Sustainability of Waste Glass Powder and Clay Brick Powder as Cement Substitute in Green Concrete

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Abstract

Of recent, concerns on the need for a sustainable and clean environment have of recent heightened awareness about the need for recycling and reusing of solid wastes that are major source of environmental pollution. Wastes are rising due to rapid population growth, urbanization, industrialization, and increased in construction activities, and the conventional management practice of treating these wastes, especially in developing nations, is open disposal on landfills and dump sites which is deemed unsafe and unsustainable. Therefore, there is need for

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sought alternatives that will help provide effective waste management practice thereby ensuring a cleaner and greener environment. Research has shown that some wastes from the industries and households can be recycled and reused as concrete constituents in the production of green concrete, that is, concrete produced using alternative and/or recycled waste materials to reduce natural resources consumption, environmental impact, and energy use. Moreover, reports also pointed out that concrete is the most used construction material contributing large part of worldwide greenhouses (GHG) emissions. Consequently, reusing waste in concrete production create alternative solution for effective waste management and limiting the impact of concrete production on the environment. This chapter discusses the prospect of recycled clay brick waste, ground into powder and reuse as construction materials to substitute cement in producing green moderate strength concrete for use in developing nations and recommendations to deepen material recycling and reuse for future developmental needs.

Keywords

Clay brick · Waste recycling · Compressive strength · Tensile strength · Green concrete · Sustainability · Green concrete · Eco-friendly concrete