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TITLE OF PROJECT: Application of Graphene Based Concreting in Developing Sustainable Road Infrastructure

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ABSTRACT: In today's world, the construction industry is growing at a rapid pace. With this there is also increase in carbon foot print, which is a major threat that possess towards global warming. One of the major component of construction industry is road infrastructure. Addition of Graphene Oxide in concrete can give sustainable and ecofriendly solution in road infrastructure. Graphene is a simple substance with complex properties. Graphene is just a single layer of carbon atoms arranged in a hexagonal matrix. Construction of Road with Graphene based concreting as an additive can increase strength, reduce clinker factor in cements (reducing carbon footprint) and potentially increase longevity of road. The technology has the potential to deliver stronger, less permeable concrete structures enabling a new generation of concrete designs. Use of graphene concrete road may reduce the timescales for roadworks, improving safety and significantly reducing carbon footprint. Also it will reduce the aging effect caused by ultraviolet light to further extend the life and durability of its roads. In a world where all the cars could be electric in future, creation of such road which contains an element (Graphene Oxide) that conducts electricity could allow recharging the car's battery directly from the road while waiting at a stop light or while a car is parked anywhere along a street. Concrete structures represent a huge investment in terms of materials and energy and they lead to significant environmental impacts. Thus, there is a need to choose the most sustainable and eco-friendly alternative. Owing to this problem creation of graphene-based concreting can bring a major change in construction industry. In this paper we are presenting the review of graphene-based concreting in road infrastructure.

KEYWORDS: Carbon footprint, Characteristics of Graphene, Graphene Oxide, Graphene based Concreting, Sustainable concrete

CATEGORY: Transportation Engineering