1. Report No. FHWA-NJ-2016-006	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Laser Scanning Aggregates for Real Time Property Identification		5. Report Date December 2016
		6. Performing Organization Code
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9. Performing Organization Name and Address Department of Civil Engineering, Rowan University 201 Mullica Hill Rd, Glassboro, NJ 08028		10. Work Unit No.
		11. Contract or Grant No.
12. Sponsoring Agency Name and Address		13. Type of Report and Period Final Report
New Jersey Department of Transportation PO 600 Trenton, NJ 08625	Federal Highway Administration US Department of Transportation Washington, D. C. 20590	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

The goal of this project is to develop a portable system for determining the mineralogical composition of aggregates in the field for quality control. Laser Induced Breakdown Spectroscopy (LIBS), which involves firing a laser pulse at a sample to determine its composition from light spectra emitted and interpreted using a spectrometer and a custom program, was chosen to be the basis of the portable system. Along with system development, results were analyzed via Partial Least Squares Regression (PLSR). The current analysis technique utilizes split-training and y-scaling to analyze spectra data and performs well for most samples. The results obtained from the LIBS system was compared with X-ray Fluorescence (XRF) data provided by the NJDOT.

17. Key Words Aggregate Mineralogy, Material Testing, Laser Technology, LIBS, PLSR, Deployable MATLAB software, Real time testing, Portable equipment		18. Distribution Statement	
19. Security Classification (of this report) Unclassified	20. Security Classification. (of this page) Unclassified	21. No of Pages: 77	22. Price