

QUARTERLY PROGRESS REPORT

September 1, 2018 - November 30, 2018

PROJECT TITLE: Research Advances on the Use of Solid Wastes in Concrete and Asphalt

PRINCIPAL INVESTIGATOR(S): Timothy G. Townsend

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Department of Environmental Engineering Sciences

CO-PRINCIPAL INVESTIGATOR(S): Christopher C. Ferraro

AFFILIATION: Research Assistant Professor, University of Florida
Department of Civil and Coastal Engineering

COMPLETION DATE: May 31, 2019

PHONE NUMBER: 352-392-0846

PROJECT WEBSITE: <https://www.essie.ufl.edu/home/townsend/research/bu/research-advances-on-waste-in-concrete--asphalt/>

Work accomplished during this reporting period:

During this time period, a mobile screening machinery vendor was contracted to process stockpiled bottom ashes from a mass burn waste-to-energy (WTE) facility in Florida. Graduate and undergraduate students assisted in the field screening of this bottom ash to obtain an ideal particle size distribution for use as aggregate. The target particle size range was 3/8" to 3/4" for coarse aggregate and below 3/8" for fine aggregate. Graduate students developed and executed a sampling event for this screened ash in accordance with ASTM D75, Standard Practice for Sampling Aggregates. In order to collect representative composite samples of stockpiled bottom ash from the facility, three samples were collected representing three different points of processing for each size fraction. The grab samples were transported back to UF for characterization and processing. Gradation of the ash will be determined at UF's labs using ASTM C136, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates. This step is particularly important for developing a Superpave mix design for asphalt concrete since the gradation plays a crucial role in the volumetrics of an asphalt mixture.

Work planned for the next reporting period:

The UF research team will continue to analyze other relevant properties of the ash for asphalt concrete and Portland cement concrete (PCC) mixture design. Specific gravity and absorptivity will be tested using ASTM C127, Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate. Specific gravity describes how dense a material is relative to water (pure water = 1.0) and is a very important parameter for any PCC or asphalt concrete mix design. Additionally, absorptivity is a very important parameter for any PCC or asphalt

concrete mix design as this quality plays a role in water demand (for PCC) and asphalt demand (for asphalt concrete).

UF researchers will also focus on washing ash and conducting further physical and environmental tests to discern what significant effects, if any, washing will have on these material properties.

TAG Meetings:

No Technical Awareness Group (TAG) meetings were planned for this period.

Metrics:

- *Graduate Students:*

Name	Rank	Department	Professor	Institution
Kyle Clavier	PhD Student	Environmental Engineering	Timothy Townsend	University of Florida
Yalan Liu	PhD Student	Environmental Engineering	Timothy Townsend	University of Florida
Chad Spreadbury	PhD Student	Environmental Engineering	Timothy Townsend	University of Florida

- *Undergraduate Students:*

Name	Rank	Department	Professor	Institution
Brian Cochran	Undergraduate Research Assistant	Civil Engineering	Timothy Townsend	University of Florida
Mohamad Shavar	Undergraduate Research Assistant	Civil Engineering	Timothy Townsend	University of Florida
Sharez Sohail	Undergraduate Research Assistant	Environmental Engineering	Timothy Townsend	University of Florida
Thomas LeBlanc	Undergraduate Research Assistant	Environmental Engineering	Timothy Townsend	University of Florida

- *Research publications resulting from THIS Hinkley Center project: **None.***

- *Research presentations resulting from (or about) THIS Hinkley Center project: **None.***
- *Who has referenced or cited your publications from this project: **None.***
- *How have the research results from THIS Hinkley Center project been leveraged to secure additional research funding? What additional sources of funding are you seeking or have you sought? **None.***
- *What new collaborations were initiated based on THIS Hinkley Center project? **None.***
- *How have the results from THIS Hinkley Center funded project been used (not will be used) by the FDEP or other stakeholders? **None.***