s biggest taxi companies are Taxi Stockholm, www.taxistockholm.se, Taxi Kurir, www.taxikurir.se and Taxi 020, www.taxi020.se. All licensed taxis are required to have big yellow unit price tags on their rear door windows and on the dash board. We would recommend that you use one of the three taxi companies mentioned above. If you take a taxi from the airport we recommend that you agree on a fixed price before you start your trip.

We would recommend that you use one of the three taxi companies mentioned above. If you take a taxi from the airport we recommend that you agree on a fixed price before you start your trip.
Social events
The Welcome Reception will be held in exhibition area at the congress venue on Wednesday, September 21 at 18:30.

The Gala Dinner will take place at the Grand Ballroom at Berns on Thursday, September 22 at 19:30. Please make sure you bring your purchased ticket to gain access.

The Stockholm City walking tour, included for accompanying persons will start outside the congress venue on Wednesday, September 21 at 14:00. The tour will include a walk in the old town and city centre and will finish at 17:00 at the congress venue.

Technical tours
Thursday, September 22
Introduction session is open for all congress delegates, whilst the tour is only for those who have purchased a ticket in advance.

Citybanan - Stockholm Railway Bypass
10:30 – Introduction session, congress venue
13:30 – Coach departs from outside congress venue
16:30 – Tour ends (participants make their own way back)

Citybanan, a 6 kilometer long commuter train tunnel under central Stockholm, with two new stations, Stockholm City and Stockholm Odenplan. One part of the tunnel is designed and build as a submerged tunnel, Söderströmstunneln. This is a 400 meter long railway tunnel underneath the stream, Söderström. Work with the tunnel is in its final stages and therefore, an almost finished plant will be presented during the visit in September. After the completion of the tunnel, the existing railway link through the central part of Stockholm will be rebuilt and upgraded for a prolonged lifetime as well as to handle long-distance traffic only. This rebuilding takes place in a historically sensitive surrounding.

Slussen
10:30 – Introduction session, congress venue
13:30 – Coach departs from outside congress venue
17:00 – Tour ends and coach drops of at congress venue

Slussen, located between the Old town and Södermalm, is one of the most important historical junctions in Stockholm’s traffic system but after 80 years the existing structure is in a very poor condition. The structures including the foundation needs to be replaced and the area will be adapted to face the future demands from the citizens of Stockholm. The project involves demolishing the existing plant and, on the same spot, build a new interchange including a new sluice.

Haga City and Karolinska University Hospital
10:30 – Introduction session (Haga City and Karolinska University Hospital), congress venue
13:30 – Coach departs from outside congress venue to the Karolinska University Hospital, Haga City will not be visited
17:00 – Tour ends and coach drops of at congress venue

Hagastaden is one of Stockholm’s largest and most important urban development projects. By 2025, the area of Norra Station between the city of Stockholm and Solna, will be built and developed into an entirely new neighborhood with a mixture of apartments, workplaces, cultural attractions, green are-
The dense city structure provides access to good transport links and proximity to downtown Stockholm. Parts of Hagastaden are being built on top of existing roads. By placing segments of the European highway E4/E20 and the Värtabanan railway in tunnels, the landscape can be developed and thus transformed into a vibrant area that will serve as home and workplace to thousands of people.

New Karolinska Solna (NKS) is the project name for the state-of-the-art hospital under construction at the Karolinska University Hospital in Solna. Highly specialized healthcare will be provided alongside research and training of the very highest quality. The finished hospital will be one of the first university hospitals in the world to be certified according to the Leadership in Energy and Environmental Design (LEED) requirements of the U.S. Green Building Council. New Karolinska Solna will bring Sweden and Stockholm not only a new cutting-edge university hospital and landmark but also a unique environment for world-class medical research. The new Karolinska Hospital will welcome their first patients in 2016. The first homes will be ready to move in to, in 2017.

Industrial sessions
Revealing the Future of Bridge Design and Engineering
Friday, September 23, 2016: 10:30 - 12:00

Building Information Modeling (BIM) is now an important aspect of all types of infrastructure project, bridges included. As a result, the next generation of Bentley’s bridge modeling software is purpose-built to support the standards and processes demanded by the designers and contractors who create, construct, maintain, and document bridges of all sizes and complexity.

Technology should provide engineers with the ability to create a workflow that promotes true bridge information mobility. That allows all stakeholders and disciplines to evaluate and share critical data from the planning and bidding phase, all the way through to commissioning, operations and maintenance.

This workshop explores some of the challenges working in this complex sector presents. Followed by an overview of Bentley’s software solution for bridges, including the recently released Open-Bridge Modeler - your gateway to BIM for bridges, and the key to today’s design build projects, P3 and accelerated bridge construction.

This is where vision meets reality, so join Bentley’s bridge experts Barbara Day, P.E. and Jean-Pierre Chanard as they Reveal the Future of Bridge Design and Engineering. Discover how Bentley software can help you increase quality, improve safety, advance collaboration, test constructability, mitigate risk and deliver smarter assets.

Presenters: Barbara Day and Jean-Pierre Chanard
Getting the Most Out of Construction – Using BIM as a Collaboration and Innovation Enabler
Friday, September 23, 2016: 13:30 - 15:00

WSP has for long been monitoring the evolution of BIM and took an early decision to be a pioneer and a forerunner in its development and implementation within the industry. As a result of that strategy we have gained experience on a large scale of different types of projects and during all project stages. A significant lesson learned from all this project experience is that to get the most out of construction we need to have available, correct and complete information. To achieve that, the early involvement of all concerned disciplines in establishing common goals and the right level of detailing in the modeling are to be seen as success factors.

During this session will we will present several projects with its foundation within Bridge and Hydraulic engineering, all from small scale to large multi-disciplinary infrastructure projects.

Presenter: Stefan Wilck

WSP
OVERVIEW OF THEMES AND SESSIONS

A – Analysis (11)
Advances in numerical modelling
Bridge dynamics
Bridge Risk Management
Buckling and Vibration Design and Analysis in Complex Bridges and Structures
Design and analysis I
Design and analysis II
Fatigue Design
KBE - Knowledge Based Engineering
Robustness and Reliability
Structural Design
VDC - Virtual Design and Construction

C – Construction and Production (6)
Construction and production
Construction History
Contracts and procurement
Decision support
Product declaration and analysis
Value for money through innovation

F – Forensic (3)
Forensic Engineering I
Forensic Engineering II
Forensic Engineering III

L – Loads (5)
Climate and Resilience
Earthquake Resistant Structures
Seismic design
Trends in seismic analysis
Wind load

M – Materials (7)
Advanced Concrete
Advances in Concrete Structures
FRP / GFRP I
FRP / GFRP II
Innovations and New materials
New materials
Sustainable Steel Properties

R – Repair & Maintenance (9)
Advances in SHM and Maintenance Strategies
Assessment and Strengthening I
Assessment and Strengthening II
Assessment and Strengthening III
Evaluation of Concrete Structures
LCC
Retrofitting and repair
Sensors and Monitoring I
Sensors and Monitoring II

S – Structures (21)
Coastal Highway Route E39 I
Coastal Highway Route E39 II
Composite structures
Concrete structures I
Concrete structures II
Concrete structures III
Concrete structures IV
Innovations in Structural Engineering
Landmark bridges I
Landmark bridges II
Landmark bridges III
Landmark bridges IV
Landmark structures
Railway structures I
Railway structures II
Railway structures III
Suspension and cablestayed bridges
Sustainable Built Environment I
Sustainable Built Environment II
Tall buildings
Temporary Structures
# Programme Overview

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<th>Room/TIME</th>
<th>Congress Hall A</th>
<th>Congress Hall C</th>
<th>Room 201</th>
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<td>09:30-18:00</td>
<td>IABSE WORKING GROUP FORENSIC STRUCTURAL ENGINEERING</td>
<td>PRE-Congress Course</td>
<td>Forensic Structural Engineering: causes, investigations &amp; prevention of failures</td>
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<td>OPENING CEREMONY</td>
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<td>Lena Erixon, GD Swedish Transport Administration</td>
<td>David A. Nethercot, President of IABSE</td>
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<td>Technical Tour introduction: Citybanan - Stockholm Railway Bypass &amp; Slussen&lt;br&gt;Tech Tour introduction: Haga City and Karolinska University Hospital&lt;br&gt;C - Construction and Production: Value for Money through Innovation&lt;br&gt;C - Construction and Production: Construction History&lt;br&gt;S - Structures: Railway Structures II&lt;br&gt;F - Forensic: Forensic Engineering III</td>
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<td>R - Repair &amp; Maintenance: Assessment and Strengthening I&lt;br&gt;S - Structures: Concrete Structures IV&lt;br&gt;C - Construction and Production: Contracts &amp; Procurement&lt;br&gt;A - Analysis: Robustness and Reliability&lt;br&gt;A - Analysis: Bridge Dynamics&lt;br&gt;L - Loads: Earthquake Resistant Structures&lt;br&gt;Technical Tour external visits: 13:30-17:00</td>
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PLEASE NOTE THAT THIS PROGRAMME MAY BE SUBJECT TO CHANGE
KEYNOTES

Sustainable Asset Management – A View from Asia
Wednesday September 21, 09:00

Yozo Fujino, Japan
Emeritus Professor of the University of Tokyo and
Distinguished Professor of Yokohama National University
Contact: fujino@ynu.ac.jp

Yozo Fujino is a world-famous expert in bridge dynamics, wind effects of structures, passive/active control technology and monitoring of bridges, with a special focus on long-span bridges. He has been involved in many international bridge projects including Akashi Kaikyo Bridge, Japan; Millennium Bridge, UK (vibration control), and the Padoma Bridge, Bangladesh. He has received many awards, some recent ones are the Medal with Purple Ribbon from the Emperor of Japan, the Raymond C. Reese Research Prize; R.H. Scanlan Medal; the ASCE G. Winter Medal; the IABSE Outstanding Paper Award and IABSE Honorary Membership.

Yozo Fujino has been very active in research and international academic activities. He is a former Vice President of IABSE and he is the former President of ANCRiSST and EASEC. He is now the programme director of Infrastructure Maintenance, Renovation and Management of The Strategic Innovation Promotion Program, Council of Science, Technology and Innovation, Cabinet Office in Japan.

A Sustainable City is a City for People
Wednesday September 21, 09:30

Helle Soeholt, Denmark
Co-Founder and CEO, Gehl Architects Denmark
Contact: helle@gehlpeople.com

Helle is Founding Partner and CEO of Gehl. She started the company with Professor Jan Gehl in 2000. Through her leadership, strategic and organisational talent, the office has developed a knowledge base and experience portfolio that is respected internationally in the field of urban design and urban development. Over the years of its existence, Gehl has been awarded multiple prizes and recognitions for their contribution to making cities more livable and sustainable around the world.
Coastal Highway Route E39  
Thursday September 22, 08:30  
Børre Stensvold, Norway  
Norwegian Public Roads Administration  
Contact: borre.stensvold@vegvesen.no

Børre grew up in the arctic archipelago of Lofoten in the northern part of Norway, where the urgent need for bridges to improve public accessibility inspired him to pursue an M.Sc. degree in civil engineering. After graduating from the Norwegian University of Science and Technology in Trondheim in 1981, he worked in both a contractor and a consulting company before joining the Norwegian Public Roads Administration in 1984. Initially responsible for bridge management in the Oslo area, he was appointed Project Manager for a new national Bridge Management System in 1991. From 2003 he was Project Manager for an agency R&D programme for calculating the asset value and maintenance backlog of the Norwegian road network. In 2005 Børre was appointed Bridge Director in the Directorate of Public Roads. From September 2016 he will serve as temporary Project Manager for the E39 Coastal Highway Route.

Børre is a member of the Bridge Committee in the World Road Association (PIARC) and the Norwegian Society of Graduate Technical and Scientific Professionals. In 2012, he was appointed Adjunct Professor of the Research Institute of Highway, Ministry of Transportation, China.

Innovative Tunnelling in a Sustainable Built Environment  
Thursday September 22, 09:00  
Tomas Jesel, Switzerland  
Director Tunnelling Division, Amberg Engineering Ltd  
Contact: tjasel@amberg.ch

Thomas Jesel joined Amberg Engineering directly after his master degree in early 1999. He started as a design engineer in the tunneling department and was mainly involved in the design of the Gotthard base tunnel (GBT). He spent one year in Faido (GBT) as site supervisor and took over the responsibility for the detailed design for rock support and inner lining after returning to the Amberg’s main office.

In the following years he worked as project manager GBT and was a member of the JV board. Simultaneously he started a consulting job for transfer from the GBT to the smaller Ceneri base tunnel. Applying his expertise he started working in international projects of Amberg Engineering, predominantly in Sweden.

From 2011 onwards he was involved in the Förbifarten project as a responsible designer for special design parts such as mixed face conditions, jet grouting areas and the inner lining. Recently he took over additional tasks in other Swedish projects such as Tunnelbana Stockholm and Boråsbana High Speed Rail.
Trends within Sustainable Bridge Operation and Maintenance
Thursday September 22, 09:30

Jens Sandager Jensen, Denmark
COWI A/S, Kongens Lyngby, Denmark
Contact: jes@cowi.com

Jens Sandager Jensen is Senior Vice President for COWI’s Division for Bridges, Scandinavia, which services the Scandinavian bridge market and the international O&M (Operation and Maintenance) market. He is a member of COWI’s Transportation Board, a Chairman of the Infrastructure committee of the Danish organisation FRI (the Danish Association of Consulting Engineers), and active member in IABSE and IABMAS. He holds a BSc in Civil and Structural Engineering and a BSc in International Management and Economics.

Jens Sandager Jensen has been responsible for O&M activities on a large number of major Danish infrastructure projects such as East Tunnel and West Bridge of the Great Belt, land works for the Øresund Bridge and the Copenhagen Metro. He has also managed many Design-Build projects for contractors in the Scandinavian infrastructure market with high focus on time/costs for the contractors as well as focusing on the requirements of the public end clients. Finally, Mr. Jens Sandager Jensen has been in charge of the comprehensive EU projects “Sustainable Bridges; Assessment for future traffic demands and longer lives” and “MAINLINE – maintenance, renewal and improvement of rail transport infrastructure to reduce economic and environmental impacts.”

Sustainable Concrete
Friday September 23, 15:30

Karen Scrivener, Switzerland
EPFL Lausanne, Switzerland
Contact: karen.scrivener@epfl.ch

Karen Scrivener graduated in Materials Science from University of Cambridge in 1979. She went on to do a PhD at Imperial College, remaining there until 1995. In 1995 she joined the Central Research Laboratories of Lafarge in France. In 2001 she was appointed as Professor and Head of the Laboratory of Construction Materials, at EPFL - Ecole Polytechnique Fédérale de Lausanne (Switzerland). The work of this laboratory is focused on improving the sustainability of cementitious building materials. She is the founder and coordinator of Nanocem, a Network of industry and Academia for fundamental research on cementitious materials and Editor in Chief of Cement and Concrete Research. In 2014 she was made a fellow of the UK Royal Academy of Engineering.
DETAILED PROGRAMME

WEDNESDAY SEPTEMBER 21

CONGRESS HALL AB

08:30-09:00 OPENING CEREMONY
Mats Karlsson, Chair of the Organising Committee
Lena Erixon, GD Swedish Transport Administration
David A. Nethercot, President of IABSE

09:00-09:30 KEYNOTE LECTURE
Sustainable Asset Management – a view from Asia
Yaso Fujino

09:30-10:00 KEYNOTE LECTURE
A Sustainability City is a City for People
Helle Søholt

10:00-10:30 COFFEE BREAK IN EXHIBITION AREA

CONGRESS HALL AB

10:30-12:00 M - Materials
Advanced Concrete
Large-scale replacement project of Hanshin Expressway
Kono, Yassu
Development of High Penetration Agent and its Application to Concrete Bridge Deck Waterproofing, Repair and Reinforcement
Kaba, Kazuya; Nagata, Yoshihumi; Hiraoka, Tomio; Gyakushi, Hidetoshi; Ishigaki, Tatsunori
Structural Concrete Repair against mechanical and thermal loads
Reddy, Harinadh; Ramaswamy, Ananth
A refined model of concrete carbonation by coupling of multi-factors
Tu, Yongming
Concrete structures strengthening by iron-based shape memory alloys: an experimental demonstration
Shahverdi, Moslem; Czaderski, Christoph; Annen, Philipp; Motavalli, Massoud
Strengthening of unreinforced masonry structures using Ultra High Performance Fibre Reinforced Concrete (UHPFRC)
Lampropoulos, Andreas; Tsoulou, Ouralia; Paschalis, Spyridon; Dritsos, Stephanos
Strengthening of concrete members using fabric reinforced cementitious composites – state of the art
Sabau, Cristian; Sas, Gabriel; Blanksvärd, Thomas; Täljsten, Björn

CONGRESS HALL C

10:30-12:00 L - Loads
Wind Load
The wind microclimate optimisation of large-scale re-developments
Hankin, David; Aurelius, Leighton; Cammell, Stefano
Multimode flutter analysis of Chacao bridge
Aas-Jakobsen, Ketil; Bugge, Georg A.
Peak factor estimating methods of non-Gaussian wind pressures on a rectangular high-rise building
Zhuang, Xiang; Dong, Xin; Zheng, Yimin; Zhao, Xin
Modelling of self-excited wind forces on long span bridges using State-space models
Xu, Yuwangs; Gilseth, Ole; Moan, Torgeir
Evaluation and Improvement of Wind Environment and Vehicle Runnability on Long-span Bridge Deck under Strong Crosswind
Yang, Tongjin; Cao, Fengchan; Ge, Yaojun
Wind effects of a pedestrian arch bridge with complex shape
Argentini, Tommaso; Diana, Giorgio; Giappino, Stefano; Muggiasca, Sara; Rocchi, Daniele; Cosentino, Nicola; Majowiecki, Massimo

Kavrakov, Igor; Camara, Alfredo; Morgenthal, Guido

ROOM 201
10:30-12:00 L - Loads
Trends in Seismic Analysis
Application of the Equivalent Static Analysis procedure for the seismic design of added viscous dampers
Palermo, Michele; Di, Antoine; Silvestri, Stefano; Gasparini, Giada; Trombetti, Tomaso
An innovative seismic protection system for existing buildings: External Dissipative Towers
Dezi, Luigino; Gara, Fabrizio; Gionella, Laura; Balducci, Alessandro
Spatially variable seismic ground motions and their effect on cable-stayed bridges: The role of the tower.
Efthymiou, Eleftheria Andri; Camara, Alfredo
Application Research of Viscous Damping Outtrigger in Seismic Design of Super High-rise Buildings
Ding, Jiemin; Wang, Shiyu; Wu, Honglei
Numerical Analysis on Seismic Performance of Hybrid Precast Segmental Bridge Columns
Zhang, Yue; Ge, Shuai
Structural and Seismic Investigation on Historical Papaz Bridge in Turkey
Gedik, Yasar; Demir, Aysegul; Orhan, Arman; Guenes, Oguz

ROOM 202
10:30-12:00 A - Analysis
Bridge Risk Management
An Empirically Verified System for Quality and Risk Management
Brehm, Eric; Hertle, Robert
Risk Assessment of Corroded Bridge Wires using 3D Laser Scanner
Miyachi, Kazuhito; Nakamura, Shinichi
Checking of Structural Safety – Experiences with Large-Scale Structures
Hertle, Robert; Hertle, Thomas
On Bayesian Identification Methods for the Analysis of Existing Structures
Croce, Pietro; Marsili, Francesca; Fornichi, Paolo; Landi, Filippo; Friedman, Noemi
Experiences in infrastructure and bridge risk management
Franchetti, Paolo; Frizzarin, Michele
Risk Management for Construction of a Mega Project in Kuwait
AlSanad, Shaikhab Abdullatif
Estimation of ship bridge collision probability by use of Monte Carlo simulations
Andersson, Axel; Forsman, Björn; Wilske, Erland

ROOM 203/204
10:30-12:00 F - Forensic
Forensic Engineering I
Earthquake Damage Estimations of Byblos Potable Water Network
Makhou, Nisrine; Mikhail, Elane
Interventions on existing buildings in ‘aggregates’: lessons learnt from some Italian collapses
Palmasano, Fabrizio; Penlli, Pasquale
Italy tower collapse in Sao Jose do Rio Preto-SP-Brazil
Stucchi, Fernando Rebecouas
Engineering Investigation, Analyses and Retrofit Procedures for Earthquake Damaged Heritage URM Churches in Bohol Island
Moraes, Emilio Matias; de la Cruz, Ram Mikhlai Apoloni
Lessons from collapse of a 9-storey building in Sweden
Thelanderusson, Sven; Danewid, Robert

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Deterioration of connections and failure of light-weight façade envelopes due to sequence of seismic and wind actions
Dakov, Dimitar; Belev, Borislav; Penelov, Chavdar

ROOM 300
10:30-12:00 S - Structures
Concrete Structures I
Experimental Studies of Controlling Thermal Cracks in Mass Concrete Foundation by Circulating Water
Liu, Wenchao; Cao, Wanlin; Zhang, Jianwei; Qiao, Qiyun; Yin, Fei

Applied Plasticity Methods for Design of the Concrete Substructure at Mersey Gateway Bridge
Pedersen, Nikolaj Rask; Ravn, Uffe Graaskov; Brennan, Gerard

Form Recommendations for Integral Reinforced Concrete Bridges
Kleiser, Michael

The effect of confining concrete on strut capacity inside massive pile caps
Ravn, Uffe Graaskov; Kleissl, Kenneth

Recommendations for Finite Element Analysis for Design of Reinforced Concrete Bridges
Plos, Mario; Pacoste, Costin; Johansson, Morgan

Identification of relevant parameters for choosing an appropriate method of concrete construction
Piekk, Philip; Wium, Jan Andries

ROOM 307
10:30-12:00 S - Structures
Landmark Bridges I
Almonte Viaduct. Construction Process
Arribas, David; Caveno, Pedro; Carrero, David; Jiménez, Pablo

Almonte Viaduct. Detailed Design
Arribas, David; Bernal, Pablo; Pérez, José María; González, José Ignacio

The Mersey Gateway Project, UK – delivery of a major new 3P procured crossing
Hogarth, Dean; Bennett, Mike

Design of ponte dei congressi in rome, Italy
Capellán, Guillermo; Arenas, Juan José; Siviero, Enzo; Di Marco, Roberto; Di Marco, Fabio; Ascarelli, Gianni; Pistolesi, Alessandro; Sacristán, Miguel

Mersey Gateway Bridge (UK) - Design for Construction
Sanders, Paul

12:00-13:30 LUNCH

CONGRESS HALL AB
13:30-15:00 R - Repair & Maintenance
Retrofitting and Repair
Large-scale structure repair project of Hanshin Expressway
Egawa, Nonaki

Expansion joint replacement using the Mini-Fly-Over system to minimise impacts on traffic
Spuler, Thomas; O’Sullieablain, Colin; Moos, Gianni

Tests and performance-based design of reinforced concrete frames retrofitted with robust shape memory alloy braces
Leon, Roberto; Yang, Chuang-Sheng; Walter, Vega-Behar, Pablo; Des Roches, Reginald; Haznun, Darel

Hammersmith Flyover – Strengthening of a Prestressed Segmental Bridge
Moore, Stuart; Jackson, Paul

Effective anchorage strategies in retrofit and strengthening
Silva, John F

Replacement of Corroded Cable Stays on Tjörn Bridge
Laigaard, Jakob; Darholm, Thomas; Skoglund, Martin; Maglica, Adriano

Conversion of Three Crude Oil Tanks into Liquid Bitumen Storage Tanks at Auhafen, Basel, Switzerland
Jaeger, Peter

CONGRESS HALL C
13:30-15:00 S - Structures
Concrete Structures II

Folded plate action for concrete box girder bridges
Vergoossen, Rob; Hagenaares, Peter; Winter, Eelco de Boer, Marijn de

Analysis of the Shear Strength of Joints in Segmental Prestressed Concrete Bridges
Song, Shoutan

Mechanical performance and cost correlation of Ultra High Performance Fiber Reinforced Concrete (UHPFRC)
Paschalis, Spyridon; Lampopoulos, Andreas

Lightweight Concrete Bridges - Recent Findings reveal New Opportunities
Castrodale, Reid Wilson

Modelling of Damage and its Use in Assessment of a Prestressed Bridge
Huang, Zheng; Tu, Kinming; Gner, Niklas; Sabourouva, Natalia; Bagge, Niklas; Blanksvård, Thomas; Ohisson, Ulf; Elfgren, Lennart

Industrialized light-weight steel bridge concept using corrugated core steel sandwich plates
Nilsson, Peter; Al-Emrani, Mohammad

ROOM 201
13:30-15:00 C - Construction and Production
Construction and Production
Mapping of resource consumption in transport infrastructure project – a case study of the project Bårhultsmotet
Olofsson, Thomas; Claesson-Jonsson, Christina; Simonsson, Peter

An Interactive Construction Deployment Planning Model for the SKA Project
Rena, Johannes; Wium, Jan Andries

Cost Efficiency in Design - Hydenabad Metro Rail
C, Sankaralingam; Koneru, Bhavani; Viswanathan, Senthil Kumar; Manoharan, Paramasivam

Integrated project teams in early design stages – Key variables influencing cost effectiveness in bridge building
Ekström, Daniel; Rempling, Rasmus; Simonsson, Peter; Plos, Mario

Analysis of the productivity of the process of concreting in federal district: characterisation and proposal of improvements
Aráujio, Suélio da Silva; Simpson, Rudi Satro;菲尔, Halley; Rodrigues, Palacio, Cristian David Urbe; Carvalho, Michele Teresa Marques

ROOM 202
13:30-15:00 S - Structures
Landmark Structures
Structural Design of Ningbo Global Shipping Plaza
Kunitsu, Hiroaki

London 2012 Olympic Stadium Transformation: Part 2: Engineering the Extraordinary
Birchall, Matthew; McCormick, Fergus

San Mames New Football Stadium. Design and Construction.
Llarena, Javier; Bilbao, Armando; Castro, Nerea

Kai Tak Landscaped Deck – From Mountain to Sea
Wojnarski, Lukasz Leszek; Hussain, Naeem; To, Murphy

ROOM 203/204
13:30-15:00 M - Materials
Advances in Concrete Structures

New Durable Bond Anchorage for Strengthening with Prestressed Near Surface Mounted CFRP
Vorwagner, Alois; Bartscher, Stefan; Lachinger, Stefan

Post-installed shear connectors - coiled spring pins
Hällmark, Robert; Jackson, Paul; Collin, Peter

Experimental Investigation on Fatigue Behavior of Prestressed Concrete Box-Girders
Yuan, Ming; Yan, Donghuang
Study on the main parameters that influencing the actions of shrinkage and creep in the widened hollow Slab bridges
Wang, Peng; Wang, Fumin

Evaluation of the service live design method for different chloride diffusion and carbonation models applied on Belgian concretes.
Minne, Peter

ROOM 300
13:30-15:00 S - Structures
Sustainable Built Environment I
Meet the challenges of the Fehmarnbelt Fixed Link
Pompeu-Santos, Silvino

A link between Germany and France – The new bridge on the Rhine
Guth, Didier

Design and Construction of Frank Gehry Bridge.
First access to the new Island of Zorrotzaurre in Bilbao, Spain
Capellán, Guillermo; Breafe, Hector; Alfonsuo, Pablo; López, Jorge; García, Victor

Cycle Superhighways: Ullevaal Bridge, Oslo
Emst, Christian; Arason, Magnus

Bridge over Jökulsá á Fjöllum – when is a glacial flood too large to design for?
Gudmundsson, Gudmundur Valur

ROOM 307
13:30-15:00 S - Structures
Railway Structures I
Analysis and Optimization on Orthotropic Steel Deck System of Hutong Yangtze River Highway and Railway Bridge
Liu, Xiaoguang; Ju, Xiaoachen

Parametric Study on Hutong Highway and Railway Bridge
Guo, Hui; Liu, Xiaoguang; Zhao, Xinxin

FEM-based research on the dynamic response of a concrete railway arch bridge
Wang, Chao

Dynamic vehicle-bridge coupling analysis with a finite element model based on Abaqus
Yang, Dong

Current research and development in bridges for high-speed railways in Sweden
Ülker-Kaustell, Mahir; Östlund, Johan; Andersson, Andreas

15:00-15:30 COFFEE BREAK IN EXHIBITION AREA

CONGRESS HALL AB
15:30-17:00 R - Repair & Maintenance
LCC
Carbon efficiency in selection of overbridge options to cross a motorway
Villa, Alessandra; Chapman, Tim

A probabilistic approach for handling uncertainty in infrastructure LCA
Larsson, Oskar; Honfi, Daniel; Stripple, Mikael

Life Cycle Assessment of Timber Bridges: A case study
Niu, yishu; Salotangkas, Lauri

Life Cycle Costs - Any Use in Tendering?
Laiggaard, Jakob

Evaluating the life cycle environmental impact of short span bridges
Du, Guangji; Pettersson, Lars; Karoumi, Raif

Green practices in the Kuwait building industry: drivers and barriers
AlSanad, Shaikha Abdulatif

CONGRESS HALL C
15:30-17:00 R - Repair & Maintenance
Sensors and Monitoring I
Integrated fibre-optic sensor networks as tools for monitoring strain development in bridges during construction
Butler, Liam J; Gibbons, Niamh; Middleton, Campbell; Elshafie, Mohammed Z.E.B.

Smart bridge components (expansion joints, bearings and seismic devices) for intelligent infrastructure
Islam, Khaled; Meng, Niculin; O’Sullivanahin, Colm

Damage Initiation and Propagation Model for Bridge Members
Ninomiya, Yasum; Mizutani, Daisuke; KAITO, Kyuyuki

Big data and structural health monitoring
Cremona, Christian

Structural Health Monitoring of Crussel Bridge
Turunen, Markku; Puikkonen, Pekka Antero; Toivola, Pekka

Monitoring structural behavior of reinforced concrete walls with openings using digital image correlation
Sabau, Cristian; Popescu, Cosmin; Sas, Gabriel; Blanksvård, Thomas; Tjälsten, Björn

Phased array ultrasonic inspection of rib-to-deck welded joints in orthotropic steel decks
Makita, Tohru

ROOM 201
15:30-17:00 A - Analysis
Advances in Numerical Modelling
Simple Model for Contact Stress of Strands Bent over Circular Saddles
Mohareb, Sherif; Goldack, Arndt; Schlaich, Mike

Simulation of Thermal Load Distribution in Portal Frame Bridges
Gottsäter, Erik; Larsson, Oskar; Plos, Mario; Molnár, Miklós; Crocetti, Roberto

Numerical Modelling of Flexure-Shear-Critical RC Column
Li, Wencong

A numerical approach for structural system identification by observability techniques
Lozano Galant, Jose Antonio; Norogi, Maria; Lei, Jun; Xu, Dong; Turmo, Jose

An innovative methodology to determine the partial load factor for prestressing in cable supported bridges
Carrucci, Alberto; Pahisa, Mariona; Moneypenny, Kelvin

A higher order finite element to analyse steel-concrete composite bridge decks
Carbonari, Sandro; Dezi, Luigi; Gara, Fabrizio; Leoni, Graziano

ROOM 202
15:30-17:00 S - Structures
Landmark Bridges II
La Florida Suspension Bridge. Oviedo, Spain
Arenas, Juan José; Capellán, Guillermo; Godoy, Alejandro; García, Marianela; Ruiz, Juan; Guerra, Santiago

Temburong Bridge, Brunei - Design of CC1 Tunnels and Bridges in Mentri
Kite, Steve; To, Murphy; Desaintpaull, Florent; Chin, Kok Kong; Hussain, Naem; Leung, William

Manchetti viaduct - design and assembling of a bowstring arch bridge with a span of 250m
Pistoletti, Pierangelo

Tradition and innovation for San Ignacio’s Bridge in the new Island of Zorrotzaurre, in Bilbao.
Lorea, Ana Irene; Saiz, Sergio

A new bridge for London: the Garden Bridge
Kirk, Martin; Archer, Francis; Marley, Anthony
THURSDAY SEPTEMBER 22

CONGRESS HALL AB
08:30-09:00  KEYNOTE LECTURE
Coastal Highway Route E39
Børre Stensvold

09:00-09:30  KEYNOTE LECTURE
Innovative Tunneling in a Sustainable Built Environment
Thomas Jesel

09:30-10:00  KEYNOTE LECTURE
Trends within Sustainable Bridge Operation and Maintenance
Jens Sandager Jensen

10:00-10:30  COFFEE BREAK IN EXHIBITION AREA

ROOM 201
10:30-12:00  C - Construction and Production
Value for Money through Innovation
Key Technology and Innovation Design of Chongqing Dongshuimen Yangtze River Bridge
Wang, Fumin; Geng, Bo

Development and implementation of a new steel bridge edge beam for a cost-efficient replacement
Veganzones Muñoz, José Javier; Ramos Sangrós, Diego; Nilsson, Ulf; Sundquist, Håkan

Performance-based Design of Civic Buildings
Krebs, Andrew; Tsui, Alvin

Implementation and cost-efficiency of stainless steel bridge edge beams
Veganzones Muñoz, José Javier; Sederholm, Bror

Borrowing of the Horotiu Paa Bridge - Maximising Structural Efficiency and Economy
Edwards, Liam

ROOM 307
15:30-17:00  S - Structures
Concrete Structures III

Engineering Assessment Method for Anchorage in Corroded Reinforced Concrete
Blomfors, Mattias; Zandi, Kamyab; Lundgren, Karin; Larsson, Oskar; Honfi, Daniel

The influence of concrete filling on the fatigue behaviour of tubular steel bridge joints
De Backer, Hans; Outtier, Amelie; Staal, Omar

Design Challenges of the Horotiu Paa Bridge - Maximising Structural Efficiency and Economy
Edwards, Liam

ROOM 202
10:30-12:00  C - Construction and Production
Construction History
Load-carrying capacity of two 110 year old steel portal frame bridges
Van Bogaert, Philippe

Assessment and repair of a historic brickwork covering of River Scheldt
Van Bogaert, Philippe

The rehabilitation of an historical building with (new !) suspension floors
Lozupone, Fabio Domenico; Gamabino, Giuseppe

Upgrading of an old railway bridge - the Old Årsta Bridge
Lundmark, Tore; Hallmark, Robert; Dahlman, Lars; Collin, Peter

Retrofitting of AYALA Bridge, an historic steel bridge in Manilla, Philippines
Buchin-Roulin, Vanessa; Kaczkowski, Nicolas; Gros, Alexandre; Tesson, Fabien
Retrofit of Historic Structures: Sustaining Environment and Culture
Sarkisian, Mark; Mathias, Neville; Keileh, Jeffrey; Zhang, Joanna; Lyrenmann, John

Non-invasive interventions on three concrete structures of high cultural and aesthetic value
Brihwiler, Eugen

ROOM 300
10:30-12:00  S - Structures
Railway Structures II
Analysis of material properties and weldability of steel in old railway bridges
Holowaty, Janusz

Evaluation of Strengthening Applications for Old Railway Bridges in Egypt
Abbas, Hussein H.; Hassan, Maha Moddather

Fire design for the refurbishment of a railway tunnel
Outtie, Amelie; De Backer, Hans

Vibration Control of a High-Speed Railway Bridge Using Multiple Tuned Mass Dampers
Beygi, Heydar; Karoumi, Raid

3D non-linear FE analysis of a full scale test to failure of RC Railway Bridge strengthened with carbon fibre bars
Puurula, Arto Matt; Enochsson, Ola; Sas, Gabriel; Blanksvård, Thomas; Ohlsson, Ulf; Bernspång, Lars; Täljsten, Björn; Elfgren, Lennart

ROOM 307
10:30-12:00  F - Forensic
Forensic Engineering II
Repair of fractured slab anchors of curved non-composite box-girder bridges
Konno, Koji; Nagata, Yoshifumi; Itabashi, Yumiko

Contributing factors for the collapse of a temporary structure for the B-tower in Rotterdam
Terwel, Karel

ASCE/SEI 37-14 Design Loads on Structures During Construction Standard
Ratay, Ph.D., P.E., Robert T.; Duntemann, John F

The architectural and structural revitalization of an old cement plant in the south of Poland
Ravaske-Skotniczny, Anna; Tylek, Izabela; Nałepka, Marek

Risk assessment under temporary use conditions
Tanner, Peter; Hingorani, Ramon

12:00-13:30  LUNCH

CONGRESS HALL AB
13:30-15:00  R - Repair & Maintenance
Assessment and Strengthening I
Study on Large-Scale Repair Plan of the Kannon Bridge (a Long-Span Expressway Suspension Bridge)
Yoshida, Tadahiro; Maeda, Yoshito; Hino, Shinichir; Ogata, Tatsuo; Nishiyama, Shozo; Imamura, Takehiro

Tame Valley Viaduct Assessment and Strengthening
Bliek, Sarah Jane; West, Chris

Strengthening and reconstruction of the Hugo Treffner Gymnasium building in Tartu, Estonia
Avellan, Kari Christer; Belopotocanova, Erika

Bridges Piers’ replacement due to alkali-silica reaction pathologies
Perry da Câmara, António; Veira, Carlos

Partially Strengthened Main Cable System for the Rehabilitation of an Old Suspension Bridge
Lee, Bode; Lee, Minjae; Park, Taskyoun

CONGRESS HALL C
13:30-15:00  S - Structures
Concrete Structures IV
Proposal of an Equation of Stress in PS Strands at Flexural Strength
Park, Jae-Hyun; Cho, Jae-Yool; Koh, Hyun-Moo

Development of extremely thin prefabricated concrete façade elements
Zwický, Daia; Bártschi, Hans-Rudolf

Structural concept of novel RPC sandwich façade elements with GFRP connectors
Planbjer, Mathias; Honfi, Dániel; Williams Portal, Natalie; Vennetti, Daniel; Mueler, Urs; Wlasak, Lech

Numerical Modeling and Experimental Verification of Pullout Loading of Anchor Bolts in Reinforced Concrete Structures
Nilforoush, Rashid; Elfgen, Lennart; Nilsson, Martin

Influence of the concrete strength, cylindrical specimen size and the type of laboratory in determining the compressive strength of concrete
Araújo, Sutilio da Silva; Guimardes, Gilson Natal; Geyer, André Luiz Bortolacci

Influence of the speed of loading and discharging of the test machine in determining the compressive strength of concrete
Araújo, Sutilio da Silva; Guimardes, Gilson Natal; Geyer, André Luiz Bortolacci

ROOM 201
13:30-15:00  C - Construction and Production
Contracts and procurement
Tendering Based on Life Cycle Cost and Life Cycle Analysis
Köylüolu, Özgür

Increased innovation through change in early design procedures
Larsson, Johan; Jansson, Gustav; Olofsson, Thomas; Simonsson, Peter

Design build contracts: key to cost efficiency
Heggade, VN

Structural safety in integrated contracts
Mans, Dik-Gert; Rings, Louis

Bridge performance and tendering based on Life Cycle Costs
Simonsson, Peter; Linneberg, Poul; Raccuranu, George; Karlsson, Robert; Lindmark, Jenny

Sustainable Bridge Infrastructure Procurement
Safi, Mohammed; Du, Guangli; Simonsson, Peter; Karoumi, Raid

ROOM 202
13:30-15:00  A - Analysis
Robustness and Reliability
More realistic Codes for Existing Bridges – Examples
Elfgen, Lennart

Simulation of Traffic Loads on bridges by Simulation, Finnish Transport Agency (FTA) in cooperation with Destia Ltd
Lunanab, Torsten Pehr; Lilja, Heikki; Julku, Kimmo; Moisio, Valteri

The Perception of Safety from a Global Standpoint (T)
Leonard, Niamh

Robustness based evaluation of a concrete frame considering the Eurocode design guidelines
Beygi, Heydar; Karoumi, Raid

Probabilistic system identification of spatial distribution of structural parameter using Bayesian network
Lee, Se Hyok; Song, Junho

Spatial probabilistic analysis on a prestressed concrete slab bridge based on modified chloride diffusion coefficient model subject to chloride-induced corrosion
Peng, Jianxin; Hu, Shouwang; Zhang, Jianren

Reliability of RC members submitted to gas explosions
Hingorani, Ramon; Tanner, Peter; Zanuy, Carlos
Regulatory requirements to meet challenges for sustainability in Indian construction industry

Sharan, Shambhoo

Innovative High Strength Steel Construction by Mixed Connections

Kuhlmann, Ulrike; Speigler, Jennifer; Kleiner, Andreas

Efficient methods for design of cable bridge and roof structures

Kulbach, Valdek; Öger, Karl

Multifunctional commercial buildings in steel and composite construction

Streitmann, Richard Maria; Hölting, Lukas

Bending Moment Diagram as Shape: Bicententio Bridge in San Sebastian (Spain)

Guisasola, Mario

ROOM 307
15:30-17:00 A - Analysis

Fatigue Design

Fatigue Design of Steel Bridges for Finnish Vehicle Traffic
Leskinen, Ville Valter; Lilja, Heikki; Tirkkonen, Timo; Ryynänen, Markus

Comparison of deterministic and probabilistic fatigue assessment methods: A case study of road bridge
Sæstad, Alexander; Ersdal, Gerhad; Siniardvade, Sudath

Size effect on the fatigue of High Frequency Mechanical Impact treated welds
Shams-Hakimi, Poja; Yıldırım, Halid Can; Al-Emrani, Mohammad

Effect of short term rust on low cycle fatigue strength of welded joints
Hauge, Geir Tuntland; Kacay, Samdar; Siniardvade, Sudath

Fatigue behaviour of a riveted beam-to-column connection
Fonseca de Oliveira Correia, José António; De Jesus, Abilio Manuel Pinho; Rebelo, Carlos; Gervásio, Helena; Simões da Silva, Luis

Fatigue behaviour of single and double shear connections with resin-injected preloaded bolts
Fonseca de Oliveira Correia, José António; De Jesus, Abilio Manuel Pinho; Rebelo, Carlos; Gervásio, Helena; Simões da Silva, Luis

Fatigue Features and Optimal Design of Orthotropic Steel Deck with a New-type of Rolled U-ribs
Luo, Pengjun; Zhang; Qinghua; Xu, Gongyi; Bu, Yizhi; Li, Qiao

17:00-17:15 SHORT BREAK

CONGRESS HALL AB
17:15-18:15 R - Repair & Maintenance

Assessment and Strengthening III

Strengthening of Riveted Connections of a Steel Arch Bridge: Lessons Learned
Darlow, Mark Richard; Paulissen, Joep

Assessment of the residual stress distribution of a welded stiffener-to-deck plate connection of an orthotropic steel deck using hole-drilling
Nagy, Wim; Van Puymbroeck, Evi; Van Bogaert, Philippe; De Backer, Hans

Effect of transverse bending moments on the shear resistance of concrete bridges
Karagiannis, Dimosthenis; Kaufmann, Walter

Macdonald Bridge Suspended Spans Deck Replacement: Construction Engineering Challenges and Solutions
Radijovic, Dusan; Kirkwood, Keith

Assessment Of Bridge Repair Works Using Modal Testing Technique
Kamal, Medhat

CONGRESS HALL C
17:15-18:15 S - Structures

Coastal Highway Route E39 II

Multi-span suspensions bridge on floating foundations – Challenges in design
Holtberget, Simen Hellgren; Vete, Johannes; Jena, Parthasarathi

The Submerged Floating Tube Bridge: Design Philosophy and Concept
Dunham, Kjersti Kvalheim; Braha, Amar; Firth, Ian

19th IABSE Congress Stockholm

Development

Myhr, Anders; Brandtsegg, Andreas Saur; Kristensen, Vegard B.; Minoret, Arianna; Afte Haugrud Stein; Aaslund, Talde Egieberg

History of the Bjernafjorden fjord crossing project
Eidem, Mathias Egeland

Coastal Highway Route E39 – Extreme structures along the coast of Norway
Dunham, Kjersti Kvalheim

Proposal for a Submerged Floating Tube Bridge as part of the Bam-laford crossing
Eidem, Mathias Egeland; Sekse, Jorunn; Minoret, Arianna

ROOM 201
17:15-18:15 F - Forensic

Forensic Engineering III

Forensic Structural Engineering in education
Terwee, Karel; Hordijk, Dick

Forensic investigation of early age Alkali Aggregate Reaction damaged concrete elements: causes and lessons
Brühwiler, Eugen

How to deal with Structures affected by Delayed Ettringite Formation
GODART, Bruno

Systems for Structural Failure Investigations in the United States
Delatte, Norbert J

ROOM 202
17:15-18:15 S - Structures

Landmark bridges III

Vaduct over River Amonde. Design and Analysis
Arenas, Juan José; Capellán, Guillelmno; Martínez, Javier; Merino, Emilio; Guíl, Ysabel; Garcia-Arias, Pascual

The design challenges of the new movable bascule bridge ‘Parallelstruc- tur A12 Gouda’
van der Burg, Mark; Hesselink, Bert; Geijssen, Ronald; Verdouw, Vincent

Examples of Polish extradosed bridges – design and construction
Toczkiewicz, Robert; Biliszczuk, Jan; Cmyjsyj, Jerzy; Barcik, Wojciech

Copenhagen Inner Harbour Bridge
Bhara, Amar; Firth, Ian

The A82 Pulpit Rock Improvements: A Complex Propped Cantilever Vaduct
Patel, Jaime; Stroscio, Riccardo; Casewll, Andrew

ROOM 203/204
17:15-18:15 C - Construction and Production

Product Declaration and Analysis

A Cradle-to-Gate Framework for Optimizing Material Production in Road Construction
Jassim, Hassan; Krantz, Jan; Lu, Weizhuo; Olofsson, Thomas

Capitol Tower: Lessons from early implementation of Whole Building Lifecycle Assessment in the LEED framework
Kestner, Dirk Matthew; Shea, Kleigh Erin

First Environmental Product Declaration, EPD, for a Building
Wiklund, Ulf Kjell Christer

ROOM 300
17:15-18:15 M - Materials

FRP / GFRP I

James, Stephen; Undeland, Henrik

Flexible plug expansion joints – Benefits of polyurethane versus bitumi- nous
Moor, Gianni; Gallai, Gustav; Meng, Nicolin

Full-scale fatigue testing with initial damage as validation of FRP road bridge design
Hiddinj, Jan; Grebhorst, Ronald; Veltkamp, Martijn

New concepts in movable lightweight bridges in fibre reinforced polymers (FRP)
Veltkamp, Martijn; Hoffmans, Amoud

Monitoring and Inspection of a Fiber Reinforced Polymer (FRP) Road Bridge
Gabler, Markus; Pelke, Eberhard; Knippers, Jan

ROOM 307
17:15-18:15 L - Loads
Seismic Design
Seismic strengthening of columns with deficient ductility and capacity
Athanasiospoulos, Fotis; Christodoulou, Melani; Dritsos, Stephanos

Optimal Placement of Mega Brace Damper for Integrated Seismic Design of Super Tall Building Structures
Zhao, Xin; Han, Xiaoping

Sensitivity Analysis based Optimal Seismic Design of Tall Buildings under Story Drift and Base Shear Constraints
Qin, Lang; Zhao, Xin

Seismic horizontal forces exerted by granular material on flat bottom silos: experimental and analytical results
Pieczynski, Lucas; Palermo, Michele; Silevitch, Stefano; Gasparini, Giada; Trombetti, Tomaso

FRIDAY SEPTEMBER 23

CONGRESS HALL AB
08:30-10:30 R - Repair & Maintenance
Advances in SHM and Maintenance Strategies
Evaluation of damage severity and load carrying capacity of steel girders using local vibration modes
Khatri, Thamshwar; Nagayama, Tomonori; Di, Su

Fatigue assessment of stringer beams using structural health monitoring
Hågström, Jens; Blanksvärd, Thomas; Collin, Peter

Some proposals for the Highway Bridge Design System improvement, aimed at increasing of maintenance and rehabilitation efficiency
Syrov, Anton Vladimirovich

Maintenance-friendliness in management of civil engineering structures
Mancera, Rafael; Stillerbrand, Johan L

Defining a Bridge Maintenance Strategy - Some Practical Constrains
Schellenberg, Kristian; Hess, Reto; Müller, Riet; Huber, Heribert

The MCrack-TLS method for assessing cracks on concrete bridges based on image processing and laser scanning
Valença, Jónatas; Puente, Iván; Julio, Eduardo; González-Jorge, Higinio

Project Materiality Assessment To Increase The Use Of Lower Impact Building Materials
Watson, Natasha Nancy

CONGRESS HALL C
08:30-10:00 R - Repair & Maintenance
Evaluation of Concrete Structures
Prediction of punching behaviour of RC slabs using continuum nonlinear FE analysis
SHU, JIANGPENG; Plos, Mario; Zandi, Kamayab; Johansson, Morgan; Nilenius, Filip

Experimental investigation on Structural performance of corroded beams with plain and deformed steel bars
Ma, Yafei; Su, Xiaochao; Wu, Tingting; Wang, Lei; Zhang, Jianren

Effect of strand corrosion on cracking behavior of PC structures
Wang, Lei; Dai, Liuhao; Ma, Yafei; Zhang, Jianren

Bond Performance between Corroded Strand and Concrete
Zhang, Jianren; Yi, Ju; Zhang, Xuhui; Wang, Lei; Ma, Yafei

Validation of a crack growth model by observed cracks in a bridge
Maljaars, Johan; Paulissen, Joep

ROOM 201
08:30-10:00 L - Loads
Climate and Resilience
Estimation of the influence of climate change on snow load on structures
Croce, Pietro; Formichi, Paolo; Landi, Filippo; Marsili, Francesca

Sustainable Engineering Decisions in Disaster Recovery
Parsons, Gregory

Evaluation of Fracture Critical Bridges in the US using System Redundancy
Di Bernardi, Salvatore

Vehicle Safety Assessment on Bridge Deck under Cross Wind
Kim, Se-Jin; Kim, Ho-Kyung

On the contribution of technological concepts to the resilience of bridges as critical infrastructure assets
Honti, Daniel; Lange, David; Pursiainen, Christer; Rad, Bjarte

Multi-level road bridge assessment
Skokandic, Dominik; Mandic Ivanovic, Ana; Džeba, Ivica

ROOM 202
08:30-10:00 S - Structures
Landmark bridges IV
Lilla Lidingöbron: Guidelines for design
Harris, Simon; Knight, Martin; Werner, Jan

Ancient and modern - a contemporary footbridge at Harlech Castle, Wales
Andrasi, Katalin; Duguid, Brian; Burton, Tim; Packer, James; Winslow, Pete

The new Kennelebyen Bridge in Ulm, Germany – an urban landmark in a historic setting
Haliczek, Bartlomiej; Veth, Heinz-Josef; Lange, Uwe

Design and Construction of Pont Schuman, Lyon
Stross, Oliver; Sanders, Paul

The Design and Construction of Greenwich Reach Swing Bridge
Knight, David Furnival; Firth, Ian

Expansion joints and bearings for the largest lift bridge in Europa
Redeker, Holger
ROOM 300
08:30-10:00 M - Materials
Sustainable Steel Properties
Methodology for Construction Stress Evaluation for Reuse of Structural Steel
Keller, Philipp; McConnell, Jennifer; Thostenson, Erik; Schumacher, Thomas
Evaluating the Influence of Scratch, Coating Method and Spray Method through Combined Cycle Test of Metal Spray Plate
Hattoni, Masaumi; Furuya, Yoshiyasu; Hirose, Takeshi
Sustainability in action – Expansion joint renewal with focus on retention and re-use
Spuler, Thomas; Hoffmann, Simon; Savorz, Pascal
Properties of structural steels in a railway plate girder bridge
Holloway, Janusz; Wichtowski, Bernard
Scattering of deicing salt and corrosion of steel bridges
Iwasaki, Eiji
ROOM 307
08:30-10:00 S - Structures
Innovations in Structural Engineering
Experimental Assessment of a new steel hysteretic device: Crescent Shaped Brace
Dib, Antoine; Palermo, Michele; Silvestri, Stefano; Tombetti, Tomaso
Graphical Methods for the Design of Structures
Beghini, Alessandro; Sarkisian, Mark; Mathias, Neville
Innovative Design for the SFOBB 1-80 Yerba Buena Island WB Ramps
Lee, Hoshing; Cordoba, Eric
Innovative Tuned Liquid Damper System
Ghisbain, Pierre; Mendes, Sebastiano; Pinto, Marguerite; Malsch, Elisabeth
Challenges in structural designing of egg-shaped steel structure
Fateki, Atilla
Foundation - Shoes Structural Design
Araújo, Suélio da Silva; Vieira, Luciano Lins

10:00-10:30 COFFEE BREAK IN EXHIBITION AREA

CONGRESS HALL AB
10:30-12:00 INDUSTRIAL SESSION
Bentley - Revealing the Future of Bridge Design and Engineering

CONGRESS HALL C
10:30-12:00 R - Repair & Maintenance
Sensors and Monitoring II
Analysis of several strategies for the monitoring of bridges under fire
Álvaro Moya, José; Marco-Espinosa, Francisco Simón; Paya-Zaforteza, Ignacio; Peris Sayol, Guillem
Development of Stay Cable Measurement System using Wireless Sensors
Kwak, Younghak; Shin, Yoon Bong; Kim, In Gyu; Kim, Younghoon
A Correlation Study for Concrete Resistance vs. Ultrasonic Pulse Velocity for a Group of Reinforced Concrete Bridges
Akgul, Ferhat
Vehicle-based Health Monitoring System for Short and Medium Span Bridges
Miymoto, Ayaho; Kiyulama, Risto; Yabe, Akito; Emoto, Hisao
Viaduct over River Almonte. Site Control and Supervision
Capellán, Guillermo; Martínez, Javier; Menino, Emilio; García-Arias, Pascual; Abad, David; Jiménez, Pablo
Concepts for an early identification of security-relevant defects in concrete bases of wind turbines in terms of Condition Monitoring Systems
Reznik, Boris; Ribakov, Yuri; Iskhakov, Iakov
Seismic Response Analysis of Hakuso Suspension Bridge from Long-term Monitoring System
Siringoringo, Dionysius; Fujino, Yaza

ROOM 201
10:30-12:00 M - Materials
FRP / GFRP II
Application of GFRP for Inspection Way
Furuya, Yoshiyasu; Nakamura, Hitoshi; Koizumi, Kousuke; Ishii, Yuya; Nakai, Hiroshi; Nishida, Masayuki
Application of FRP Materials for Construction of Culvert Bridges
Haghian, Reza; Yang, Jincheng
Experimental study on a grp girder reinforced with cfrp for application to extended sidewalk
NOZAKA, Katsuoyoshi; Hisabe, Nobuhiro; Matsumura, Masahide
KoöBaal - Bocholt (Germany) – Design of a GFRP footbridge as part of an urban development
Huebner, Sarah; Baumann, Katrin; Thie, Edwin
GFRP connectors in textile reinforced concrete sandwich elements
Williams Portal, Natalie; Zandi, Kamysb; Malaga, Katarina; Witsak, Lech
Design of a 120 m high GFRP Landmark tower structure
Tromp, Liesbeth; Klaas; Ernst; Uselmijden van, Rees; Boeaters, Ton

ROOM 202
10:30-12:00 S - Structures
Tall buildings
The Articulated Funiculator
King, Fritz; Hallgren, Mikael
Tubed Mega Frame Structural Systems for Tall Buildings
King, Fritz; Hallgren, Mikael; Patovi, Aiko Rothe; Svárd, Jenny
Integrated Optimal Design of Scissor-Jack-Damper for Super Tall Buildings under Human Comfort Constraint
Zhao, Xin; Ma, Zhuang
Optimal Design of Toggle Brace Dampers for the Wind Resistance
Design of Super Tall Buildings
Ma, HaoJia; Zhao, Xin
Life Cycle Cost Assessment of Integrated Structure-Viscous Damper System for Tall Buildings
Zhao, Xin; Li; Hao
Design and Study of Super Suspend Curtain Wall Support Structure of Shanghai Tower
ding, jiemin; HE, Zhijun; LI, Jiupeng

ROOM 203/204
10:30-12:00 A - Analysis
Design and Analysis I
Why strengthen? Repair mitigation with finite element assessment
Monteiro Batista de Oliveira, Alexandre Ricardo; Wójnarski, Lukasz Leszek
Bearing capacity of existing bridges- calculations and load tests
Raunitis, Heini
Recalculate and strengthening of the girder bridge near Hagestein.
Wensveen, Paul; Hesselink, Bert; Geijseren, Ronald; Snijder, Bert
Recalculate and strengthening of the double arch bridge.
Alphen, Sander van; Steenbrink, Ayen; Blom, Anne; Snijder, Bert; Hesselink, Bert

ROOM 300
10:30-12:00 S - Structures
Temporary Structures
Particular stability aspects of temporary structures
Hertle, Robert; Hertle, Thomas
Safety of temporary stands
Vennetti, Dienne; Honfi, Daniel
Safety of temporary scaffolds
Spygg, Henrik; Vennetti, Dienne
Design Specifications for Bridge Temporary Works in the United States
Duntemann, John F
Temporary demountable structures
Soane, Alastair; Cutlack, John

Temporary Support Design for Cross Passage Construction
Yeruva, Ramana Reddy; Yeruva, Ramana Reddy

Study on the key issues of the wheel-spoke shaped pretension structure system
Zhang, Yueqiang; Zhang, Zheng; Ding, Jiemin

ROOM 307
10:30-12:00 A - Analysis
VDC - Virtual Design and Construction
Product Configuration – Performance Improvement of Design Work
Gerth, Robert; Smiding, Erik; Jensen, Patnik; Simonsson, Peter

Product and Process Platforms in Transport Infrastructure Projects
Olofsson, Thomas; Jensen, Patnik; Lu, Wenzhao; Larsson, Johan; Simonsson, Peter

Oceanpiren, Helsingborg, a unique cable-supported footbridge
James, Stephen; Thorsson, Patrik

Understanding BIM – What does it mean and what can it be used for
Seitz, Peter

Virtual Design and Construction in MT Højgaard
Falk, Niels Wingesøe; Kjaergaard, Birgitte

IPM: The Evolution of Project Management
Jurgens, Chris

BIM Application in Design of China Corporate United Pavilion (CCUP)
Zheng, Zhang; Li, Li

12:00-13:30 LUNCH

CONGRESS HALL AB
13:30-15:00 INDUSTRIAL SESSION
WSP – Getting the Most Out of Construction – Using BIM as a Collaboration and Innovation Enabler

CONGRESS HALL C
13:30-15:00 A - Structures
Railway Structures III
Structural control of high-speed railway bridges by means of fluid viscous dampers
Rädeström, Sarah; Ökter-Kaustell, Mahir; Andersson, Andreas; Tell, Viktor; Karoumi, Raid

Design and construction of a large railway bridge in a complex traffic junction
Langedijk, Walter; Lierop, Pieter van; Kortenhof, Brieke van

Innovative Intelligent Management of Railway Bridges - A European Horizon 2020 Project
Sax, Gabriel; Blanksvärd, Thomas; Täljsten, Björn; Nilimaa, Jonny; Ellgren, Lennart; Carolin, Anders

Safety and Serviceability Assessment of Existing Railway Bridges in Poland
Wisniewski, Dawid; Majka, Michal; Topczewski, Lukasz; Ciesla, Juliusz

Results and Experiences from European Research Projects on Railway Bridges - Paulsson, Björn; Bell, Brian; Schewe, Britta; Jensen, Jens Sandager; Carolin, Anders; Ellgren, Lennart

ROOM 201
13:30-15:00 A - Analysis
Design and Analysis II
Fatigue reliability assessment of welded bridge details using probabilistic fracture mechanics
Leander, John; Zamiri, Farshid; Al-Emrani, Mohammad

Realistic traffic-data based load models for existing road bridges
Nowak, Marcel; Fischer, Oliver

‘Strengthening by Assessment’ Using Finite Element Approaches – Case Studies of Rail Bridges
Ilias, Panagiotis; Ilias, Evangelos; Popotas, Vasileios

Sustainable strengthening of structures using UHPFRC and computational verification
Martin-Sanz, Henar; Egger, Adrian; Chatzi, Eleni; Brühwiler, Eugen

ROOM 202
13:30-15:00 C - Construction and Production
Decision Support
Thinking critically about structural engineering through role-playing games
Huynh, Tracy; Paya-Zaforteza, Ignacio

Structural Innovation: A Dissection of Confidence
Sarkisian, Mark; Mathias, Neville

Using Sustainability as a Driver for Change in Denmark’s Construction Industry
Horswill, Duncan; Nielsen, Timo

Conspectus of Bridge Criticism
Li, Ying

Enhanced decision making in the structural design process by means of a dashboard approach
Loos, Lennert; Verbeek, Kenny; De Laet, Lars

ROOM 300
13:30-15:00 M - Materials
Innovations and New materials
Design of an Experimental Arch Pedestrian Bridge Made of UHPC
Tej, Petr; Knů, Petr; Mourek, Jan

Study on conceptual design process of bridges
Li, Ying; Xing, Rucheng; Sun, Bin

New materials
Illuminating system for the construction and management of students residences - Frameup system
de Andrade, Pedro António Pimenta; Lagerqvist, Ove; Veljkovic, Milan; Simões, Rui; Lundholm, John

Bridges and Special structures: Towards an innovative and sustainable built environment
Reis, Antonio Jose

ROOM 307
13:30-15:00 C - Construction and Production
Innovations in Structural Engineering
Innovation: Key to Structures of Tomorrow
Mendrey, Philippe

ROOM 307
13:30-15:00 M - Materials
New Materials
In-plane Shear Test of Floor Structure Adapting for the CSTS Using a Cross Laminated Timber
Fujita, Masanori; Ohtaki, Mayo; Okoshi, Yuki; Iwata, Mammor

Development and Construction of Non-Metal Bridge
OGATA, Tatsuo; Oshiro, Takeshi; Fukuda, Masato; Kasuga, Akio; Asai, Hiroshi; Naganoto, Naoki

Two-way walls with cut-out openings strengthened by fiber-reinforced polymers
Pospelov, Cosmin; Sas, Gabriel; Blanksvärd, Thomas; Täljsten, Björn

Bio-based composite movable bridge
Claassen, Wouter

15:00-15:30 COFFEE BREAK IN EXHIBITION AREA

CONGRESS HALL AB
15:30-16:15 KEYNOTE LECTURE
Sustainable Concrete
Karen Scriwener

16:15-17:00 CLOSING CEREMONY
Mats Karlsson, Chair of the Organising Committee
Lennart Ellgren, Chair of the Scientific Committee
David A. Nethercot, President of IABSE
Young Engineer Awards
Next IAIBSE Symposium
## EXHIBITOR FLOORPLAN AND LISTING

### COMPANY
- Aigner Albrecht Anlagenbau GmbH
- Bentley
- Bridge design & engineering
- Bridon Bekaert
- Cementa AB
- COWI
- Fatzer AG Wire Ropes
- HRC Europe NL BV
- Lusas
- Mageba group
- Maurer AG
- MIDAS IT (UK) Ltd
- NCC Infrastructure
- Oasys Ltd
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- Pfeifer Seil- und Hebetechnik
- Ramboll
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- Strängbetong
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### Diagram
- Main Congress Hall
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## ANNUAL MEETINGS SCHEDULE

**Venue:** City Conference Centre, Folkets Hus, Barnhusgatan 12-14, 111 23 Stockholm.  
**IABSE Desk** is open from 07:30-18:00 during the Annual Meetings.

### SEPTEMBER 19 (MONDAY)

<table>
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<th>Events</th>
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| 08:00–11:00 | Administrative Committee  
WC 1 Structural Performance, Safety and Analysis*  
WC 2 Steel, Timber and Composite Structures*  
WC 4 Conservation of Structures*  
WC 5 Design Methods and Processes*  
WC 6 Engineering Software and Information Modelling*  
WC 7 Sustainable Engineering*  
WC 8 FRP (Fibre Reinforced Polymer) Structures*  
SEI Editorial Board |
| 11:00–14:00 | WC 3 Concrete Structures*  
WG 1 Glass Structures*  
WG 5 Bearings and Joints*  
WG 7 Earthquake Resistant Structures*  
SEI Correspondents  
IABSE Strategy |
| 14:00–18:30 | Technical Committee  
Chairs National Groups  
Foundation Council  
IABSE Strategy |
| 19:30     | Reception of the President of IABSE |

### SEPTEMBER 20 (TUESDAY)

<table>
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<tr>
<th>Time</th>
<th>Events</th>
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| 08:00–12:00 | Executive Committee  
OStrA Committee  
YEP Board*  
E-Learning Board  
SC Stockholm 2016  
SC Vancouver 2017  
SC Nantes 2018 |
| 08:00–17:00 | WG 10 Super-long Span Bridge Aerodynamics |
| 09:00–12:30 | WG 9 Construction History |
| 12:00–13:30 | Lunch of the President of IABSE |
| 14:00–17:00 | Permanent Committee  
WG 7 Earthquake Resistant Structures*  
Bulletin Editorial Board |
| 17:15–18:00 | Bulletin Editorial Board |
| 19:00–20:30 | Reception of the Chair of the Swedish Group of IABSE |

### SEPTEMBER 21 (WEDNESDAY)

<table>
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<th>Time</th>
<th>Events</th>
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<tbody>
<tr>
<td>13:30–17:30</td>
<td>WG 8 Forensic Structural Engineering*</td>
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*Guests are welcome with approval from chair of the group.
PRE-CONGRESS COURSE

‘Forensic Structural Engineering: Causes, Investigations and Prevention of Failures’
Stockholm, Tuesday, September 20, 09:30-18:00
Course Coordinator: Robert T. Ratay

Synopsis
Failures of structures occur in all parts of the world as the result of design deficiencies, construction defects, abuse or misuse, lack of maintenance, aging and deterioration, and environmental effects such as wind, flood, snow and earthquakes.

In several countries the investigation of the failures and resolution of the consequent damage claims have created an active field of professional practice, often referred to as forensic structural engineering, with well-defined technical and legal procedures.

In this scenario, the IABSE Working Group on Forensic Structural Engineering was formed in 2011. It aims to examine and mitigate failures, improve the professional practice of forensic structural engineering, and facilitate the dissemination and application of failure information to structural design and construction throughout the world.

Followed the success of the forensic structural engineering sessions at the IABSE Madrid 2014 and Geneva 2015 Conferences and of the pre-conference course that took place in 2015 in Geneva, the WG is organizing the course ‘Forensic Structural Engineering: causes, investigations and prevention of failures’ that is aimed at structural engineers who want to acquire a working knowledge of forensic structural engineering, practicing forensic engineers who want to learn from and share with other practitioners, and university students who wish to gain an advanced understanding of forensic structural engineering to underpin future research/career interests.

The course aims also to illustrate the concepts of failure causes and investigations as a general engineering tool for enhancing construction quality and failure prevention. In order to make the course interactive, time will be provided for discussion and for a ‘CSI’ (Crime Scene Investigation) moment where the lecturer will stop and the participants will have to analyse by themselves the provided information to come up with reasonable causes.

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Contact information

Congress Secretariat
MCI Nordics I Stockholm Office
Attn: IABSE 2016
P.O. Box 6911
102 39 Stockholm
Sweden
T: +46 8 5465 1500
E: confirmation@mci-group.com

Organising Committee (OC)
Chair OC: Mr Mats Karlsson
Swedish Transport Administration
e-mail: mats.d.karlsson@trafikverket.se
phone: +46 10 123 69 72, mobile: +46 70 536 66 00

Sekr. OC: Lahja Rydberg Forssbeck
Swedish Transport Administration
e-mail: lahja.rydberg-forssbeck@trafikverket.se
phone: +46 10 123 71 89, mobile: +46 70 257 37 41

Scientific Committee (SC)
Chair SC: Prof Lennart Elfgren
Luleå University of Technology
e-mail: lennart.elfgren@ltu.se
phone: +46 920 493 660, mobile: +46 70 689 13 60

Sekr. SC: Dr Johan Jonsson
Swedish Transport Administration
e-mail: sciabse2016stockholm@trafikverket.se
phone: +46 10 123 25 91, mobile: +46 70 724 52 14