MyConcrete: The Bulletin of the American Concrete Institute – Malaysia Chapter

American Concrete Institute
Malaysia Chapter

Introduction to American Concrete Institute – Malaysia Chapter

American Concrete Institute - Malaysia Chapter (ACI-Malaysia) is a non-profit technical and educational society representing ACI Global in Malaysia, which is one of the world's leading authorities on concrete technology. Our members are not confined to just engineers; in fact, our invitation is extended to educators, architects, consultants, corporate, contractors, suppliers and leading experts in concrete related field. The purpose of this Chapter is to further the chartered objectives for which the ACI was organized; to further education and technical practice, scientific investigation, and research by organizing the efforts of its members for a non-profit, public service in gathering, correlating, and disseminating information for the improvement of the design, construction, manufacture, use and maintenance of concrete products and structures. This Chapter is accordingly organized and shall be operated exclusively for educational and scientific purposes.

Did you know the objectives of ACI-Malaysia?

- ACI is a non-profitable technical and educational society formed with the primary intention of providing more in-depth knowledge and information pertaining to the best possible usage of concrete.
- To be a leader and to be recognized as one of Malaysia's top societies specializing in the field of concrete technology by maintaining a high standard of professional and technical ability supported by committee members comprising of educators, professionals and experts.
- Willingness of each individual member/organization to continually share, train and impart his or her experience and knowledge acquired to the benefit of the public at large.

Are you ready for your benefits as member of ACI-Malaysia?

- *Individuals, professionals, corporate, students can interact and widen their networking.*
- *A one-stop centre where educators & members can contribute their areas of expertise by sharing and presenting topics related to concrete technology at seminars organized by ACI on a monthly basis.*
- *ACI can assist members to resolve technical issues, seek professional assistance and even development of solution to their existing problems.*
- *Individual or corporate members can send their employees to attend seminars organized by ACI to learn and re-learn any topics that relate to concrete technology and to improve their technical knowledge which will assist in their work to reduce and avoid any reworks and repairs.*
- *Participate in seminars and networkings at an affordable price.*
- *Our institution will organize hands-on trainings which will benefit any intellectuals or fresh graduates and prepare them for work in the real work environment.*
- *An institution where members can contribute to our bulletins to keep our members informed of what is new in the concrete industry and the latest developments and innovations around the world. Our website will keep you informed and updated on what is coming along the concrete technology pipelines.*
- *Corporate members will enjoy the benefits of being able to pick and recruit fresh graduates from the large pool of student members.*
- *ACI Library where members can source information on articles published, gain access to technical literatures and related topics pertaining to the concrete industry.*

Register Now……

We look forward to your kind support and, more importantly, to your participation and registration as a member of ACI-Malaysia Chapter . It is our firm belief your involvement and together with your commitments will go a long way in our quest to uphold all our objectives to mutually benefits for all members.

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Biography of President

Ms Serina Ho has a long experience in the cement and concrete industry. Serina holds a Chemistry degree from University of Malaya and MBA Degree from University of Hull, UK. She is a member of Malaysian Institute of Chemistry and the President of American Concrete Institute, Malaysia Chapter. Serina has a vast experience in both cement and concrete industry. She has held position as Chemist in cement plant, in charge of quality and R&D of cement products. She has also held position as Product Manager in ready-mixed company, responsible for developing and marketing of concrete products. Currently she is the Manager, Technical and Product Development in Hume Cement. Not one to shy from public speaking, she is an excellent communicator and has more than 20 years of experience in public speaking and training.

Technical Reports

American Concrete Institute
Malaysia Chapter

1. EXISTING BUILDING AND FIRE

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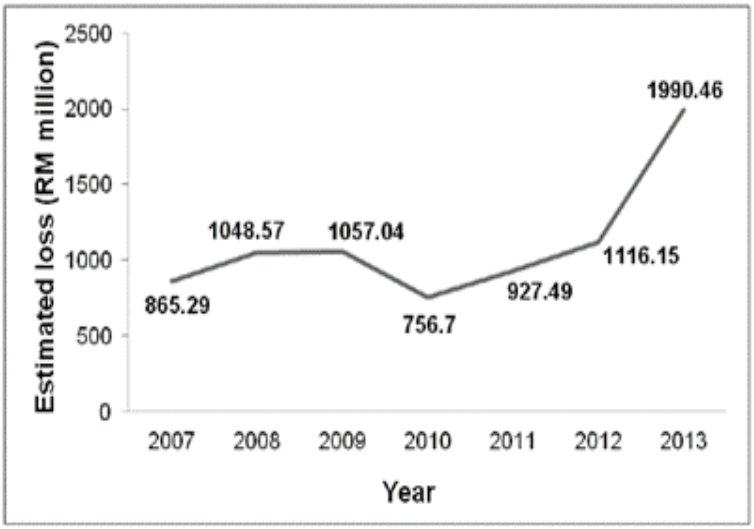
INTRODUCTION

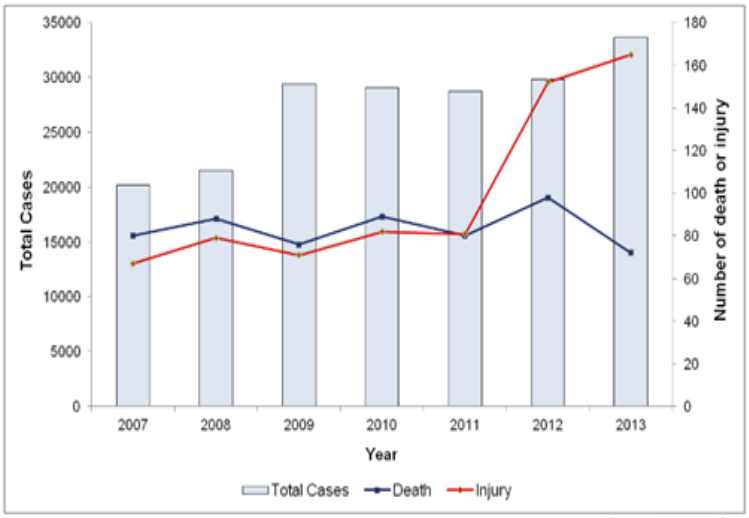
The service life of concrete structures mainly depends upon both the satisfactory design and use of appropriate construction materials. Any In the developing and under-developing countries, fire-fighting aspects are inadequate especially in high- rise buildings. This is because of economic constraints, which makes it difficult to cope with fire in high-rise buildings. High-rise building fires are more injurious as compared to other structure fires based on data from US. Fire Administration [USFA] through National Fire Incident Reporting System; NFIRS [1], estimated 15,400 high-rise structure fires resulted in 46 civilian deaths, 230 injuries, and $219 million of property loss each year.

In Malaysia, Fire and Rescue Department of Malaysia (FRDM) reported an average of 92 cases per day i.e. 33,640 fires in 2013 throughout the country, compared to 29848 fires in 2012. This was the highest annual figure documented with the constant upward trend since 2007 [2], as shown in Fig. 1. Nevertheless, a stable trend in the fire incidents was obvious from 2009 to 2012 [3], followed by a severe increase of fire incidents in 2012 resulting in the death of 72 civilians, although this was the lowest number of fatalities for the last seven years [2], however, the death statistics indicated were the immediate casualties at the place of incidence and the definite number of fatalities as a result of fire are absolutely greater. Overall, as mentioned by [3], the death statistics due to fire eruptions were stable though the occurrence of these events were more frequent.



(Source: FDRM, 2014)

Fig. 1. Estimated Loss (RM million) due to fire breakouts in Malaysia [2]



(Source: FDRM, 2014)

Fig. 2. Buildings fire statistics in Malaysia from 2007 to 2013 [2]

In terms of property loss, millions of dollars were scorched due to fire outbursts, as demonstrated in Fig. 2. In 2013, total 33,640 cases initiated the loss of approximately 20 billion Malaysia Ringgit (USD 6 billion), i.e. 78.3% increase from the year 2012 [2]. Besides property loss, there is also a need to identify the structural loss of existing buildings when a fire breaks out. Most of the existing buildings are not designed to contain fire for a longer period of time and structural elements simply bear the concrete cover of 25 mm – 30 mm. This article reveals the structural fire-resistance rating of the full-scale fire test of reinforced concrete column conducted at the Fire Testing Laboratory Universiti Teknologi Malaysia (UTM) by the researchers from Universiti Teknologi MARA (UiTM). Structural fire-resistance rating is defined in building codes in terms of the length of time (hours) of satisfactory performance taken by the structure during the standard fire test [4]. Another way to define structural fire-resistance rating is in terms of the fire-resistance safety factor, which is the ratio of the critical fire load to the expected fire load. The critical fire load is that for which the respective minimum strength is equal to the applied structural load [4]. The purpose of this study is to increase the resistance of structural members against elevated temperatures, experienced in fire, to a level that will provide adequate time for the occupants of the building to escape to safety.

EXPERIMENTAL METHOD

The full-scale column used in this testing was 200 mm x 200 mm x 2640 mm deigned according to ACI 318-08 (2008). The length of the column (2640 mm) was short to reach the plunger height, so a high strength (Grade 60) cylindrical base lined with a circular thick steel plate of length 2120 mm was provided at the bottom of the column. The extruded main bars from the columns were first welded with the steel plate bolted with the base. The base was in turn bolted with the ground in order to provide fix connection at the bottom. Also, at the top of the column the steel plate was welded that was bolted with the plunger in order to provide a fix connection at the top as well. The top and bottom plates as well as the plunger were protected with rock wool boards. The base was also further protected with ceramic fibres.

The process of preparation of column started from the preparation of steel reinforcement cage. Steel reinforcement used in the preparation of columns was: main bars of 12 mm and stirrups of 10 mm diameter (Ø). According to the column design, four main bars were used in each column, and stirrups were placed at the spacing of 200 mm centre-to-centre. Yield strength of main bar and stirrups was 460 MPa and 280 MPa respectively. The reinforcement cage was assembled (Fig. 3a) and placed in the plywood form, which was properly fabricated, to have the same internal dimensions as designed, shown in Fig. 3b.

Fig. 3. Steel cage (left) and Formwork (right)

After preparation of steel cage and formwork, thermocouples were installed in main steel bars. However, the readings could not be recorded from strain gauges during fire test due to their ineffectiveness at early stage of fire-test. Thermocouples of type 'K' were installed in the rebars, concrete core (at the depth of 100 mm) and concrete surface. In order to record the temperature readings from those points during fire-test. For each point in column, two opposite readings were recorded and then their average was reported in the results.

After fixing of steel cage into the formwork, pre-mixed concrete, ordered from local supplier was poured. The ready-mix concrete was of grade 30 concrete; mix design for grade 30 concrete is given in Table 1, as obtained from the concrete supplier. Cast column was taken out of the formwork after 7 days of casting and then cured using gunnysack in the laboratory for another 7 days. Subsequently, columns were kept in the laboratory till their transfer to the fire-testing laboratory. Casting and curing procedures are shown in Fig. 4.

Table 1: Mix Design of Concrete Provided by the Supplier

Raw Materials	Quantity (kg/m^3)
Cement (Type 1)	340.0
Siliceous Fine Aggregates	818
Siliceous Coarse Aggregates (20 mm)	861
Water	185.0
Retarder	0.34 Litre/m^3
Water reducing agent	0.75 Litre/m^3
Water-cement ratio	0.54
Slump	75
Unit weight	2304 kg/m^3
Air content	2%

Fig. 4. Casting of column (left) and curing using gunnysack (right)

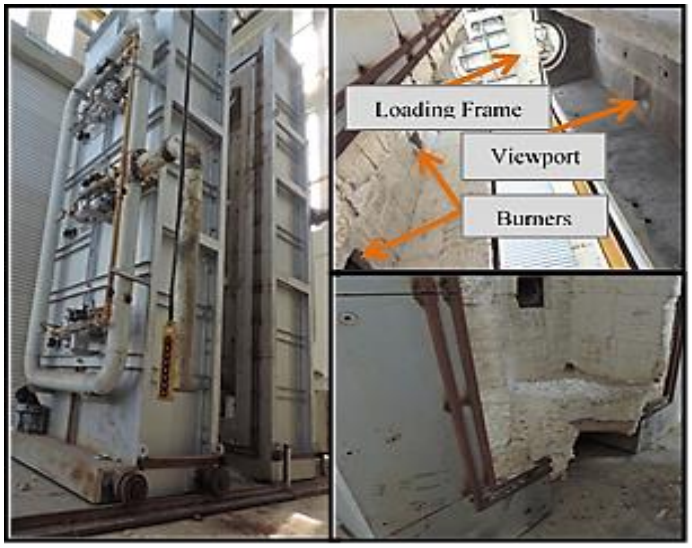


Fig. 5. Full-scale furnace in fire testing laboratory at Universiti Teknologi Malaysia

FULL-SCALE FIRE TESTING

In order to test RC column specimens under ASTM E119 with sustained axial concentric load, full-scale column furnace was used as shown in Fig. 5. Furnace was operated with the gas. The capacity of the loading frame was around one ton. Therefore, columns were designed accordingly. Throughout the test, 40% of experimental failure load (468 kN) was maintained until the hydraulic jack could not sustain the load, at that point, the column was declared failed, and the test was stopped. Thermocouples were connected to the data logger and the temperature readings throughout the test were recorded.

Fig. 6. Column before and after ASTM E119 fire test

According to Schneider [5], concrete starts to lose its original compressive strength at temperature level above 200°C. As can be seen in figure 6 that temperature level exceeded 200°C in column after 12 min of exposure to fire which shows that the deterioration of the strength of concrete started after only12 minutes of fire. There is a continuous increase in the temperature on the surface as well as in the core of concrete (100 mm depth). However, temperature in the core was recorded lesser than the temperatures on the surface of the column. In steel rebar (Figs. 8 & 9), till first 20 minutes there is a drastic increase in temperature and the temperature in steel rebar reached beyond 400°C which has surpassed the drop of more than 20% of yield strength [6]. Subsequently, temperature increased gradually till the failure of the column.

RESULTS

After full-scale fire test, it was found that the control column, as shown in Fig. 6, failed by the yielding of steel rebar. It seems that the temperature penetrated faster in the upper one-third portion of the column resulting in the softening of rebar, leading to the failure of the column. The fire resistance of the column was recorded as 75 minutes only, which means that column was declared failed after 75 minutes of fire. From the viewport, image was also captured during fire (Fig. 7), showing the lose portion of concrete just before the failure due to explosive spalling.

Fig. 7. Image of column during ASTM E119 fire test captured from the viewport of furnace

The measured axial deformations recorded during preload and fire test phase from the instrument from the start of the experiment till the failure point, as graphically shown in Fig. 10. The witnessed axial deformations of the columns were the result of a combination of load effects and thermal expansion. In the pre-load phase, deformations linearly increased up to around 17 mm. After the start of fire test, the column expanded, for some time deformations remained constant followed by the considerable decrease, up to 12 mm at failure point, due to the contraction of column, as also reported in [7]. The contraction of the column is corroborated mainly with loss of strength and stiffness of the concrete and steel as the internal temperatures increased.

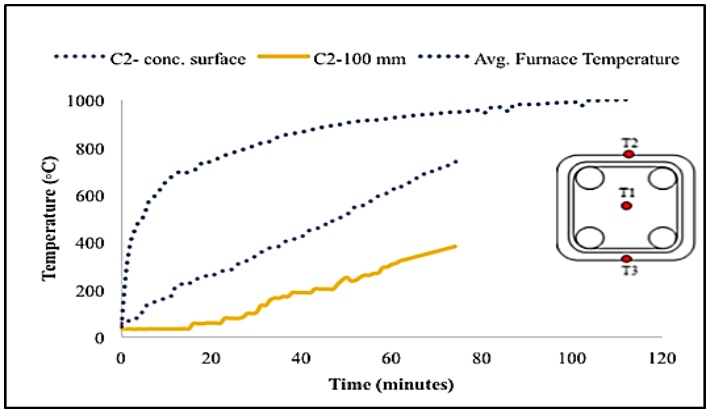


Fig. 8. Concrete temperatures (at the surface and at the depth of 100 mm) for the column exposed to ASTM E119 fire

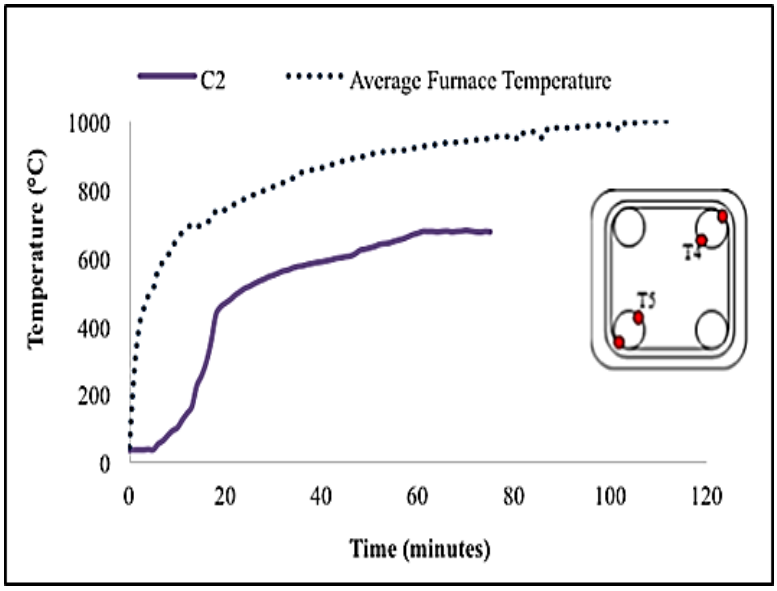


Fig. 9. Steel temperatures for columns exposed to ASTM E119 fire

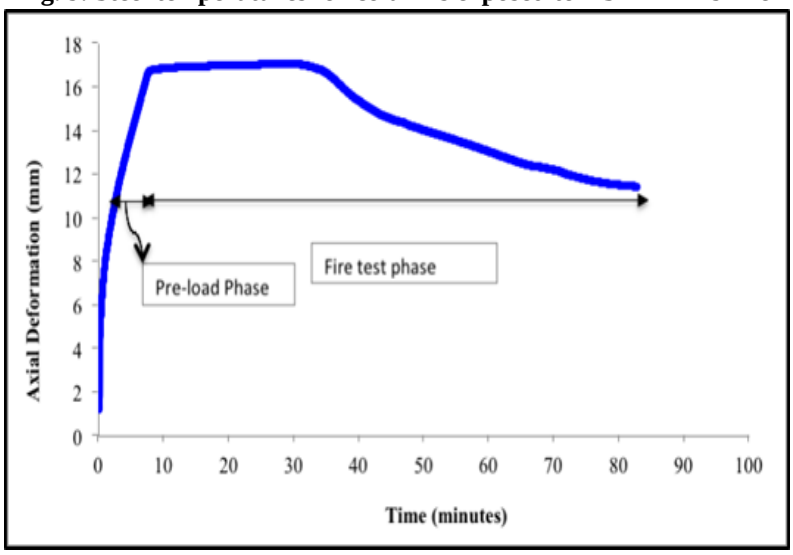


Fig. 10. Measured axial deformation during fire test as a function of exposure time

CONCLUDING REMARKS

Test Results show that there is a dire need to protect the existing reinforced concrete structures with a passive fire protection layer that is easily and cheaply available. Currently available passive fire protection coatings are very expensive and out of the reach of a common man. Furthermore, detailed information on the ingredients of fire insulation systems are proprietary in most cases that could not be reproduced easily, and therefore only limited information about their temperature dependent thermal properties is available restricting their usage for a layman.

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2. STRENGTHENING OF RC BEAMS USING PRESTRESSED FRPs

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INTRODUCTION

The service life of concrete structures mainly depends upon both the satisfactory design and use of appropriate construction materials. Any flaw in these factors may result in the early degradation and deterioration of the structure. The replacement of such structures is not always possible due to the high operational expenditure and their usage limitations. The only way to retain the structure in a safe working mode is to strengthen or renovate the structures [1]. A number of attempts have been undertaken by the researchers to identify the most suitable materials and appropriate techniques to strengthen the deficient structures, which resulted in an abrupt increase in the use of the prestressing technique for this purpose. Nowadays, strengthening has widely been done using prestressed materials, such as steel tendon and fiber reinforced polymers [2].

Prestressing the FRPs allows the material to efficiently utilize its tensile capacity which enhances its ultimate and serviceability limit capabilities [3]. The popular types of FRP identified by researchers include aramid fiber reinforced polymers (AFRP), carbon fiber reinforced polymers (CFRP) and glass fiber reinforced polymers (GFRP) in the form of rods, strips, plates and laminates. The aim of this study is to find out that which material has received considerable attention from researchers using different prestressing techniques. The use of prestressed CFRP under near surface mounted, externally bonded reinforcement and externally posttensioned techniques is presented and the corresponding advantages and disadvantages are highlighted.

PRESTRESSED STRENGTHENING MATERIALS

The steel and FRPs have been used in the strengthening of deteriorated structures (Fig. 1). Steel is the traditional and commonly used material. Though all the materials are adequate for strengthening, however, the passage of time and the advancement in the subject have led researchers to explore strengthening materials that have the ability to provide maximum benefits in terms of strength, serviceability and construction, as well as maintenance cost. In steel, the ductility, good strength to weight ratio and low fabrication and erection costs makes it a suitable material for strengthening purposes in both normal and prestressed conditions. Strengthening by prestressed steel tendons is a popular method due to its availability, uniform material properties, easy of working, high ductility and high strength. Strengthening reinforced concrete beams with steel tendons is an efficient technique.

However, the disadvantages exhibited by prestressed steel tendons motivated the researchers to identify a better replacement for steel for the purpose of strengthening. Importantly, the upgrading of concrete structures is not easy in most cases as structures pose a difficult and different set of problems.

Prestressed FRPs compensate the weaknesses displayed by prestressed steel and have been introduced in recent decades as a more suitable strengthening material than steel. Prestressed FRPs have recently been used in concrete structural members as external or internal reinforcement instead of conventional steel tendons. FRPs have good potential of use due to their desirable properties in prestressed conditions. These properties include high performance, high strength-to-weight ratio, high stiffness to weight ratio, high energy absorption, corrosion resistance and high fatigue resistance. When used for strengthening, prestressed FRPs can control the aging of construction materials and can sustain the impacts of vehicles and fire far better than prestressed steel. Seismic upgrading and changes in the use of the structure are also more easily accommodated through the use of these polymers. Among the available FRPs, prestressed CFRP accounts for 95% usage in applications adopted for the strengthening of structures. Prestressed CFRPs are suitable where the strength, stiffness, lower weight and fatigue are critical issues. Moreover, CFRPs are useful in applications that require high temperature resistance, chemical attack resistance and damping resistance. At this stage, it is essential to validate the suitability of prestressed CFRP usage under different prestressing techniques.

FRP materials have great advantages for using in prestressing and post-tensioning strengthening applications. Beside their economic benefits, prestressed FRP systems provide the following benefits and advantages: i) it can improve the serviceability of the beam, ii) reduce the dead load deflections, iii) it can reduce the crack widths and delay start of cracking, iv) it can relieve the strains in the internal steel reinforcement, v) it can increase the yielding of internal steel reinforcement at a higher proportion of the ultimate load, vi) it can provide more efficient use of the concrete and the FRP materials.

PRESTRESSED STRENGTHENING TECHNIQUES

All of these materials (steel and FRPs) have been investigated under a variety of strengthening techniques that include near surface mounted (NSM), externally bonded reinforcement (EBR) and external post-tensioning (EPT) as can be seen in figure 1 by using anchorage and non-anchorage systems [4]. Strengthening using prestressed NSM CFRP technique is growing widely and offers an alternative to the EBR and EPT prestressing systems. The schematic diagram of NSM prestressed FRP reinforcement and its real-life application are shown in Figs. 2 & 3.

However, the real-life application of EBR and EPT with prestressed FRP reinforcement is shown in Figs. 4 & 5, respectively.

The following are some of the advantages of NSM over EBR and EPT:

- Excellent for strengthening in the negative moment regions, where EBR would be subjected to mechanical and environmental damage.
- Feasibility of anchoring into members adjacent to the one to be strengthened.
- Less likely to debond near ultimate capacity.
- Protection of the embedded FRP in the grooves from external damage, such as vehicle impact, better fire performance, resistance to moisture and avoids freeze-thaw problems.
- The choice of FRP material with higher strength and modulus of elasticity such as CFRP instead of GFRP and AFRP, would allow the use of smaller FRP and groove cross sectional areas; hence, there is less risk of interfering with the internal reinforcement.
- In terms of structural behaviour, it's most relevant mechanical properties are the tensile and shear strengths; therefore, the grooves can be properly filled with epoxy adhesive or cement mortar.

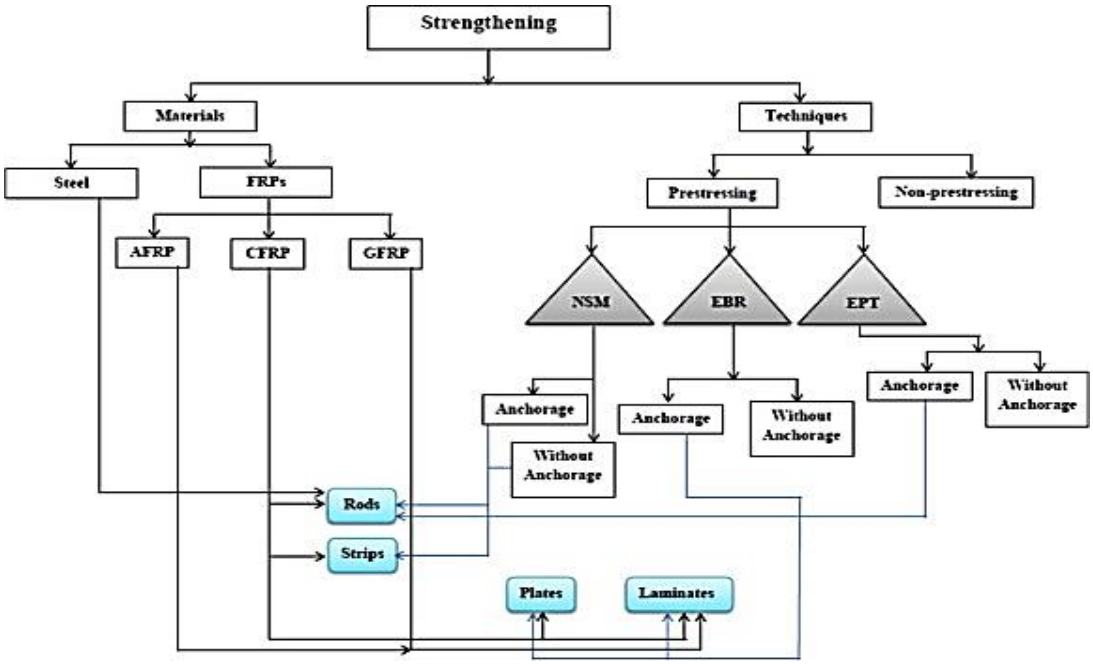

Fig. 1. Chart of Strengthening Process

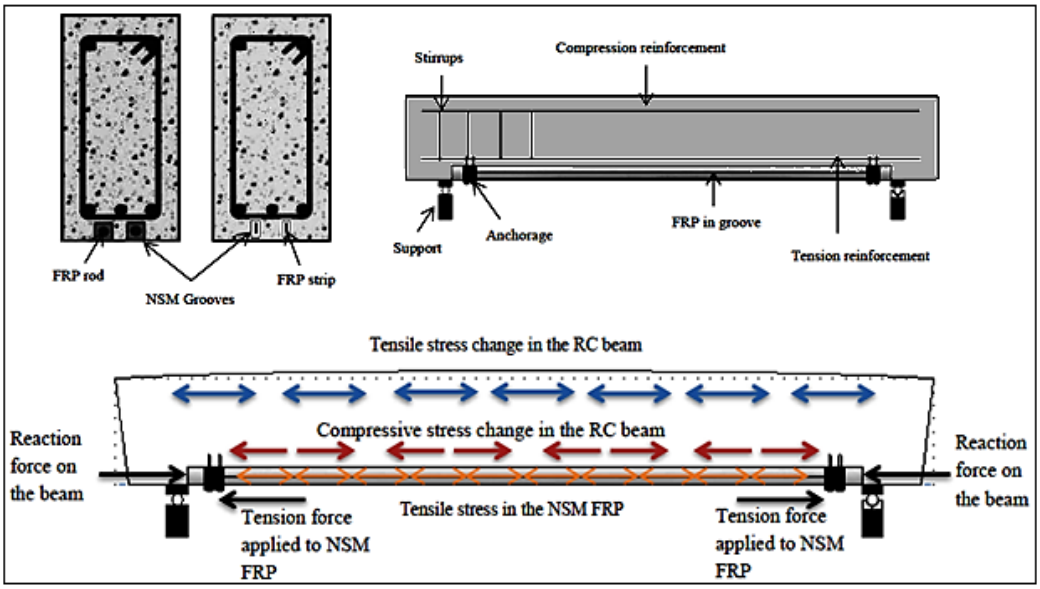

Fig. 2. Schematic diagram of NSM prestressed FRP reinforcement

Fig. 3. The application of NSM method using prestressed FRP bar for strengthening RC beam [5]

Fig. 4. Real life picture of externally prestressed CFRP bonded strengthened building, Ebikon, Switzerland (CH) [6]

Fig. 5. Real life strengthened bridge (EPT Technique)

CONCLUSIONS

The general conclusion made from this study are summarized below:

- Compared to FRPs, the prestressed steel has comparatively heavier weight and low resistance against adverse environmental conditions that can produce a larger reduction in its mechanical properties.
- Compared to prestressed steel, prestressed FRPs exhibited good potential and desirable structural properties including high flexural strength, enhance the ultimate load carrying capacity, reduce the deflections, high strength to weight ratio, high stiffness to weight ratio, high energy absorptions, corrosion resistance and high fatigue resistance. Moreover, the debonding resistance of prestressed FRP is higher than for prestressed steel.
- Among the types of FRPs, CFRPs are more likely to contain all the advantages of other FRPs, and, in addition, it was observed that prestressed CFRPs increase the flexural strength and ductility of the structure.
- The near surface mounted (NSM) technique provides a shield to the prestressed strengthening material against the environment, and, at the same time, provides an optimum and quick experimental setup. In addition, it may improve the cracking, yielding and ultimate loads more effectively.

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Past Events

Seminar on Innovative Concrete Systems: Design & Materials

18th August 2016
Armada Hotel, Petaling Jaya

Organiser
American Concrete Institute
Kuala Lumpur Chapter

In Collabration with
Universiti Teknologi MARA
CSM Concrete

American Concrete Institute
Malaysia Chapter

Past Events (Competitions)

3.1. International Highest Early Self-consolidated concrete cube competition (i-HESCCC) 2016

ACI-Malaysia Chapter in collaboration with the Institute of Infrastructure Engineering and Sustainable Management (IIESM); Universiti Teknologi MARA (UiTM); Faculty of Civil Engineering UiTM, Shah Alam; and Concrete Society of Malaysia (CSM) organized the International Highest Early Strength Self-Consolidating Concrete Competition 2016 (i-HESSCCC 2016), an annual event that has been held for nearly a decade. The event was sponsored by Platinum sponsors HUME Cement and Hume Concrete Malaysia.

The Construction Industry Development Board (CIDB) Malaysia, Cement Industries of Malaysia Berhad (CIMA), ALPHA Instruments, Supplies and Services, ZACKLIM Floor Specialist, NL Scientific, and MIGHTY Shield Industries sponsored the prizes and event expenditures.

Arak Azad University, Iran, won the Highest Early Strength; Hume Concrete won second place; and third was taken by Universiti Kebangsaan Malaysia (UKM). The best presentation award was presented to Diponegoro Universiti, Indonesia.

This competition was held at the Faculty of Civil Engineering, UiTM Shah Alam, Malaysia, on April 14-15, 2016, in conjunction with International Construction Week (ICW) 2016 organized by the CIDB of Malaysia.

This year, the competition was extended to the international level. Participants included 36 groups from Malaysia, five groups from Indonesia, and one group from Iran, respectively.

3.2. Malaysia Concrete Canoe Competition (MCCC) 2017 and Malaysia's Longest Concrete Canoe

Reported by:
Dr. Sudharshan N. Raman

Secretary, American Concrete Institute – Malaysia Chapter

The Malaysian Concrete Canoe Competition 2017 (MCCC2017) which had been in the planning for almost 15 months, was successfully organized by the American Concrete Institute – Malaysia Chapter on 25th and 26th of November 2017. The competition which was co-organized with the Concrete Society of Malaysia and University of Malaya, Malaysia, was held at the Varsity Lake of University of Malaya Campus in Kuala Lumpur, under the patronage of Y. B. Datuk Wira Dr. Abu Bakar Mohamad Diah, the Deputy Minister of Science, Technology and Innovation of Malaysia. The two-day carnival like event was further enhanced with various interesting activities such as exhibition booths from sponsors, food trucks, non-Newtonian walking-on-water challenge, big bikes show, lion dance and various other performances.

The event was also supported by major governmental, professional and trade organizations involved in the development and advancement of cement and concrete industry and standards in Malaysia, namely the Ministry of Science, Technology and Innovation of Malaysia (MOSTI), The Institution of Engineers, Malaysia (IEM), the Master Builders Association Malaysia (MBAM), The Cement & Concrete Association of Malaysia (C&CA) and The National Ready-Mixed Concrete Association of Malaysia (NRMCA).

For the record, this was the largest event ever organized by Malaysia Chapter – ACI to date.

The main objective for Malaysia Chapter – ACI to embark on this major project was to provide the opportunity and platform for civil engineering and built environment students to gain hands-on, practical and leadership skills and experience to support professional, research, innovation and knowledge creation in the field of concrete engineering and technology, with the cooperation from the Malaysian cement and concrete industry. In addition, this event was also to evidence Malaysia Chapter – ACI's commitment towards advancing engineering and built environment education in Malaysia.

A total of eight teams from seven Malaysian institutions of higher learning participated in the 2-day event. These were: [1] Bujang Senang of University College of Technology Sarawak (UCTS); [2] PoseidUM from University of Malaya (UM); [3] PUTRA CANOE from Universiti Putra Malaysia (UPM); [4] Superciv from Universiti Selangor (UNISEL); [5] The Enbrave from Universiti Selangor (UNISEL); [6] UNIMAS-WAKA from Universiti Malaysia Sarawak (UNIMAS); [7] UT canoe from Universiti Teknologi Malaysia (UTM); and [8] Water's Eye from Universiti Teknologi MARA (UiTM).

The first day of the event was dedicated for the evaluation of the posters, canoes and oral presentations by the teams and floatation test of the canoes. The officiation of the event was held in the morning on the 2nd day, 26th November 2017 by the Deputy Minister himself, Y. B. Datuk Wira Dr. Abu Bakar Mohamad Diah, and he was accompanied by the dignitaries from Malaysia Chapter – ACI, the Concrete Society of Malaysia, University of Malaya and the Ministry of Science, Technology and Innovation of Malaysia.

The Opening Ceremony of Malaysian Concrete Canoe Competition 2017 (MCCC2017)

The canoe races were held after the opening ceremony, where the races were divided into five categories, namely the men's and women's sprint races, men's and women's endurance races, and the mixed sprint race. The judging was done by three distinguished professionals nominated by the organizing committee and the supporting bodies, namely Mr. Zack Lim, the Deputy President of Concrete Society of Malaysia, Ir. Yun-Tong Siow representing The Institution of Engineers, Malaysia, and Ms. Siew-Chin Teng representing Malaysia Chapter – ACI. A total of 5 Grand Awards, with total prize money amounting to MYR38,500 (approximately USD$10,000) and 12 Special Awards were presented to the winners of the competition, as following.

Grand Awards

1st Place Overall Winner:	PoseidUM (University of Malaya)
2nd Place Overall Winner:	UNIMAS-WAKA (Universiti Malaysia Sarawak)
3rd Place Overall Winner:	UTM canoe (Universiti Teknologi Malaysia)
4th Place Overall Winner:	Water's Eye (Universiti Teknologi MARA)
5th Place Overall Winner:	PUTRA CANOE (Universiti Putra Malaysia)

Special Awards

Best Design Poster:	UNIMAS-WAKA (Universiti Malaysia Sarawak)
Best Oral Presentation:	PoseidUM (University of Malaya)
Best Final Product:	PoseidUM (University of Malaya)

Women's Endurance Race: PoseidUM (University of Malaya)

Men's Endurance Race: Superciv (Universiti Selangor)

Women's Sprint Race: PoseidUM (University of Malaya)

Men's Sprint Race: Superciv (Universiti Selangor)

Mixed Sprint Race: Superciv (Universiti Selangor)

Best Sportive Award: The Enbrave (Universiti Selangor)

Bujang Senang (University College of Technology Sarawak)

PUTRA CANOE (Universiti Putra Malaysia)

Most Innovative Canoe: PoseidUM (University of Malaya)

The Canoe Race

The 1st Place Overall Winner, PoseidUM from University of Malaya, with their winning prize and trophy

The 2nd Place Overall Winner, UNIMAS WAKA from Universiti Malaysia Sarawak, with their winning prize and trophy

Another highlight of the event was Malaysia Chapter – ACI's achievement to break into the Malaysia Book of Records by constructing the Longest Concrete Canoe in Malaysia. Through the undeterred effort by the Malaysia Chapter – ACI Team and the collaboration from University of Malaya and Concrete Society of Malaysia, a concrete canoe of 7.05 meters was constructed, with a material density of 930 kg/m^3.

The record breaking canoe was unveiled by the Deputy Minister and the Organizing Team of MCCC2017 in the morning of 26th November 2017, and the record certificate was presented by the Official from Malaysia Book of Records to the President of Malaysia Chapter – ACI, Ms. Serina Ho.

The unveiling of Malaysia's Longest Concrete Canoe

The successful organization of the event would not have been possible without the financial support from the sponsors of the event, such as. the **Diamond and Main Sponsor:** Hume Industries Berhad; **Platinum Sponsors:** Cement Industries of Malaysia Berhad, G-Cast Concrete Sdn. Bhd.-Starken AAC Sdn. Bhd., and Forta Corporation-Innofloor Sdn. Bhd.; **Gold Sponsors:** Kerjaya Prospek (M) Sdn. Bhd., Bayangan Sepadu Sdn. Bhd., JKS Repairs Sdn. Bhd., Al-Ambia Sdn. Bhd., and Academy of Concrete Technology Sdn. Bhd.; **Silver Sponsors:** Q-Cem Sdn. Bhd., Sinar Muhibbah Sdn. Bhd. Plytec Formwork System Industries Sdn. Bhd., GCP Applied Technologies (M) Sdn. Bhd., Adept Technical Services Sdn. Bhd., National Ready-Mixed Concrete Association of Malaysia (NRMCA), and Structural Repairs (M) Sdn. Bhd.

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Malaysia's Longest Concrete Canoe with a length of 7.05 meters

Ten paddlers in the longest concrete canoe

The Organizing Committee of MCCC2017 is indebted to University of Malaya, especially to the Office of Deputy Vice-Chancellor (Development), Department of Civil Engineering, Faculty of Engineering, Sports Centre, Department of Development and Estate Maintenance (JPPHB), UM Security Office, UM Corporate Communication Office, UM Water Warriors and UM Student Health Clinic for their support and cooperation in ensuring the success and realization of this event.

Future Events

American Concrete Institute
Malaysia Chapter

Future Events

International highest early strength self-consolidating concrete competition (i-HESSCCC) 2018.

Institute for Infrastructure Engineering and Sustainable Management (IIESM) of Universiti Teknologi MARA (UiTM) in collaboration with American Concrete Institute - Malaysia Chapter and Concrete Society of Malaysia (CSM) are organized International Highest Early Strength Self-Consolidating Concrete Cube Competition (i-HESSCCC) 2018.

With great pleasure, we would like to invite universities and industry players to attend this competition that will be held on 19-20 April 2018 at the Faculty of Civil Engineering, Universiti Teknologi MARA (UiTM), Shah Alam, Selangor, Malaysia in conjunction with International Construction Week (ICW) 2018 organised by Construction Industry Development Board (CIDB) of Malaysia.

International Highest Early Strength Self-Consolidating Concrete Cube Competition (i-HESSCCC) is an bi-annual event and was first held since a decade ago aimed to encourage innovative ideas in addition to foster technical skills of the participants.

This competition involves researchers, students and the industry in producing highest strength self-consolidating concrete in 24 hours after mixing with minimum cost. This year, we extend this competition to international level to encourage participants from other countries, especially Asian countries to participate.

For further inquiries, kindly contact our secretariat,

Mrs. Khairulniza (+ 6012-232 7724) or,
Prof. Dr. Hamidah Mohd Saman (+ 603-5543 6432 / + 6019-236 1274).

For registration form, please visit our website as http://www.acimalaysia.org/i-hessccc.

Below are the aims and objectives of this competition:

1. Encourage students, researchers and industry players to put their creativity and technical skills in producing an optimum cost concrete of very high flowability and strength at early age;
2. Create awareness on the versatility of possibility of producing a high flowability and early strength concrete;
3. Serve as a platform for interaction among students, NGOs and concrete industry players locally and internationally.

Registration Last Date: 16th March, 2018

Competition Date: 19th to 20th April, 2018

Venue: Faculty of Civil Engineering, UiTM Shah Alam, Selangor, Malaysia.

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