

Industrial

Materials And Their Benefits

Industrial materials include coal combustion products, spent foundry sand, construction and demolition materials, iron and steel slags, scrap tires, and pulp/paper mill residuals. Many of these materials have engineering, chemical, and physical properties that make them valuable resources, but are often disposed as waste. Recycling industrial materials in construction embodies green design by conserving natural resources and reducing energy use and greenhouse gas emissions associated with virgin materials. In addition, industrial materials are often less expensive than the virgin materials they replace. As the demand for construction materials continues to rise in the U.S. and abroad, designing with recycled industrial materials can make good economic sense for project owners and builders.

We Want To Promote Your Project!

If you are interested in recycling industrial materials in your construction projects, or for more information about the Construction Initiative, contact our coordinators at rcc-challenge@epa.gov. Recognizing that success fosters success, we also are interested in documenting and promoting ongoing or recent construction projects in which recycled industrial materials are used.

Visit For Additional Resources

EPA Industrial Materials Recycling Web page:
www.epa.gov/industrialmaterials

FHWA's Recycling Web page:
www.fhwa.dot.gov/pavement/recycling/

Industrial Resources Council:
www.industrialresourcescouncil.org



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CONSTRUCTION INITIATIVE

Supporting green design
in construction through
industrial materials recycling



The U.S. Environmental Protection Agency's (EPA)

Construction Initiative (CI)

is a collaborative, public-private sector effort to increase the recycling and reuse of industrial materials in building and transportation construction projects across the nation. It is a part of EPA's Resource Conservation Challenge (RCC), a national program that provides renewed urgency to the Agency's message of reducing, reusing, and recycling valuable materials. The Initiative increases awareness of the potential value and unique abilities of these materials to replace virgin materials in numerous construction applications. To reach this goal, EPA is working with the Federal Highway Administration (FHWA) and the Industrial Resources Council (comprised of representatives from seven industry associations), to provide technical assistance to building owners, real estate developers, architects, general contractors, and transportation officials.

Value To Construction Applications

Industrial materials can be recycled in nearly all aspects of construction for buildings, roads, and other structures. In some cases, they can even improve the quality of the products in which they are used. For example, using coal fly ash as a partial replacement for portland cement enhances the strength, durability, and workability of concrete. Common uses for coal fly ash, ground granulated blast furnace slag, and spent foundry sand, include concrete, road embankments, and flowable fill. Concrete and asphalt rubble can be crushed and used as road base, aggregate in pavements, structural fill, or drainage material. Roofing shingles can be shredded and recycled in pavement, replacing costly virgin asphalt.



EPA's Region 8 headquarters in Denver has earned a Leadership in Energy and Environmental Design (LEED®) Gold rating and contains recycled industrial materials throughout the structure. For more information, visit: www.epa.gov/region8/building/index.html.

Green Building And The Construction Initiative

Green, or sustainable, building is the practice of creating and using healthier and more resource-efficient models of construction, operation, maintenance, and renovation. Designing with industrial materials is a key component of green building and can earn points in green building certification programs, such as the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED)® green building rating system.

Industrial Materials Recycling and LEED® Credits	Points
Using construction and building products containing recycled content	1-2
Reusing building materials and products	1-2
Diverting C&D materials from disposal	1-2
Using materials extracted, processed, and manufactured locally	1-2
Total Possible Points	8

Green construction also can involve a variety of other sustainability areas, including air quality, recycling, green purchasing, water stewardship, and energy efficiency. The CI works in concert with other EPA programs that support these areas. The Destiny USA project, is a prime example of the kind of multimedia assistance EPA can offer through the RCC's CI. For more information on these programs that support green building, visit EPA's green building website, www.epa.gov/greenbuilding.

A Construction Initiative Success

Destiny USA, a major commercial development in Syracuse, N.Y., will be built with recycled industrial materials. In 2006, EPA contacted the owner and developers of Destiny to discuss the environmental benefits of industrial materials recycling, as well as other green building practices. Later that year, Destiny USA and EPA entered into a voluntary Memorandum of Understanding (MOU) through the RCC. The MOU identifies Destiny's intent to pursue several conservation and pollution prevention-based programs and initiatives as part of the design, construction, and operation of the complex. Since the signing of the MOU, EPA has provided technical assistance to Destiny that has resulted in several environmental accomplishments:

Greenhouse gas emissions reductions. With EPA's assistance, Destiny determined the project could utilize concrete containing 30% coal fly ash with no compromise to performance. The project has already exceeded the 3,000 tons of coal ash pledged in the MOU. To date Destiny has utilized more than 5,440 tons in sidewalks, parking lots, pile caps, elevator shafts and grade beams, reducing greenhouse gas emissions by nearly 5,400 tons, which is equivalent to the annual emissions of about 900 passenger vehicles.

Reduced air emissions from construction. EPA assisted Destiny on transitioning from B20 biodiesel fuel to B100 biodiesel fuel for all construction vehicles involved in the project, resulting in reduced air emissions of particulate matter, carbon dioxide, and carbon monoxide from construction.

Switched to green power. EPA's Green Power Partnership assisted Destiny in switching from 19.5 million kilowatt-hours to 100% green power for the operation of the existing Carousel Center mall which is currently being expanded as part of this project, preventing approximately 958 tons of greenhouse gas emissions.

Destiny has joined EPA's WasteWise program and also has committed to joining the Water Sense and ENERGY STAR® programs. For more information on the Destiny project, visit www.destinyUSA.com.