



## Technology Example 5.5 (A)



*I-540*  
Raleigh, North Carolina

### Highlighted Technology: Recycled Materials in Highway Construction

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#### Technical Strategies:

On one section of Interstate 540, known as the Raleigh Outer Loop, the N.C. Department of Transportation (NCDOT) has showcased the use of recycled materials it has pioneered since 1991.

##### *Tires*

Nineteen tons of tire chips (about 1,900 tires) were tilled into a portion of the soil along the embankments. Tire chips serve as an excellent aerator for young plants and are a much cheaper fill than pure soil. In addition, the weed mats under the guardrails were manufactured from tire chips.

##### *Plastics*

Recycled plastic has been used in this project in several ways. The guardrail offset blocks—the blocks that are inserted between the steel guardrails and the support posts behind them—are made from recycled plastic. Offsetting the rail from the support posts with a plastic block stabilizes the guardrail and also helps minimize the damage inflicted to cars that may bump against it. Plastic delineator—the flexible guideposts that help direct traffic—and temporary slope embankment pipes from plastic were also used in the project.

##### *Post-Industrial Asphalt Shingles*

Nearly 700 tons of shingles—“seconds” left over from the manufacturing process—have been mixed into the asphalt on a section of the Outer Loop project. These shingles make an excellent blending medium for asphalt, producing a driving surface that is attractive and durable.

##### *Municipal Sludge*

The City of Raleigh donated 260 tons of municipal sludge to use in place of agricultural limestone fertilizer on the Outer Loop project. The sludge, which was spread along the embankments, will provide a nutrient-rich base for landscaping.

##### *Coal Fly Ash*

A mixture of concrete and coal fly ash was used to fill the inner core of the sign posts on the project. Local power companies donated the coal fly ash, a by-product of the coal burning.

##### *Clearing and Grubbing Debris*

The NCDOT also established a “no burn policy.” This requires contractors to dispose of the waste generated during clearing and grubbing in a way that does not harm the environment. Instead of burning waste, contractors either mulch the material and sell it to outside agencies or find a way to reuse it in other construction projects.