

## Utilization of Indigenous Intermediate Size Aggregates in Concrete Mixtures

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### Problem

Problems with the quality of concrete mixtures are partly attributable to gaps in the gradation of the aggregate combinations. Extensive research has addressed optimization of the aggregate gradations. A Transportation Research Board report concluded that control of total aggregate gradation may result in significant improvements to concrete mixture properties, including reduced costs, lower water requirements, improved durability, and reduced cracking potential.

Louisiana's indigenous coarse aggregates have practically been depleted due to extensive construction during the past century. As a result, Louisiana must rely on imported crushed stone from other regions of the United States to satisfy its demand for coarse aggregate. Louisiana may have an adequate supply of intermediate size aggregates that could be used to alleviate gap grading.



*Sieves Used for Gradation of Aggregates*



**LTRC**



Louisiana Transportation  
Research Center

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## Objective

Performance-based specifications for materials that are combined to produce concrete are desirable. This research will evaluate the fundamental engineering properties of concrete mixtures using Louisiana's indigenous intermediate size aggregates. The goal of this study is to develop aggregate standards that maximize the use of Louisiana's natural resources and evaluate their performance in concrete mixtures.

## Description

Louisiana's existing resources of intermediate size aggregates must be inventoried. Trial concrete mixtures using indigenous aggregate will be tested in the laboratory. Mixture properties will be compared to properties of a reference mixture that complies with current specifications.

Upon completion of the laboratory testing and identification of a suitable mixture, a demonstration field project will be constructed. Field cores will be tested, and long-term performance will be monitored. The demonstration project will also include interviews with the contractor, concrete plant manager, and other construction personnel, relative to the new mixture.

## Implementation Potential

The results of this research study will assist the Louisiana Department of Transportation and Development in determining if it should allow greater use of Louisiana's indigenous aggregates in concrete mixtures. Louisiana can benefit economically from specifications that incorporate greater use of its indigenous aggregates.