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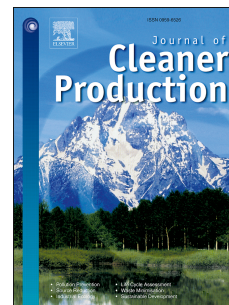
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Recycling of Dimensional Stone Waste in Concrete: A Review

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Abstract

Disposal of industrial waste is a worldwide problem. Additionally, the non-biodegradable nature of these wastes further increases severity of the problem. The shortage of land to accommodate the waste landfills, increased transportation cost and other associated problems have forced industries to search for other viable alternatives. Moreover, over-exploitation of natural resources by the construction industry has led to their depletion. Thus, the construction industry is compelled to look for other economic and sustainable substitutes for conventional raw materials (river sand, natural aggregates) and cement. Past studies suggest that waste of discarded rubber tyres, silica fume, glass, slag, pond ash, bottom ash, metakaolin, stone etc. can effectively replace a part or the whole of conventional materials used for concreting. Recycling of these wastes as construction material can be a sustainable practice. However, the green concrete so produced needs to satisfy certain parameters for its applicability. In recent years, studies have claimed that waste from dimensional stone industry can be effectively recycled into concrete, a practice certainly benefiting the stone as well as construction industries.

This paper reviews the applicability of dimensional stone waste in concrete. The effect of stone waste substitution on workability, strength and durability parameters such as permeability, chloride migration, porosity, water absorption, carbonation, acid and sulphate resistance have been reviewed in the paper. It is suggested to investigate in-detail the durability of concrete containing dimensional stone waste to establish the same as popular construction material.

Keywords: Recycling; Dimensional Stone Waste; Durability; Marble; Granite; Limestone; Concrete

Abbreviations: CMA: Coarse Marble Aggregate; DSW: Dimensional Stone Waste; GD: Granite Dust; GP: Granite Powder; GS: Granitic Sludge; GCW: Granite Cutting Waste; HSC: High Strength Concrete; LCD: Limestone Crusher Dust; LF: Limestone Fines; LS: Limestone; LSC: Low Strength Concrete; MS: Marble Slurry; MGR:

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