

CONTENTS

OPENING SESSION

Koji Sakai (JP)

A New Concept concerning Concrete Sustainability for a Sustainable Society 3

KEY NOTES

Ronald G. Burg, Kevin P. Mlutkowski, Douglas J. Sordyl &
James K. Wight (US)

American Activities toward Development of a Unified Front to Advance Concrete Sustainability and Resilience 15

Christoph Müller (DE)

Cement and concrete within the concept of sustainable development 21

ALTERNATIVE BINDERS (Session 15)

Al-Jabri Khalifa, Al-Kamyani Zahran, Taha Ramzi, Baawain Mahad,
Al-Shamsi Khalid and Al-Saidy Abdullah (OM)

Performance of Concrete Made with Spent Catalyst as Cement Replacement 29

Luís Ferreira, Inês Barata, Hugo Costa, Eduardo Júlio, Jorge Coelho
and Paulo Maranhã (PT)

Design of Alkali-Activated Mortar Mixtures 33

Prabir Sarker and Karamchand Ramgolam (AU)

Fracture Energy of Geopolymer Concrete 37

Batian Kolani, Laurie Buffo-Lacarrière, Alain Sellier, Gilles Escadeillas,
Laurent Boutillon and Lionel Linger (FR)

Multiphasic Hydration Model of Concrete Incorporating Gound Granulated Blast-Furnace Slag 41

Anders Lindvall, Ingemar Löfgren and Oskar Esping (SE)

Properties of concretes mixed with fly ash or blast furnace slag 45

Julie Piérard, Valérie Pollet, E. Cailleux and Christian Pierre (BE)

Strength Development and Durability Properties of High Slag Cement Based Concrete 49

Ellen Grist, Dr. Kevin Paine, Dr. Andrew Heath and Dr. James Norman (UK)

The feasibility and potential of modern hydraulic lime concretes 53

CARBONATION AND CARBON DIOXIDE UPTAKE & RECYCLING (Session 6)	
Corneliu Bob, Tamas Dencsak and Ionel Balcu (RO) Tests for the determination of carbon dioxide uptake by concrete carbonation	59
Björn Lagerblad (SE) Carbon dioxide capture-rate and mode of carbonation	63
Andrzej Ajdukiewicz & Alina Kliszczewicz (PL) Structural Recycled Aggregate Concrete - Instantaneous and Long-Term Properties	67
Luc Boehme, Jeroen Vrijders & Ann Van Gysel (BE) Assessment of Recycled Concrete Aggregates in Concrete C20/25 & C25/30	71
Duan, Zhen-hua; Kou, Shi-cong & Poon, Chi-sun (HK) Using ANNs to Predict the Mechanical Properties of Recycled Aggregate Concrete Prepared with Old Concrete with Different Strength Grades	75
CASE STUDIES AND AESTHETICAL ISSUES – A (Session 3)	
John Orr, Antony Darby, Tim Ibell & Mark Evernden (UK) Fabric formwork for ultra high performance fibre reinforced concrete structures	81
Maria F. Serrano-Guzmán, Diego D. Pérez-Ruiz & Juan-S. Ferreira-Diaz (CO) Paving blocks prepared with debris: Alternative for low-traffic roads	85
Aurelio Muttoni, Franco Lurati & Miguel Fernández Ruiz (CH) Concrete shells: time for reappraisal – Case study of a 93 meter-span shell in sprayed concrete	89
Chris Tyler (AU) Adding 18 Storeys on Top of an Existing 10 Storey Building: A Case Study into Sustainable Development	93
Xavier Destrée (BE) & Johan Silfwerbrand (SE) Steel Fibre Reinforced Concrete in Free Suspended Slabs: Case Study of the Swedbank Arena in Stockholm	97
CASE STUDIES AND AESTHETICAL ISSUES – B (Session 18)	
Peter Minne, Robby Caspeepe & Geert De Schutter (BE) Water demand predictions as key parameter for the mix design of durable concrete	103
Peter Roots & Alexander Engström (SE) Efficient utilization of thermal mass with TermoDeck system for climate control of buildings	107

Nicolas Busquet, Julien Lamour, Michel Moussard, Emilie Luangkhot & Yannick Tardivel (FR) Comparative life-cycle assessment of an innovative technology repair of a steel orthotropic deck and its full replacement	111
DESIGNING CONCRETE STRUCTURES - A (Session 1)	
Patarapol Tantipidok, Koji Matsumoto, Ken Watanabe & Junichiro Niwa (JP) Experimental Investigation of Diagonal Compression Failure for High Strength Concrete Beams with Wide Stirrup Spacing	117
Mikael Hallgren (SE) Sustainable design of concrete slabs supported by steel edge and corner columns	121
Ali Akbar Ramezani-pour, Ehsan Jahangiri, Babak Ahmadi & Faramarz Moodi (IR) Evaluation and Modification of the fib Service-Life Design Model for the Persian Gulf Region	125
Milan Holický, Miroslav Sýkora (CZ) Probabilistic Design of Concrete Structures for Durability	129
Edgar Bohner, Harald S. Müller (DE) Prediction Model for Concrete Cover Cracking due to Corrosion of Reinforcement	133
DESIGNING CONCRETE STRUCTURES - B (Session 4)	
Britta Hackbarth & Viktor Sigrist (DE) Extending Service Life of a Structure through In-depth Shear Assessment	139
Jens Wasner & Viktor Sigrist (DE) Computation of Crack-Control for Durable Quay Structures	143
Günter Rombach & Matthias Kohl (DE) Fatigue Strength of Concrete Members without Web Reinforcement	147
Richard Malm & Anders Ansell (SE) Crack formation in two segmentally constructed balanced cantilever box-girder bridges	151
Raphael M. Souza, Guilherme S. Melo & Ronaldo B. Gomes (BR) Punching in reinforced concrete flat slabs with holes adjacent to the column	155
Jan L. Vitek, Robert Brož & Alexandr Tvrz (CZ) Construction of the network arch bridge in Prague	159

DESIGNING CONCRETE STRUCTURES – C (Session 7)	
Kamyab Zandi Hanjari, Mathias Flansbjerg, Jan Erik Lindqvist & Johan Silfwerbrand (SE)	
Structural analysis of concrete members with shear failure	165
Katarina Malaga, Kristian Tammo, Mathias Flansbjerg, Thomas Blanksvärd & Örjan Petersson (SE)	
Textile Reinforced Concrete Sandwich Panels	169
Evan C. Bentz (CA)	
Shear Behaviour of FRP-Reinforced Members without stirrups using the New Model Code	173
Shahriar Agaajani & Danièle Waldmann (LU)	
Static Analysis of a New Wall System realized by Modular Concrete Blocks	177
DESIGNING CONCRETE STRUCTURES – D (Session 10)	
Michael Vogel & Harald S. Müller (DE)	
Performance based design of hydraulic concrete structures in consideration of abrasion loads	185
Giancarlo Groli, Alejandro Pérez Caldentey & Andreu Gelpi (ES)	
Use of Recycled Steel Fibres for Crack Width Control of Jointless RC Structures	189
Stephan Pirringer, Johann Kollegger (AT)	
A New Approach for Small Formatted Metal-Concrete-Composite-Slabs	193
Yngve K. Alvarsson (SE)	
Can Better Production Methods Improve the Resistance?	197
N.Kaptijn, A.H.J.M.Vervuurt & C.P.M.Kuilboer (NL)	
Results of Monitoring large Carbon Fibre Post-tensioning Systems in a Balanced Cantilever Bridge (Dintelharbour bridge, The Netherlands)	201
DESIGNING CONCRETE STRUCTURES – E (Session 13)	
Ioannis P. Sfikas, Antonis Kanellopoulos, Konstantinos G. Trezos & Michael F. Petrou (GR)	
Reproducibility of Self-Compacting Concrete batches between two different EU laboratories	207
Bastian Jung & Guido Morgenthal (DE)	
Uncertainty analysis of tension stiffening approaches in reinforced concrete structures for the model quality evaluation	211
Antonio Mari Bernat, Jesús M. Bairán García, Eva Oller Ibars & Ignasi Fernandez Perez (ES)	
Numerical simulation of the structural effects of the deterioration in concrete structures	215

Jesus M. Bairan, Antonio R. Mari & Noemi Duarte (ES)	
Direct optimal design of partially prestressed concrete for controlled cracking or fatigue	219
Steinar Helland (NO)	
New ISO 16204 on Durability Design of Concrete Structures	223
Anna Emilie A. Thybo, Henrik Stang & John F. Olesen (DK)	
The Relationship between Rebar-Debonding and Cracking in Reinforced Concrete	227
DESIGNING CONCRETE STRUCTURES – F (Session 16)	
Fernando Stucchi, Marcelo Coelho Ungaretti & Francisco Lopes Blancas (BR)	
Brazilian Arenas for the 2014 FIFA World Cup	233
Alfred Strauss (AT) & Dan M. Frangopol (US)	
Performance assessment of existing structures using monitoring based Markov decision processes	237
Johann Kollegger, David Wimmer & Susanne Gmainer (AT)	
Balanced lift method for the design of sustainable concrete bridges	241
Jan Cervenka & Vladimir Cervenka (CZ), Dirk Proske & Davide Kurmann (CH)	
Pushover Analysis of Nuclear Power Plant Structures	245
DURABILITY – A (Session 14)	
John Orr, Antony Darby, Tim Ibell & Mark Evernden (UK)	
Durability enhancements using fabric formwork	251
Jukka Lahdensivu (FI)	
Durability Properties of Existing Concrete Facades	255
Abdelkrim Ammouche, Christophe Carde, Nouredine Rafai, Lionel Linger & François Cussigh (FR)	
Overview of a two decades durability follow-up for two major bridges: Vasco de Gama (Portugal) and Rion-Antirion (Greece)	259
Urs Müller, Moritz-Caspar Schlegel, Franziska Emmerling (DE) & Katarina Malaga (SE)	
Novel techniques for studying damage mechanisms of cementitious matrices affected by sulphate attack	267
Mohamed Abd Elrahman, Bernd Hillemeier (DE)	
Ecological Concrete by Mix Design for Solar Energy Storage Water Tank	271
Alexey Sidelev, Engui Liu, Weihua Jin, Gamal E. Khalil, Christian Bruckner & Masoud Ghandehari (US)	
Sensing High pH and ASR Detection in Cementitious Materials	275

DURABILITY – B (Session 23)

Takuya Kondou, Takashi Yamamoto, Hideki Manabe, Ichiro Murata & Toyo Miyagawa (JP) Flexural Capacity of Post-Tensioned PC Cracked Due to Corrosion	281
Hirokazu Tanaka & Toyoaki Miyagawa (JP) Durability improvement by low shrinkage concrete impregnated with silane water-repellent material	285
Lidia Ruiz-Ripoll, José Antonio Lozano-Galant & José Turmo (ES), Bryan E. Barragán & Sandro Moro (IT), A Simple Methodology for Quantifying Early Shrinkage Cracking in Concrete	289
Michael Kaffetzakis & Catherine Papanicolaou (GR) Durability aspects of Pumice Aggregate Self-Compacting Concrete (PASCC): Comparison with Normal-Weight SCC (NWSCC)	293
Oliver Schwoon (CH) Sustainable Concrete through Admixtures	297
Michala Hubertova, Rudolf Hela (CZ) Durability of Lightweight Concrete	301
DURABILITY – C (Session 26)	
B. Erdil, U. Akyuz & I. O. Yaman (TR) Behaviour of CFRP confined low strength concrete columns under temperature changes	307
R. Doug Hooton, Majella Anson-Cartwright & Uwe Schutz (CA) Improved Durability and Sustainability of Concretes Using Combined Aggregate Gradations	311
R. Doug Hooton & Ester Karkar (CA) Evaluating Durability of Concretes Using Rapid Measurements for Fluid Penetration Resistance	315
Paul Sandeford (AU) The Production and Use of Guidance Documents for the Development of Road Structure Durability	319
Mohammad Tahershamsi, Kamyab Zandi Hanjari, Karin Lundgren & Mario Plos (SE) Anchorage Capacity of Naturally Corroded Reinforced Concrete Beams	323
Hannele Kuosa, Markku Leivo, R. Miguel Ferreira & Jukka Piironen (FI) Effect of concrete frost deterioration on chloride penetration and carbonation	327

LCC & LCA (Session 12)

Jose Campos e Matos, Paulo Jorge Sousa Cruz, Isabel Brito Valente & Luis Canhoto Neves (PT) An Advanced Reliability Procedure for Lifetime Assessment of Structures: Application to Reinforced Concrete Beams	333
Patrick Guiraud, Guillaume Habert & Amélie Semat (FR) Environmental impact comparison between 4 different bridge structures	337
Michio Satou, Hiroki Arizono, Akira Hasumi, Hiroshi Minagawa & Makoto Hisada (JP) A study on the maintenance cost considering with the importance of facilities in an electric power plant	341
Mohammed Safi, Håkan Sundquist, Raid Karoumi & George Racutanu (SE) Bridge Management System with an Integrated Comprehensive LCC Tool	345
Andreas May & Danièle Waldmann (LU) Lightweight woodchip concrete in composite constructions	349
Guangli Du & Raid Karoumi (SE) Environmental Comparison of a Railway Bridge with Alternative Designs	353
Laetitia D'Aloia Schwartzentruber, Mikaël Rabier, Catherine Cabut & Anne Charlotte Gasser (FR) LCA applied to the Evaluation of potential environmental Impacts of Tunnels	357
REPAIR, RENOVATION AND UPGRADING – A (Session 19)	
Thomas Blanksvärd, Björn Täljsten & Gabriel Sas (SE) Mineral based strengthening systems for upgrading RC Structures	363
Alessio Caverzan & Liberato Ferrara (IT) “Collapsible” concrete as a blast and impact absorber: from material concept to static characterization	367
Ylva Edwards & Leif Fjällberg (SE) Chemical Resistance and Wear for Concrete Protection Systems to be used in Biological Treatment Plants - Laboratory Testing and Results	371
Janusz Hołowaty (PL) Widening and Upgrading of a RC Slab Bridge for Improved Sustainability	375
Katsuyuki Miyauchi, Hiroyuki Shimoeda & Yoshitaka Kuroishi (JP) Environment Impact Assessment of New Seismic Strengthening Method of Existing RC Piers by Dry Sprayed Polymer Cement Mortar	379

REPAIR, RENOVATION AND UPGRADING – B (Session 22)	
Christis Z. Chrysostomou, Nicholas Kyriakides & Themis Demetriou (CY) Retrofitting Strategies for Existing Structures for Sustainable Development	385
Mathias Flansbjerg, Jan Erik Lindqvist, Gabriel Johansson & Michael Löfgren (SE) Mechanical behaviour of concrete piles affected by sulphate attack	389
Hideo Araki & Seiya Izaki (JP) Seismic Performance of Low Strength Concrete Members Repaired by Epoxy Resin	393
Antonio Marí Bernat, Jesús M. Bairán García, Rosangel Moreno González & Juan Jesús Álvarez Andrés (ES) Analysis of remodelled and strengthened concrete bridge structures	397
Eva Oller Ibars, Mireia Pujol Sánchez, Antonio Marí Bernat & Jesús Miguel Bairán García (ES) The Contribution of FRP Laminates to the Shear Strength of Externally Bonded Reinforced (EBR) Concrete Structures	401
REPAIR, RENOVATION AND UPGRADING – C (Session 25)	
Allen L. Jones, Stephanie Klay & Nadim I. Wehbe (US) Character, Extent, and Severity of Corrosion in Continuously Reinforced (CRC) Pavements for Service-Life Extension and Improved Sustainability	407
E. Vesikari (FI) & R.M. Ferreira (PT) Service Life Assessment for refurbishment concepts of concrete façades	411
Jonny Nilimaa, Björn Täljsten & Thomas Blanksvärd (SE) Post-Tensioning of Reinforced Concrete Trough Bridge Decks	415
Martin C. Nilsson, Ulf Ohlsson, Mats Emborg & Lennart Elfgren (SE) Fastenings (Anchor Bolts) in Concrete Structures – Influence of surface reinforcement	419
Gabriel Sas, Thomas Blanksvärd, Jonny Nilimaa, Björn Täljsten, Lennart Elfgren, Anders Bennitz & Anders Carolin (SE) Strengthening of Concrete Structures with Carbon Fibre Reinforced Polymers (CFRP) – Case studies	423
SUSTAINABLE CONCRETE MATERIALS – A (Session 2)	
Terje Kanstad, Mette Rica Geiker, Giedrius Zirgulis & Elena Vidal Sarmiento (NO) Flowable Fibre Reinforced Concrete: Materials development, fibre distribution and structural properties	429
Lars Elof Bryne & Anders Ansell (SE) Laboratory testing of the bond strength between shotcrete and rock	433

Seong-Cheol Lee, Jung-Hwan Oh, Da-Hye Min & Jae-Yeol Cho (KR) Monotonic and Cyclic Tensile Behaviour of Steel Fibre Reinforced Concrete	437
Tristan Herbst, Katrin Rübner, Birgit Meng & Bruno Hauer (DE) Sustainable Evaluation - Concept to Assess the Applicability of Secondary Aggregates in Concrete	441
Bhavna Tripathi, Anurag Misra & Sandeep Chaudhary (IN) Permeability of Concrete Containing Pyrometallurgical Slag as Partial Replacement of Sand	445
SUSTAINABLE CONCRETE MATERIALS – B (Session 5)	
Carlo Pellegrino & Flora Faleschini (IT) Experimental Investigation on RC Beams containing Slag as Recycled Aggregate	451
S.A.A.M. Fennis, S. Grünwald, J.C. Walraven & J.A. den Uijl (NL) Influence of Particle Packing Density on the Rheology of Low Cement Content Concrete	455
Hyun Do Yun, Chang Sik Choi, Young Jae Song, Seok Jun Jang & Zhong Jie Yu (KR) Keitetsu Rokugo (JP) Freeze-Thaw Effect on the Flexural Behaviour of Plain Concrete Beams with a Layer of Sustainable Strain-Hardening Cement Composite (2SHCC)	459
Toshio Yonezawa, Etsuo Sakai, Kiyoshi Koibuchi & Mitsuo Kinoshita (JP) High-Slag Cement and Structures for Substantial Reduction of Energy · CO₂	463
Norbert Randl & Csaba Simon (AT) Monotonic and Cyclic Loading of High Performance Concrete Members with High Strength Reinforcement	467
SUSTAINABLE CONCRETE MATERIALS – C (Session 8)	
Ane de Boer & Cornelis van der Veen (NL) Longterm behaviour of cantilever concrete bridges	473
Karin Habermehl-Cwirzen, Vesa Penttala & Andrzej Cwirzen (FI) Roger Curtain, John Provis & Laura Gordon (AU) Sustainable Straw-based Cementitious Building Materials	477
Yuko Ogawa, Kimitaka Uji & Atsushi Ueno (JP) Effect of Fly Ash in Low Fraction	481
G.Saravanan, C. Antony Jeyasehar, S.Thirugnanasambandam & S.Kandasamy (IN) Development of Fly Ash Based Geopolymer Precast Concrete Elements	485

SUSTAINABLE CONCRETE MATERIALS – D (Session 11)	
Ildiko Merta & Elmar K. Tschegg (AT)	
Uniaxial Fracture Energy of Natural Fibre Concrete	491
Douglas Reid (EE) & Vaclav Vimmr (CZ)	
Concrete mix utilising oil shale ash	495
Paolo Corvaglia & Alessandro Largo (IT)	
Marios Soutsos (UK)	
Sustainable, innovative and energy-efficient concrete, based on the integration of all-waste materials: the SUS-CON Project	499
Juan J. Soto-Bernal, M. Rosario Moreno-Virgen, Jose A. Ortiz-Lozano, M. Rosario Gonzalez-Mota & Iliana Rosales-Candelas (MX)	
CO₂ laser radiation effects on physical, mechanical and microstructural properties of Portland cement pastes	503
SUSTAINABLE CONCRETE PAVEMENTS (Session 20)	
Juan Lima (ES) & Hans-Rudolf Ganz (CH)	
PT Slab on Ground: a Sustainable Solution	509
Maria Meinel, Hans-Carsten Kühne & Wolfram Schmidt (DE)	
Multilayer Concrete Pavers – Solutions for the Mitigation of the Urban Heat Island Effect	513
Dallshad K.H. Amen Bzeni, Rafah Rasheed & Ahmed H. Mohammad (IQ)	
Porosity, Pore Size Distribution and Permeability Evaluation of Porous Concrete Using Image Analysis	517
Elia Boonen & Anne Beeldens (BE)	
Photocatalytic concrete: purifying the air through the pavement	521
Nadim Wehbe, Richard Reid, Jason Stripling & Hesham Mahgoub (US)	
Optimization of Concrete Mixtures for Sustainable Jointed Plain Concrete Pavement	525
SUSTAINABLE CONCRETE PRODUCTION, RHEOLOGY AND FLOW (Session 9)	
George Croitoru & Augustin Popaescu (RO)	
Study about regularly tests for conformity on r.c. and p.c. electrical poles. Tests results and recommendations	531
Christian Heese, Wolfgang Breit, Frank Schuler, Arnulf Latz & Dariusz Niedziela (DE)	
Simulation of the Flow and Form Filling Behavior of UHPC with Fibers	535
Susanne Fröhlich, Christoph Glotzbach & Michael Schmidt (DE)	
Measuring Air Content and Rheological Characteristics of UHPC Mortars	539

SUSTAINABLE CONCRETE STRUCTURES – A (Session 21)	
Kenichiro Ashizuka, Kenji Miyamoto, Kenichi Kata & Akio Kasuga (JP)	
Construction of a Butterfly Web Bridge	545
Josef Hegger, Martin Claßen, Joerg Gallwoszus & Tobias Dreßen (DE)	
Integrated and sustainable floor-slab-systems in composite construction	549
Johan Silfwerbrand (SE)	
The Effect of Climate Changes on Concrete, Concrete Structures, and Concrete Construction	553
Takashi Ishikawa, Takashi Yamamoto, Satoshi Takaya & Toyo Miyagawa (JP)	
Bond Performance between ASR Affected Concrete and Reinforcement	557
Jonas Thor Snæbjörnsson (IS)	
Short- and long term changes in dynamic characteristics of a medium rise RC building	561
SUSTAINABLE CONCRETE STRUCTURES – B (Session 24)	
E.h Werner Sobek & Jan Mittelstädt (DE)	
Development of a Sustainable Construction Method for Segmented Thin Walled Concrete Structures	567
Tor Ole Olsen (NO)	
Marine Concrete Structures for the Future	571
Josef Hegger, Joerg Gallwoszus, Sabine Heinemeyer, Markus Feldmann, Max Gündel & Maik Kopp (DE)	
New Systems for Composite Constructions – Fatigue Analysis	575
Josef Knitl (DE)	
New Generation of Wind Power Plants – Hybrid Wind Power Plants with High Performance Self-Compacting Concrete	579
Ann Van Gysel & Joren Andries (BE)	
Study of the Flexural Behaviour of Reinforced Recycled Aggregate Concrete Beams	583
Arastoo Hedayatnasab (IR)	
Mukesh Limbachiya & Hsein Y. Kew (UK)	
Recycled Aggregates and Reuse in Steel-Reinforced Recycled Concrete Beams Made with Equal Strength Recycled Concretes	587
SUSTAINABLE CONCRETE STRUCTURES – C (Session 27)	
Jan Biliszczuk, Jerzy Onysyk, Robert Toczkiwicz, Robert Toczkiwicz, Przemysław Prabucki, Mariusz Sułkowski & Krzysztof Sadowski (PL)	
Construction of Multi-Span Motorway Viaducts Using Various Technologies	593

Demetris Nicolaidis, Pericles Savva, Antonios Kanellopoulos & Michael F. Petrou (CY)	
Static response of UHPFRCC slab specimens	597
Hiroto Takatsu, Tooru Hirade, Yasuyoshi Miyauchi & Toshio Yonezawa (JP)	
Seismic Behaviour of Reinforced Concrete (RC) and Concrete Filled Tube (CFT) Columns using Energy and CO₂ Minimum (ECM) Cement	601
Lars Elof Bryne & Björn Lagerblad (SE)	
Texture and bond at the interfacial zone between rock and sprayed concrete	605
Natalia Sabourova, Nikas Grip, Arto Puurula, Ola Enochsson, Yongming Tu, Ulf Ohlsson, Martin Nilsson, Lennart Elfgren & Anders Carolin (SE)	
The Railway Concrete Arch Bridge over Kalix River - Dynamic Properties and Load Carrying Capacity	609
Pierre-Claude Aïtcin, Arezki Tagnit-Hamou & Sydney Mindess (CA)	
Building Highly Sustainable Concrete (HSC) Structures	613
THERMAL MASS, ENERGY STORAGE & FIRE PROTECTION (Session 17)	
Joakim Albrektsson, Robert Jansson & Johan Silfwerbrand (SE)	
Assessment of fire exposed concrete structures	619
Peter Holzer & Daniela Trauninger (AT)	
The Usage of Thermal Concrete Mass for Lowest Energy Buildings	623
Peter Roots & Carl-Eric Hagentoft (SE)	
Efficient use of thermal mass in buildings	627
Jonathan Karlsson, Lars Wadsö & Mats Öberg (SE)	
A conceptual model that simulates the influence of high thermal inertia in building structures	631
ORGANIZING COMMITTEE	635
SCIENTIFIC COMMITTEE	637
AUTHOR INDEX	639

OPENING

(Opening session)