Multifunctional Corrosion Control System as a Sustainable Approach for Reinforced Concrete Elements Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/110

(This dataset supports report **Multifunctional Corrosion Control System as a Sustainable Approach for Reinforced Concrete Elements**)

This U.S. Department of Transportation-funded dataset is preserved by the Transportation Consortium of South-Central States (TRAN-SET) in the LSU Digital Commons Repository (https://digitalcommons.lsu.edu), and is available at https://digitalcommons.lsu.edu/transet_data/110

The related final report **Multifunctional Corrosion Control System as a Sustainable Approach for Reinforced Concrete Elements**, is available from the National Transportation Library's Digital Repository at https://rosap.ntl.bts.gov/view/dot/61736.

Metadata from the LSU Digital Commons Repository record:

Authors:

- Homero Castaneda, Texas A&M University
- Miladin Radovic, Texas A&M University
- Brendy Rincon, University of Texas at San Antonio
- Oladis Troconis, University of Texas at San Antonio
- Arturo Montoya, University of Texas at San Antonio
- Changkyu Kim
- Loreto Dacio

Document Type: Data Set
Publication Date: 9-2021

Abstract: Corrosion inhibitors can be utilized to decrease the corrosion kinetics and therefore increase the durability of reinforced concrete structures. Recently, a green synthesized organic compound, 1-benzyl-4-phenyl-1H-1,2,3-triazole (BPT), was shown to be a successful green organic corrosion inhibitor for mild steel. Studies suggested that the BPT adsorbs chemically onto the steel and acts as a mixed inhibitor, suppressing both the anodic and cathodic corrosion kinetics of steel. In addition, microcapsules have shown to be an efficient way for a controlled inhibitor release in reinforced concrete structures. On the other hand, geopolymers (GPs) comprised of a long range of covalently bonded alumino-silicates, with amorphous network structure are generally considered as a suitable substitute for OPC for many structural applications due to their high strength and durability. The use of recycled waste materials or natural abundant materials for the production of GPs has attracted world-wide attention as it presents an environment-friendly aspect that may shed light on for replacing traditional OPC by its sustainability. One of the advantages of GPs is the significant reduction to CO2 emission due to the energy consumption, the geopolymers utilize materials such as fly-ash, which is a byproduct of coal combustion, or natural precursor materials (clays, basalt rocks, etc.) and their derives (metakaolin), which does not produce net CO2 emission. Recent studies have shown that GPs based cements can hinder the corrosion of reinforcement steel in concrete structures when

compared to OPC, mostly because of lower chloride ingress (due to barrier protective capabilities) and the highly alkaline pH nature of geopolymer cements.
Comments: Tran-SET Project: 20CTAMU22

Recommended citation:
Castaneda, H., Radovic, M., Rincon, B., Troconis, O., Montoya, A., Kim, C., & Dacio, L. (2021). Multifunctional corrosion control system as a sustainable approach for reinforced concrete elements. Retrieved from https://digitalcommons.lsu.edu/transet_data/110

Dataset description:
This dataset contains 1 file collection described below.

Dataset.zip:
This file collection has 334 files, organized into multiple folders.

File Type Descriptions:
From NTL's exploration of the file collection they found the most common file types listed below, however this may not be a complete list for file types found in the .zip file.

- The .dta file extension is often used for various data files and can be both in text and binary format. This file type can be found in many programs, but unless it's the same developer, these formats are usually completely different (for more information on .dta files and software, please visit https://www.file-extensions.org/dta-file-extension).
- The .dat file extension is traditionally used by many various applications or programs for their data or resource files (for more information on .dat files and software, please visit https://www.file-extensions.org/dat-file-extension).
- 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/110 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.