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Experimental Study on Partial Replacement of Coarse Aggregate by Iron Slag in Cement Concrete (M₂₅)

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Abstract : Iron slag is a waste by-product of steel industry. Basically it consists of aggregates which are bonded together by cement and water. Since the lifetime of many metal products can be longer than 10 years and sometimes longer than 50 years, these products for building and construction, there is an accumulation of metal in use since the beginning of the industry. As the disposal of this waste is posing serious problem to the environment it is better to use this type of material in making concrete so that a waste material can be disposed off by cleaner technology. This technique will also prevent degradation in environment. Iron slag which is generated in large quantities as waste is hardly being used in the preparation of concrete. Special quality control procedures may be required to address the lack of consistency in some properties such as gradation, specific gravity, and absorption found. Control concrete with 20%, 30%, 40% and 50% of coarse aggregate replacement by Iron slag were made. Blast furnace slag is mildly alkaline and exhibits a pH in solution in the range of 8 to 10. Although blast furnace slag contains a small component of elemental sulphur (1 to 2 percent), the leach ate tends to be slightly alkaline and does not present a corrosion risk. Concrete obtained by this method may have more self-weight than the conventional concrete, but it is expected to provide more strength than the conventional concrete.

Keywords : Iron slag, Compressive strength, Split tensile strength, Flexural strength.

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