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IMPLEMENTATION OF SUSTAINABLE CONCRETE WITH GRAPHENE AND CACTUS EXTRACT ON COLUMN USING NANOTECHNOLOGY

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ABSTRACT: The new dimension in the construction world is nanotechnology. The development in the field of nanotechnology gives an advantage of developing cementitious materials at nano scale. This experimental work is completely based on nano technology and came up with the idea of introducing nano particles in the raw materials used for construction. While, during the production of cement, carbon dioxide is released in enormous quantity which pollutes the environment. Hence fly ash is used as a partial replacement for cement and cactus gel can be used with water which can reduce carbon emission and cost. This paper aims to investigate the effect of Graphene on fly ash concrete and to find out the optimum quantity of Graphene in fly ash concrete required to achieve maximum compressive, tensile and flexural strength of concrete. Graphene oxide was added to the concrete in various proportions with replacement of cement by fly ash up to 40%. To achieve the aim, all the specimens were prepared and tested at various ages for the period of 7, 14 & 28 days. Test results indicated that the inclusion of Graphene in concrete enhanced the compressive, split tensile and flexural strength.

Keywords: *Fly Ash Concrete, Graphene Oxide, Cactus Gel, Compressive, Tensile Strength, Flexural Strength*