

## Conference Programme

10 – 12 September 2013, Riddel Hall, Queen's University Belfast

### Tuesday 10<sup>th</sup> September 2013

09:00 Registration

10:00 Welcome and Introduction

Claire Whysall, NetComposites & Prof. Su Taylor, Queen's University Belfast

Morning Session Chaired by: Su Taylor, Queen's University Belfast

10:10 Keynote:

Glass Fibre Reinforced Polymer (GFRP): The Most Compatible Reinforcement for Concrete Bridge Decks Subjected to Repeated Loads

Aftab Mufti, University of British Columbia

### FRP Strengthening: Concrete Structures

10:40 **Shear Transfer in CFRP Strengthened Reinforced Concrete**

Monika Grusova, Tim Ibell, Antony Darby and Mark Evernden, University of Bath

11:00 **Assessment of an Off-Axis, Dual Ply CFRP Material for Strengthening RC Beams**

Paul Davies and Rebecca Troake, University of Glamorgan

11:20 **Shear Strengthening of Rectangular and Circular Concrete Members Using FRP**

Jon Shave and John Bennetts, Parsons Brinckerhoff and John Orr, University of Bath

11:40 **Moment Redistribution in FRP-Strengthened Continuous RC beams: A Theoretical Study**

Abbas Tajaddini, Tim Ibell, Antony Darby, Mark Evernden

12:00 **Break**

### FRP Structures

12:30 **Hybrid FRP-Concrete Railway Sleeper**

M.W. Ferdous, Amar Khennane, Obada Kayali, UNSW Canberra

12:50 **PET Core Materials for Structural Sandwich Applications in Building and Construction**

Stefan Reuterlov, Armacell International

13:10 **Quasi-Static and Dynamic Responses of Carbon Fiber Sandwich Beams with Square Honeycomb Cores**

Tao Liu, University of Nottingham

**13:30 Lunch**

Afternoon Session Chaired by: Toby Mottram, University of Warwick

## **Fire and Elevated Temperature**

- 14:30 **Fire Performance of Well-Anchored TRM, FRCM and FRP Flexural Strengthening Systems**  
Luke Bisby, Tim Stratford, Courtney Hart and Sinead Farren, University of Edinburgh
- 14:50 **The Temperature Dependency of Mechanical Properties of the Adhesive Bonding in CFRP Strengthened Civil Engineering Metallic Structures**  
Ghayth Abed, University of Sheffield and Marcus Lee, Curtin University, Sarawak Malaysia
- 15:10 **The Impact of Adhesive Post Conditioning on Glass Transition Temperature**  
Daryan Othman, Tim Stratford, and Luke Bisby, University of Edinburgh
- 15:30 **Design of FRP-Reinforced Concrete Beam System for Fire Performance**  
Mohamed Kiari, Eleni Triantafyllidou, Silvian Grosu, Tim Stratford and Luke Bisby, University of Edinburgh
- 15:50 Structural Fire Endurance of a Concrete Slab Strengthened with Near Surface Mounted CFRP Bars with a T<sub>g</sub> Above 200 °C  
Patrick Petri, Milliken & Company, Gregg Blaszak, Milliken Design Inc, Sami Rizkalla, North Carolina State University
- 16:10 **Fire Performance of FRP Reinforced Concrete: Bond Deterioration at Elevated Temperature**  
Emma Reid-McIntyre, Luke Bisby, Tim Stratford, T.E. Dolan & D.M. Ruthven, University of Edinburgh

## **FRP Strengthening: Steel and Timber Structures**

16:30 **Break**

## **Early Career Researchers Competition (Sponsored by Atkins)**

- 16:50 A set of up to 10, five minute presentations from the shortlist of our Early Career Researchers Competition. The winner to be announced at the conference dinner on Wednesday evening.
- 17:45 Drinks Reception & viewing of posters from ECR entrants.
- 19:00 Close

## Wednesday 11<sup>th</sup> September 2013

09:00 Registration

Morning Session Chaired by: Neil Farmer, Tony Gee and Partners

### Durability and Environmental Conditions

09:30 **Keynote:**

**Compression Behaviour of Pultruded GFRP Tubes: Subject to Concentric Compression**

Daniel Cardoso and Kent Harries, University of Pittsburgh, and Eduardo de M. Batista, COPPE Federal University of Rio de Janeiro, Brazil

10:00 **Effects of Span-to-Depth Ratio on the Behaviour of Hybrid FRP-Concrete Bridge Truss Girders**

Mamdouh El-Badry, M.H. Moravvej Hamedani and M.H. Aghahassani, University of Calgary

10:20 **Investigation of Shear Transfer across a Diagonal Crack in Reinforced Concrete Strengthening with Externally Bonded FRP Fabric**

Robert Foster, Chris Morley and Janet Lees, University of Cambridge

10:40 **Critical Buckling Load of FRP Thin-Walled Column: Influence of Creep Effect**

Giosue Boscato, Carlo Casalegno, Salvatore Russo, IUAV University of Venice and J. Toby Mottram, University of Warwick

11:00 **Study of Structural Behaviours of GFRP Reinforced Concrete Slabs through NLFEA**

Yu Zheng, Dongguan University of Technology, Xueyi Fu, Shenzhen University, China, Zhongyu Lu and Yungeng Pan, Harbin Institute of Technology, China

11:20 **Break**

11:50 **Nonlinear Finite Element Analysis (FEA) of the Flexural Behaviour of Reinforced Concrete Beams Externally Strengthened with Carbon Fibre Reinforced Polymer (CFRP)**

Mahdi Al-Farttoosi, Y. Rafiq, J. Summerscales and C. Williams, University of Plymouth

12:10 **Tests of FRP-Strengthened RC Beams under Low Velocity Impact**

Yong Lu, Jien-Fei Chen, K. Gordon, K. Francis and Tim Stratford, University of Edinburgh and Ian May, Heriot Watt University.

12:30 **Laterally Unrestrained Bearing Strength of Hot-Wet Conditioned Pultruded FRP Material**

Behrouz Zafari and J.Toby Mottram, University of Warwick

12:50 **Experimental Determination of the Resistance of Pultruded FRP Beams Failing by Lateral Torsional Buckling**

Tien-Thuy Nguyen, Tak-Ming Chan, and J. Toby Mottram, University of Warwick

13:10 **Lunch**

Afternoon Session Chaired by: Brian Bell

## **FRP Strengthening: Confinement**

14:10 **The Need of a Unified Model for Strength Analysis of Strengthened Concrete Columns**

Mithila Achintha and S. Georgiou, University of Southampton

14:30 **Experimental and Numerical Analyses of Masonry Columns Confined with GFRP Straps**

Josip Galic, Tomislav Kišiček and Ivan Kalafatic, University of Zargreb

## **FRP Reinforced Concrete**

14:50 **Tests of Continuous Concrete Slabs Reinforced with Carbon Fibre Reinforced Polymer Bars**

Mohamed Mahroug, Ashraf Ashour, and D. Lam, University of Bradford

15:10 **Behaviour of Fabric-Formed Concrete Beams Reinforced with FRP Bars**

Kaloyana Kostova, Tim Ibell, Antony Darby and Mark Evernden, University of Bath

15:30 **Basalt Fibre Reinforced Polymer Strengthening of Normal Strength Reinforced Concrete Floor Slabs Subject to Arching Effects**

Anthony Martin, Su Taylor, Des Robinson and David Cleland, Queen's University Belfast

15:50 **Close**

19:30 **Drinks Reception and Conference Dinner**

The Great Hall, Queen's University Belfast

## Thursday 12<sup>th</sup> September 2013

09:00 Registration

Morning Session Chaired by: Antony Darby, University of Bath

### FRP Bridges

09:30 **Keynote:**

**Structural Behaviour of Hybrid Composite Beam Bridges in Missouri, USA**

Mohamed A. Abeol Seoud, C. Renee Earley and John J. Myers, Missouri University of Science and Technology, USA

### FRP for New Build

10:00 **Biocomposites for Architecture**

Geoff Foulds and Edwin Stokes, NetComposites Limited

10:20 **Behaviour of a Polymeric Reinforced Skew FlexiArch Bridge System**

Paul McNulty, Susan Taylor, Desmond Robinson, Adrian Long, Queen's University Belfast

10:40 **New Design Strategy for Freeform Structures in CFRP Concrete**

Frédéric Waimer and Jan Knippers, University of Stuttgart

11:00 **Haramain High Speed Railway Station Roof**

Mark Hobbs, Gurit (UK) Limited

11:20 **Break**

### Joining

11:50 **Ultimate Loads, Strength, Extensions and Strains of Pultruded GFRP Single-Lap, Single-Bolt Tension Joints**

Geoffrey Turvey, Lancaster University

12:10 **Analysis of the Interfacial Stresses in an Adhesive Joint Subjected to Warm Temperatures**

Daryan Othman, Tim Stratford and Luke Bisby, University of Edinburgh

12:30 **Rationale for Simplifying the Strength Formulae of the Design of Multi-Row Bolted Connections Failing in Net Tension**

J. Toby Mottram, University of Warwick

### Monitoring

12:50 **Inspection and Monitoring of Composites in Construction – Challenges and Solutions**

Richard Lee, ESR Technology, Simon Frost, Walker Technical and Michael Gower, National Physical Laboratory

13:10 **FRP Road Bridge Monitoring**  
Lee Canning, Sinclair Knight Mertz

13:30 **Lunch and Close**