DAY 1

Scientific Tracks & Abstracts

International Conference on

Structural and Civil Engineering Research

October 01-02, 2018 | Amsterdam, Netherlands

DAY 1

October 01, 2018

Sessions

Civil Engineering and Architecture | Steel Structures And Construction | Earthquake Engineering and Disaster Management | Structural Analysis And Designing | Reinforced Concrete Structure |Building Technology And Construction Management | Modular Constructions

Session Chair	Session Co-Chair
Sherif A. Mourad	Rais Ahmad
Cairo University, Egypt	California State University Northridge, USA

Session Introduction

Title: **Executive design: Technological innovation and instrumental procedures**
Massimiliano Nastri, Polytechnic University of Milan, Italy

Title: **Alkali Silicate Activated, Slag-Fly Ash Binders**
Waltraud M. Kriven, University of Illinois at Urbana-Champaign, Illinois, USA

Title: **The new techniques of strengthening and rehabilitation of existing RC structures**
Islam M. Ezz El-Arab, Tanta University, Egypt

Title: **Tourism constructions in fragile ecosystems: case study in Galapagos Islands, Ecuador**
Ruiz Lourdes, Universidad Internacional del Ecuador, Ecuador

Title: **Effects of blast loading on buckling restrained braces**
Rais Ahmad, California State University Northridge, USA

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Massimiliano Nastri, JET 2018 Volume: 7

EXECUTIVE DESIGN: TECHNOLOGICAL INNOVATION AND INSTRUMENTAL PROCEDURES

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This study examines the theoretical and instrumental contents concerning the executive design that was considered as an operational and cognitive apparatus aimed at planning, managing and guiding the on-site production and construction processes. The executive design is defined as means of knowledge and action aimed at modeling, anticipating and simulating the production and construction reality. Its objective is to lead, guide and materialize the practical implementation according to the development of the technical devices aimed both at structuring the contents, rules and design data, and at the feasibility assessment. The study is defined as a sum of research and didactic activities including the analysis relating both to the references concerning the technological design culture and the executive design practices carried out in the contemporary scenario. Furthermore, the study aims at developing a fundamental theoretical system concerning the executive design, whereby to proceed with the configuration of the layout related to the specific subject area and with the in-depth analysis of educational aspects (with respect to the impartation of instrumental knowledge), procedural aspects (with respect to the development of organizational and management processes) and notional and regulatory aspects. The executive design develops the graphic and descriptive contents with the purpose of representing an interaction and mediation tool for operators, professionals, qualified workers, experts, especially in relation to the production phase and the implementation phase; structuring, organizing and managing information (regarding products and materials, systems, components and technical elements, operators and their responsibilities); developing a decision making tool and an instrument that would determine the managing, prediction and rational organization procedures concerning the production and construction phase; creating a communication tool, with the aid and the application of scientific representation modes by using a symbolic and coded language, for viewing and controlling the production and construction phase

Biography

Massimiliano Nastri has received his PhD in 1999 and the Post-Doctoral degree in 2002 in *Technical Innovation and Architectural Design*, and a Research Grant in 1999-2000 at the Polytechnic of Milan. He is serving as Assistant Professor in *Building Technology* at the Department of architecture, built environment and construction engineering of the Polytechnic of Milan (since 2005). He develops his own scientific activity related to innovative executive design methods and to advanced building structures and envelopes. Scientific Director of the Editorial Collection *Executive culture and technological innovation* (Tecniche Nuove Publishing House S.p.A.), he published *Introduzione al design vibro-acustico* (FrancoAngeli, Milano, 1997; also translated in Greece, 1998), *Technítes* (Maggioli, Santarcangelo di Romagna, 2002), *Involucro e architettura* (Maggioli, Santarcangelo di Romagna, 2008), *Téchne e progetto esecutivo* (Maggioli, Santarcangelo di Romagna, 2008), *La costruzione dell'architettura. Strumenti e procedure operative per l'elaborazione tecnica del progetto* (FrancoAngeli, Milano, 2009), *La realtà del progetto* (Maggioli, Santarcangelo di Romagna, 2009).

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Waltraud M. Kriven et al., JET 2018 Volume: 7

ALKALI SILICATE ACTIVATED, SLAG-FLY ASH BINDERS

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Sodium silicate activated, slag-fly ash binders (SFB) and slag-metakaolin binders (SMKB) are room temperature hardening binders that have excellent mechanical properties and a significantly lower carbon footprint than does Ordinary Portland cement (OPC). The aim of this study was three-fold. The first aim was to study the properties of precursors. Fly ash, slags and commercial metakaolins were characterized using energy dispersive x-ray fluorescence (EDXRF), X-ray diffraction (XRD), laser diffraction, Fourier transform infrared (FTIR) spectroscopy as well as magic-angle spinning, nuclear magnetic resonance (MAS-NMR) spectroscopy. The second aim was to develop a method to identify and quantify all poorly-ordered phases (unreacted precursors and products) present in SFB and SMKB. This was achieved by selective chemical extractions and MAS-NMR spectral subtraction of binders and extraction residues. The third aim was to observe the nanostructural evolution of the product phases with time, temperature and slag/fly ash ratio in SFB. This was accomplished by deconvoluting the MAS-NMR spectra. It was observed that the proportion of true geopolymer present was only 0-15 % and higher in SMKB when compared to SFB. Although C-N-A-S-H and geopolymer coexisted in SFB and SMKB, C-N-A-S-H was the major product phase formed. The mean chain length (MCL) and structure of C-N-A-S-H gel were estimated as a function of time, temperature and slag/fly ash ratio. The MCL decreased with increasing slag/fly ash ratio and decreased with increasing temperature. While increasing the slag/fly ash ratio accelerated the strength development, the cure time was decreased due to the formation of calcium silicate hydrate (C–S–H), calcium aluminum silicate hydrate (C–A–S–H), and (Ca, Na) based geopolymer. No new crystalline phases evolved through 28 days in ambient- or heat-cured binders. Furthermore, the early age properties of slag - fly ash binders namely, set time, and heats of reaction were investigated. Set time was investigated using a combination of the ASTM C403 penetration testing, and s-wave ultrasonic wave reflectometry (SUWR). The discrepancy in set time identified by these two methods suggested the presence of a soft gel which eventually hardened with time. The composition of this soft gel was analyzed by suspending the chemical reaction of the binder after the soft gel formed, but before it hardened. In order to analyze the composition of the soft gel, selective chemical extractions were performed on the binder. 29Si MAS-NMR and FTIR spectroscopy were performed on binders and extraction residues. The soft gel contained a modified calcium silicate hydrate gel (C-N-S-H where N=Na), with a short mean chain length and no observable Al incorporation. Orthosilicate units were also found to be present in relatively high proportions when compared to hardened binders at later ages

Biography

Waltraud M. Kriven is a Full Professor and has held joint faculty positions in the Materials Research Laboratory (initially) and the Department of Materials Science and Engineering. She received her Ph.D in 1976 in Solid State Chemistry from the University of Adelaide in South Australia. The B.Sc. (Hons) and Baccalaureate degrees were in Physical and Inorganic Chemistry, and Biochemistry, also in Adelaide. Professor Kriven has internationally recognized expertise in the areas of geopolymers, phase transformations in inorganic compounds and their applications in structural ceramic composites, and low temperature synthesis of oxide ceramic powders. In addition she has made extensive contributions to oxide composites design, microstructure characterization by electron microscopy techniques and phase equilibria. The Kriven group has developed a new technique for in situ, hot stage (up to 2000°C) synchrotron studies of ceramics in air, including an image plate detector capable of taking a high resolution, diffractometry spectrum within 20 seconds. She has written or co-authored 282 journal and 56 conference publications, as well as given or co-authored over 432 conference presentations. Prof. Kriven has edited or co-edited 26 books to date. She has given 34 keynote/plenary lectures at international meetings, as well as 218 invited lectures both nationally and internationally, including the US, Japan, Germany, United Kingdom, Switzerland, Spain, Turkey, Egypt, Korea, Italy, Ukraine, France, Australia, Colombia, Brazil. Professor Kriven has won the James A. Mueller Award (2017) from the Engineering Division of the American Ceramic Society for her research in ceramics. She was awarded the Brunauer Award twice (in 1988 and 1991) from the American Ceramic Society for co-authoring the best research papers of the year.

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Islam M Ezz El-Arab, JET 2018 Volume: 7

THE NEW TECHNIQUES OF STRENGTHENING AND REHABILITATION OF EXISTING RC STRUCTURES

Islam M Ezz El-Arab
Tanta University, Egypt

Repair and strengthening of damaged or vulnerable reinforced concrete structures is important in order to guarantee the safety of residents or users. Structural elements are important for withstanding loads, so finding the efficient repair and strengthening methods are necessary in terms of maintaining the safety of the structures. In this lecture, previous and the newest works on structural assessment for strengthening and rehabilitation techniques systems will be presented to show the principal concept of structural assessment for existing structure buildings. Also, advanced and conventional strengthening techniques for rehabilitation in the construction market will be presented to show the differences among them. Moreover, the advantages and disadvantages of each system will be presented in detail for the famous systems. A famous practical application of them will be presented in actual projects. Classification to the analytical, experimental, and parametric studies are presented by others to cover this area and make complete survey on structural assessment and strengthening techniques

Biography

Islam M Ezz El-Arab is a Professor at the Structural Engineering Department, Faculty of Engineering, Tanta University. He obtained his BSc in Civil Engineering and MSc in Structural Engineering from Tanta University in 1998 and 2002, respectively. He has completed his PhD in Earthquake Engineering, 2007. He has published more than 25 papers and two international books in reputed journals and has been serving as an Editorial Board Member of repute. He is classified as Consultant Engineer in Reinforcement Concrete Structures in Egypt and KSA. He has participated as structural designer, reviewer and construction consultation engineer of the tall buildings, colleges, shopping complexes, hospitals, and security buildings by considering the structural requirements and adequate construct able systems to complete the projects within allocated budget and time schedule. He has founded INGAZ, IVE Consultant Bureau established at 2007 as Structural Consultant Specialist in structural assessment, strengthening, rehabilitation of existing buildings, and value engineering. His research interests include Earthquake Engineering and Structural Dynamics, Assessment of Existing Structures and precast structures, Experimental Testing of Small and Full-Scale Structures.

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Ruiz Lourdes, JET 2018 Volume: 7

TOURISM CONSTRUCTIONS IN FRAGILE ECOSYSTEMS: CASE STUDY IN GALAPAGOS ISLANDS, ECUADOR

Ruiz Lourdes
Universidad Internacional del Ecuador, Ecuador

This paper addresses elements related to sustainability in tourism construction related planning and project for how to manage the negative environmental impact in fragile beach ecosystems in Galapagos Islands, Ecuador, which have been caused by certain construction approaches and techniques. The study discusses the current status of construction on beachfronts and other coastal areas, including economic, sociocultural, environmental aspects and other instruments aimed at ensuring sustainability. The application of environmental assessment methods to the field of construction design allows us to study and evaluate the actions that take place in the activity of planning, projecting, implementation, the use and eventual abandonment or recycling of built objects, with the goal of determining, predicting, interpreting and communicating the negative impacts that these actions cause to the environment under current conditions, in order to achieve a social model with sustainable approaches to tourism in Galapagos Islands of Ecuador. At the same time, it is necessary to use the analysis and synthesis methods to study the primary contributions of the research subject and to verify its validity in the field of tourism construction. The application of the work will contribute to the analysis of economic costs from an environmental perspective, through the adoption of preventive environmental measures rather than retroactive ones; reducing the consumption of materials, manpower, energy and time by focusing on the problem in advance and estimating the environmental costs that must be included in long-term valuations as part of feasibility studies

Biography

Ruiz Lourdes has completed her PhD from Universidad Técnica José Antonio Echeverria in Havana, Cuba and Postdoctoral Studies from Dresden University in Germany and Universidad de Alcalá de Henares in Spain. She is an Architect, Master in Construction Sciences, Doctor in Technical Sciences and General Director of Research at Universidad Internacional del Ecuador. She has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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Rais Ahmad et al., JET 2018 Volume: 7

EFFECTS OF BLAST LOADING ON BUCKLING RESTRAINED BRACES

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Buckling restrained braced frames (BRBF) are being used all around the world to resist lateral loads on structures. They are used due to their high ductility after yielding and the ability to absorb energy. Due to emerging use of BRBFs as a major seismic or lateral force-resisting system, it has generated lots of interests among researchers to investigate its behaviour under different loading conditions like blast loading. The threat of blast can be catastrophic as the effects can lead to loss of life and failure of the building. In this research, investigations were carried out on how buildings which were originally designed with BRBFs as primary lateral force resisting system, behaves under the impact of blast loading. Particular focus was set on how the behaviour of the frame was influenced by the brace thickness, compressive strength of the concrete fill of the BRBs under blast loading. Investigations were also carried out to understand the interaction between the brace plates, surrounding concrete and the steel casing. Different brace orientations such as single bay Chevron and V-Brace were examined in this study. The study also investigated how the collapse starts in the BRBF's and which are the critical elements that are vulnerable inside the BRB braces under blast loading

Biography

Rais Ahmad is an Associate Professor in the Civil Engineering and Construction Management Department at California State University, Northridge (CSUN). He has received his PhD in "Guided Wave Techniques to Detect Defects in Underground Pipes" from the University of Arizona. His research interests include Advanced Material Behaviour, Wave Propagation and Non-destructive Testing (NDT), Earthquake Engineering, Steel and Concrete Design. His research interests are in the fields of Acoustic Modelling, Wave Propagation and Blast Loading Analysis. He has authored more than 40 papers in various journals, conference proceedings etc. He is a Licenced Professional Engineer (PE) in the states of California and North Carolina, USA. He is the ASCE-CSUN Faculty Advisor.

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Shubham Srivastava et al., JET 2018 Volume: 7

USE OF MICRO PILES IN BRIDGE FOUNDATION IN LEH-LADDAKH REGION

Shubham Srivastava[1], Mohd Zain[1] and Pramood Kumar Gupta[2]

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Construction of foundation of bridges in remote hilly terrain, in adverse climatic condition, isvery difficult due to the limited working period and unavailability of transportation of machinery and equipments as in Leh-Ladakh region of India. In such situations regular pile foundation is not feasible. The study was taken up with to carry out experimental design for bridge and ascertain the applicability of micro-piles as bridge foundation under such adverse conditions. The methodology included field and lab tests for soil and sub-soil investigation, vertical and lateral load tests on micro-piles. The design of micro-pile foundation and sub structure is based on success results of the tests i.e. the safe load capacity achieved in these tests. Based upon experimental success results, confirmation for using micro piles was accorded. In future, micro-piles can prove to be a better solution in where river bed is laden with boulders and other similar difficult situations

Biography

Er. Shubham Srivastava is working as Asst. Prof. in the Faculty of Civil Engineering Department, Shri Ramswaroop Memorial University. He has been associated with various research and consultancy works, worked as Faculty coordinator for foreign tour(AIT, Bangkok, Thailand) and guided both PG thesis and graduation project works. His current research interests include bacterial concrete, self compacting concrete, structural design, retrofitting and seismic analysis of buildings. Mr. Srivastava is member of Institution of Civil Engineers (India). He was also engaged as interview expert panel member for JE (Civil), Uttar Pradesh Rajya Vidyut Utpadan Nigam Ltd. and he is a reviewer of various International journals JETIR and IJCRT. He has authored various papers and has been actively participating in various conference (both national and international). Currently he is pursuing Ph. D. from IIT BHU (Indian Institute of Technology, Banaras Hindu University).

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Ma Bavan et al., JET 2018 Volume: 7

STRENGTHENING OF COMPOSITE BEAM WITH WEB OPENINGS SUBJECTED TO COMBINED HOGGING MOMENT AND AXIAL TENSION

Ma Bavan[1], Shahrizan Bin Baharom[2] and Siti Aminah Osman[2]

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This paper describes the strengthening of composite beam by providing openings on web of composite beam subjected to hogging moment and axial tension. A nonlinear three-dimensional numerical model was developed for steel concrete composite beam subjected to combined hogging moment and axial tension and the predicted applied vertical and axial loads were found within 15% of deviation including similar failure criteria. Failure of the bond between studs and surrounding concrete was observed due to the extensive axial loads and flexural stiffness of studs became smaller as the increase of axial loads. Web openings were applied subsequently and it was found that web openings have influenced the failure criteria and ultimate strength of the composite beam. In addition, a parametric study, by applying stiffness on the web of the composite beam including the various parameter of stiffness, was then carried out in the developed numerical model. As a result, applying stiffness on the web of the composite beam generally gives much better ultimate strength, including postponing first failure mode, which presented herein as conclusive of strengthening method

Biography

Ma Bavan has completed his MSc in Civil and Structural Engineering from National University of Malaysia and Master of Engineering in Geotechnics from University Technology Malaysia. He is a Senior Engineer in Civil and Structural Engineering with 14 years of vast professional experiences and currently, he is enduring the research to pursue PhD. He has published more than 50 papers in reputed journals and international conferences.

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LOCAL BEHAVIOURS ON WEB OF COMPOSITE BEAM WITH WEB OPENINGS SUBJECTED TO COMBINED HOGGING MOMENT AND AXIAL TENSION

Ma Bavan[1], Shahrizan Bin Baharom[2] and Siti Aminah Osman[2]

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[2]National University of Malaysia, Malaysia

A numerical procedure for the analysis on web of composite beam by applying stiffness on web for strengthening is herein studied. The study accounts for nonlinear behaviour of materials used in steel concrete composite beam including three dimensional material components of steel and concrete. In particular, the mechanism of stress strain transition in material components due to the openings on the web, applying stiffness on the web and applying loads on combined vertical and horizontal directions are taken into account for the analysis. The accuracy and reliability of the developed numerical model for steel concrete composite beam subjected to combined hogging moment and axial tension were ensured within 15% of deviation in predicting applied vertical and axial loads including similar failure criteria by the existing experimental program. Then, the developed model was included with web openings and stiffnesses and the analytical results were compared with corresponding beam without openings. The reported results demonstrated that, applying stiffness is a valid tool for postponing the failure criteria while web buckling is postponed or eliminated. The numerical procedure developed in this research allowed to predict the actual nonlinear behaviour of the steel beam and the shear transfer in the steel beam where the openings and stiffeners are located allowed to predict the local behaviour of the composite beam including failure criteria and ultimate strength of the steel concrete composite beam

Biography

Ma Bavan has completed his MSc in Civil and Structural Engineering from National University of Malaysia and Master of Engineering in Geotechnics from University Technology Malaysia. He is a Senior Engineer in Civil and Structural Engineering with 14 years of vast professional experiences and currently, he is enduring the research to pursue PhD. He has published more than 50 papers in reputed journals and international conferences.

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