Contribution ID: **30** Type: **Poster Presenter**

Environmental Consequences and Compressive Strength of Cement Mortar with addition of Marble Dust and Coconut Dust

The world has become global village where the rapid growth of human needs in many sectors has not only created an ease of life but a significant decrease in the availability and viability of the natural resources is also threating the world. The high volume production is associated by considerable amount of waste materials that are produced through various sources and it has an adverse impacts on the surrounding environment.
One of the major waste generating industries is the marble production in world especially the rapid growth industries of marble in Pakistan has greatly threatened the environment as it has not only cause bio degrability problems but also disturbed the eco-system. This paper addressed the possible environmental impacts that might generate from ornamental stone production as a rapid growth industrial sector in Pakistan and to review the adequacy of Pakistan environmental legislations in controlling the environmental protections norms associated with such industry. The 25 % of marble dust is transported into upper atmosphere directly, thus the environment is highly polluted.
Mortar is a workable paste which is made by mixing cement, aggregates (fine) and water in suitable ratio. Sometimes admixtures are also added to get desirable properties.it is used as a binding agent in holding blocks together to form a unit mass. In this study coconut husk and marble dust were incorporated in mortar in various percentages to check its properties and to study the use fullness of its use in concrete by comparing its consequences with environment. Coconut husk and marble dust are waste materials which are dangerous to environment. During the polishing and grinding operation of rocks/marbles 25% of the actual marble is lost into the upper atmosphere in the form of dust thus causing various environmental problems including lungs diseases. In this study coconut husk and marble dust were added by weight of mortar in the ratio of 5, 10 and 15% by weight of mortar paste of 2×2×2 inches. Cement to sand ratio was kept as 1:3 while water to cement ratio was kept as 0.5.All the blocks were prepared in normal manner with proper compaction and were then cured in ordinary way at room temperature for 3, 7 and 28 days. Results revealed that that with addition of coconut husk in mix ,the compressive strength first increased however by further increasing the percentage of coconut husk the compressive strength decreased at all stages of curing. According to results the addition of coconut husk in mix up to 5% showed highest 3day strength, 10 % showed 7 day strength while addition of 15% coconut husk showed lowest compressive strength at all stages of curing. Similarly results showed that addition of marble dust into the mix, the compressive strength increased at some stages. Addition of 5% of marble dust showed highest 28th day strength, 10% showed 7 day strength while addition of 15% marble dust in mortar mix showed highest 28th day compressive strength. However with further increase of percentage of marble dust into the mix, the compressive strength increased at 7 day and 28 day. However with further increase of marble dust in mortar beyond 5% the compressive strength was reduced at all days of curing compared to reference mortar because as the percentage of marble dust increased the saturation of calcium silicate hydrate gel increases due to which the compressive strength greatly reduced.
The increased usage of marble dust and coconut husk in mortar and concrete largely reduces the pollution/percentage of such wastes in environment and thus played an important role in reducing the environmental consequences of such wastes.

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Track Classification: Civil & Construction Engineering