



PROJECT TITLE: RECYCLED CONCRETE AGGREGATE IN PORTLAND CEMENT CONCRETE

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Dwindling supplies of natural coarse aggregate in New Jersey and increased interest in using more sustainable methods and materials for construction led NJDOT to study the barriers and opportunities for using crushed concrete waste, known as recycled concrete aggregate (RCA), as an aggregate for new concrete. This report reviewed available published reports, the experiences of other states and the results of a laboratory and field testing program to determine the conditions under which RCA could be used in NJDOT projects.

Research Objectives and Approach

The objective of this work was to determine if RCA is suitable for use in concrete on NJDOT projects and if so, what limitations there are to its use. In order to answer these questions a review of previous published reports was performed along with a review of the experiences other state DOTs have with the material. This was followed by laboratory testing of RCA produced in New Jersey. This New Jersey produced RCA was then used as aggregate in concrete field trials. The trials included cast-in-place and precast applications.

Findings

Based on this study the following recommendations were made.

The New Jersey Department of Transportation should allow the use of recycled concrete as coarse aggregate for concrete.

Applications should be limited to non-structural or roadway concrete items, excluding surface and base courses. Precast roadway concrete

items with SCC using RCA should also be permitted.

Because of the unknown history of material reaching Class B recyclers, specific mitigation methods are required for all mixes using RCA unless the source aggregate is known such as in the case of precast concrete operations.



Figure: Carpenter Street placement on June 30, 2011 and condition on Aug 9, 2012