

Development of protocols for determining deleterious material content in processed glass aggregate

Neha Subedi, Advisors: Drs. Matthew Scarborough and Mandar Dewoolkar,
 University of Vermont

Abstract

High quality sand borrow is increasingly scarce and expensive. Processed glass aggregate (PGA) studied in this project is a fine crushed recycled glass with a high potential to replace sand borrow and other free-draining fill materials. In practice, PGA is not widely used in our region because of a lack of clear guidance on deleterious material content determination.

The main objective of this study is therefore to develop and perform a variety of processes to determine deleterious material content in PGA; evaluate the effectiveness of individual processes using lab-manufactured PGA (LM-PGA) samples; and recommend a reliable protocol for determining deleterious material content in PGA produced at recycling facilities.

Two protocols were developed. Protocol 1 (Magnet Test + Furnace Test) was developed to determine the overall deleterious contents present in PGA. The result was fairly accurate for this process. Protocol 2 (Magnet + Float Test) was developed to determine the plastic contents in the PGA. This protocol was less accurate for both the lab manufactured as well as recycling facility PGA. Protocols to accurately determine plastic contents are currently under development. The testing procedures and protocols are being evaluated to quantify operator dependence, if any.

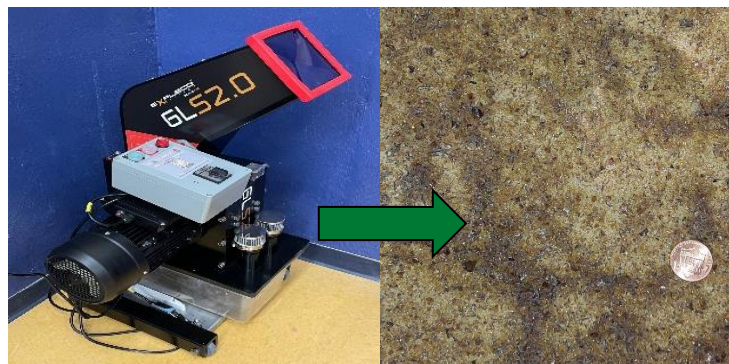


Figure 1. Glass crusher (left) and clean crushed glass (right) for producing LM-PGA

Acknowledgements: Funding for this research is provided by the Transportation Infrastructure Durability Center at the University of Maine under grant 69A3551847101 from the U.S. Department of Transportation’s University Transportation Centers Program. Additional financial project for this project is provided from CSWD and VTrans and is gratefully acknowledged.