



Best Practices in Glass Recycling

Studies of Glass in Construction Applications

Material: Recycled Glass

Issue: *The use of recycled glass as an alternative construction aggregate has been growing over the last five years. Recycled glass cannot be collected, processed, and delivered to a construction site and compete with the cost of aggregate on an absolute basis. However, if the right kind of economic incentives are in place, construction aggregate can be a “relief valve” for excess collected material. Although there are 5000 years of glass technology, before 1990 no comprehensive studies had ever been undertaken to determine the performance of glass compared with natural aggregates. In the last five years, however, there have been a number of studies of the performance of glass as a construction aggregate. The results of these studies are a logical starting point for any group interested in developing local construction uses for recycled glass.*

Best Practice: This is a list of studies that are known to be available for purchase or free.

Clean Washington Center

Glass Feedstock Evaluation: This study, conducted in 1993 by Dames & Moore Consulting and funded by the states of Minnesota, New York, California, Oregon, Washington, and the Southwest Public Recycling Association, was the first public overall evaluation of glass as a construction aggregate. The study resulted in a comprehensive **five-volume report**:

- *Using Glass as a Construction Aggregate* - Eight page summary brochure of test results with application recommendations. An excellent introductory piece for contractors. Report #GL-93-1.
- *Testing Program Design* - testing standards, protocols, and an overview of the characteristics to be tested. Report #GL-93-2.
- *Environmental Suitability Evaluation* - Four environmental issues: leachate testing, worker safety, analysis of airborne dust, and contamination levels. Report #GL-93-3.
- *Equipment Evaluation* - A listing and discussion of important characteristics of glass processing systems producing 3/4” minus, an economic model and field evaluations of six systems. Report #GL-93-4.
- *Engineering Suitability Evaluation* - Results of physical testing. Data in tabular and chart format. Report #GL-93-5.
- *Evaluation of Cullet as a Construction Aggregate* - Summary of test results with model specifications and application recommendations. Report #GL-93-6.

Additionally, the Clean Washington Center has the following two fact sheets available:

- *Washington Department of Transportation Specifications for Glass Aggregate* - Text and discussion of WSDOT specifications for 100% glass aggregate and blended glass aggregate. Fact sheet #GL-95-3.
- *Construction Inspector’s Guide to Recycled Glass Aggregate* - Compares characteristics of glass to those of natural aggregates in order to facilitate field inspection. Fact sheet #GL-95-2.

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Clean Washington Center reports and fact sheets are available by calling 206-587-5520, or faxing 206-464-6902 to order or to request an order form. CWC fact sheets are also on its website at www.cwc.org

Florida Institute of Technology

Developing Specifications for Waste Glass and Waste-to-Energy Bottom Ash as Highway Fill Materials - Volume 2 of 2 (Waste Glass), June 1995 - More longitudinal tests and a more analytical approach than the Clean Washington Center report. Covers similar physical properties, with more emphasis on organics leaching issues. Available for order at 407-768-8000 ext. 7555.

Schmucker, Bruce O., and Buffalini, Rick J., *Pulverized Glass and Landfill Liner Systems*, A paper presented at the WasteTech '95 Conference. - Summarized in the April 1995, issue of Waste Age magazine, a copy of this full paper was not available at this writing. However, from the Waste Age article, it appears to contain excellent physical performance information.

University of Missouri - Rolla

Glasphalt Paving Handbook - Written by Delbert Day and Robert Schaffer, this is the most complete treatment of using recycled glass in asphalt, including historical and longitudinal information. Prepared for the Missouri Enterprise Business Assistance Center, Rolla, MO 65401.

Implementation: These references can serve as a starting point for any group interested in developing specifications for glass in aggregate applications.

Benefits: There have been a plethora of pilot projects using glass as an aggregate in fill or in asphalt. Unfortunately, a great amount of energy has been wasted in some projects by “reinventing the wheel,” and then not capturing lessons learned for the benefit of others. Recycling will gain the most by public reports that add to and enhance existing knowledge.

Application Sites Engineering offices, construction sites.

Contact: For more information about this Best Practice, contact CWC, (206) 443-7746, e-mail info@cwc.org.

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