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Investigating the Potential Use of Microfibre Surgical Face Masks for Soil Improvement

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ABSTRACT

Disposable single-use face masks, the majority of which are composed of microfibre materials, have become much more popular because of the COVID-19 outbreak (World Health Organization, 2020). Even though these masks are necessary for maintaining public health, disposing of them presents a serious environmental risk. To address this issue, the research investigates whether the fabric extracted from face masks can be repurposed for soil improvement. Mechanical properties tests are conducted within the context of geotechnical engineering. The concept of integrating recycled microfibres from face mask layers with other materials into soil is explored, following the methodology suggested by Jamsawang et al. (2018). Prior to the utilisation of recycled face masks, sterilisation methods are employed to eliminate any potential risk to public health from virus transmission through the shredded mask materials. Subsequently, the effects of microfiber inclusion on the mechanical properties of the soil are evaluated using established testing procedures, as outlined by Thwe Win et al. (2023). The mechanical investigation includes assessing flexural strength, shear strength, and compressive strength, which are crucial for geotechnical engineering applications such as road work (Wang et al., 2022), including subbase construction and erosion control. Life cycle assessments are conducted to determine the cost efficiency of waste management approach. In conclusion, this research presents a viable strategy for addressing the environmental issues associated with discarded face masks by exploring the potential use of recycled microfibres to improve soil.

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