General

Ir. Dr. Chin Siew Choo produces sustainable construction material OHE-Crete

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A researcher from the Department of Civil Engineering, College of Engineering, Universiti Malaysia Pahang (UMP), Ir. Dr. Chin Siew Choo produced sustainable construction material, namely OHE-Crete.

According to the Negeri Sembilan-born, OHE- means green in the Hawaiian language.

“Therefore, OHE-Crete refers to green concrete that uses bamboo fibres to produce sustainable construction material.

“Bamboo is used as the main material in this study because the world is moving towards developing green and sustainable materials, and bamboo can be used as an alternative to steel because it has high tensile strength.

“In addition, bamboo is also cheap compared to steel, and it is readily available throughout the country and easily grown locally,” she said.

She added that bamboo is lighter than steel, but it has the strength to weight ratio greater than steel. “Basically, concrete has low flexural and tensile strengths.

“Through this study, bamboo fibres in concrete can improve the flexural strength and ductility.

“The species of bamboo used are Semantan, Betung, and Beting that are easily available in Malaysia, but for this research, the bamboo was obtained from Raub, Pahang,” she said.

She said the bamboo was harvested based on its maturity between three and five years.

“The bamboo went through the process of drying and chemical treatment before use.

“The research that was started in 2015 has gone through many phases.

“These include the evaluation of the physical and mechanical properties of the fibre, performance evaluation of various species of bamboo and composite, and the application of bamboo in structural and concrete materials reinforcement.

“The idea of this study started when I joined CITREx in 2014,” she said, who is an expert in the field of structures and materials.

During that time, she studied structural reinforcement using synthetic fibre made of carbon fibre. The study only involved how to use the product more effectively by applying on the surface of the

concrete.

After receiving comments from the judges, she had the idea to study readily available strong green material that can be used to reinforce concrete structures and replace the use of synthetic carbon fibre, which is expensive and harmful to the environment and human health.

“Processed bamboo fibres are mixed in the concrete to improve the flexural strength.

“OHE-Crete is quick and easy to use. These bamboo fibres are incorporated with concrete materials during the concrete preparation.

“It can be used on roads, staircases, terraces and floors. Concrete containing bamboo fibres can increase the strength of concrete up to 40%.

According to Ir. Dr. Chin Siew Choo, the goal of this research is to produce environmentally friendly building materials.

“It is suitable for use in the construction of a structure or green building.

“This will create a higher demand for bamboo products and create bamboo entrepreneurs in terms of small and medium enterprises and also bamboo agriculture sector.

“In general, this research product can solve the problem of sustainable construction projects and help improve the local communities’ socio-economic.

“The use of bamboo fibres is not only used in concrete but also used as a green fibre polymer composite to replace the expensive carbon fibre that has adverse effects to the environment and public health,” she said.

In addition, she said that bamboo is also a solution to the strengthening of sustainable structures to improve the plantation and cultivation of bamboo industry in Malaysia.

It also provides job opportunities to people in rural areas, especially to the orang Asli who are more discerning regarding bamboo.

This study was supported by the Ministry of Higher Education Research Acculturation Grant Scheme (RAGS) in 2015 worth RM58,150.00 and also the UMP internal grant.

Ir. Dr. Chin Siew Choo also has an MoA with Edotco Group Sdn. Bhd. in another bamboo research.

Ir. Dr. Chin Siew Choo said that this research project bagged a gold medal in the Malaysian Technology Expo 2020.

In the international category, this study received the Award of Merit from the Republic of Croatia in the Malaysia-Croatia Technology Expo Exchange 2020.

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