Resilient 3D-Printed Infrastructure with Engineered Cementitious Composites (ECC) Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/111

(This dataset supports report **Resilient 3D-Printed Infrastructure with Engineered Cementitious Composites (ECC)**)

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The related final report **Resilient 3D-Printed Infrastructure with Engineered Cementitious Composites (ECC)**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/61737.

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Abstract: Conventional construction of reinforced concrete structures is slow, labor-intensive, and expensive. 3D printing holds great potential to assist engineers and architects in constructing fast and economical yet complex representational infrastructures. One of the most significant barriers to the broader adoption of concrete 3D printing in civil infrastructure is the difficulty of providing printed structural components with reinforcement to achieve sound structural performance under different loading conditions. Hence, it is essential to design concrete that can be utilized as a rebar-free material by considering strength and ductility. Recently, the development of Engineered Cementitious Composites (ECC) has neared the possibility to achieve both strength and ductility in the concrete structures without embedding steel reinforcement. ECC has been offered to enhance the problem related to the ductility and low tensile strength of traditional concrete and Fiber Reinforced Composite (FRC). As such, the implementation of intrinsically reinforced cementitious materials has the potential to address this barrier in the reinforcement of 3D-printed concrete and yields significant benefits such as an enhanced structural capacity, durability, and resiliency. This project proposes the development of ECC materials utilizing readily available ingredients in Region 6 with rheological characteristics tailored specifically for 3D printing applications. Furthermore, the project aims to conduct a comprehensive evaluation of the hardened properties of 3D-printed ECC specimens, including mechanical tests.

Comments: Tran-SET Project: 20CUNM41

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Dataset description:
This dataset contains 1 file described below.

Test_Results.xlsx:
The .xlsx and .xls file types are Microsoft Excel files, which can be opened with Excel, and other free available software, such as OpenRefine.

National Transportation Library (NTL) Curation Note:
As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (https://ntl.bts.gov/public-access) Section 7.4.2 Data, the NTL staff has performed ***NO*** additional curation actions on this dataset. NTL staff last accessed this dataset at https://digitalcommons.lsu.edu/transet_data/111 on 2022-05-20. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.