

UTC Project Information – Project # C7.2018	
Project Title	Alternative Cementitious Materials (ACMs) For Durable and Sustainable Transportation Infrastructures
University	University of Maine
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Funding Source(s) and Amounts Provided (by each agency or organization)	UTC TIDC (\$83,238) and UMaine (\$83,300)
Total Project Cost	\$166,538
Agency ID or Contract Number	69A3551847101
Start and End Dates	06/01/2019 to 05/31/2021
Brief Description of Research Project	Concrete produced with Alternative Cementitious Materials (ACMs) often exhibits superior mechanical performances and lower carbon footprint compared to those produced with Ordinary Portland Cement (OPC). ACMs also allow utilizing high-volume of industrial by-products as the binding materials instead of OPC, thus offering an environment-friendly alternative of traditional concrete. However, the durability performances of ACMs can vary depending on the selection of the reaction route (i.e., strength gaining mechanism). As a result, any definite evidence on the service life performances and shrinkage properties of these materials are still in infancy. To address these challenges, we will investigate the durability performances of ACM concrete in comparison to those of traditional OPC-concrete, specifically for typical cold-climatic regions. Two ACM systems will be evaluated in this project, including (i) alkali-activated binders and (ii) CO ₂ activated binders.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	Our hope is that current MaineDOT standard (2020 MaineDOT Standard Specifications) will be modified following our research. This study recommends using “Formation Factor” for permeability/durability control rather than current surface electrical resistivity criterion. Also, it was recommended to set some restrictions for free shrinkage of concrete based on its application. Finding these limits could be the subject of our next research.
Impacts/Benefits of Implementation (actual, not anticipated)	Actual impacts and benefits of the research will be reported after the implementation phase.
Web Links <ul style="list-style-type: none"> • Reports • Project website 	N/A