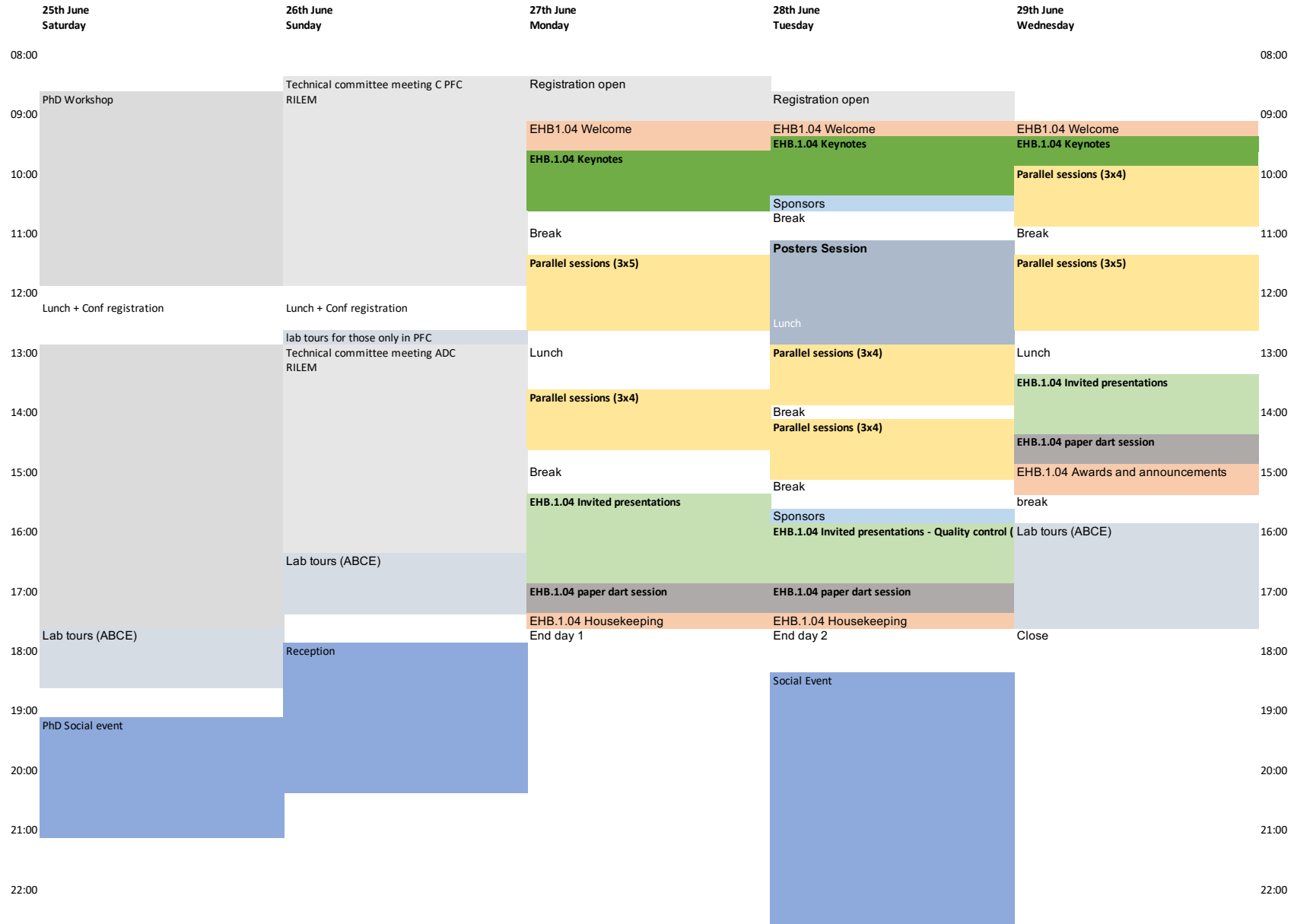


DC2022: 5 day plan at a glance



Technical Programme - Day 2: Tuesday 28th June 2022

	EHB.1.04 (Plenary room)	EHB.1.10A	EHB.1.10B
09:00	Welcome back and housekeeping		
09:15	Keynote Presentations: Lessons learnt from the field		
09:15	The Realities of Additively Manufactured Concrete Structures in Practice		
09:45	? Title. ?		
10:15	Sponsors address		
10:15	Synthomer		
10:20	Sika		
10:30	Break		
11:00	Poster session: lightning presentations by poster convenors <i>Chair: Wilson Leal da Silva</i>		
	Design, defects and durability		
	Digital design and control		
	Wet material property control		
	Binders and aggregates		
	Case studies and applications		
	Printability and set control		
	Reinforcement		
	Alternative Processes		
11:30	Poster session: parallel session in poster hall See poster session programme Lunch with event		
12:45	Structural design and optimisation	Material Jetting	Reinforcement: 2
13:45	Break		
14:15	Particle-bed binding	Digital design, workflow and control: 1	Binders and aggregates: 2 - aggregates
15:15	Break		
16:00	Sponsors address		
16:00	Elhem		
16:05	COBOD/Nextcon		
16:15	Invited presentations from CCR SI: Particle-bed printing		
16:15	Material-process interactions in particle bed 3D printing and the underlying physics		
16:45	A structural fibre-reinforced cement-based composite oriented to particle bed 3D- printing systems. Case study: Parque de Castilla (Alcobendas, Madrid) Footbridge.		
17:15	Paper dart session: designing for digital fabrication, what will the next generation of design tools look like?		
17:45	Housekeeping		
18:00	End of Day 2		

Technical Programme - Day 1: Monday 27th June 2022

EHB.1.04 (Plenary room)	EHB.1.10A	EHB.1.10B
09:15 Welcome		
09:45 Keynote Presentations: Technology status and next steps		
09:45 Technology Readiness and conference framework,		
10:15 A road map for quality control of hardening and hardened printed concrete		
11:30 Wet material property control	Binders and aggregates: 1 - strain hardening	Printability and set control: 1
11:30 Automated quality control for additive manufacturing by visual inspection of near nozzle droplet formation	Development of Cementitious Metamaterial with Compressive Strain Hardening Characteristics	Using limestone powder as a carrier for the accelerator in extrusion-based 3D concrete printing
11:45 Microfibrillated cellulose as a new approach to tune the rheological behavior of cementitious composite for 3D printing applications *	Properties of 3D-Printable Ductile Fiber-Reinforced Geopolymer Composite	A strain-based constitutive model ensuring aesthetic 3D printed concrete structures: Limiting differential settlement of filaments
12:00 Test methods for assessing fresh and plastic-state 3D concrete printing materials	Feasibility of using ultra-high ductile concrete to print hollow structure without steel reinforcement	On-demand stiffening control in concrete 3D printing with in-line activation using encapsulated accelerator
12:15 Measuring Plastic Shrinkage and Related Cracking of 3D Printed Concretes	Incorporation and characterization of multi-walled carbon nanotubes concrete composites for 3D printing applications	Monitoring strain using digital image correlation during compressive and tensile loading; assessment of critical strain of cementitious materials
12:30 Material design and rheological behavior of sustainable cement-based materials in the context of 3D printing	Consistency of mechanical properties of 3D printed strain hardening cementitious composites within one printing system	Temperature impact on the structural build-up of cementitious materials – experimental and modelling study
12:45 Lunch		
13:45 Printability and set control: 2	Heterogeneities and defects: 1	Reinforcement: 1
13:45 Experimental study on elastic and creep properties of 3D printed concrete at early age *	Digitally fabricated keyed concrete connections	Injection 3D Concrete Printing: Integration of Structural Reinforcement *
14:00 A Thixotropic Model for Predicting the Buildability for 3D Printable Concrete *	The environment's effect on the interlayer bond strength of 3D printed concrete	Core Winding: Force-flow oriented fibre reinforcement in Additive Manufacturing with concrete
14:15 Printability assessment of cement-based materials using uniaxial compression test	Bond strength between 3D printed concrete and self-compacting concrete	Fabrication of freeform reinforcement by robotic laying of carbon yarns and its combination with 3D concrete printing *
14:30 Early age shear and tensile fracture properties of 3D printable cementitious mortar to assess printability window	Interlayer mechanical strengths of 3D printing geopolymers: measurement and origin **	Robotically placed reinforcement using the Automated Screwing Device – an application perspective for 3D concrete printing
14:45 Break		
15:30 Invited presentations from CCR SI: Quality control		
15:30 Assessing the fresh properties of printable cement-based materials: high potential tests for quality control		
16:00 A chemical process engineering look at digital concrete processes: critical step design, inline mixing, and scaleup		
16:30 Geometric quality assurance for 3D concrete printing and hybrid construction manufacturing using a standardised test part for benchmarking capability		
17:00 Paper dart session: quality for commercialisation - what do we need and how do we get there?		
17:30 Housekeeping		
17:45 End of Day 1		

Technical Programme - Day 2: Tuesday 28th June 2022

	EHB.1.04 (Plenary room)	EHB.1.10A	EHB.1.10B
09:00	Welcome back and housekeeping		
09:15	Keynote Presentations: Lessons learnt from the field		
09:15	The Realities of Additively Manufactured Concrete Structures in Practice		
09:45			
10:15	Sponsors address		
10:15	Synthomer		
10:20	Sika		
10:30	Break		
11:00	Poster session: lightning presentations by poster convenors		
	Design, defects and durability		
	Digital design and control		
	Wet material property control		
	Binders and aggregates		
	Case studies and applications		
	Printability and set control		
	Reinforcement		
	Alternative Processes		
11:30	Poster session: parallel session in poster hall See poster session programme Lunch with event		
12:45	Structural design and optimisation	Material Jetting	Reinforcement: 2
12:45	Injection 3D Concrete Printing (IDCP) Combined with Vector-based 3D Graphic Statics	Influence of material and process parameters on hardened state properties of Shotcrete 3D-printed elements	Integrating reinforcement with 3D Concrete Printing: Experiments and numerical modelling
13:00	The production of a topology-optimized 3D-printed concrete bridge	Shotcrete 3DCP projection angle optimization: experimental approaches and theoretical modelling	Preinstalled reinforcement for 3D concrete printing
13:15	Mesh Mould Prefabrication	A 3D Printing Platform for Reinforced Printed-Sprayed Concrete Components	Fundamental study on automated interlayer reinforcing system with metal fiber insertion for 3D concrete printing *
13:30	3DCP structures: the roadmap to standardization	ARCS: Automated Robotic Concrete Spraying for the fabrication of variable thickness doubly curved shells	Flow-Based Pultrusion of Anisotropic Concrete : Mechanical properties at hardened state
13:45	Break		
14:15	Particle bed binding	Digital design, workflow and control: 1	Binders and aggregates: 2 - aggregates
14:15	Evaluating the Effect of Methyl Cellulose on Hardened State Properties in Selective Cement Activation	Filament geometry control in 3D concrete printing: printing regimes and practical design guidelines *	Fresh and hardened properties of 3D printable foam concrete contain porous aggregate
14:30	Effect of Curing in Selective Cement Activation	Uncertainty quantification of concrete properties at fresh state and stability analysis of the 3D printing process by stochastic approach	Sustainable 3D Concrete Printing with Large-aggregates
14:45	Particle Bed Technique For Hempcrete	Influence of Infill Pattern on Reactive MgO Printed Structures	Design and Fabrication of Spatially Graded Concrete Elements with Ice Aggregate Method
15:00	Selective Paste Intrusion: Stability of cement paste mixtures towards changing ambient temperature	Simulation of 3D Concrete Printing using the Discrete Element Method	Mix design for a 3D-printable concrete with coarse aggregates and consideration of standardisation
15:15	Break		
16:00	Sponsors address		
16:00	Elham		
16:05	CD&O/Nextcon		
16:15	Invited presentations from CCR SI: Particle-bed printing		
16:15	Material-process interactions in particle bed 3D printing and the underlying physics		
16:45	A structural fibre-reinforced cement-based composite oriented to particle bed 3D- printing systems. Case study: Parque de Castilla (Alcobendas, Madrid) Footbridge.		
17:15	Paper dart session: designing for digital fabrication, what will the next generation of design tools look like?		
17:45	Housekeeping		
18:00	End of Day 2		

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

Poster hall	Poster hall	Poster hall
<p>11:30 Design, defects and durability</p> <p>Mechanical behavior of 3D printed hourglass shape of cementitious mortar into carrier liquid</p> <p>The Effects of 3D Printing on Durability of Concrete</p> <p>Drying-induced damages in fresh cement-based materials during extrusion-based additive manufacturing</p> <p>Application of X-ray micro-computed tomography for evaluations of 3D printed concrete</p> <p>Evaluation of the interfacial bond strength between layers in extrusion-based 3D concrete printing</p> <p>Factors influencing the void generation and distribution in 3D concrete printing</p> <p>Efficient structural modelling of 3d-printed structures through periodic homogenization</p> <p>Towards the Application of Mesostuctures in 3D Concrete Printing</p> <p>Assessing the shear capacity of 3dgp box girders using destructive testing</p> <p>Cyclic response of a 3D printed concrete shear wall made with concrete extrusion</p>	<p>Digital design and control</p> <p>A digital workflow for the design and manufacturing of 3D printed concrete bridges in a circular economy</p> <p>Robotic On-Site Adaptive Thin Layer Printing: Challenges and Workflow for Design and Fabrication of Bespoke Cementitious Plasterwork at Full Architectural Scale</p> <p>Efficient voxel-based simulation of an extrusion-based 3D concrete printing process considering process and material uncertainties</p> <p>Compensation method based on variable flow for intersecting toolpaths</p> <p>Quality control of printed concrete using computer vision</p> <p>Inline Measurement System for Automated Quality Assurance of 3D Printed Concrete Structures</p>	<p>Wet material property control</p> <p>Investigation of different rheological testing methods to evaluate the fresh properties of printable mortars</p> <p>Effect of nanoclay on extrudability, printability and mechanical performance of extrusion-based 3D printing mortar (SDPM)</p> <p>Towards an in-line measurement system to predict and control the quality of 3D printed concrete</p> <p>Effect of polypropylene fiber content on the shape retention and strength of 3D printed concrete</p> <p>Concrete admixtures: the key element to widespread the use of locally produced concrete in 3DCP</p> <p>Evaluation of printability using cone plunger test to determine suitable material for 3D concrete printing</p> <p>In-line assessment of printable concrete dynamic yield stress by "Slugs-test" series</p> <p>Mix design insights for printable mortars based on structural build-up rate requirements</p> <p>Effects of fiber length on fiber stability of SHCC and 3D printing process</p>
<p>12:45 Start of oral parallel sessions</p>		
<p>11:30 Alternative Processes</p> <p>Assessment of scale up criteria of Digital Casting Systems and inline mixing process</p> <p>Advantages of Two-Stage-Concrete In Scale-up of Digital Casting Systems</p> <p>3D printed shell formwork for shape optimized concrete slabs</p> <p>Design, fabrication, and testing of an optimised reinforced concrete floor slab fabricated with robotically 3D printed formwork</p> <p>Power Floating Plastic-state Concrete for Additive Manufacturing Applications</p> <p>Methods of manufacturing large size wax blocks: an important puzzle piece for the Industrial Non-Waste-Wax-Formwork technology</p>	<p>Printability and set control</p> <p>Rheology and extrudability of 3D printing cement-based systems with nanoclays and viscosity modifiers</p> <p>Influence of sand/cement and water/cement ratio on the fresh state behavior of 3DCP mixture</p> <p>Outcome of shotcrete accelerators on the evolution of physicochemical properties of self-compacting mortar used for 3DCP (3D Concrete Printing)</p> <p>Rheotropic behavior of 3D printable cement-based materials</p> <p>Development of a Universal 3D Printable Concrete Solution</p>	<p>Reinforcement</p> <p>Load Behavior of Additive Manufactured Reinforcement Bars with Different Types of Surface Profiles</p> <p>Evaluation of Flexural Performance of Cementitious Composites Reinforced with Additively Manufactured Architectured Polymeric Elements</p> <p>Additive manufacturing of structurally reinforced concrete elements through spraying</p> <p>Shape retention and strength of sisal fiber reinforced 3D printed concrete</p> <p>Assessing the positional accuracy of robot grippers in pick and place operations for steel rebars during 3DCP process</p>
<p>12:45 Start of oral parallel sessions</p>		
<p>11:30 Binders and aggregates</p> <p>Comparative study of different recycled fine aggregates for 3D printing mortars</p> <p>Hempcrete - CO2 neutral wall solutions for 3D printing</p> <p>Effect of aggregates volume fraction on the tensile behaviour of fresh cement-based materials</p> <p>Development of a lightweight 3D printed mixture with recycled glass aggregates</p> <p>3D-printing development of low carbon building materials</p> <p>Paste content Requirement for Printing with fly ash-slag Geopolymers</p> <p>Formulation of geopolymer based concrete for sustainable 3D printing</p> <p>Rheology of alkali-activated materials made of fly ash, slag and recycled mineral wool for 3D printing</p> <p>Gelatin as biologically-based binder in temperature-sensitive printing mortar for advanced free form constructions</p> <p>Direct tensile behavior of 3D printed Ultra-High Performance Strain Hardening Cementitious Composites (UHPC-SHCC) with 2vol% polyethylene (PE) fibers</p> <p>Influence of Printing Parameters on 3D Printing Engineered Cementitious Composites (3DP-ECC) Authors</p>	<p>Case studies and applications</p> <p>Usability of recycled gypsum powders for the formation of 3D-printed acoustic panels</p> <p>Challenges during assembly of off-site 3D printed modules for construction of single storey building</p> <p>Fabrication aware Modularization of Freeform Concrete Elements for Additive Formwork: An Agent-based Approach</p> <p>Lightweight reinforced concrete slab</p> <p>RCAM's Vision of 3D Concrete Printed Renewables: Progress in the Development of Renewable Energy Support Structures</p>	
<p>12:45 Start of oral parallel sessions</p>		

Technical Programme - Day 3: Wednesday 29th June 2022

EHB.1.04 (Plenary room)	EHB.1.10A	EHB.1.10B
09:00 Welcome back and housekeeping		
09:15 Keynote Presentations: Mobile robotic positioning systems		
09:15 Additive Manufacturing Using Mobile Robots: Opportunities and Challenges for Building Construction		
09:45 Change rooms		
09:55 Reinforcement: 3	Heterogeneities and defects: 2	Digital design, workflow and control: 2
09:55 Integration of Mineral Impregnated Carbon Fibre (MCF) into fine 3D-printed concrete filaments	Interlocking 3D printed concrete filaments through surface topology modifications for improved tensile bond strength	A closed-loop workflow for quality inspection and integrated post-processing of 3D-printed concrete elements
10:10 Feasibility of pre-stressing 3D-printed concrete elements using iron-based shape memory alloy bars *	Mechanical properties and failure pattern of 3D printed hollow cylinders and wall segments under uniaxial loading	Generative Structural Design: A Cross-Platform Design and Optimization Workflow for Additive Manufacturing
10:25 Flexural behaviour of steel-reinforced topology-optimised beams fabricated by 3D concrete printing	Impact of drying of 3D printed cementitious pastes on their degree of hydration	Force flow compliant robotic path planning approach for reinforced concrete elements using SC3DP
10:40 Proof-of-concept: Sprayable SHCC Overlay Reinforcement Regime for Unreinforced 3D Printed Concrete Structure	Interlayer bonding of 3D printed limestone-calcined clay-based cementitious materials *	Process Control for Additive Manufacturing of Concrete Components
10:55 Break		
11:30 Binders and aggregates: 3 - alternative binders	Alternative process	Durability
11:30 Developing printable fly ash – slag geopolymers binders with Rheology modification	Adaptive foam concrete in digital fabrication	Influence of the print process on the durability of printed cementitious materials
11:45 Formulation and characterization of a low carbon impact cementitious ink for 3D printing	Mobile Additive Manufacturing: A case study of reusable clay formworks for bespoke in situ concrete construction	Two Year Exposure of 3D Printed Cementitious Columns in a High Alpine Environment
12:00 Strategies for reducing the environmental footprint of additive manufacturing via sprayed concrete	Knit Casting – experiments in controlling concrete's inflation for CNC manufactured knit formwork *	Freeze-thaw performance of 3D printed concrete: influence of interfaces
12:15 Mechanical Performance of 3-D Printed Concrete Containing Fly Ash, Metakaolin and Nanoclay	Zero-Waste Production of Lightweight Concrete Structures with Water-Soluble Sand Formwork	Salt scaling resistance of 3D printed concrete
12:30 Accelerating early age properties of ultra-low clinker cements for extrusion-based 3D printing	An early trial on milling 3D printed concrete geometries: observations and insights of the process	Evaluation of durability of 3D-printed cementitious materials for potential applications in structures exposed to marine environments
12:45 Lunch		
13:30 Invited presentations from CCR SI: Sustainability		
13:30 Environmental impact of extrusion-based additive manufacturing - generic model, power measurements and influence of printing resolution		
14:00 On Sustainability and Digital Fabrication with Concrete		
14:30 Paper dart session: 3DCP - how are we going to realise the sustainability agenda in practice?		
15:00 Awards and conference close		
15:30 Break		
15:45 Lab tours		
17:30 End of Day 3		