

Of all the materials processed by recyclers for reuse in new products, one of the most expensive is concrete. Debris from building demolitions and road-building projects is the heaviest of all recycled materials, and its density requires powerful, expensive processing equipment.

But with more regulations restricting what can go in landfills, and disposal costs continuing to rise, it still makes economic sense to find ways to reuse concrete. Mobile concrete-crushing units have become an essential tool in this effort.

Recycling concrete from demolition projects can result in considerable savings because it saves the cost of hauling broken concrete to landfills (as much as 25 cents per ton/per mile), and eliminates disposal costs (as high as \$100 per ton), according to the [Construction Materials Recycling Association](#).

The reuse of building materials also has become more common with the advent of the “green” building movement. In its Leadership in Energy and Environmental Design (LEED) certification system, the U.S. Green Building Council awards points for using recycled materials in construction and for recycling building debris.

Currently, the biggest source of concrete for recycling is road-building projects in which the existing, concrete roadway is torn up to be replaced by new surfaces. On most projects, mobile crushing units are brought to construction sites to process the material, which is then stockpiled nearby to be reused as a base under the new pavement.

Albertville, Minn.-based Intex Corp. has a fleet of five mobile crushing units, each consisting of two compression-crushers, a front-end loader, conveyor belts, a skid-steer and a portable generator to supply power. Each unit crushes from 500,000 to 700,000 tons per year, according to Intex CEO Greg Buhl.

After the used concrete is broken apart, industrial-strength electromagnets are used to remove rebar and other steel used for reinforcement when concrete is poured.

Before the recent recession slowed construction activity, Intex was able to keep all five of its crushing units busy within the Twin Cities metro area; more recently it has expanded its service area into the Dakotas to keep revenue coming in, he said.

With at least seven crushing businesses competing in the metro area, “prices are low and it’s very competitive,” Buhl said. Currently, Intex charges \$3 a ton for crushing.



Another local concrete recycler is [Atomic Recycling](#), which processes construction and demolition debris at its facility in north Minneapolis. The \$5 million facility has an automated system to separate concrete from other debris such as wood, metals and glass, according to Vice President Brian Pieti.

After sorting, the concrete is transported to crushing facilities to be reduced to gravel-size pieces and sold for use in construction, paving and road-building projects.

The Minnesota Department of Transportation is the state's largest user of recycled concrete, according to Bill Hines, project manager for PCI Roads LLC, a St. Michael, Minn.-based contracting business that frequently works on major highway projects.

Recycled concrete crushed into gravel-sized pieces is also used for fill around and under new building foundations and for base layers for parking lots and sidewalks.

Generally, recycled concrete is not used in mixing concrete for new construction. That's because the concrete reclaimed from demolition projects often has other substances mixed in, such as soil or asphalt, said Tim Becken, a senior vice president with St. Paul-based Cemstone Inc. Concrete-mixers typically need to use "virgin" aggregate to meet building-material standards.

"When you design a concrete mix, the stones are the strong component," explains Paul Schiller, a vice president with Minneapolis-based Barr Engineering. "The cement that 'ties' everything together is the weak part."

Adding cement to bind virgin and recycled material (which already contains a certain percentage of cement) results in concrete that is not as strong as new concrete, Schiller

said.

Even so, the Construction Materials Recycling Association says the use of recycled concrete in new concrete is growing nationally. It is “in its infancy stage, with few recyclers attempting this reuse strategy, although confidence is gaining” through organizations that promote environmentally conscious building practices, according to the association’s website (cdrecycling.org).

In addition, researchers and engineers, under the auspices of the [American Concrete Institute](#), are working to develop better concrete formulas so that more recycled concrete can be used in building structures, Schiller said.

In the Twin Cities, perhaps the most unusual example of reusing concrete is the 300,000-square-foot Spectrum Commerce Center, at 1000 Blue Gentian Road in Eagan. Beginning in 2001, the center was built with large pieces of pre-stressed concrete that were formerly part of two rental car garages at the Minneapolis-St. Paul International Airport.

In the late 1990s, Rick Morphew, president of Eagan-based Spectrum Development Group LLC, heard the garages were slated to be demolished to make room for more public parking. The company acquired the pre-stressed concrete sections for future use.

Architects designed the Spectrum building to accommodate the shape and size of the pieces, which weighed about 30 tons each. The reuse project saved Spectrum a significant amount in construction costs, according to Morphew.

Recycling concrete is a great idea, Morphew said, but opportunities like the Spectrum project are relatively rare.

“It has to be the right time and place; the planets have to line up exactly right,” he said. “Nobody [locally] had done anything like that before, and everybody in town thought we were crazy. But it turned out to be a beautiful building.”

Another advantage of using the parking-ramp components is that Spectrum Center’s parking lot is on the roof — which provides natural insulation from winter cold and summer heat.

Source: finance-commerce.com