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Editorial

Welcome from the Editors

Welcome to the sixth issue of Malaysian Construction Research Journal (MCRJ). In this issue, we are pleased to include another six interesting papers from various contributors that cover the wide range of research area in construction industry. The editorial team would like to express our sincere gratitude to all contributing authors and reviewers for their contributions, continuous support and comments. It is hope that this issue will bring beneficial information to the readers.

Hanizam Awang and Wan Hamidon study the flexural performance of roof panel constructed from profiled steel sheeting connected to dry board. The system called profiled steel sheeting dry board (PSSDB) is proposed as an alternative to the conventional forms of roof construction. Using finite element modeling (FEM), they analyze the performance of the system such as bending, elastic behavior and deflection as well as the effect of their thickness on the deflection.

Nor Hayati Abdul Hamid presents the seismic assessments on precast wall panels using fragility curves. Three types of precast wall were constructed i.e. monolithic reinforced concrete walls, slender precast reinforced concrete wall with slenderness ratio of 60 and prestressed precast hollow core wall. Experimental works were carried out and the behavior of the wall such as cracks propagation, crack patterns, spalling, buckling and bar fractures were observed. Color coded system is used to identify damages states, performance level and ductility factors, while fragility curve is used to assess their seismic performance using classification damage states.

Mahyuddin Ramli and Eethar Thanon Dawood investigates the performance of high strength flowing concrete containing steel fiber. This paper highlights the use of varying percentage of steel fibre as volumetric fractions on the high strength flowing concrete (HSFC) to determine the mechanical properties, which include density, compressive strength, flexural strength, splitting tensile and static modulus of elasticity. Results show that the increase percentage of steel fiber will improve the strength and mechanical properties of HSFC.

Ahmad Baharuddin Abd. Rahman, et al. study the performance of grouted sleeve connectors subjected to incremental tensile load. The paper investigates the behavior and the strength performance of grouts sleeve connectors for joining recast concrete components. These connectors were subjected to incremental tensile loads until failure. Their performances were evaluated in terms of stiffness, yield strength, ductility and failure modes.

Mastura Jaafar, et al. present the assessment of women involvement in the construction industry. Based on survey questionnaires sent to women contractors in Northern Malaysia, it is revealed that the majority of women entrepreneurs started with small business, which for some successfully grew. Most of them gained business knowledge through formal courses and received Government assistance. The authors concluded that it is not impossible for women to achieve success in this male dominated industry.

The final paper by Ting Sim Nee, et al. analyse the payment affected by standard forms of construction contract in Sarawak. The purpose is to create better understanding of the explicit clauses in various standard forms relating to payment. Analysis was made of three different standard forms in East Malaysia, i.e. the Malaysian Public Works Department 75 (PWD 75), the CIDB Standard Form of Contract for Building Works 2000 edition (CIDB 2000) and the Malaysian Standard Form of Contract 1998 edition (PAM 1998). Findings show that the prevalent standard form in Sarawak fails to clarify various issues such as penultimate claims, account preparation procedures, time frames for settlement and submission of final claim. The findings show these problems are prevalent in the industry and changes and improvements are crucial to bring betterment to the industry and all the contracting parties.

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FINITE ELEMENT PREDICTION ON THE FLEXURAL PERFORMANCE OF INDIVIDUAL PANEL OF PROFILED STEEL SHEET DRY BOARD (PSSDB) ROOF SYSTEM

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Abstract
Roof panel system constructed from profiled steel sheeting connected to dry board (known as profiled steel sheeting dry board (PSSDB)) by self-drilling, self tapping screws is being proposed as an alternative to the traditional forms of roof construction. In the proposed system, the normal position of the PSSDB system has been reversed. The board plays an important role in providing the flat surface for the roofing system and also to enhance the strength of the panel system. This kind of structure has a significant advantage of removing the internal trussing and support that is normally required in a traditional trussed roof system, hence creating additional useable space within the roof space, which is advantageous to homeowners. This paper looks into the possibility of employing the PSSDB panel to form a complete roof structure, analyzing it under the effect of bending test using the already established and verified finite element method (FEM). The basic behaviour in the elastic range is studied to check for deflection as the main controlling design factor. The effect of the steel sheeting thickness on the deflection of the mid span panel is investigated. In addition, the effect of using timber strip along the edge side of the roof panel as the method of enhancing the structure is also studied. The finite element model developed has shown accuracy within 5% to 11% compared to experimental results in predicating the deflection of the PSSDB panel. It was found that, the stiffness of the panels increased with the thickness of the steel profiled and the use of timber connecting strips along the side between adjacent PSSDB panels. Thicker panel and the present of timber strip along the edge side of the panel have increased the span of the panel for the loading value considered.

Keywords: Profiled Steel Sheet, Dry Board, Timber Strip, Deflection
ASSESS SEISMIC PERFORMANCE OF THREE TYPES OF CONCRETE STRUCTURAL WALL PANELS USING FRAGILITY CURVES

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Abstract
A seismic assessment on three types of precast wall panels using fragility curves is presented herein. These walls are monolithic reinforced concrete walls which designed in accordance to NZ3101 (New Zealand Standard Code of Practice), slender precast reinforced concrete wall with slenderness ratio (Height/thickness of the wall) of 60 and prestressed precast hollow core wall which designed using Damage Avoidance Design (DAD) philosophy. Their seismic performances were observed during experimental work and then, the classification of their damage states are accordance to drift limits. Visual observations during experimental work were recorded such as crack propagations, crack patterns, spalling and crushing of concrete, buckling and fractures of longitudinal bars before classify them into damage-states limit. Damage states of these walls panels are followed by their definitions and descriptions are given in HAZUS. Colour-coded system is used to identify damages states, level of performances and ductility factors, while fragility curve is used to assess their seismic performance using classification damage-states. The level of safety for these wall panels in reinforced concrete buildings are assessed using fragility curves and the prediction of damage states are based on Design Basis Earthquake (DBE) and Maximum Considered Earthquake (MCE).

Keywords: Colour-coded System, Damage States Limit, Fragility Curves, Design Basis Earthquake, Maximum Considered Earthquake
PERFORMANCE OF HIGH STRENGTH FLOWING CONCRETE CONTAINING STEEL FIBRE

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Abstract
This study investigates the use of varying percentages of steel fiber (0-2%) as volumetric fractions on the high strength flowing concrete (HSFC) to determine the density, compressive strength, flexural strength, splitting tensile and static modulus of elasticity. The flexural toughness indices were also determined according to ASTM C1018. The results show that the use of 1.0% steel fiber increases the compressive strength by about 10%, whereas, the use of 1.5% of steel fiber increases the flexural strength by about 42%. The splitting tensile strength, static modulus of elasticity & toughness indices results indicate that the increase in steel fiber fractions leads to improvements in these properties as well.

Keywords: Fiber Concrete, Performance, Steel Fiber, High Strength Flowing Concrete
PERFORMANCE OF GROUTED SLEEVE CONNECTORS SUBJECTED TO INCREMENTAL TENSILE LOADS

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Abstract
Full strength grouted sleeve connectors ensure the integrity of connected precast concrete components. This research investigated the behaviour and the strength performance of the proposed A, B, C and D-series grouted sleeve connectors for joining precast concrete components. The connectors were subjected to increasing tensile loads until failure. The performances of the connectors were also evaluated in terms of stiffness, yield strength, ductility and failure modes. The experimental results show that the C-series grouted splice sleeve connectors successfully achieved the full tensile strength of the connected steel bars. In addition, the confinement provided by the steel sleeve controls and delays the splitting cracks of the surrounding grout and eventually enhances the bond between bar-and-grout significantly. The enhanced bond contributes to a shorter development length of the connected bar as compared to the conventional bar lapping method.

Keywords: Bond, Connector, Grout, Precast Concrete, Splice Sleeve
EXPLORATORY STUDY ON WOMEN CONSTRUCTION ENTREPRENEURS IN MALAYSIA

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Abstract
Starting a business in a male-dominated industry is a challenging task for women entrepreneurs. Hence, this paper aims to assess women involvement in the construction industry. Fifty survey questionnaires were sent to women contractors in the northern region of Peninsular Malaysia i.e., Penang, Kedah, Perlis, and Perak. The findings revealed that the majority started with small businesses, which for some of the respondents successfully grew. These women operated as full-time contractors and highly emphasised the need to work hard. Most of them gained business knowledge through formal courses and received assistance from the government. Their experience and industry knowledge helped in terms of managing their firms and finding external opportunities. The research concludes that it is not impossible for women to achieve success in a typically male-dominated sector. To capture the general scenario of women’s involvement in the construction industry, this study proposes a thorough research to be conducted in Malaysia.

Keywords: Women Construction Entrepreneurs, Construction Industry, Business
AN ANALYSIS OF PAYMENT EFFECTED BY STANDARD FORMS OF CONSTRUCTION CONTRACT in SARAWAK, MALAYSIA: A COMPARATIVE STUDY OF PWD 75, CIDB 2000 AND PAM 1998

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Abstract
In Malaysia, there are several standard forms of general conditions of contract used as formal tools for contractual relationships between the parties in the local construction industry. The purpose of this study is to create a better understanding of the explicit clauses in alternative Standard Forms relating to payment in general and how, in their application, construction contract administration effects efficient project realisation. Contract clauses are examined towards a body of work that seeks to update and review and identify contract improvement suggestions. Analysis was made of three principal standard forms in East Malaysia, firstly the most commonly used and dominant Standard Form in Sarawak, that of the Malaysian Public Works Department 75 (PWD 75), secondly the CIDB Standard Form of Contract for Building Works 2000 Edition (CIDB 2000) and, thirdly the Malaysian Standard Form of Building Contract 1998 Edition (PAM 1998 Form). Theoretical comparisons were made and semi-structured interviews were carried-out to investigate practice and application in industry with regard to completeness and comprehensiveness. Findings show that the prevalent standard form in Malaysia’s largest state fails to clarify issues such as penultimate claims, account preparation procedures, time frames for settlement and submission of final claim, leading to a greater propensity for dispute and conflict in the realisation of the client’s brief. Findings offer a contribution to this field of construction contract administration in Malaysia. It also set the stage for further and necessary studies into construction contracts in Malaysia, where majorities of construction projects are carried out with standard forms. Problems as such shown in findings are prevalent in the industry and this indicates that improvements and changes are crucial in order to bring betterment to the industry and all the contracting parties.

Keywords: Construction-Contracts; Standard-Forms; Payment; Sarawak-Malaysia
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