Technology Brief

A Tool Kit for Using Recycled Glass as a Construction Aggregate

Key Words	
Materials:	Recycled Glass.
Technologies:	Performance of Glass Construction Aggregate.
Applications:	All unbound aggregate applications.
Market Goals:	Outlet for low-value and mixed-color recycled glass.
Abstract:	A Tool Kit consolidating case studies and research reports on glass aggregate.

The use of recycled glass as a construction aggregate has been technically well-established, with over 50,000 tons used in construction projects in the state of Washington alone. In addition, Department of Transportation specifications in at least six states have been amended, allowing the use of recycled glass in road projects.

However, a continuing barrier to increased construction use has been the lack of a single document consolidating the primary technical research and practical field experience to give engineers, in a single document, all of the information they need to specify recycled glass aggregate with confidence.

The CWC, along with Soil and Environmental Engineers (S & EE) of Redmond, Washington, and Re-Sourcing Associates of Seattle, has created this recycled glass aggregate "tool kit." The tool kit includes case studies, lessons learned, and a summary of the findings of several important technical studies.

Case Studies

The report uses a standard format to capture the pertinent experience from existing projects incorporating recycled glass aggregate. Among the data captured for six projects in Washington and three outside of Washington is:

- type of aggregate application
- location
- gradation
- material specifications
- volume
- economics
- special handling procedures
- lessons learned
- contact people

The case studies develop the information shown above for a wide variety of aggregate applications (e.g. road base, lightweight fill, drainage aggregate, retaining wall backfill, utility trench backfill, etc.). A wide variety of uses are shown in order to provide real-world experience in actual applications, and to increase the confidence of specifying engineers that they do not need to "re-invent the wheel" in order to specify recycled glass aggregate in their projects.

Report Consolidation

Two major studies and several smaller studies have analyzed the technical performance of glass as a construction aggregate. The two major studies are *The Glass Feedstock Study*, performed by Dames & Moore consulting engineers of Seattle in 1993, and

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funded by six states and two corporations, and *Developing Specifications for Waste Glass and Waste-to-Energy Bottom Ash as Highway Fill Materials*, performed by the Florida Institute of Technology in 1995. Additional research that is applicable in whole or in part has been performed or sponsored by BFI of Ohio; the University of Missouri Rolla; the City of Oberlin, Ohio; and the Cold Regions Research and Engineering Laboratories.

The report consolidation section of this study compares duplicate tests performed by different laboratories to confirm or contradict the conclusions of the tests. The study also identifies and summarizes complementary tests to extend the conclusions of the tests.

The report also presents model specifications for glass aggregate. In part, the project is a four-year "retrospective" of the use of glass in Washington and other states. Special emphasis is given to "lessons learned," including site safety and health issues and quality assurance.

Tool Kit

The two sections described above are combined in one report of less than 100 pages. In the future, a "brochure" will be developed summarizing all of the results and giving model specifications in an accessible format not over eight pages.

The goal of this project is to have a package that can be used both for technical background and in presentations to any level of expertise. Photographic slides, videos, and a PC-based overhead presentation are also under production to fill out the presentation package. The CWC is available to present this material to any interested group.

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For More Information

For a copy of the report, *A Tool Kit for the Use of Post-Consumer Glass as a Construction Aggregate (GL-97-5)*, use the CWC Publication Order Form. For more information call CWC at (206) 443-7746, email info@cwc.org, or visit the CWC Internet Website at www.cwc.org.

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