

## **Eco-friendly stabilization of sulfate-rich expansive soils using Geopolymers for transportation infrastructure Dataset**

Dataset available at: [https://digitalcommons.lsu.edu/transet\\_data/83/](https://digitalcommons.lsu.edu/transet_data/83/)

(This dataset supports report **Eco-Friendly Stabilization of Sulfate-Rich Expansive Soils Using Geopolymers for Transportation Infrastructure**)

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/83/](https://digitalcommons.lsu.edu/transet_data/83/)

The related final report **Eco-Friendly Stabilization of Sulfate-Rich Expansive Soils Using Geopolymers for Transportation Infrastructure**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/56560>.

### **Metadata from the LSU Digital Commons Repository record:**

Document Type: Data Set

Publication Date: 10-2020

Abstract: Traditional calcium-based stabilizers, such as lime, to stabilize sulfate-rich expansive soils, are lasting-challenges in geotechnical engineering. The biggest problem with using calcium-based stabilizers is that when calcium and water are exposed to sulfate-rich expansive soils, they form ettringite as an expansive mineral, which causes sulfate-induced heaving. The study aimed to investigate the feasibility of stabilizing sulfate-rich expansive soils using geopolymers for transportation infrastructure. Literature review on sulfate-induced heaving and sulfate-rich soils stabilized with geopolymers suggests a direction for how to stabilize sulfate soils using geopolymers. The engineering tests were conducted to determine the swell, shrinkage, and strength behavior of natural, lime stabilized- and geopolymer-stabilized soils. Scanning electron microscopy (SEM) with energy-dispersive X-ray spectroscopy (EDS) and X-ray diffractometer (XRD) tests were performed to compare the microstructural changes of geopolymer-stabilized soils with natural and lime-stabilized soils. Laboratory tests were conducted considering the influence of the geopolymer composition, dosage, and curing period to investigate the effect of the geopolymer in stabilizing the sulfate-rich expansive soils.

Comments: Tran-SET Project: 19GTUTA01

### **Recommended citation:**

Yu, X., Puppala, A., Radovic, M., Chakraborty, S., Jang, J., & Huang, O. (2020). Eco-friendly stabilization of sulfate-rich expansive soils using Geopolymers for transportation infrastructure. Retrieved from [https://digitalcommons.lsu.edu/transet\\_data/83](https://digitalcommons.lsu.edu/transet_data/83)

### **Dataset description:**

This dataset contains 1 .zip file collection described below.

### **Eco-Friendly Stabilization of Sulfate-Rich Expansive Soils Using Geopolymers for Transportation Data.zip:**

The file collection contains 1 .docx file and 1 .xlsx file, described below.

- Data\_Set\_19GTUTA01.xlsx
- Data\_Notes\_19GTUTA01.docx

The .xlsx file type is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.

The .docx file is a Microsoft Word file, which can be opened with Word and other free word processor programs, such as Kingsoft Writer, OpenOffice Writer, and ONLYOFFICE.

### **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/83/](https://digitalcommons.lsu.edu/transet_data/83/) on 2021-07-15. If, in the future, you have trouble accessing this dataset at the host repository, please email [NTLDataCurator@dot.gov](mailto:NTLDataCurator@dot.gov) describing your problem. NTL staff will do its best to assist you at that time.