

8th International Conference on Advanced Composite Materials in Bridges and Structures

Virtual Conference – August 5-7, 2021



FINAL TECHNICAL PROGRAM

www.acmbs2020.ca

Register also for the free pre-conference
Third International Workshop on Fiber Reinforced Polymer (FRP) Bar
"Advances in concrete reinforcement"
Virtual – August 3-4, 2021; <https://acmbs2020.ca/iw-gfrpcs3/>



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MESSAGE FROM THE CHAIR

The 8th International Conference on Advanced Composite Materials in Bridges and Structures, ACMBS-VIII, will be held in Sherbrooke, Quebec, Canada from 5-7 August 2021. One of the longest running conference series focusing on this topic, the conference is organized under the auspices of the ACMBS Technical Committee of the Canadian Society for Civil Engineering (CSCE). The conference is hosted by University of Sherbrooke. The success of the previous conferences (Sherbrooke, 1992; Montreal, 1996; Ottawa, 2000; Calgary, 2004; Winnipeg, 2008; Kingston, 2012, and Vancouver 2016) has established this event as a premier forum for the exchange of knowledge and experience with the use of advanced composites in bridges and structures.

The objectives of the ACMBS-VIII Conference are to provide a forum for the presentation and discussion of recent developments in the use of advanced composite materials (ACM) and fiber reinforced polymers (FRP) in bridges & other structures, and to provide an opportunity for national and international delegates from industrial, research and academic institutions to interact and share their knowledge, to learn about new and innovative technologies in the field, and to discuss future directions.

A total of 101 peer-reviewed papers are included in the proceedings. They have been authored by various experts in the field from 15 different countries around the world, including Australia, Belgium, Canada, China, Czech Republic, Egypt, France, Iraq, Italy, Japan, Oman, Spain, Switzerland, UK, and USA. On behalf of the organizing committee, I am very thankful to the authors for their valuable contributions to the conference. I am also very grateful to the paper reviewers for their time and diligence.

I would like to thank all participants – without them this conference would not be successful.

Finally, I would like to invite you to attend the one and half day Pre-Conference *Third International Workshop on FRP Bars for Concrete Structures (IWFPRCS-3)* which will be held from 3-4 August 2021, <https://acmbs2020.ca/iw-gfrpcs3/>. This workshop will be held online and does not charge a registration fee. **DO NOT MISS IT.**

Sincerely,

Professor Brahim Benmokrane, Ph.D., P. Eng., FRSC, FACI, FCSCE, FIIFC, FCAE, FEIC, FBEI

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Conference Program at a Glance

Thursday, August 5, 2021	
Time	Event
8:15 – 8:30	Opening Ceremony
8:30 – 9:00	Keynote Lecture 1
9:00 – 10:00	Sessions 1 (Platform A, B, and C)
10:00 – 10:30	Morning Break
10:30 – 11:00	Keynote Lecture 2
11:00 – 12:00	Session 2 (Platform A, B, and C)
12:00 – 13:30	Lunch Break
13:30 – 14:00	Keynote Lecture 3
14:00 – 15:00	Session 3 (Platform A, B, and C)
15:00 – 15:30	Afternoon Break
15:30 – 16:30	Session 4 (Platform A, B, and C)
16:30 – 17:30	Session 5 (Platform A, B, and C)

Friday, August 6, 2021	
Time	Event
8:30 – 9:00	Keynote Lecture 3
9:00 – 10:00	Session 6 (Platform A, B, and C)
10:00 – 10:30	Morning Break
10:30 – 11:30	Session 7 (Platform A, B, and C)
11:30 – 12:30	Session 8 (Platform A, B, and C)
12:30 – 14:00	Lunch Break
14:00 – 14:30	Keynote Lecture 5
14:30 – 15:30	Session 9 (Platform A, B, and C)
15:30 – 16:00	Afternoon Break
16:00 – 17:10	Session 10 (Platform A, B, and C)

Saturday, August 7, 2021	
Time	Event
9:00 – 9:30	Keynote Lecture 6
9:30 – 10:50	Session 11 (Platform A, B, and C)
10:50 – 11:10	Closing Ceremony

Thursday, August 5, 2021

Time	Event	Platform	
8:15 – 8:30	Opening Ceremony	A	
8:30 – 9:00	Keynote Lecture 1: Abdeldjelil Belarbi	A	
9:00 – 10:00	Sessions 1.A: Practical Applications 1		
	9:00 – 9:20	Moving-Wheel Load Test of a Cantilevered RC Slab Strengthened with Bond-Improved Ultra-High Modulus CFRP Rods <i>Hiroaki Hasegawa, Takahisa Kato, Kodai Shimose, Isamu Yoshitake (Japan) – 011</i>	A
	9:20 – 9:40	Hollow Composite Reinforcing Systems for Precast Concrete Slabs <i>Azam Edo, Allan Manalo, Mohammed Al-Rubaye (Australia) – 015</i>	
	9:40 – 10:00	Influence of Reinforcement on the Behavior of ECC Link Slabs in Bridge Deck Systems <i>Lifei Zhang, Yu Zheng, Lipeng Xia (China) – 120</i>	
	Session 1.B: Bond and Interfacial Stresses 1		B
	9:00 – 9:20	Damage Identification of Interface State Between FRP Bars and Self-Compacting Concrete Using Piezoceramic Transducers <i>Lingzhu Zhou, Yu Zheng, Gangbing Song (China) – 099</i>	
	9:20 – 9:40	Influence of Pre-Impregnation Process on Mechanical Performance of Glass/Ettringitic Matrix Composite <i>Omayma Homoro, Marie Michel, Thouraya Baranger (France) – 118</i>	
	9:40 – 10:00	Experimental Investigation of The Mechanical Behaviour of the Textile/Matrix Interface of Cementitious Matrix <i>Mohamed Saidi, Aron Gabor (France) – 119</i>	
	Session 1.C: Design Guidelines and Modeling 1		C
	9:00 – 9:20	Reliability-Based Calibration of Eurocode-Like Design Equations for Shear Strength of FRP-RC beams <i>Amir Mofidi, Kourosch Nasrollahzadeh, Reza Aghamohammadi (UK) – 053</i>	
9:20 – 9:40	Advanced Modal Analysis for Damage Assessment of RC Beam-Column Joints Strengthened with EB FRP <i>Farah Rifai, Ludovic Gauzente, Claude Rospars, Pierre Argoul, Boumediene Nedjar, Marc Quiertant (France) – 105</i>		
9:40 – 10:00	Examining the Effect of Load Type and History Using Reliability on Optimizing the Design of FRP Strengthened RC Members in Flexure <i>Connor Petrie, Fadi Oudah (Canada) – 148</i>		
10:00 – 10:30	Morning Break		

Thursday, August 5, 2021

10:30 – 11:00	Keynote Lecture 2: Ehab El-Salakawy		A
11:00 – 12:00	Session 2.A: Performance under Seismic, Dynamic and Impact Loading 1		A
	11:00 – 11:20	Large GFRP-Confined Concrete Columns Subjected to Simulated Seismic Loads <i>Zahra Kharal, Shamim Sheikh (Canada) – 093</i>	
	11:20 – 11:40	Effect of the Axial Load Ratio on the Cyclic Shear Performance of GFRP-Reinforced Squat Walls <i>Islam Shabana, Ahmed Sabry Farghaly, Brahim Benmokrane (Canada) - 037</i>	
	11:40 – 12:00	Effect Of Aspect Ratio on The Behavior of GFRP-RC Circular Columns Under Simulated Seismic Loading <i>Amr E. M. Abdallah, Ehab El-Salakawy (Canada) – 063</i>	B
	Session 2.B: Internally Reinforced Concrete Members 1		
	11:00 – 11:20	Reliability-Based Slenderness Limit of GFRP Reinforced Concrete Columns <i>Koosha Khorramian, Pedram Sadeghian, Fadi Oudah (Canada) - 023</i>	
	11:20 – 11:40	Gravity Load Effect on Punching Behavior of GFRP-RC Interior Slab-Column Connection Subjected to Lateral Cyclic Load <i>Mohamed Eladawy, Brahim Benmokrane, Mohamed Hassan (Canada) – 045</i>	
	11:40 – 12:00	Behavior of Arch Slabs Reinforced with FRP Bars under Concentrated Loads <i>Sherif El-Gamal, Ali Al-Nuaimi, Hind Al-Shukeili (Oman) - 128</i>	
	Session 2.C: Durability, Fatigue and Long-Term Performance 1		C
	11:00 – 11:20	Improved GFRP Rebar for Reinforced Concrete Structural Application <i>Doug Gremel, Ryan Koch, Mala Nagarajan, David Hartman (USA) – 086</i>	
11:20 – 11:40	Behaviour of A GFRP-Reinforced Concrete Bridge Deck Under Pulsating and Rolling Loads <i>Laura M. Tauskela, Amir Z. Fam (Canada) – 046</i>		
11:40 – 12:00	The Short-Term Performance of Corrugated HDPE Pipe Made with and without Recycled Resins - Physicochemical Properties <i>Quoc Khanh Nguyen, Brahim Benmokrane, Mathieu Robert, Patrice Cousin, Célestin Mwiseneza, Khaled Mohamed (Canada) – 010</i>		
12:00 – 13:30	Lunch Break		

Thursday, August 5, 2021

13:30 – 14:00	Keynote Lecture 3: Mark F. Green		A
14:00 – 15:00	Session 3.A: Fire Resistance 1		A
	14:00 – 14:20	Experimental Investigation of Fire-Damaged RC Columns Retrofitted with CFRP Jackets <i>Cheng Tan, Jia Xu, Riyad Aboutaha (USA) – 003</i>	
	14:20 – 14:40	Behavior of GFRP Bars and Sheet Coupons Under Sustained Stress and High Temperatures <i>Jahanzaib, M. Faizan, Qureshi, Zahra Kharal, Shamim Sheikh (Canada) – 092</i>	
	14:40 – 15:00	Effects of Load Level on The Structural Fire Behaviour of GFRP-Reinforced Concrete Beams with Straight-End Bar Lap Splices <i>Sobita Gurung, Sam Salem (Canada) - 153</i>	B
	Session 3.B: Internally Reinforced Concrete Members 2		
	14:00 – 14:20	Assumptions and Rationale for The Design of Top Mat GFRP Reinforcement for Bridge Decks in The State of Texas <i>Taya Retterer, Timothy Bradberry, Marco Rossini, Antonio Nanni (USA) - 52</i>	
	14:20 – 14:40	In-Site Quality Control of The Tensile Strength of Glass Fiber-Reinforced Polymer (GFRP) Bent Bars <i>Khaled Mohamed, Claude Nazair, Marc-Antoine Loranger, Brahim Benmokrane (Canada) - 108</i>	
	14:40 – 15:00	Long-Span Square RC Members with Uniformly Distributed FRP Bars Under Flexure Loads <i>Salaheldin Mousa, Hamdy M. Mohamed, Brahim Benmokrane, Antonio Nanni (Canada) - 079</i>	
	Session 3.C: Confinement of Concrete 1		
	14:00 – 14:20	Experimental Behaviour of Hollow $\pm 55^\circ$ Filament Wound GFRP Pipes Under Monotonic Flexural Loads <i>Dillon Betts, Pedram Sadeghian, Amir Fam (Canada) – 014</i>	C
	14:20 – 14:40	Modeling the Nonlinear Response of ± 55 Angle-Ply GFRP Tube Used in CFFT Applications <i>Akram Jawdhari, Amir Fam, Pedram Sadeghian (USA/Canada) – 111</i>	
	14:40 – 15:00	Experimental Behaviour of Concrete Confined with Unidirectional Flax Fiber-Reinforced Bio-Based Polymers <i>Dillon Betts, Pedram Sadeghian, Amir Fam (Canada) – 033</i>	
15:00 – 15:30	Afternoon Break		

Thursday, August 5, 2021

Thursday, August 5, 2021			
15:30 – 16:30	Session 4.A: Performance under Seismic, Dynamic and Impact Loading 2		A
	15:30 – 15:50	Elasto-Plastic Transition Point of GFRP-Reinforced Shear Walls Under Cyclic Loading <i>Ahmed Hassanein, Nayera Mohamed, Ahmed Farghaly, Brahim Benmokrane (Canada) – 069</i>	
	15:50 – 16:10	A Review on Seismic Performance of Reinforced Concrete Columns Strengthened with Smart and Composite Materials <i>Adel Al Ekkawi, Raafat El-Hacha – 160</i>	
	16:10 – 16:30	Evaluation of Concrete Columns Reinforced with GFRP Bars and Spirals Subjected to Quasi-Static Cyclic Load <i>Girish Narayan Prajapati, Ahmed Sabry Farghaly, Brahim Benmokrane (Canada) – 038</i>	B
	Session 4.B: Confinement of Concrete 2		
	15:30 – 15:50	Plasticity Based Failure Criteria for Circular Concrete Columns Wrapped with FRPs <i>Koosha Khorramian, Pedram Sadeghian (Canada) – 024</i>	
	15:50 – 16:10	Axial Capacity of Concrete Filled GFRP Tubes with Simulated Tube Damage <i>Osvaldo Taveras, Abdeldayem Hadhood, Amir Fam, Bhum Keun Song (Canada) – 134</i>	C
	16:10 – 16:30	Slenderness Effects in Concrete-Filled FRP Tube Columns <i>Kevin Barber, Sam Salem, Amir Fam (Canada) – 156</i>	
	Session 4.C: Design Guidelines and Modeling 2		
	15:30 – 15:50	Second-Order Response of Glass Fiber-Reinforced Polymer -Reinforced Concrete Slender Columns <i>Waseem Abdelazim, Hamdy M. Mohamed, Brahim Benmokrane (Canada) – 077</i>	C
	15:50 – 16:10	Development of Design Charts for One-Way Slabs Reinforced with Glass Fibre Reinforced Polymer (GFRP) Bars <i>Aslan Zarei, Douglas Tomlinson (Canada) – 101</i>	
	16:10 – 16:30	Effect of Reinforcement Type on Punching Shear Behavior of GFRP-RC Edge Slab–Column Connections <i>Ahmed E. Salama, Mohamed Hassan, Brahim Benmokrane (Canada) – 142</i>	

Thursday, August 5, 2021

Thursday, August 5, 2021			
16:30 – 17:30	Session 5.A: Bond and Interfacial Stresses 2		A
	16:30 – 16:50	Analytical Study on The Bond Between CFRP Rod Panels and Concrete Substrate <i>Akram Jawdhari, Issam Harik (USA) – 007</i>	
	16:50 – 17:10	Evaluating FRP-Concrete Bond Performance <i>Kenneth Crawford (USA) – 041</i>	
	17:10 – 17:30	Towards the Use of digital Image Correlation to Detect and Measure FRP-Concrete Debonding in RC Structures <i>Joshua E. Woods, Yuan-Sen Yang, David T. Lau, Jeffrey Erochko (Canada) – 060</i>	
	Session 5.B: Fibre-Reinforced Cementitious Matrix 1		B
	16:30 – 16:50	A Review on Properties of Carbon Nanofibre Infused Ultra-High-Performance Fibre Reinforced Concrete <i>Marwa Ibrahim, Raafat El-Hacha – 159</i>	
	16:50 – 17:10	Mechanical Properties of Concrete Reinforced with Alkali Resistant-Glass Fibers and Polypropylene Fibers <i>Habil Ahmad, M. Neaz Sheikh, Muhammad N.S. Hadi (Australia) – 047</i>	
	17:10 – 17:30	Splitting and Direct Tensile Strengths of Ambient Cured Geopolymer Concrete with Glass Fibers <i>Shehroze Ali, M Neaz Sheikh, Muhammad N.S. Hadi (Australia) – 025</i>	
	Session 5.C: Internally Reinforced Concrete Members 3		C
	16:30 – 16:50	New Compressive Test Methods for GFRP Bars <i>Omar Alajarmeh, Allan Manalo, Ali Mohammed, Brahim Benmokrane (Australia/Canada) – 019</i>	
	16:50 – 17:10	Manufacturing and Structural Performance of GFRP-Reinforced Precast Concrete Boat Ramp Planks <i>Allan Manalo, Omar Alajarmeh, Charles-Dean Sorbello, Senarath Weerakoon, Brahim Benmokrane (Australia/Canada) - 062</i>	
	17:10 – 17:30	Evaluation of GFRP Reinforced Circular Geopolymer Concrete Columns Under Concentric and Eccentric Axial Loading <i>Shehroze Ali, M Neaz Sheikh, Muhammad N.S. Hadi, Ian Cumming (Australia) - 066</i>	

Friday, August 6, 2021

Time	Event	Platform	
8:30 – 9:00	Keynote Lecture 4: Riadh Al-Mahaidi	A	
9:00 – 10:00	Session 6.A: Strengthening of Structures 1		
	9:00 – 9:20	Bridge Footing Strengthening Using Various FRP Systems <i>Xingji Lu, Riyad Aboutaha (USA) - 001</i>	A
	9:20 – 9:40	Experimental Investigation of the Flexural Strength of CFRP Retrofitted Beams <i>Steve Efe, Jacob Oluwoye (USA)- 131</i>	
	9:40 – 10:00	Influence of Bidirectional GFRP System on Shear Capacity of Reinforced Concrete Deep Beams <i>Mustafa Raheem, Hayder Rasheed (Iraq/USA) - 067</i>	
	Session 6.B: Structural health monitoring and intelligent sensing 1		B
	9:00 – 9:20	Crack-Detection in Concrete Covered with Fiber-Reinforced Polymer (FRP) Through Electrical Impedance Variations <i>Kenji Tada, Yuji Takeda, Hiroaki Hasegawa, Isamu Yoshitake (Japan) – 065</i>	
	9:20 – 9:40	Nondestructive and Structural Response Monitoring for Risk-Informed Maintenance Management of Bridges <i>Wael A. Megid, Juan Mejia, Joel Hay, D.Robert Hay (Canada/Egypt) – 028</i>	
	9:40 – 10:00	Advanced Image-Based Microstructural Finite Element Modeling of Concrete: Porosity Effect on Mechanical Performance <i>Mustafa Alhusain, Adil Al-Mayah (Canada) – 151</i>	
	Session 6.C: Fibre-Reinforced Cementitious Matrix 2		C
	9:00 – 9:20	Hollow Concrete Beams with Textile Reinforcement on The Internal Surface <i>Tomáš Vlach, Jakub Řepka, Zuzana Jirkalova, Petr Hájek (Czech Republic) – 135</i>	
9:20 – 9:40	Stress-Strain Behaviour of Glass Fiber-Reinforced Grout for Masonry Construction <i>Omar Gouda, Ahmed Hassanein, Khaled Galal (Canada) – 110</i>		
9:40 – 10:00	Mechanical Characteristics Analysis of Different Fiber-Reinforced Lightweight Concrete <i>Shuren Wang, Xiaogang Wu, Wenxue Chen, Yahong Ding, Jianhui Yang (China) – 138</i>		
10:00 – 10:30	Morning Break		

Friday, August 6, 2021

Friday, August 6, 2021			
10:30 – 11:30	Session 7.A: Performance under Seismic, Dynamic and Impact Loading 3		A
	10:30 – 10:50	Hybrid Simulation of Damaged Reinforced Concrete Shear Walls Repaired Using Externally Bonded CFRP Sheets <i>Joshua E. Woods, David T. Lau, Jeffrey Erochko (Canada) – 029</i>	
	10:50 – 11:10	Determination of Modeling Parameters of FRP Retrofitted Reinforced Concrete Shear Walls <i>Jazalyn Dukes, Siamak Sattar (USA) – 032</i>	
	11:10 – 11:30	Seismic Performance of Masonry Walls Strengthened for Shear Using Externally Bonded FRP <i>Nestore Galati, Tarek Alkhrdaji, Nancy Torres Castellanos (USA) – 084</i>	B
	Session 7.B: Basalt FRP 1		
	10:30 – 10:50	Structural Behaviour of Precast Slab Made Pre-Stressed with Basalt Fibre Reinforced Bars and FRSCC <i>M. Sonebi, S. Taylor, B. Dal Lago, L. Ferrara, P. Deegan, A Pattarini (UK) – 031</i>	
	10:50 – 11:10	Development Length of Basalt-FRP Bars Embedded in Normal and High Strength Concrete <i>Decebal Michaud, Amir Fam (Canada) – 049</i>	C
	11:10 – 11:30	Shear Strength of Lightweight Self-Consolidating Concrete Beams Reinforced with FRP Bars <i>Shehab Mehany, Hamdy M. Mohamed, Brahim Benmokrane (Canada) - 081</i>	
	Session 7.C: Durability, Fatigue and Long-Term Performance 2		
	10:30 – 10:50	Repairing Concrete Structures Damaged by Frost Using Carbon Fiber Reinforced Epoxy Composites <i>Elhem Ghorbel, Mariem Limaiem, Oualid Limam (France) – 127</i>	C
	10:50 – 11:10	Flexural Behavior of GFRP Bars after Exposure to Elevated Temperatures <i>Sherif El-Gamal, Abdulrahman Al-Fahdi (Oman) – 129</i>	
	11:10 – 11:30	Durability Performance of various Corrosion Resistant Reinforcing Materials under Sever Environmental Exposures <i>Raafat El-Hacha, Martin Hudecek, Kip Skabar (Canada) – 139</i>	

Friday, August 6, 2021

Friday, August 6, 2021			
11:30 – 12:30	Session 8.A: Design Guidelines and Modeling 3		A
	11:30 – 11:50	Assessment of the Flexure Stiffness of Slender Concrete Columns Reinforced with Glass Fiber-Reinforced Polymers <i>Waseem Abdelazim, Hamdy M. Mohamed, Brahim Benmokrane (Canada) – 078</i>	
	11:50 – 12:10	Safety Evaluation of The Reduction Factor for CFTs Columns without Longitudinal Reinforcement <i>Koosha Khorramian, Pedram Sadeghian, Fadi Oudah (Canada) – 039</i>	
	12:10 – 12:30	Finite Element Modeling of GFRP Concrete Slab-Column Edge Connections Reinforced with GFRP Shear Stirrups <i>Ahmed E. Salama, Mohamed Hassan, Brahim Benmokrane (Canada) – 141</i>	B
	Session 8.B: Bond and Interfacial Stresses 3		
	11:30 – 11:50	Load-Slip Response of Larger Diameter GFRP Truss-Action Shear Connectors for Precast Concrete Insulated Wall Panels <i>Sergio Arevalo, Douglas Tomlinson (Canada) – 102</i>	
	11:50 – 12:10	Field Investigation of CFRP Bond on RC Bridges <i>Kenneth C. Crawford (USA) – 146</i>	C
	12:10 – 12:30	Effect of Bond Strength of Newly Developed Glass Fiber-Reinforced Polymer Bars on the Load-Slip Performance <i>Mohamed Eladawy, Wenxue Chen, Brahim Benmokrane (Canada) – 158</i>	
	Session 8.C: Internally Reinforced Concrete Members 4		C
	11:30 – 11:50	Performance Evaluation of High-Strength Concrete Circular Columns Reinforced with GFRP Bars and Spirals <i>Mu'taz M. Almomani, Ehab El-Salakawy (Canada) – 064</i>	
11:50 – 12:10	Effect of Confinement on Compression Splices of GFRP Bars in Concrete Columns <i>Amir-homayoon Tabatabaei, Abolfazl Eslami, Hamdy M. Mohamed, Brahim Benmokrane (Canada) – 071</i>		
12:10 – 12:30	Experimental Testing of GFRP-Reinforced Concrete Beams with Mid-Span Lap Splices Utilizing Straight- and Hooked-End Bars <i>Omar Nour, Sam Salem, Ahmed Mostafa (Canada) - 155</i>		
12:30 – 14:00	Lunch Break – COMMEMORATION OF THE FIRST ACMBS CONFERENCE (ACMBS-I) ORGANIZED IN SHERBROOKE IN 1992		

Friday, August 6, 2021

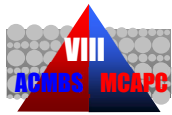
14:00 – 14:30	Keynote Lecture 5: Steven Nolan		A
	Session 9.A: Practical Applications 2		
14:30 – 14:50	Case Study on CFRP Prestressed Concrete Soldier Pile Walls with GFRP Reinforced Precast Concrete Panels <i>Joseph Losaria, Steven Nolan, Andra Diggs II (USA) – 022</i>		A
14:50 – 15:10	Flagler Beach GFRP-RC Secant Pile Seawall for Hurricane Resilience, Durability and Efficiency <i>Christian Steputat, Steven Nolan, Marco Rossini, Antonio Nanni (USA) – 026</i>		
15:10 – 15:30	Critical Review of the Design and Performance of GFRP Reinforced Bridge Decks in Nova Scotia <i>David Idemudia, John Newhook, Fadi Oudah (Canada) – 150</i>		
	Session 9.B: Strengthening of Structures 2		
14:30 – 15:30	14:30 – 14:50	Experimental Investigation of Bridge Widening Through Pier Cap Beam Extension Using CFRP Composites <i>Jia Xu, Cheng Tan, Riyad Aboutaha (USA) – 002</i>	B
	14:50 – 15:10	Finite Element Modeling and Verification of a Wedge Anchorage for CFRP Plates <i>Mustafa Alhusain, Adil Al-Mayah (Canada) - 152</i>	
	15:10 – 15:30	Repair of Damaged Reinforced Concrete Pipes with Layered Sandwich Fiber Composites <i>Thomas Goill, Pedram Sadeghian (Canada) - 034</i>	
	Session 9.C: Internally Reinforced Concrete Members 5		
	14:30 – 14:50	Effect of Longitudinal GFRP Reinforcement Ratio on the Axial-Flexural Performance of Lightweight Self-Consolidating Concrete Columns <i>Abdoulaye Sanni Bakouregui, Hamdy M. Mohamed, Ammar Yahia, Brahim Benmokrane (Canada) – 070</i>	C
	14:50 – 15:10	Pull-Out Behaviour of Headed-End GFRP Bars Embedded in Basalt Fiber Cementitious Composites <i>A.G. Bediwy, E. El-Salakawy (Canada) - 068</i>	
	15:10 – 15:30	Mechanical Properties of Newly Developed Glass Fiber Reinforced Polymer Bars <i>Ahmed E. Salama, Wenxue Chen, Brahim Benmokrane (Canada) – 147</i>	
15:30 – 16:00	Afternoon Break		

Friday, August 6, 2021

16:00 – 17:00	Session 10.A: Confinement of Concrete 3		A
	16:00 – 16:20	Effect of Natural FRP Confinement on Axial Compressive Strength of Concrete <i>Junaid Ahmad, Tao Yu, Muhammad N. S. Hadi (Australia) – 027</i>	
	16:20 – 16:40	System-Based Reliability Approach to Design Existing Columns Strengthened Using FRP <i>Koosha Khorramian, Fadi Oudah, Pedram Sadeghian (USA) – 040</i>	
	16:40 – 17:00	Flexural Behavior and Ultimate Strength of Post-Tensioned Rectangular CFFT Beams <i>Asmaa Abdeldaim Ahmed, Mohamed Hassan, Radhouane Masmoudi (Canada) – 058</i>	B
	Session 10.B: Innovative Structural Systems 1		
	16:00 – 16:20	Novel Prefabricated Composites Jacket for Structures Repair <i>Ali Mohammed, Allan Manalo, Omar Alajarmeh, Yan Zhuge, John Pettigre (Australia) – 082</i>	
	16:20 – 16:40	Evaluation of Different CFRP Sandwich Deck Cores of Deployable Treadway Bridge Beam <i>Ashraf Osman, Khaled Galal (Egypt/Canada) – 125</i>	C
	16:40 – 17:00	Two-Way Flexural Behaviour of Sandwich Panels with Flax FRP Faces and Foam Cores Under Monotonic Loads <i>Dillon Betts, Pedram Sadeghian, Amir Fam (Canada) – 012</i>	
	Session 10.C: Strengthening of Structures 3 & Design of FRP-RC Members		C
	16:00 – 16:20	Use of Fabric Reinforced Cementitious Mortar to Strengthen Reinforced Concrete Beams in Shear <i>Dylan Kennedy, Ahmad Rteil (Canada) - 006</i>	
	16:20 – 16:40	Flexural Strengthening of Reinforced Concrete Structures using Iron-based Shape Memory Alloy: Case Studies <i>Benjamin Forrest, Raafat El-Hacha, Julien Michels (Canada/ Switzerland) - 161</i>	
	16:40 – 17:10	Flexural and Shear Design Software for Concrete Members Reinforced with FRP Internal Bars <i>Hayder A. Rasheed, and Alaaeldin Abouelleil</i>	

Saturday, August 7, 2021

Time	Event		Platform
9:00 – 9:30	Keynote Lecture 6: Emmanuel Ferrier		A
	Session 11.A: Strengthening of Structures 4		
9:30 – 9:50	RC Wall-Slab Connection Reinforced by FRP: Mechanical Behaviour Under Cycling Loading <i>Antoine Chalot, Laurent Michel, Emmanuel Ferrier, Nathalie Roy (France/Canada) - 117</i>		A
9:50 – 10:10	Preventive Fatigue Strengthening of Steel Structures with Bonded CFRPs – Efficiency Demonstration on a Real Bridge <i>K. Benzarti, S. Chataigner, M. Wabeh, R. Boundouki, E. Martin, L. Sopena, M. Zalbide, D. Garcia-Sanchez, V. Birtel, F. Lehmann, G. Gemignani (France/USA/Spain/Italy) -121</i>		
10:10 – 10:30	Bond Behavior of FRP Shear Reinforcement on I-Sections <i>Muhammad Arslan Yaqub, Stijn Matthys, Christoph Czaderski (Belgium/Switzerland) - 157</i>		
	Session 11.B: Performance under Seismic, Dynamic and Impact Loading 4		
9:30 – 10:50	9:30 – 9:50	Seismic Fragility Assessment of an Existing Multi-Span Isolated Bridge in Eastern Canada <i>Saber A. S. Fosoul, Michael J. Tait (Canada) – 100</i>	B
	9:50 – 10:10	Rocking Response of AFRP Reinforced Concrete Columns with Unbonded Energy Dissipaters <i>Muritala Adegoke, Mehdi Shokouhian, Monique Head, Steve Efe, (USA) – 106</i>	
	10:10 – 10:30	Dynamic Response Calibration of Hybrid Floating Bridge System Using Rayleigh Damping <i>Ahmed S. Elareshy, Sherif A. Mazek, M. M. Abdel Wahab, Ashraf Osman (Egypt) – 140</i>	
	10:30 – 10:50	Numerical Modeling of Hybrid Steel/GFRP Reinforced Concrete Bridges Piers <i>Ahmed Arafa, Brahim Benmokrane (Egypt/Canada) – 143</i>	
	Session 11.C: Durability, Fatigue and Long-Term Performance 3		
9:30 – 9:50	Experimental Analysis and Modeling of Nonlinear Shear Creep Behaviour at the Concrete-FRP Interface <i>François Soleilhet, Nouredine Houhou, Karim Benzarti, Sylvain Chataigner, Marc Quiertant (France) – 104</i>		C
	9:50 – 10:10	Fatigue Behavior of FRP Bars Reinforced UHPC Beams <i>E. Ferrier, L. Michel (France) – 116</i>	
	10:10 – 10:30	Durability Assessment of Fiber-Reinforced Polymer Composites Externally Bonded to A Concrete Bridge After 26-Year Exposure <i>Sandra Milev, Jovan Tatar (USA) – 154</i>	
10:50 – 11:10	Closing Ceremony		



FOR MORE INFORMATION, PLEASE FEEL FREE TO CONTACT:

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