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Janeiro, Brazil

Kent Harries (CICE 2023)  
University of Pittsburgh, USA

*Table of Contents*

**Message from the Editor ..... 1**

**Message from the President..... 2**

**Welcome to ISSCI 2023 & ISERCI 2023 ..... 4**

**Welcome to CICE 2023 ..... 12**

**Recent Highlight Publications ..... 13**

**ASCE Journal of Composites for Construction..... 19**

**List of IIFC Council Members ..... 23**

*Message from the Editor*

It is my honor to welcome you to our latest issue of FRP International. As we emerge from the global pandemic, I hope that everyone is safe and healthy. Our society suffered greatly during the pandemic, with many academic events and conferences being postponed or even cancelled. However, I am pleased to report that our academic society has remained active, adapting to the challenges and continuing to promote academic exchange and collaboration. As we move forward, I invite you to stay connected with IIFC and to attend our upcoming events and conferences. Let us continue to work together, sharing knowledge and insights that will contribute to the betterment of society. Thank you for your continued support, and may we all look forward to a thriving future of intellectual exchange.

If you like to share your ideas and information, please send your submissions to [fengpeng@tsinghua.edu.cn](mailto:fengpeng@tsinghua.edu.cn)

**IIFC has a website:**

[WWW.IIFC.ORG](http://WWW.IIFC.ORG)

## ***Message from the President***

The IIFC community will soon meet at CICE 2023 in Rio de Janeiro, Brazil, from 23-26 July 2023. This will be the first gathering of our community in a face-to-face mode since the FRPRCS Symposium in Belfast in June 2019, on account of the COVID-19 disruption experienced since early 2020. This is also a milestone conference as it is the first official IIFC conference to be held in Latin America.

The CICE 2023 Organising Committee and International Scientific Committee, under the leadership of conference Co-Chairs Daniel Cardoso (Pontifical Catholic University of Rio de Janeiro, Brazil) and Kent Harries (University of Pittsburgh, USA), are to be commended in advanced for what promises to be a spectacular event. All authors, reviewers, attendees and sponsors are also thanked in advance for their valuable contributions to the conference.

Congratulations to the 2023 IIFC award recipients, namely, Professor Riadh Al-Mahaidi (IIFC Medal) and Professor Elyas Ghafoori (Distinguished Young Research Award). Their awards are thoroughly deserved, and they will both deliver Keynote addresses at CICE 2023.

This year 2023 is the 20<sup>th</sup> anniversary of the IIFC. To recognise such a significant milestone, an “IIFC 20<sup>th</sup> Anniversary” Special Issue of the Journal of Composites for Construction (JCC) is in preparation, under the leadership of Guest editors Professor Amir Fam (Queen’s University, Canada), Professor João R. Correia (University of Lisboa, Portugal) and Professor Tao Yu (The Hong Kong Polytechnic University, China).

A new IIFC website was launched earlier in the year. The URL remains the same, namely <https://www.iifc.org/>. I encourage you to take the time to browse the new website. It offers a rich array of resources that should be of benefit to the FRP composites in construction community. Such resources are a bedrock to the value proposition of the IIFC, as it continues to pursue an agenda of knowledge creation and dissemination. The website contains a new design that is optimised for mobile devices, and it also has improved stability and safety. Additional functional enhancements under development include a members-only portal with the ability to update details, online payment (stripe), membership renewal and integrated membership records, and storage space for committees. All these

enhancements are for the benefit of IIFC members, to provide a smoother and inclusive membership experience. Congratulations to our Webmaster, Professor João R. Correia, for leading the development of the new website.

The IIFC will see a change in leadership at CICE 2023. My term as President comes to an end as with the current Executive Committee. The new President and new Executive Committee will be announced at CICE 2023. The new committee, as well as other key elections for new Council members, IIFC Fellows and CICE 2027 have been voted pre-conference in an online mode. Traditionally, voting has been conducted at CICE conferences by those physically in attendance. Recent changes to the By-laws have enabled virtual voting and the benefits include more of the membership engaged in the voting process (i.e. not just those physically present at conferences), while voting is also more inclusive of geographical and financial diversity.

It has been a tremendous privilege and honour to be your President these past 5 years, since I was elected at CICE 2018 in Paris in July 2018. I would like to thank you for the trust that you

have placed in myself and the Executive Committee. I would like to sincerely thank all who have supported namely the Executive Committee, Advisory Committee, Council members and the broader membership. It is fortuitous that the new leadership take charge on the 20<sup>th</sup> anniversary and as we meet face-to-face at CICE 2023 after such a long time apart. This represents a new chapter for the IIFC as it enters its third decade. I wish the incoming President and Executive Committee all the very best as they advance our wonderful organisation – the IIFC.

Yours Sincerely,  
Scott Smith  
IIFC President  
The University of Adelaide  
Australia



## ***Welcome to ISSCI 2023 & ISERCI 2023***



### **Introduction**

Following the success of the inaugural, second, third, and fourth International Summer School on Composites in Infrastructure (ISSCI), which were hosted by University of Wollongong (inaugural and second ones in 2016 and 2017), Tsinghua University (2018), and Huazhong University of Science and Technology (2019), respectively, we are organising the fifth summer school of its series in the coming August (14-16 August 2023) at Western Sydney University, Sydney, Australia.

The ISSCI, to be taught by a strong team of world's leading scholars, will focus on the structural use of fibre-reinforced polymer (FRP) composites in infrastructure. The ISSCI aims to prepare researchers and postgraduate students for high-quality research in the area, and to

prepare engineers for practical applications. It will provide a comprehensive and thorough treatment of the behaviour, modelling and design of structures incorporating FRP composites (including both FRP-strengthened structures and FRP-based new structures), with a strong emphasis on their fundamental mechanics.

Similar to the previous practice of this series, in this year, the summer school will be followed by the 4<sup>th</sup> International Symposium for Emerging Researchers in Composites for Infrastructure (ISERCI), which will be held on 17-18 August 2023. The ISERCI series, initiated in 2017 by the University of Wollongong, aims to provide an international forum for upcoming researchers/practitioners and rising stars in the

area to share their recent advances in both research and practice, and to explore research/industry partnership opportunities.

## **ORGANISING COMMITTEE**

### **Chairs:**

Cheng Jiang, Western Sydney University,  
Australia

Shishun Zhang, Huazhong University of Science  
and Technology, China

Participants of the ISSCI are encouraged to attend the ISERCI with a discounted registration fee.

## **FURTHER INFORMATION**

### **Dr. Cheng Jiang**

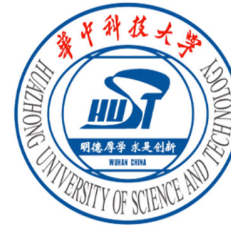
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Western Sydney University

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Official activity of International Centre for Composites in Infrastructure (ICCI)

# 4<sup>th</sup> International Symposium for Emerging Researchers in Composites for Infrastructure (ISERCI 2023)

17-18 August 2023

Western Sydney University, Sydney, Australia

## Introduction

The 4th International Symposium for Emerging Researchers in Composites for Infrastructure (ISERCI 2023) will be hosted jointly by School of Engineering, Design and Built Environment, Centre for Infrastructure Engineering, and Urban Transformations Research Centre at Western Sydney University. The inaugural, 2<sup>nd</sup>, and 3<sup>rd</sup> ISERCIs were held at the University of Wollongong (2017), Tsinghua University (2018), and Huazhong University of Science and Technology (2019), respectively. Due to the epidemic situation of COVID-19, this symposium was suspended and will be re-launched in 2023.

The use of composite materials in infrastructure has increased tremendously over the past two decades, primarily for the strengthening of

existing structures but also increasingly for the construction of new structures. The ISERCI series aims to provide an international forum for upcoming researchers/practitioners and rising stars in the area to share their recent advances in both research and practice, and to explore research/industry partnership opportunities.

This ISERCI symposium will be held after the International Summer School on Composites in Infrastructure (ISSCI 2023), which will be hosted at Western Sydney University. The ISSCI, to be taught by a strong team of experts, aims to prepare researchers and postgraduate students for high-quality research in the area, and to prepare engineers for practical applications.

## ORGANISING COMMITTEE

### Chairs:

Cheng Jiang

Shishun Zhang

### Members (In alphabetical order):

#### Western Sydney University:

Pejman Sharafi      Wenchi Shou

Vivian Tam      Zhong Tao

Jun Wang      Leo Zhang

Yixia (Sarah) Zhang

#### University of Technology Sydney:

Jun Li      Wengui Li

#### University of Wollongong:

Muhammad Hadi

### Secretariat:

Wenzhai Bi      Ayman Elshorbagi

## INTERNATIONAL SCIENTIFIC COMMITTEE

### Chairs:

Tao Yu, Peng Feng

### Members (In alphabetical order):

Guang-Ming Chen      Wensu Chen

João R. Correia      Dilum Fernando

Cheng Jiang      Jia-Fei Jiang

Yail Jimmy Kim      Wengui Li

Guan Lin      Susanna Lin

Fidelis Mashiri      Nicola Nisticò

Togay Ozbakkaloglu      Thong Pham

Kai Qian      Maria Rashidi

Theodoros Rousakis      Xin Wang

Fei Xu      Qian-Qian Yu

Jun-Jie Zeng      Deju Zhu

Ying-Wu Zhou      Shishun Zhang

Xihong Zhang      Yu Zheng

*More members to be added*

## TOPICS

The following topics will be covered by ISERCI 2023:

- Composite materials and structures
- FRP materials and products
- Interfacial and bond issues
- All FRP structures

- Hybrid structures
- Life-cycle and sustainability
- FRP reinforced concrete structures
- FRP for strengthening and retrofit of structures
- Health monitoring
- Smart structures
- Aging and durability
- Code and design guidelines
- Additive manufacturing
- Green and natural composites
- Extreme loading
- Inspection and quality control
- Non-destructive techniques
- Experimental investigation
- Theoretical investigation
- Numerical simulation
- Case studies and applications
- Textile reinforced concrete

## CALL FOR ABSTRACTS

Researchers who obtained their PhD degree within the last 15 years or so, as well as current PhD students, are invited to submit abstracts to ISERCI 2023 to be held in Western Sydney University, Sydney, Australia on 17-18 August 2023 (Thursday and Friday).

Extended Abstracts should be sent by 10 May 2023 to: [drjason.group@gmail.com](mailto:drjason.group@gmail.com). Authors of

accepted abstracts will be invited to give a presentation at the symposium.

## FURTHER INFORMATION

**Dr. Cheng Jiang**

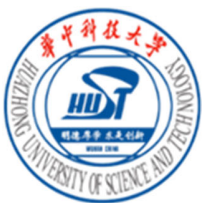
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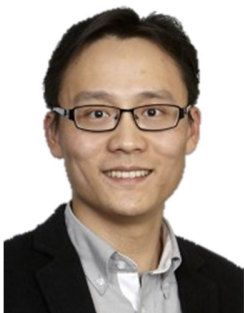


International Institute for  
FRP in Construction

Australian Society for Off-Earth  
Construction (ASOC)

## Confirmed Keynote Speakers/Lecturers

(In alphabetical order, more speakers to be added)



**Prof. Yu Bai**  
Professor, Monash  
University, Australia



**Prof. Jian-Guo Dai**  
Professor, The Hong Kong  
Polytechnic University,  
HKSAR



**Prof. Peng Feng**  
Professor, and Head of  
Department of Civil  
Engineering, Tsinghua  
University, China  
Changjiang  
Distinguished Professor



**Dr. Fabio Matta**  
Associate Professor,  
University of South  
Carolina, America



**Dr. Denvid Lau**  
Associate Professor,  
City University of Hong  
Kong, HKSAR



**Prof. Tamon Ueda**  
Distinguished Professor,  
Shenzhen University,  
China & Professor  
Emeritus, Hokkaido  
University, Japan  
Academician, Japanese  
Academy of Engineering  
President, Japan Society  
of Civil Engineers (JSCE)

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**Prof. Yu-Fei Wu**  
Distinguished Professor,  
Shenzhen University,  
China



**Prof. Weichen Xue**  
Professor, Tongji  
University, China  
Changjiang Distinguished  
Professor

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**Prof. Jie Yang**  
Professor, RMIT  
University, Australia  
Lead Editor-in-Chief,  
journal *Engineering  
Structures*



**Prof. Tao Yu**  
Professor, The Hong Kong  
Polytechnic University,  
HKSAR

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**Prof. Shishun Zhang**  
Professor, Huazhong  
University of Science  
and Technology, China



**Prof. Yixia (Sarah)  
Zhang**  
Professor, Western  
Sydney University,  
Australia

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**Prof. Yan Zhuge**  
Professor, University of  
South Australia,  
Australia

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## ***Welcome to CICE 2023***



The Conference Program and Proceedings are now available on the conference website: <https://cice2023.org/>. The website also contains a lot of key information about the conference such as the Keynote Speakers. This is all a very rich source of information that will be of significant benefit to the community.

Looking forward to seeing you in Rio!

Daniel Cardoso, PUC-Rio

Kent Harries, University of Pittsburgh

Conference co-chairs

## ***Recent Highlighted Publications***

### **Finite-Element Modeling of FRP-Confined Noncircular Concrete Columns Using the Evolutionary Potential-Surface Trace Plasticity Constitutive Model for Concrete**

**Author:** Bo-Tong Zheng; Jin-Guang Teng.

**DOI:** [10.1061/\(ASCE\)CC.1943-5614.0001271](https://doi.org/10.1061/(ASCE)CC.1943-5614.0001271)

**Journal:** Journal of Composites for Construction

**Abstract:** The compressive behavior of fiber-reinforced polymer (FRP)-confined concrete columns with a noncircular cross section has been investigated through extensive experimental, analytical, and numerical research, but a unified theoretical/numerical approach that can accurately predict both their section-average behavior and local concrete behavior is not yet available. In noncircular columns under axial compression, the concrete is typically under a nonuniform stress state of three-dimensional (3D) compression, with the lateral compressive stresses being the reactive stresses from the confining device (i.e., passive confinement). The authors of the present paper recently developed a plasticity constitutive model for concrete under general 3D compressive stresses, which possesses a potential surface with an evolutionary deviatoric trace that can accurately capture the results of existing compression tests of concrete cubes under nonuniform, passive confinement. This paper explores the application and capability of this evolutionary potential-surface trace (EPT) plasticity constitutive model in finite-element (FE) analysis of FRP-confined square, rectangular, and elliptical plain-concrete columns under concentric compression. The section-average behavior of all the selected noncircular columns predicted by these FE analyses was close to the existing experimental data. The numerical results obtained with the EPT plasticity constitutive model were then examined in detail to achieve an improved understanding of local concrete behavior in FRP-confined noncircular columns.



## Development of GFRP Monopole Guyed Communication Tower

**Author:** Sami Alshurafa; Hanan Alhayek; Dimos Polyzois

**DOI:** [10.1061/JCCOF2.CCENG-3799](https://doi.org/10.1061/JCCOF2.CCENG-3799)

**Journal:** Journal of Composites for Construction

**Abstract:** In recent years, there has been a growing demand for a lightweight, dependable, and cost-effective construction material with low maintenance requirements and high corrosion resistance to replace steel communication towers. This paper reports on an examination of glass fiber-reinforced polymer (GFRP) as an unconventional material for the fabrication of a GFRP lightweight communication guyed tower. The study included extensive experimental testing as well as numerical modeling of a 9-m GFRP guyed communication tower. Extensive material testing was conducted to define the material properties required for modeling the guyed tower. Furthermore, the study involved the fabrication of a unique adjustable collapsible multiuse device to form the prismatic tower cells required for the tower's fabrication. The newly designed collapsible mandrel fabricated individual cells using fiberglass matting and a hand lay-up method. The 9-m tower had a uniform constant cross section of three identical cells bonded together to form an equilateral triangle with sides of 500 mm. The tower was tested under static loading conditions using a whiffle-tree arrangement to simulate uniformly distributed wind loading. Under static loading conditions, a comprehensive experimental strain and deflection study was conducted and three critical regions on the tower were thoroughly evaluated. To simulate the structural behavior of the tower, a nonlinear finite-element model was created. The results for the finite-element model were validated by comparing them with experimental results. The structural performance of the GFRP guyed tower was accurately predicted by the finite-element model.

## Structural design and compression-bending test of ultra-lightweight carbon-fiber-reinforced polymer truss structures

**Author:** Shiping Li; Wujun Chen; Jianhui Hu; Bing Zhao; Haitao Zhao; Longlong Chen; Xiaohui Huang.

**DOI:** [10.1016/j.compstruct.2023.116909](https://doi.org/10.1016/j.compstruct.2023.116909)

**Journal:** Composite Structures

**Abstract:** Based on the ultra-lightweight, large-span, and heavy-load structural design requirements for the load-bearing structure of next-generation spacecraft, the ultra-lightweight structure design, modular integration technology and joint construction pattern of carbon-fiber-reinforced polymer (CFRP) truss structures are systematically studied herein, and an ultra-lightweight full-scale CFRP composite truss structure is proposed. The truss module can be separately designed for structural pattern based on the force characteristics and functional requirements, which enhances the freedom of structural design. Using developed self-equilibrium test equipment, the compression-bending behavior of the two novel 1:1 full-scale CFRP truss structure prototypes with spans of 20.4 m (A-Truss and B-Truss) are experimentally studied. The failure mode of the truss structure is analyzed, the reasons for the failure of the joints are identified, and the corresponding improvement measures for the joint failure position are proposed and verified through tests. The designed ultra-lightweight CFRP truss structure prototype meets four design specifications in terms of bearing capacity and deformation, solving the ultra-lightweight structure design issue of truss structures and realizing the large-span, ultra-lightweight, and heavy-load structural design goals.

## Full-scale experimental test for load-bearing behavior of the carbon fiber shell reinforced stagger-jointed shield tunnel

**Author:** Xiaohui Zhang; Zhangrun Lin; Keping Zhang; Honggui Di; Chao He; Shunhua Zhou.

**DOI:** [10.1016/j.compstruct.2023.116773](https://doi.org/10.1016/j.compstruct.2023.116773)

**Journal:** Composite Structures

**Abstract:** Shield tunnels in the soft soil area are vulnerable to nearby engineering activities, resulting in deformation and damage problems. To investigate the effect of carbon fiber shells (CFS) on improving the loading bearing behavior of the tunnel under overloads, a full-scale experimental test is conducted and presented in this paper. Three rings of the stagger-jointed shield tunnel are chosen to be tested with twenty-four loads per ring applied to simulate the soil load and overload. Two loading processes are performed before and after the CFS are installed. Response data of the original tunnel and the CFS during the two loading processes are measured and analyzed. Main conclusions can be drawn as follows: (1) CFS reinforced tunnel has the same or even higher load-bearing capacity than the normal non-damaged tunnel. (2) The bonding effect between the CFS and the original tunnel is a critical parameter for the reinforced structure. The bending moment and axial force of the CFS reinforced tunnel are 33% and 20% smaller than those of the original tunnel before the CFS are detached. (3) The CFS can improve the bending resistance of the longitudinal joints which open at the intrados arc surface of the tunnel; however, no obvious effect is observed for those open at the extrados arc surface of the tunnel. (4) In the ultimate condition, the CFS is detached from the tunnel near the longitudinal joints which open at the intrados arc surface, and fractured partially near the longitudinal joints that open at the extrados arc surface of the tunnel.

## Effect of using fibre reinforced epoxy adhesive on the strength of the adhesively bonded Single Lap Joints

**Author:** Ranjan K. Behera; S.K. Parida; R.R. Das.

**DOI:** [10.1016/j.compositesb.2022.110358](https://doi.org/10.1016/j.compositesb.2022.110358)

**Journal:** Composites Part B: Engineering

**Abstract:** In this paper, the static strength and elongation of the adhesively bonded Single Lap Joints (SLJs) at failure are enhanced by using glass fibres reinforced with epoxy adhesive. Commercially available Araldite, a standard epoxy adhesive, is utilised as the binding agent, while Aluminium plate and Glass Fibre Reinforced Plastic (GFRP) are used as metal and composite adherend materials, respectively, in the experiment. The performance of glass fibre reinforced epoxy adhesives in terms of strength improvement has been tested for two types of SLJs: MTM (Metal-to-Metal) and MTC (Metal-to-Composite). The strength controlling parameters considered during the experiment are certain variables such as the alignment of the bundle of long glass fibres along the loading direction, the size of glass fibres and the weight ratio of short glass fibres reinforced with epoxy adhesive in the overlap region of the SLJ. The effects of these controlling parameters on the strength and elongation have been discussed. In addition, the bundles of long glass fibres are overlaid at the fillet region along the loading axis, extending beyond the overlap ends to observe the effect of the peel stress at the overlap ends and examine its effect on the failure strength of the SLJ. The experimental results show that there is a substantial increase in failure load and elongation. Fractography analysis has also been carried out to analyse the fracture surfaces using a Scanning Electron Microscope (SEM).

## Presenting a strategy to prevent FRP debonding for strengthening RC connections

**Author:** Ebrahim Rostamiyan; Ali Golafshar; Mohammad Hossein Saghafi.

**DOI:** [10.1016/j.engstruct.2023.115823](https://doi.org/10.1016/j.engstruct.2023.115823)

**Journal:** Engineering Structures

**Abstract:** Defects in the beam-column connections of old RC frames significantly increase the vulnerability of exterior connections in an earthquake. One of the methods for improving the performance of defective connections in the previous studies was to use FRP. The noteworthy point in the past studies is the focus on 2D connections without considering the lateral beams and slabs. These elements in 3D connections simultaneously increase the confinement and increase the shear demand in the connection core. Therefore, considering the limited studies about the improvement of 3D weak connections using FRP, the aim of this study is to improve defective connections. On the other hand, the main challenge in using FRP is debonding. In this paper, a plan for the installation sequence of FRP sheets on 3D geometric connections presented, while avoiding the creation of holes or grooves on the concrete surface. For this purpose, five experimental specimens, including one connection with seismic details, two connections with defects, and two strengthened connections are tested in the laboratory under cyclic loading. The results show improvement in the behavior of the strengthened connections, moreover, FRP debonding was not observed.



# ASCE Journal of Composites for Construction



The American Society of Civil Engineers (ASCE) Journal of Composites for Construction (JCC) is published with the support of IIFC. As a service to IIFC members and through an agreement with ASCE, *FRP International* provides an index of ASCE JCC. The ASCE JCC may be found at the following website:

<http://ascelibrary.org/cco/>

ASCE JCC subscribers and those with institutional access are able to obtain full text versions of all papers. Preview articles are also available at this site.

Papers may be submitted to ASCE JCC through the following link:

<http://www.editorialmanager.com/jrncceng/>

## Recent Issues

### Volume 27, Issue 1. February 2023

*Stiffness Degradation of Textile-Reinforced Mortar under Unloading–Reloading Tensile Cycles*

[Marco Carlo Rampini, Giulio Zani, Matteo Colombo and Marco di Prisco](#)

*Quick Repair of Damaged Infill Walls with Externally Bonded FRPU Composites: Shake Table Tests*

[Łukasz Hojdys, Piotr Krajewski, Arkadiusz Kwiecień, Theodoros Rousakis, Vachan Vanian, Marcin Tekieli, Alberto Viskovic, Alper Ilki, Matija Gams, Zoran Rakicevic, Bogusław Zajac and Aleksandra Bogdanovic](#)

*Application of CFRP Tendons to Novel Connections of Precast Concrete Deck Panels: Experiments and Analytical Models*

[Menghan Hu, Zhenlei Jia, Qiang Han, Yulei Bai, Chiyu Jiao and Peiheng Long](#)

*NSM GFRP Strengthening of Reinforced Concrete Beams after Exposure to Fire: Experiments and Theoretical Model*

[Vu Nguyen Nguyen and Vui Van Cao](#)

*Innovative FRP-Reinforced Self-Bearing Arches*

[Alessio Cascardi, Francesco Micelli and Maria Antonietta Aiello](#)

*Seismic Retrofit of Nonuniformly Corroded Coastal Bridge Piers with FRP and Engineered Cementitious Composite Overlays*

[Yingwu Zhou, Xiaohan Wang, Biao Hu, Lili Sui and Fang Yuan](#)

*Finite-Element Modeling of FRP-Confined Noncircular Concrete Columns Using the Evolutionary Potential-Surface Trace Plasticity Constitutive Model for Concrete*

[Bo-Tong Zheng and Jin-Guang Teng](#)

*Experimental and Numerical Investigations of Punching Shear Behavior of FRCM-Strengthened Two-Way RC Slabs*

[Khuong Le-Nguyen, Xuan-Huy Nguyen, Huy Cuong Nguyen, Minh-Quyen Cao, Amir Si Larbi and Zakaria Ilyes Djamai](#)

*Pullout Behavior of Connections Using Self-Drilling Screws for Pultruded Fiber-Reinforced Polymer Composites in Construction*

[Zhenqi Cai, Chengyu Qiu, Yu Bai, Lawrence C. Bank and Xiao-Ling Zhao](#)

*Proposed Development Length Equations for GFRP Bars in Flexural Reinforced Concrete Members*

[Omar Gouda, Ahmed Hassanein and Khaled Galal](#)

*Novel Embedded FRP Anchor for RC Beams Strengthened in Flexure with NSM FRP Bars: Concept and Behavior*

[Y. Ke, S. S. Zhang, S. T. Smith and T. Yu](#)

*Evaluation of Spliced UHM CFRP Strip Panels for Strengthening Steel Beams*

[Akram Jawdhari, Abheetha Peiris, Amir Fam and Issam Harik](#)

*Effect of Transverse Reinforcement Ratios and Configurations on the Behavior of Hollow Circular Concrete Columns Reinforced with GFRP under Concentric Loading*

*Mohammed Gamal Gouda, Hamdy M. Mohamed, Allan C. Manalo and Brahim Benmokrane*

*Development of GFRP Monopole Guyed Communication Tower*

*Sami Alshurafa, Hanan Alhayek and Dimos Polyzois*

*A Strut-and-Tie Model for Predicting the Shear Strength of Exterior Beam-Column Joints Strengthened with Fiber-Reinforced Polymers*

*Reza Mashhadi, Mohammad Ali Dastan Diznab and Fariborz M. Tehrani*

*Bond between Sand-Coated GFRP Bars and Normal-Strength, Self-Compacting, and Fiber-Reinforced Concrete under Seawater and Alkaline Solution*

*Milad Shakiba, Milad Bazli, Mohammad Karamloo and Alireza Doostmohamadi*

*Effect of U-Wrap Anchors on Flexural Behavior of Reinforced Concrete Beams Flexurally Strengthened with Externally Bonded CFRP Sheets*

*J. Tatar, C. Viniarski, M. Ishfaq, K. A. Harries and M. Head*

*Fatigue Damage Tolerance of Adhesively Bonded Pultruded GFRP Double-Strap Joints with Adhesion Defects*

*Cheikh Makhfouss Fame, Li He, Lik-ho Tam and Chao Wu*

*Finite-Element Modeling and Experimental Verification of Two-Way Sandwich Panels Made of Natural Fiber Composites*

*Dillon Betts, Pedram Sadeghian and Amir Fam*

*Evaluation of Stability Resistance Factor for Slender Concrete Columns Internally Reinforced with Fiber-Reinforced Polymer Bars*

*Eman Saleh and Mai Aljaberi*

*Compressive Behavior of GFRP Tubes Filled with Self-Compacting Concrete*

*Pan Xie, Lik Lam and Tao Jiang*

*Bond Behavior of Prestressed CFRP Strips-to-Concrete Joints Using the EBROG Method: Experimental and Analytical Evaluation*

*Niloufar Moshiri, Enzo Martinelli, Christoph Czaderski, Davood Mostofinejad, Ardalan Hosseini and Masoud Motavalli*

**Volume 27, Issue 2. April 2023**

*Unified Ultimate Axial Strain Model for Large Rupture Strain FRP-Confined Concrete Based on Energy Approach*

*Peng-Da Li, Tao Zhang and Jun-Jie Zeng*

*Experimental Study on the Bond Performance of Steel-Basalt Fiber Composite Bars in Concrete*

*Shengjiang Sun, Lili Xing, Peng Gui, Bo Li, Hangyu Li, Lei Zhao and Kuihua Mei*

*Cyclic Behavior of Beam-Column Pocket Connections in GFRP-Reinforced Precast Concrete Assemblages*

*Tohid Ghanbari-Ghazijahani, Reza Hassanli, Allan Manalo, Scott T. Smith, Tom Vincent, Rebecca Gravina and Yan Zhuge*

*Dilation Characteristics of FRP-Confined Square Engineered Cementitious Composite Columns*

*Pengda Li, Deqing Huang, Yingwu Zhou and Songbin Zheng*

*Experimental and Numerical Study on Seismic Performance of PEN FRP-Jacketed Circular RC Columns*

*Yu-Lei Bai, Yu-Feng Zhang, Peng-Xuan Sun, Jian-Guo Dai and Togay Ozbakkaloglu*

*Fatigue Repair of Cracked Steel Plates Using Small-Patch Ultrahigh-Modulus CFRP Governed by Bond Failure*

*Liam Knoll, Amir Fam, Joshua E. Woods and Brahim Benmokrane*

*Shear Strength Prediction of Slender Concrete Beams Reinforced with FRP Rebar Using Data-Driven Machine Learning Algorithms*

*Mohammad Rezaul Karim, Kamrul Islam, A. H. M. Muntasir Billah and M. Shahria Alam*

*Experimental Verification of Load-Bearing Capacity of FRP Bars under Combined Tensile and Shear Forces*

*Frantisek Girgle, Ondrej Janus, Vojtech Kostiha and Petr Stepanek*

*Compressive Behavior of Concrete-Filled Filament-Wound FRP Tubes with Local Tube Damage*

*Guan Lin and Yu Xiang*

*Experimental Study on Flexural Cracking and Deformation of Reinforced-Concrete Beams Strengthened with NSM FRP Reinforcement*

*Cristina Barris, Marta Baena, Younes Jahani, Alba Codina and Lluís Torres*

*Behavior of Reinforced Concrete Beams without Stirrups and Strengthened with Basalt Fiber-Reinforced Polymer Sheets*

*Wei Zhang, Shuaiwen Kang, Yiqun Huang and Xiang Liu*

*Performance of Compression Yielded FRP-Reinforced Concrete Beams with T Sections*

*Bingcheng Guo, Xiaoshan Lin, Yufei Wu and Lihai Zhang*

*Experimental and Analytical Study of Bond Stress-Slip Behavior at the CFRP-to-Concrete Interface*

*Abbas Fathi, Georges El-Saikaly and Omar Chaallal*

*Numerical Investigation of Axial Force-Bending Moment Interaction for FRP-Confined Reinforced Concrete Columns with Internal Steel Transverse Reinforcement*

*Diogo Zignago and Michele Barbato*

*Performance-Based Seismic Design of Hybrid GFRP-Steel Reinforced Concrete Bridge Columns*

*Sherif M. S. Osman, Saif Aldabagh, M. Shahria Alam and Shamim A. Sheikh*

*Behavior and Design of Masonry Strengthened with Steel-Wire-Reinforced Cementitious Matrix under Flexure*

*Dattatreya Tripathy and Vaibhav Singhal*

*Influence of Axial Load and Transverse Impact Velocity on the Behavior of Concrete Shear Walls Reinforced with GFRP Bars*

*Renbo Zhang, Manfang Lin, Liu Jin and Xiuli Du*

*Reliability of Externally Bonded FRP-to-Concrete Joints with Epoxy Interlocking Enhancement*

*Zhao Wang and Baolin Wan*

*Seismic Behavior of Concrete Bridge Piers Reinforced with Steel or GFRP Bars*

*Cain Stratford, Alessandro Palermo and Allan Scott*

*Short-Term Performance of New Composite Anchorage with Multiple CFRP Tendons*

*Kuihua Mei, Xue Li, Xinyu Zhang, Yamin Sun, Yu Li and Shengjiang Sun*

*Symmetric and Asymmetric Strengthening of Two-Span RC Beams Using FRCM Systems*

*Ahmed Mandor and Ahmed El Refai*

*Experimental Behavior of GFRP Bar-Reinforced CFRP Strip Tie-Confined Normal-Strength Concrete Columns under Different Loading Conditions*

*Muhammad Ayoub, Hayder Alaa Hasan, M. Neaz Sheikh and Muhammad N. S. Hadi*

*Implementation of GFRP-RC Code Provisions: Detailing for Deflection Criteria*

*Isaac Higgins, Vicki L. Brown and Brendan Kearns*



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the official newsletter of the International Institute for FRP in Construction

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