Research

# Associate Professor Dr. Ramadhansyah Putra Jaya produces porous concrete ready within 24 hours

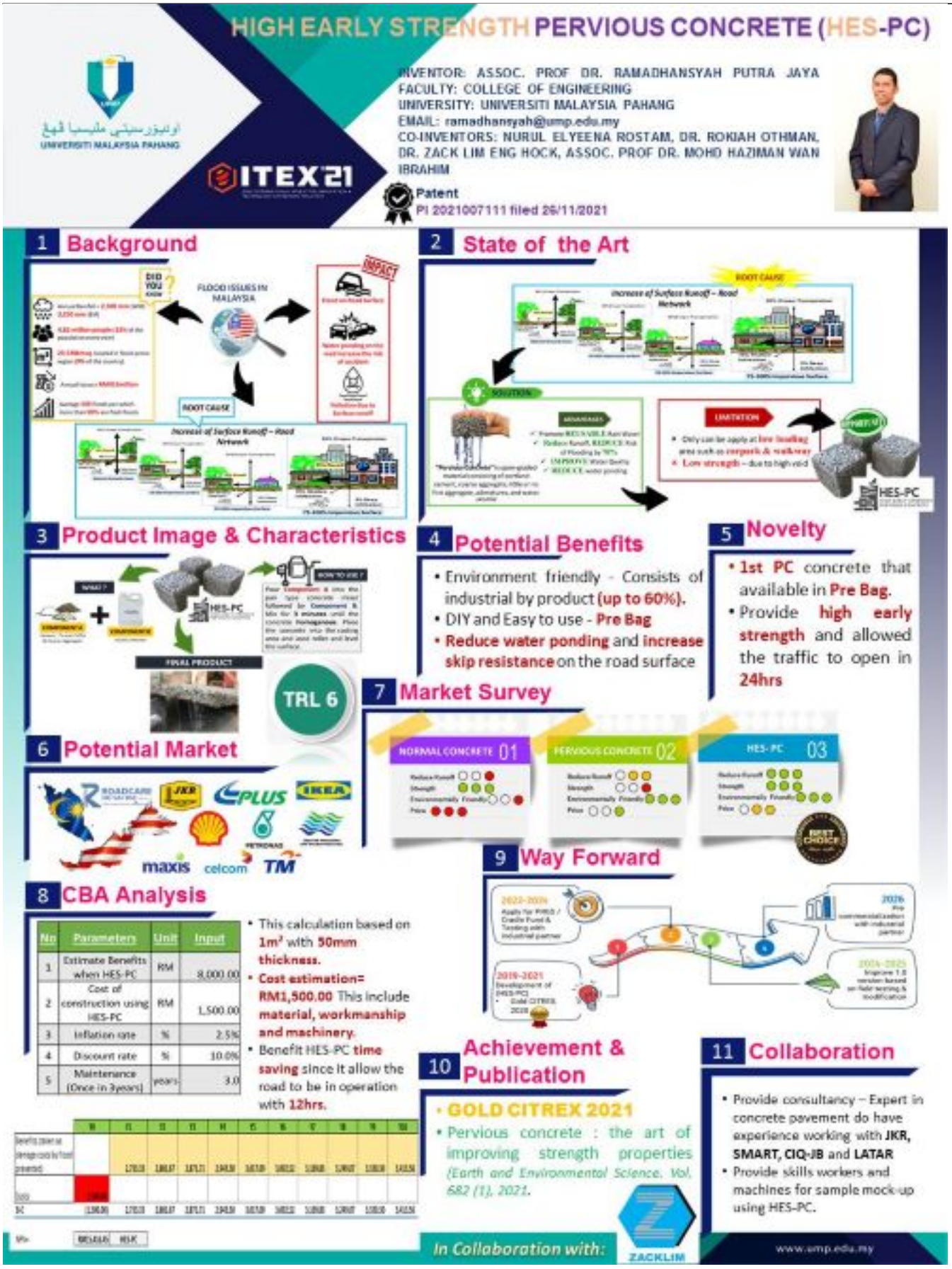
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PEKAN, 28 December 2022 – Generally, the existing porous concrete cannot be used immediately after construction.

Realising the shortcomings, a lecturer of the Faculty of Civil Engineering Technology (FTKA) UMP, Associate Professor Dr. Ramadhansyah Putra Jaya, 42 has produced *High Early Strength Pervious Concrete* (HES-PC).

This project also received collaboration from FTKA lecturer, Ts. Dr. Rokiah Othman, UMP student, Nurul Elyeena Rostam, Managing Director of Zacklim Flat Floor Specialist Sdn. Bhd., Dr. Zack Lim Eng Hock, and Universiti Tun Hussein Onn Malaysia (UTHM) lecturer, Associate Professor Ts. Dr. Mohd Haziman Wan Ibrahim.

According to Associate Professor Dr. Ramadhansyah, HES-PC is porous concrete containing cement, fly ash and aluminium silicate solution (Al2SiO5) and can be used for vehicle pavement within 24 hours of construction.




| No | Parameters | Unit | Input |
|---|---|---|---|
| 1 | Estimate Benefits when HES-PC | RM | 8,000.00 |
| 2 | Cost of construction using HES-PC | RM | 1,500.00 |
| 3 | Inflation rate | % | 2.5% |
| 4 | Discount rate | % | 10.0% |
| 5 | Maintenance (Once in 3years) | years | 3.0 |

“Porous concrete is a special concrete that allows water from rain or other sources to pass through directly.

“Fly ash as a substitute material in conventional concrete mixtures has been extensively studied

around the world.

“However, there is a lack of studies on other replacement materials in water-permeable porous concrete pavement mixtures that can yield high strength and allow for vehicle pavement after 24 hours of construction,” he said.

He further added that, in general, this research aims to evaluate the engineering properties and performance of porous concrete pavements containing cement, fly ash and Al2SiO5 solution.

“This research began in September 2020 and was fully completed in October 2021.

“Component A consists of cement, 50 per cent fly ash and coarse aggregate, while component B consists of Al2SiO5 solution.

“Both components are mixed into a concrete mixer and left for three minutes,” he said.

According to him, complete mixing is crucial to get a homogeneous concrete mixture.

“Then, the concrete is transferred into the prepared container and levelled.

“The HES-PC produced is more environmentally friendly, durable and reduces water ponding on the road surface.

“It is hoped that with the use of additional materials, namely fly ash and Al2SiO5 solution, HES-PC can be expanded in other constructions besides parking spaces such as roads in residential areas, walkways, and greenhouses,” said this lecturer from Banda Aceh, Indonesia on how to produce HES-PC.

The project is supported by Zacklim Flat Floor Specialist Sdn. Bhd. as the manufacturer of construction materials.




Meanwhile, collaboration with other agencies such as the Public Works Department Malaysia (JKR), SMART, CIQ-JB and LATAR is being actively implemented.

Previously, he had produced porous concrete pavement that could reduce flood disasters.

This research won a gold medal in the Creation, Innovation, Technology and Research Exposition (CITREx) 2021.

The research also bagged a gold medal at the International Invention, Innovation and Technology Exhibition (ITEX) 2021.

**By: Hafizatulazlin Abdul Aziz and Nur Hartini Mohd Hatta, Corporate Communications Division, Chancellery Department**

**Translation by: Dr. Rozaimi Abu Samah, Engineering College/Faculty of Chemical and Process Engineering Technology**


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