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Thermal Behavior of Eco-Aerated Concrete from Agro-Industrial Waste as Innovative Cool Building Wall Components.

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EXECUTIVE SUMMARY

Malaysia, a tropical climate country having a warm and humid equatorial year round has caught an eye especially in construction area. This inevitable interactive effect necessitates the climate sensitive which can be control by adapting the waste material besides minimizing the impact of sol air elevation besides contributing into the credit in green rating systems. As per solution, the aerated concrete from agro-industrial waste is an alternative construction material whereby it may enhance towards the development of cool concrete technology. With such invention, the unique idea of mixing the Eco-product mainly aerated concrete from POFA (Palm Oil Fuel Ash) and Bottom Ash (Coal Power Plant) totally replaced sand material (by using wastes ashes) can create insulation. Since insulation normally have a lighter weight, the introduction of air normally leads to less number of raw material per volume is needed compared to clay brick. In previous study, clay brick and even commercial aerated concrete stored a huge number of heat in particular material and release back late at night. The heat convection by using sand is 89% higher compared to bottom ash as sand replacement. High amount of heat convection means creating urban heat island (UHI) phenomenon. Thus by implementing previous study with combining the mix design and re-idea with proposing the corrugated wall based on agro-industrial aerated concrete properties is been investigate in this study. With such combination it might improve even more heat is being reflect back to atmosphere as well as delaying heat transfer (time lag) behavior to the indoor ambient temperature. The corrugated wall also will show and effect towards less heat is being transferred compared to its nature which will reflect back to the atmosphere besides having the property of double insulation. By having a pilot of actual prototype with combining the corrugated wall (façade wall), believe that the integration of heat behavior towards actual nature will give a practical results together with the identification towards the energy saving (To have a proper experiment of energy saving that related to the use of air-conditioning). It is expected that the combination of cool technology towards house wall will not only create a better way of life but also overcome the waste problem as well as generate the needs of thermal problem that occur in tropical climate country.