

RECYCLING GLASS

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The average American uses 176 glass containers each year. For Washington County, with a population of around 25,000, the number of glass containers used each year is 4.4 million, or nearly 1100 tons. While a few get reused for nail containers, flower pots, or target shooting, the vast majority wind up in the solid waste stream. In order to divert as many of these containers as possible from the county landfill, the Washington County Solid Waste Management District wanted to develop as comprehensive of a program as possible for recycling glass.

Since I am also the Solid Waste Management District Manager as well as the County Highway Engineer, co-ordination between the two departments was simplified. In order to recycle as much glass as possible, we decided to crush all glass co-mingled and use this glass as an engineering material. Typical engineering uses can include road construction, on the surface (glassphalt), base asphalt layer, or roadbase aggregate, filler in storm drain, and French drain systems.

Many glass recycling programs separate glass to achieve the best resale price, since markets for clear glass are much stronger than green, brown, and/or other colors. However, even if we only accepted clear glass, contamination of other colors would still require hand separation, making the program unfeasible.

The solution was for the district to accept mixed glass, crush the glass, and supply it to a private asphalt contractor for use in HAC base. Although this crushed glass could be substituted for up to ten percent of the sand/gravel part of the mix, in actuality the ratio is one to two percent. This is due to the small generation rates of crushed glass relative to asphalt volumes.

We bought a glass crusher using an IDEM recycling grant. When running, the district operates at 2-1/2 tons per hour average, although the rate can be increased to about 4 to 5 tons per hour with additional manpower. The total cost of \$5,500 (including hopper inlet modification) was paid using approximately 2/3 grant, 1/3 district monies.

The crushed glass is a substitute for equal parts sand and gravel. The best part is that there is little actual handling of the glass from the recycling facility to asphalt plant. The glass is fed, mixed colors, to the crusher using metal dumping bins and a fork lift.

The few contaminants such as plastic bags, large lids, and foreign material are hand removed by operators before the glass reaches the crusher. The crusher is fed by a conveyor system with hopper. At the asphalt plant, large pieces of glass and metal lids are screened on a 5/8 inch screen before going to the heating process for asphalt. Paper, plastic lids, etc. are burned in the process and have not been a problem with production. The containers do not need to be perfectly clean but nearly all seem to be well cleaned out by the individual recycler.

This glass then is used in the base and surface layer for HAC paving in Washington County. We estimate that in Washington County alone, our entire waste stream of glass containers could be utilized in this manner, producing a product equal or superior to the original. Other potential uses, such as a partial substitute for sand\ drainage layer at the landfill, give Washington County a potential for many thousands of tons of crushed glass annually to be used as an engineering material.

Using glass meets federal recycling goals for using recyclable material in asphalt, and is greatly preferred over other items, like used tires (crumb rubber). I'd suggest burning used tires for fuel in energy plants and/or cement kilns. Glass is a similar material to sand and, crushed, can easily be used as an engineering material. Problems with separation of glass have been eliminated, the individual doesn't need to waste time "removing labels", and the district can have a comprehensive glass recycling programs at a reasonable cost.

Everyone comes out ahead with this program. The private pavers can get some recycling credit, the public can simplify its recycling efforts, more solid waste can be kept out of landfills, and virgin materials are conserved. The glass gives some reflective quality on dark nights, thus improving driver safety. We've used glass for years in paint to improve visibility on our roads, why not consider using some of those old nail containers in your new overlay?

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