RoyAl: Pavement Subgrade from Industrial Byproducts

Problem Statement: Industries all over the world pose real-time challenges on disposal, handling and utilisation of byproducts. At present most of the industries dispose-off their byproduct material with no clues on bulk utilisation. The quantity and their hazardous characteristics pose a threat to the environment. One such byproduct is bauxite residues (BRs) generated from alumina. One ton of alumina generates approximately 0.8-1.5 tons of bauxite residues. Therefore, the primary objective of the present invention is to provide a bulk utilisation strategy by creating a composition for utilisation. We propose to prepare subgrades for constructing roads and pavements by using byproducts generated from alumina refinery and method thereof to cast in the field condition.

Uniqueness of the Solution: Unlike the conventional practice of making the subgrades of natural soils, this approach considers the use of industrial byproducts with a small addition of a binder to stabilise it. The composite is poured in the semisolid state, which sets subsequently. This solution is relevant, especially when the pace of road network construction is high and with a scarcity of raw materials.

Current Status of Technology: The technology is tested on a pilot scale in the laboratory and proven to be feasible technically and environmentally in a real-life situation. It has been demonstrated at Utkal Alumina International Ltd., Odisha and Vedanta Alumina Refineries, Lanjhigarh, Odisha, for a stretch of 50m. Further upscaling of the technology for rural road construction is under consideration.

Societal Impact: By creating policies and guidelines to include this byproduct as a resource for creating road networks, overall sustainable development of the society is expected with better connectivity between the places and reduced dependence on the natural resources for road construction along with lower pollution load on the environment. With sustainability being the key to the growth and development of the nation, creating such facilities using sustainable materials is a boon to the industrial era.

Patent(s): Filed

Relevant Industries: Infrastructure Development, Sustainable Materials.

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