

Technical Programme - Day 1: Monday 27th June 2022

EHB.1.04 (Plenary room)	EHB.1.10A	EHB.1.10B
<p><b>09:15 Welcome</b>  <i>Opening by Conference Chair: Richard Buswell</i>  <i>Welcome by RILEM President: Nicolas Rousset</i>  <i>Welcome by Vice Chancellor of Loughborough University: Professor Nick Jennings</i></p>		
<p><b>09:45 Keynote Presentations: Technology status and next steps</b>  <i>Chair: Nicolas Rousset</i></p>		
<p>09:45 <b>Technology Readiness and conference framework,</b>  <i>Richard Buswell, on behalf of Professor Guowei Ma</i></p>		
<p>10:15 <b>A road map for quality control of hardening and hardened printed concrete</b>  <i>Viktor Mechtcherine</i></p>		
<p>10:45 <b>Break</b></p>	<p>* Extended Abstracts</p>	
<p><b>11:30 Wet material property control</b>  <i>Chair: Mohammed Sanebi</i></p>	<p><b>Binders and aggregates: 1 - strain hardening</b>  <i>Chair: Steffen Mueller</i></p>	<p><b>Printability and set control: 1</b>  <i>Chair: Alexandre Pierre</i></p>
<p>11:30 <b>Automated quality control for additive manufacturing by visual inspection of near nozzle droplet formation</b>  <i>Derk Bos, Rob Wolfs</i></p>	<p>Development of Cementitious Metamaterial with Compressive Strain Hardening Characteristics  <i>Keisuke Nishijo, Motohiro Ohno, Tetsuya Ishida</i></p>	<p>Using limestone powder as a carrier for the accelerator in extrusion-based 3D concrete printing  <i>Yixin Tao, Karel Lesage, Kim Van Tittelboom, Yong Yuan, Geert De Schutter</i></p>
<p>11:45 <b>Microbrilliated cellulose as a new approach to tune the rheological behavior of cementitious composite for 3D printing applications *</b>  <i>Hesam Taheri, Arnaud Perrot, Shih Kawashima</i></p>	<p>Properties of 3D-Printable Ductile Fiber-Reinforced Geopolymer Composite  <i>Shin Hau Bang, Behzad Nematollahi, Venkatesh Naidu Nerella, Viktor Mechtcherine</i></p>	<p>A strain-based constitutive model ensuring aesthetic 3D printed concrete structures: Limiting differential settlement of filaments  <i>Jacques Kruger, Jean-Pierre Mastert, Gideon van Zijl</i></p>
<p>12:00 <b>Test methods for assessing fresh and plastic-state 3D concrete printing materials</b>  <i>John Kolawole, Danny De-Becker, Jie Xu, James Dobrzanski, Sergio Cavalero, Richard Buswell, Simon Austin</i></p>	<p>Feasibility of using ultra-high ductile concrete to print hollow structure without steel reinforcement  <i>Junhong Ye, Yiwei Weng, Jiantao Yu, Md Nasir Uddin</i></p>	<p>Set-on demand concrete by activating encapsulated accelerator for 3D printing  <i>Sasitharan Kanagasuntharam, Sayanthan Ramakrishnan, Jay Sanjayam</i></p>
<p>12:15 <b>Measuring Plastic Shrinkage and Related Cracking of 3D Printed Concretes</b>  <i>Vlacheslav Markin, Viktor Mechtcherine</i></p>	<p>Incorporation and characterization of multi-walled carbon nanotubes concrete composites for 3D printing applications  <i>Albanoia Dulaj, Monica Sulji, Theo Salet, Sandra Lucas</i></p>	<p>Monitoring strain using digital image correlation during compressive and tensile loading: assessment of critical strain of cement-based materials  <small>Presented by VMA</small>  <i>Yohan Jacquet, Arnaud Perrot, Vincent Picandet</i></p>
<p>12:30 <b>Material design and rheological behavior of sustainable cement-based materials in the context of 3D printing</b>  <i>Silvia Reijß, Viktor Mechtcherine</i></p>	<p>Consistency of mechanical properties of 3D printed strain hardening cementitious composites within one printing system  <i>Karsten Neffs, Anne Linde Overmeier, T.A.M. Salet, A.S.J. Suiker, Erik Schlangen, B. Savija, F.P. Bos</i></p>	<p>Temperature impact on the structural build-up of cementitious materials – experimental and modelling study  <i>Alexander Mezhev, Annika Robens-Rademacher, Kun Zhang, Hans-Carsten Kühne, Jörg F. Unger, Wolfram Schmidt</i></p>
<p>12:45 <b>Lunch</b></p>		
<p><b>13:45 Printability and set control: 2</b>  <i>Chair: Jacques Kruger</i></p>	<p><b>Heterogeneities and defects: 1</b>  <i>Chair: Daniel Weger</i></p>	<p><b>Reinforcement: 1</b>  <i>Chair: Sergio Cavalero</i></p>
<p>13:45 <b>Experimental study on elastic and creep properties of 3D printed concrete at early age *</b>  <i>Ze Chang, Yading Xu, Erik Schlangen, Branka Savija</i></p>	<p>Digitally fabricated keyed concrete connections  <i>Patrick Bischof, Jaime Mata-Falcon, Jois Burger, Walter Kaufmann</i></p>	<p>Injection 3D Concrete Printing: Integration of Structural Reinforcement *  <i>Allieen Vandenberg, Yiran Xiao, Noor Khader, Harald Kloft, Norman Hack, Dirk Lowke</i></p>
<p>14:00 <b>A Thixotropic Model for Predicting the Buildability for 3D Printable Concrete *</b>  <i>Prabhat Ranjan Prem, P.S. Ambily, Swapnil Balasahab Ghadke, Shankar Kumar</i></p>	<p>The environment's effect on the interlayer bond strength of 3D printed concrete  <i>Gerrit Moelich, JJ Janse van Rensburg, Jacques Kruger, Riaan Combrink</i></p>	<p>Core Winding: Force-flow oriented fibre reinforcement in Additive Manufacturing with concrete  <i>Stefan Gantner, Philipp Renner, Tom Rothe, Christian Hühne, Norman Hack</i></p>
<p>14:15 <b>Printability assessment of cement-based materials using uniaxial compression test</b>  <i>Ithame Harbouz, Ammar YAHIA, Emmanuel Rozière, Ahmed Loukili</i></p>	<p>Evaluation of the bond strength between 3D printed and self-compacting concrete  <i>Michiel Bekeert, Kim Van Tittelboom, Geert De Schutter</i></p>	<p>Fabrication of freeform reinforcement by robotic laying of carbon yarns and its combination with 3D concrete printing *  <i>Egor Ivanjuk, Viktor Mechtcherine</i></p>
<p>14:30 <b>Early age shear and tensile fracture properties of 3D printable cementitious mortar to assess printability window</b>  <i>Andrea Maruccci, Sriram Kompella, Francesco La Monte, Marinella Levi, Liberato Ferrara</i></p>	<p>Interlayer mechanical strengths of 3D printing geopolymer: measurement and origin *  <i>Yuning Chen, Chao Liu, Yamel Zhang</i></p>	<p>Robotically placed reinforcement using the Automated Screwing Device – an application perspective for 3D concrete printing  <i>Lauri Hass, Freek Bos</i></p>
<p>14:45 <b>Break</b></p>		
<p><b>15:30 Invited presentations from CCR SI: Quality control</b>  <i>Chair: Dirk Lowke</i></p>		
<p>15:30 <b>Assessing the fresh properties of printable cement-based materials: high potential tests for quality control</b>  <i>Nicolas Rousset, Richard Buswell, Nicolas Ducoulombier, Jirui Ivanovic, John Termitope Kolawole, Dirk Lowke, Viktor Mechtcherine, Romain Mesnil, Arnaud Perrot, Ursula Patt, Lea Reiter, Diemar Stephan, Timothy Wangler, Rob Wolf, Zuo, Wenzhang</i></p>		
<p>16:00 <b>A chemical process engineering look at digital concrete processes: critical step design, inline mixing, and scaleup</b>  <i>Tim Wangler, Rajat Pileggi, Seyma Günel, Robert J. Flatt</i></p>		
<p>16:30 <b>Geometric quality assurance for 3D concrete printing and hybrid construction manufacturing using a standardised test part for benchmarking capability</b>  <i>Richard Buswell, Jie Xu, Daniel De Becker, James Dobrzanski, John Provis, John Termitope Kolawole, Peter Kinnel</i></p>		
<p>17:00 <b>Paper dart session: quality for commercialisation - what do we need and how do we get there?</b>  <i>Chair: Rob Wolfs</i></p>		
<p>17:30 <b>Housekeeping</b></p>		
<p>17:45 <b>End of Day 1</b></p>		
<p>17:45 <b>Lab tour</b></p>		
<p>19:00 <b>End of Tour</b></p>		

Technical Programme - Day 2: Tuesday 28th June 2022

<b>EHB.1.04 (Plenary room)</b>	
<b>09:00 Welcome back and housekeeping</b>	<i>Richard Buswell</i>
<b>09:15 Keynote Presentations: Lessons learnt from the field</b>	<i>Chair: Viktor Mechtcherine</i>
<b>09:15 The Realities of Additively Manufactured Concrete Structures in Practice</b>	<i>Freek Bos</i>
09:45 <b>7 Title 7</b>	<i>Eric Kreiger</i>
<b>10:15 Sponsors address</b>	
10:15 Synthomer	<i>Charles Babichon</i>
10:20 Sika	<i>?</i>
<b>10:30 Break</b>	
<b>11:00 Poster session: lightning presentations by poster convenors</b>	<i>Chair: Wilson Leal da Silva</i>
<b>Design, defects and durability</b>	<i>Liberto Ferrara</i>
<b>Digital design and control</b>	<i>Natali Hack</i>
<b>Wet material property control</b>	<i>Alban Vandenberg</i>
<b>Binders and aggregates</b>	<i>Bekir Almazlali</i>
<b>Case studies and applications</b>	<i>Jean-François Caron</i>
<b>Printability and set control</b>	<i>Johan Van Der Putten</i>
<b>Reinforcement</b>	<i>Corasantho Almona</i>
<b>Alternative Processes</b>	<i>Romain Alami</i>
<b>11:30 Poster session: parallel session in poster hall</b>	See poster session programme
	Lunch with event
	* Extended Abstracts
<b>12:45 Structural design and optimisation</b>	<i>Chair: Muhammad Nurul Isa</i>
<b>12:45 Injection 3D Concrete Printing (I3DCP) Combined with Vector-based 3D Graphic Statics</b>	<i>Yinan Xiao, Noor Khader, Aileen Vandenberg, Dirk Louwe, Harald Klöf, Norman Hack</i>
<b>13:00 The production of a topology-optimized 3D printed concrete bridge</b>	<i>Ticho Ooms, Gieljon Vasthyghem, Yavin Tao, Michiel Bekoert, Geert De Schutter, Kim Van Tittelboom, Wouter De Corte</i>
<b>13:15 Mesh Mold Prefabrication</b>	<i>Amstar Mirjan, Jaime Mata Falcón, Carsten Rieger, Janin Herkroth, Walter Kaufmann, Fabio Gramazio, Matthias Kohler</i>
<b>13:30 I3DCP structures: the roadmap to standardization</b>	<i>Martijn Bruurs, Maarje Hoogeveen, Jolien Van Der Putten</i>
<b>13:45 Break</b>	
<b>14:15 Particle bed binding</b>	<i>Chair: Niklas Freund</i>
<b>14:15 Evaluating the Effect of Methyl Cellulose on Hardened State Properties in Selective Cement Activation</b>	<i>Inka Mei, Friedrich Herding, Dirk Louwe</i>
<b>14:30 Effect of Curing in Selective Cement Activation</b>	<i>Friedrich Herding, Inka Mei, Dirk Louwe</i>
<b>14:45 Particle Bed Technique For Hempcrete</b>	<i>Valentine Danché, Alexandre Pierre, Khadim Ndiaye, Tien-Tung Ngo</i>
<b>15:00 Selective Paste Intrusion: Stability of cement paste mixtures towards changing ambient temperature</b>	<i>Alexander Strajler, Carlo Matthäus, Daniel Weger, Thomas Kränkel, Christoph Gehlen</i>
<b>15:15 Break</b>	
<b>16:00 Sponsors address</b>	
16:00 Elhem	<i>Ahmed Khalifa</i>
16:05 COBOD/Nextcon	<i>Henrik Lund-Nielsen / Wilson Leal da Silva</i>
<b>16:15 Invited presentations from CCR SI: Particle-bed printing</b>	<i>Chair: Armand Perrot</i>
16:15 Material-process interactions in particle bed 3D printing and the underlying physics	<i>Dirk Louwe, Inka Mei, Emmanuel Kalla, Armand Perrot, Daniel Weger, Christoph Gehlen, Friedrich Herding, Wenqiang Zan, Nicolas Bussler</i>
16:45 A structural fibre-reinforced cement-based composite oriented to particle bed 3D printing systems. Case study: Parque de Castilla (Alcobendas, Madrid) Footbridge.	<i>Alberto Ferrás, Ana Belén Gámez-Gutiérrez, Sergio Cervera</i>
<b>17:15 Paper dart session: designing for digital fabrication, what will the next generation of design tools look like?</b>	<i>Chair: Manu Santhanam</i>
<b>17:45 Housekeeping</b>	
<b>18:00 End of Day 2</b>	

<b>EHB.1.10A</b>	
<b>Material Jetting</b>	<i>Chair: Xiaoming Zhou</i>
Influence of material and process parameters on hardened state properties of Shotcrete 3D-printed elements	<i>David Bahler, Inka Mei, Niklas Freund, Lukas Lochmayer, Anika Raatz, Dirk Louwe</i>
Shotcrete 3DCP projection angle optimization: experimental approaches and theoretical modelling	<i>Benjamin Gali, Thierry Lisenbacher, Agnès Petit, Vincent Bourquin, Aurélie FAVIER</i>
A 3D Printing Platform for Reinforced Printed-Sprayed Concrete Components	<i>Lex Reiter, Ana Anton, Timothy Wangler, Benjamin Dillenburger, Robert Flatt</i>
ARCS: Automated Robotic Concrete Spraying for the fabrication of variable thickness doubly curved shells	<i>Mishael Nuh, Robin Oval, John Orr</i>
<b>Digital design, workflow and control 1</b>	<i>Chair: Jie Xu</i>
Filament geometry control in 3D concrete printing: printing regimes and practical design guidelines *	<i>Rob Wolff, Nicolas Rausser</i>
Uncertainty quantification of concrete properties at fresh state and stability analysis of the 3D printing process by stochastic approach	<i>Zeinab Diab, Duc Phi Do, Sébastien Rémond, Doshnor Hoaho</i>
Influence of Infill Pattern on Reactive MJO Printed Structures	<i>AlaEddin Douba, Palash Badjatya, Shiba Kawashima</i>
Simulation of 3D Concrete Printing using the Discrete Element Method	<i>Knut Krenzer, Ulrich Patzer, Steffen Müller, Viktor Mechtcherine</i>

<b>EHB.1.10B</b>	
<b>Reinforcement 2</b>	<i>Chair: Leif Hass</i>
Integrating reinforcement with 3D Concrete Printing: Experiments and numerical modelling	<i>Jon Spangenberg, Wilson Ricardo Leal da Silva, Mj Tusher Mollath, Raphael Caminot, Thomas Juul Andersen, Henrik Stang</i>
Preinstalled reinforcement for 3D concrete printing	<i>Lukas Gebhard, Patrick Bischof, Ana Anton, Jaime Mata Falcón, Benjamin Dillenburger, Walter Kaufmann</i>
Fundamental study on automated interlayer reinforcing system with metal fiber insertion for 3D concrete printing	<i>Tomoya Asakawa, Tomoya Nishiwaki, Kazunari Ohno, Shigeru Yokoyama, Yoshito Okada, Shotaro Kajima, Youichi Satake, Yoshihiro Miyata, Yuki Miyazawa, Yushei Ito, Hideyuki Kajita</i>
Flow-Based Pultrusion of Anisotropic Concrete : Mechanical properties at hardened state	<i>Léo Demont, Malo Charrier, Pierre Margerit, Nicolas Ducoulombier, Romain Mesnil, Jean-François Caron</i>
<b>Binders and aggregates: 2 - aggregates</b>	<i>Chair: Yavin Tao</i>
Fresh and hardened properties of 3D printable foam concrete containing porous aggregates	<i>Kirubajany Pasupathy, Sayanthan Ramakrishnan, Jay Sarjayan</i>
Sustainable 3D Concrete Printing with Large-aggregates	<i>Wilson Ricardo Leal da Silva, Martin Kaasgaard, Thomas Juul Andersen</i>
Design and Fabrication of Spatially Graded Concrete Elements with Ice Aggregate Method	<i>Vasily Strilkov, Eleni Kitani, Artemis Maniaki, Ena Lioret-Fritsch, Junry Lee, Benjamin Dillenburger</i>
Mix design for a 3D-printable concrete with coarse aggregates and consideration of standardization	<i>Marius Taubert, Viktor Mechtcherine</i>

Technical Programme - Day 2: Tuesday 28th June 2022: Parallel Poster Sessions

	Poster hall	Poster hall	Poster hall			
11:30	<p><b>Design, defects and durability</b> Poster convenor: <i>Leandro Ferrara</i></p> <p><b>Mechanical behavior of 3D printed hourglass shape of cementitious mortar into carrier liquid</b> <i>Abdelhak KACI, Alexandre PIERRE, Yannick MELINGE</i></p> <p><b>The Effects of 3D Printing on Durability of Concrete</b> <i>Ella Spurina, Maris Sinka, Laura Vitola, Kristis Ziemeļis, Aleksandrs Karjākins, Andris Vanags, Dāna Bajāre</i></p> <p><b>Drying-induced damages in fresh cement-based materials during extrusion-based additive manufacturing</b> <i>Wenqiang Zuo, Emmanuel Keita, Patrick Almedieu, Michel Barneri, Nicolas Roussel</i></p> <p><b>Application of X-ray micro-computed tomography for evaluations of 3D printed concrete</b> <i>Pawel Sikora, Sang-Yeop Chung, Karol Federowicz, Mateusz Techman</i></p> <p><b>Evaluation of the interfacial bond strength between layers in extrusion-based 3D concrete printing</b> <i>Behzad Zabihzadeh, João Pereira, Cláudio Gonçalves, Vitor Cunha</i></p> <p><b>Factors influencing the void generation and distribution in 3D concrete printing</b> <i>John Kolawole, Sultan Mahmood, Dirk Engelberg, Sergio Cavallaro, Richard Buswell, Simon Austin</i></p> <p><b>Efficient structural modelling of 3d-printed structures through periodic homogenization</b> <i>Romain Mesnil, Valentin Poussard, Jean-François Caron, Karim Sab</i></p> <p><b>Towards the Application of Mesostructures in 3D Concrete Printing</b> <i>Helena Westerlind, José Hernández Vargas, Johan Sijwerbrand</i></p> <p><b>Assessing the shear capacity of 3dcp box girders using destructive testing</b> <i>Marijn Brauers, Maartje Hoogeveen, Jolien Van Der Pijpen</i></p> <p><b>Cyclic response of a 3D printed concrete shear wall made with concrete extrusion</b> <i>Lucia Licciardello, Adriano Reggio, Maurizio Marchi, Giovanni Metelli, GIOVANNI PLIZZARI</i></p>	<p><b>Digital design and control</b> Poster convenor: <i>Normi Håk</i></p> <p><b>A digital workflow for the design and manufacturing of 3D printed concrete bridges in a circular economy</b> <i>Matthew Ferguson, Rong Yu, Rob Wolfs, Theo Salet</i></p> <p><b>Robotic On-Site Adaptive Thin Layer Printing: Challenges and Workflow for Design and Fabrication of Bespoke Cementitious Plasterwork at Full Architectural Scale</b> <i>Selen Ercan Jenny, Daniele Mitterberger, Ena Lorea-Fritschi, Lauren Vasey, Eliott Saunigo, Ping-Hsun Tsoi, Petrus Aejmelaeus-Lindström, David Jenny, Fabio Gramazio, Matthias Kohler</i></p> <p><b>Efficient voxel-based simulation of an extrusion-based 3D concrete printing process considering process and material uncertainties</b> <i>Albrecht Schmidt, Lise Göbel, Tom Lahmer, Carsten Könke</i></p> <p><b>Compensation method based on variable flow for intersecting toolpaths</b> <i>José Hernández Vargas, Helena Westerlind, Johan Sijwerbrand</i></p> <p><b>Quality control of printed concrete using computer vision</b> <i>Abdihak KACI, Sami HAMAQ, Ibrahim DAKRHERIF, Rachid CHELOUAH</i></p> <p><b>Inline Measurement System for Automated Quality Assurance of 3D Printed Concrete Structures</b> <i>Dmitri Sokolov, Viktor Mechtcherine</i></p>	<p><b>Wet material property control</b> Poster convenor: <i>Alexis Vanhoussem</i></p> <p><b>Investigation of different rheological testing methods to evaluate the fresh properties of printable mortars</b> <i>Hamid Bayat, Alireza Kashani</i></p> <p><b>Effect of nanoclay on extrudability, printability and mechanical performance of extrusion-based 3D printing mortar (3DPM)</b> <i>Sandipan Kausik, Mohammed Sanebi, Giuseppina Amato, Arnaud Perrot, Utpal Kumar Das</i></p> <p><b>Towards an in-line measurement system to predict and control the quality of 3D printed concrete</b> <i>Jelle Verstege, Rob Wolfs, Theo Salet</i></p> <p><b>Effect of polypropylene fiber content on the shape retention and strength of 3D printed concrete</b> <i>Beatriz Silva, Rodrigo Santos, Ana Mayara S. Negevras, Marcos Anjos, Leonardo Dias, Marcelle Barbosa, Ulisses Bezerra</i></p> <p><b>Concrete admixtures: the key element to widespread the use of locally produced concrete in 3DCP</b> <i>Ramzi Faru, Kai-Steffen Weldert, Wilson Ricardo Leal do Silva, Andreas Eisenreich</i></p> <p><b>Evaluation of printability using cone plunger test to determine suitable material for 3D concrete printing</b> <i>Yoshihiro Miyata, Tamayo Aikawa, Tamayo Nishiwaki, Yuki Miyazawa, Youhei Ito, Hideoaki Kojima</i></p> <p><b>In-line assessment of printable concrete dynamic yield stress by "Slugs-test" series</b> <i>Léa Demont, Pierre Margenti, Malo Charrier, Romain Mesnil, Jean-François Caron</i></p> <p><b>Mix design insights for printable mortars based on structural build-up rate requirements</b> <i>Luiza Miranda, Karel Lesage, Geert De Schutter</i></p> <p><b>Effects of fiber length on fiber stability of SHCC and 3D printing process</b> <i>Nuyuan Xu, Ye Qian</i></p>			
	12:45	Start of oral parallel sessions				
	11:30	<p><b>Alternative Processes</b> Poster convenor: <i>Romain Mesnil</i></p> <p><b>Assessment of scale up criteria of Digital Casting Systems and inline mixing process</b> <i>Seyma Gürel, Timothy Wangler, Ena Lorea-Fritschi, Robert Flatt</i></p> <p><b>Advantages of Two-Stage-Concrete in Scale-up of Digital Casting Systems</b> <i>Seyma Gürel, Timothy Wangler, Ena Lorea-Fritschi, Robert Flatt</i></p> <p><b>3D printed shell formwork for shape optimized concrete slabs</b> <i>Alexander Curth, Ashley Hartwell, Tim Brodreser, Catilin Mueller</i></p> <p><b>Design, fabrication, and testing of an optimised reinforced concrete floor slab fabricated with robotically 3D printed formwork</b> <i>Joris Burger, Tobias Huber, Jaime Mata-Falcón, Ena Lorea-Fritschi, Walter Kaufmann, Fabio Gramazio, Matthias Kohler</i></p> <p><b>Power Floating Plastic-state Concrete for Additive Manufacturing Applications</b> <i>Sidou Lei, Richard Buswell, Peter Kinnell, Sarah Dhanraj, John Kolawole, James Dobrzanski, Jie Xu</i></p> <p><b>Methods of manufacturing large size wax blocks: an important puzzle piece for the industrial Non-Waste-Wax-Formwork technology</b> <i>Sven Janischkies, Jędrzik Mańka, Harald Klopf, Norman Hack</i></p>	<p><b>Printability and set control</b> Poster convenor: <i>Jolien Van Der Pijpen</i></p> <p><b>Rheology and extrudability of 3D printing cement-based systems with nanoclays and viscosity modifiers</b> <i>Hugo Varela, Gonzalo Barluengo, Yohan Jacquet, Arnaud Perrot</i></p> <p><b>Influence of sand/cement and water/cement ratio on the fresh state behavior of 3DCP mixture</b> <i>Marcos Anjos, Leonardo Dias, Marcelle Barbosa, Ulisses Bezerra</i></p> <p><b>Outcome of shotcrete accelerators on the evolution of physicochemical properties of self-compacting mortar used for 3DCP (3D Concrete Printing)</b> <i>Atta Ur Rehman, YOUNGWOOD SHIM, Birru Bizu Melesse, Jung-Hoon Kim</i></p> <p><b>Thixotropic behavior of 3D printable cement-based materials</b> <i>Ilhame Harbouz, Ammar YAHIA, Emmanuel Rozière, Ahmed Loukili</i></p> <p><b>Development of a Universal 3D Printable Concrete Solution</b> <i>Daive Zampini, Alexandre Guerin, Jeremy Esser, Jakob Jørgensen, Zaid Marmash, Alma Bangsgaard, Henrik Lund-Nielsen</i></p>	<p><b>Reinforcement</b> Poster convenor: <i>Colossalima Maria</i></p> <p><b>Bond Behavior of Additive Manufactured Reinforcement Bars with Different Types of Surface Profiles</b> <i>Niklas Freund, Johanna Müller, Jonas Hensele, Dirk Lowke</i></p> <p><b>Evaluation of Flexural Performance of Cementitious Composites Reinforced with Additively Manufactured Architected Polymeric Elements</b> <i>Pansa Namakornragit, Robert Senege, Yaghoob Farzam</i></p> <p><b>Additive manufacturing of structurally reinforced concrete elements through spraying</b> <i>Bartomej Sawicki, Agnès Petit</i></p> <p><b>Shape retention and strength of sisal fiber reinforced 3D printed concrete</b> <i>Vinicius Maia, Arthur Lima, Gabrielly Nunes, Marcos Anjos, Leonardo Dias, Marcelle Barbosa, Maxwell P. O. Santos</i></p> <p><b>Assessing the positional accuracy of robot grippers in pick and place operations for steel rebars during 3DCP process</b> <i>Xingsi Liu, James Dobrzanski, Danny De Becker, Jie Xu, John Kolawole, Richard Buswell, Sergio Cavallaro</i></p>		
		12:45	Start of oral parallel sessions			
		11:30	<p><b>Binders and aggregates</b> Poster convenor: <i>Behzad Nematollahi</i></p> <p><b>Comparative study of different recycled fine aggregates for 3D printing mortars</b> <i>Raghad AL THIBI, Mohamed Elkarim Bouarraudj, Naïma Belayachi, Nicolas Courtois, Sébastien Rémond, David BULTEEL</i></p> <p><b>Hempcrete - CO2 neutral wall solutions for 3D printing</b> <i>Maris Sinka, Ella Spurina, Aleksandrs Karjākins, Dāna Bajāre</i></p> <p><b>Effect of aggregates volume fraction on the tensile behaviour of fresh cement-based materials</b> <i>Yohan Jacquet, Vincent Picandet, Arnaud Perrot</i></p> <p><b>Development of a lightweight 3D printed mixture with recycled glass aggregates</b> <i>Karla Cuevas, Falk Martin, Sang-Yeop Chung, Sen Pfeiffer, Pawel Sikora, Dietmar Stephan</i></p> <p><b>3D-printing development of low carbon building materials</b> <i>Manon Ardérou, Aurélie Fabien, Mohammed Sanebi, Daniel Chateigner, Nassim Sebaili</i></p> <p><b>Paste content Requirement for Printing with fly ash-slag Geopolymers</b> <i>Sri Rabi Kondepuadi, Kaluru Subramanian, Behzad Nematollahi, Jay Sanjayan</i></p> <p><b>Formulation of geopolymer based concrete for sustainable 3D printing</b> <i>Corentin Le Gall, Willy Jin, Charlotte Roux, Myriam Duc, Julien Archez, Claudiane Ouellet-Pilonmond, Adélaïde Feraille, Jean-François Caron</i></p> <p><b>Rheology of alkali-activated materials made of fly ash, slag and recycled mineral wool for 3D printing</b> <i>Irving Alfredo Flores Beltran, Joshua A. Dijkman, Branko Sovija, Guang Ye</i></p> <p><b>Gelatin as biologically-based binder in temperature-sensitive printing mortar for advanced free form constructions</b> <i>Julian Christ, Lisbeth M. Ottosen, Håger Kass</i></p> <p><b>Direct tensile behavior of 3D printed Ultra-High Performance Strain Hardening Cementitious Composites (UHP-SHCC) with 2vol% polyethylene (PE) fibers</b> <i>Yan Sun, Ye Qian</i></p> <p><b>Influence of Printing Parameters on 3D Printing Engineered Cementitious Composites (3DP-ECC)</b> <i>Wen Zhou, Yamei Zhang, Lei Ma, Victor Li</i></p>	<p><b>Case studies and applications</b> Poster convenor: <i>Jean-François Caron</i></p> <p><b>Usability of recycled gypsum powders for the formation of 3D-printed acoustic panels</b> <i>Lidija Kovat, Luka Štepec, Lucija Horžič, Mihael Ramšak</i></p> <p><b>Challenges during assembly of off-site 3D printed modules for construction of single storey building</b> <i>Hitesh Meena, Shantanu Bhattacharjee, Manu Santhanam</i></p> <p><b>Fabrication aware Modularization of Freeform Concrete Elements for Additive Formwork: An Agent-based Approach</b> <i>David Stieker, Tobias Schwinn, Achim Menges</i></p> <p><b>Lightweight reinforced concrete slab</b> <i>Georg Hansermann, Christoph Holzinger, Robert Schmid, Joshua P. Tapley, Stefan Peters, Andreas Trummer</i></p> <p><b>ICAMF: Vision of 3D Concrete Printed Renewables: Progress in the Development of Renewable Energy Support Structures</b> <i>Jason Costello, Gabriel Falcone, Mason Bell</i></p>		
			12:45	Start of oral parallel sessions		

Technical Programme - Day 3: Wednesday 29th June 2022

EHB.1.04 (Plenary room)	EHB.1.10A	EHB.1.10B
09:00 <b>Welcome back and housekeeping</b> <i>Richard Buswell</i>		
09:15 <b>Keynote Presentations: Mobile robotic positioning systems</b> <i>Chair: Freek Bos</i>		
09:15 <b>Additive Manufacturing Using Mobile Robots: Opportunities and Challenges for Building Construction</b> <i>Kathrin Dorfler</i>		
09:45 <b>Change rooms</b>	* Extended Abstracts	
09:55 <b>Reinforcement: 3</b> <i>Chair: Freek Bos</i>	<b>Heterogeneities and defects: 2</b> <i>Chair: John Kalawole</i>	<b>Digital design, workflow and control: 2</b> <i>Chair: Peter Kinnell</i>
09:55 <b>Integration of Mineral Impregnated Carbon Fibre (MCF) into fine 3D-printed concrete filaments</b> <i>Tobias Neef, Steffen Müller, Viktor Mechtcherine</i>	<b>Interlocking 3D printed concrete filaments through surface topology modifications for improved tensile bond strength</b> <i>Jean-Pierre Mastert, Jacques Kruger</i>	<b>A closed-loop workflow for quality inspection and integrated post-processing of 3D-printed concrete elements</b> <i>Norman Hack, Leon Brohmann, Markus Gerke, Mehdi Maboudi, Karam Mawas, Carsten Jantzen</i>
10:10 <b>Feasibility of pre-stressing 3D-printed concrete elements using iron-based shape memory alloy bars *</b> <i>Zafiris Triantafyllidis, Valha Semianiuk, Ana Anton, Mateusz Wyrzykowski, Benjamin Dillenburger, Moslem Shahverdi</i>	<b>Mechanical properties and failure pattern of 3D printed hollow cylinders and wall segments under uniaxial loading</b> <i>Shantanu Bhattacharjee, Smrati Jain, Manu Santhanam, G Thiruvkatamani</i>	<b>Generative Structural Design: A Cross-Platform Design and Optimization Workflow for Additive Manufacturing</b> <i>Saqib Aziz, JISU KIM, Dietmar Stephan, Christoph Gengenagel</i>
10:25 <b>Flexural behaviour of steel-reinforced topology-optimised beams fabricated by 3D concrete printing</b> <i>Costantino Menno, Laura Esposito</i>	<b>Impact of drying of 3D printed cementitious pastes on their degree of hydration</b> <i>Rita Ghantous, Yvette Valadez-Carranza, Steven Reese, Jason Weiss</i>	<b>Force flow compliant robotic path planning approach for reinforced concrete elements using SCSDP</b> <i>Robin Dörrie, Harald Kloft</i>
10:40 <b>Proof-of-concept: Sprayable SHCC Overlay Reinforcement Regime for Unreinforced 3D Printed Concrete Structure</b> <i>Seung Cho, Marchant van den Heever, Jacques Kruger, Gideon van Zijl</i>	<b>Interlayer bonding of 3D printed limestone-calcined clay-based cementitious materials *</b> <i>Yu Chen, Ze Chang, Oğuzhan Çapuroğlu, Erik Schlangen</i>	<b>Process Control for Additive Manufacturing of Concrete Components</b> <i>Lukas Lachmayer, Robin Dörrie, Harald Kloft, Annika Raatz</i>
10:55 <b>Break</b>		
11:30 <b>Binders and aggregates: 3 - alternative binders</b> <i>Chair: Inka Mai</i>	<b>Alternative process</b> <i>Chair: James Dobrzanski</i>	<b>Durability</b> <i>Chair: Branko Savija</i>
11:30 <b>Developing printable fly ash – slag geopolymers binders with Rheology modification</b> <i>Anasuya Kamakshi Tippabhotla, Kolluru Subramaniam</i>	<b>Adaptive foam concrete in digital fabrication</b> <i>Robert Schmid, Georg Hansemann, Michael Autischer, Joachim Juhart</i>	<b>Influence of the print process on the durability of printed cementitious materials</b> <i>Jolien Van Der Putten, Mathieu De Smet, Geert De Schutter, Kim Van Tittelboom</i>
11:45 <b>Formulation and characterization of a low carbon impact cementitious ink for 3D printing</b> <i>Estelle Hynes, David Bulteel, Antoine Urquizar, Sébastien Rémond</i>	<b>Mobile Additive Manufacturing: A case study of reusable clay formworks for bespoke in situ concrete construction</b> <i>Gida Dielemans, Lukas Lachmayer, Tobias Recker, Lidia Atanasova, Christian Maximilian Hecht, Carla Matthäus, Annika</i>	<b>Two Year Exposure of 3D Printed Cementitious Columns in a High Alpine Environment</b> <i>Timothy Wangler, Asel Maria Aguilar Sanchez, Ana Anton, Benjamin Dillenburger, Robert Flatt</i>
12:00 <b>Strategies for reducing the environmental footprint of additive manufacturing via sprayed concrete</b> <i>Aurelie Favier, Agnès Petit</i>	<b>Knit Casting – experiments in controlling concrete’s inflation for CNC manufactured knit formwork *</b> <i>Tsz Yan Ng, Sean Ahlquist, Evgueni Filipov</i>	<b>Freeze-thaw performance of 3D printed concrete: influence of interfaces</b> <i>Armesh Das, Asel Maria Sanchez, Timothy Wangler, Robert Flatt</i>
12:15 <b>Mechanical Performance of 3-D Printed Concrete Containing Fly Ash, Metakaolin and Nanoclay</b> <i>Ahmed Abdalqader, Mohammed Sanebi, Marie Dedenis, Sofiane Amziane, Arnaud Perrat</i>	<b>Zero-Waste Production of Lightweight Concrete Structures with Water-Soluble Sand Formwork</b> <i>Daria Kavaleva, Maximilian Nistler, Alexander Verl, Lucia Blandini, Werner Sobek</i>	<b>Salt scaling resistance of 3D printed concrete</b> <i>Manu Mohan, K. A. V. Rahul, Geert De Schutter, Kim Van Tittelboom</i>
12:30 <b>Accelerating early age properties of ultra-low clinker cements for extrusion-based 3D printing</b> <i>Rutendo Rusike, Michael Sataya, Alastair Marsh, Sergio Cavalara, Chris Goodier, Susan A. Bernal, Sam Adu-Amankwah</i>	<b>An early trial on milling 3D printed concrete geometries: observations and insights of the process</b> <i>Jie Xu, John Kalawole, John Provis, James Dobrzanski, Peter Kinnell, Sergio Cavalara, Weiqiang Wang, Richard Buswell</i>	<b>Evaluation of durability of 3D-printed cementitious materials for potential applications in structures exposed to marine environments</b> <i>Fabian Rodriguez, Cristian Garzon Lopez, Yu Wang, Jan Olek, Pablo D. Zavattieri, Jeffrey P. Youngblood, Gabriel Falzone, Jason Catrell</i>
12:45 <b>Lunch</b>		
13:30 <b>Invited presentations from CCR SI: Sustainability</b> <i>Chair: Dr. Ana Blanco</i>		
13:30 <b>Environmental impact of extrusion-based additive manufacturing - generic model, power measurements and influence of printing resolution</b> <i>Kateryna Kazmenko, Nicolas Ducommun, Adèle Ferallic, Nicolas Roussel</i>		
14:00 <b>On Sustainability and Digital Fabrication with Concrete</b> <i>Robert Flatt and Timothy Wangler</i>		
14:30 <b>Paper dart session: 3DCP - how are we going to realise the sustainability agenda in practice?</b> <i>Chair: Nicolas Roussel</i>		
15:00 <b>Awards and conference close</b> <i>Chairs: Nicolas Roussel and Richard Buswell</i>		
15:30 <b>Break</b>		
15:45 <b>Lab tours</b>		
17:30 <b>End of Day 3</b>		