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Construction Sustainability Improvement through Using Recycled Aggregates in Concrete Production

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Abstract : Due to the energy consumption caused by the construction industry, the public is paying more and more attention to the sustainability of the buildings. With the advancement of research on recycled aggregates, it has become possible to replace natural aggregates with recycled aggregates and to achieve a reduction in energy consumption of materials during construction. The purpose of this paper is to quantitatively compare the emergy consumption of natural aggregate concrete (NAC) and recycled aggregate concrete (RAC). To do so, the emergy analysis method is adopted. Using this technique, it can effectively analyze different forms of energy and substance. The main analysis object is the direct and indirect emergy consumption of the stages in concrete production. Therefore, for indirect energy, consumption of production machinery and transportation vehicle also need to be considered. Finally, the emergy values required to produce the two concrete types are compared to analyze whether the RAC can reduce emergy consumption.

Keywords : sustainable construction, NAC, RAC, emergy, concrete
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