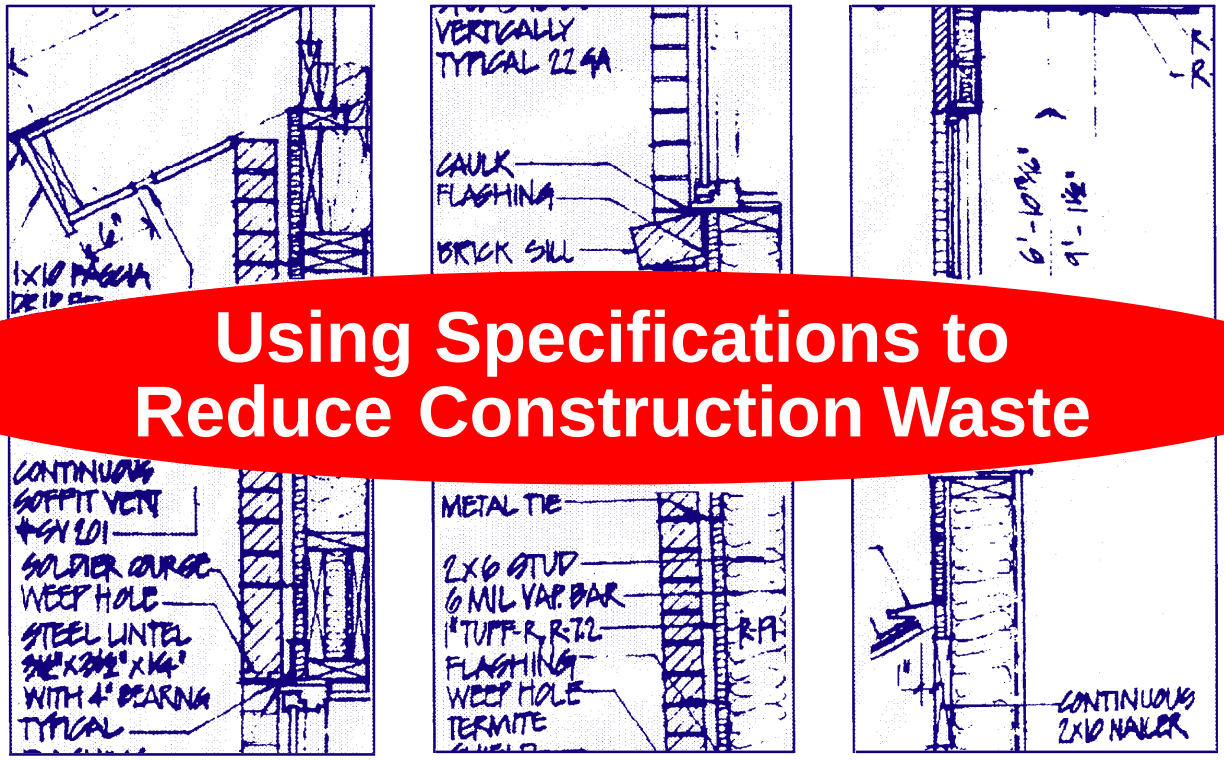

Using Specifications to Reduce Construction Waste

Architects all across the United States have begun to recognize that recycling construction waste is an important component of environmentally responsible design and construction. Many now include provisions for construction waste recycling and reuse in their project specifications. Because 50 to 80 percent of construction waste is reusable or recyclable, architects and their clients want to ensure that their construction projects are using resources in an efficient and responsible manner.

One of the tools available to help architects and engineers with this task is a manual called ***WasteSpec: Model Specifications for Construction Waste Reduction, Reuse, and Recycling.*** The 114-page manual includes detailed specifications, information for bidders on estimating recyclable waste, worksheets and forms, and a list of further resources. It includes a diskette with the specifications formatted for easy cutting and pasting into an architect's standard specifications. The manual was written by Triangle J Council of Governments (TJCOG) and two Raleigh, North Carolina, architects: Cheryl Walker with Design Harmony and Greg Flynn with Abacot Architecture. The authors also benefited from the advice of four dozen reviewers around the United States. Its production was funded by the U.S. Environmental Protection Agency.

WasteSpec was published in 1995 and has been purchased by architects and engineers in 38 of the 50 states. The distribution of ***WasteSpec*** customers across the country presented an opportunity to determine how successful these specifications were as a tool in achieving construction waste reduction in a wide variety of projects. TJCOG therefore contacted customers and identified twelve construction projects for which ***WasteSpec*** was used and for which the architects were willing and able to provide information on the waste and cost impact of using specifications to reduce waste. In all but one of the projects, the cost of the project remained the same or was reduced compared to what it would have been otherwise. These projects represent locations where landfill tipping fees ranged from $17 to $110 per ton. The projects also illustrate the variety of ways ***WasteSpec*** options can be adapted to different local situations.

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Triangle J Council of Governments is a regional organization of the local governments in a six-county area surrounding Research Triangle Park, North Carolina.
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1. Using bid alternates

One of the ways that specifications can address construction waste reduction is through the use of bid alternates. ***WasteSpec*** provides model language requiring the submission of bid alternates for undertaking specific recycling measures as an alternative to landfilling waste. This option allows the owner to determine whether these alternative recycling measures are economically feasible.

Of the 12 projects in the TJCOG survey, none had used this particular method of addressing waste reduction in its specifications.

2. Requiring recycling to the extent practical

Another option for the specifier is to use language that requires waste reduction, reuse, and recycling to the fullest extent possible. Model language to this effect is included in the ***WasteSpec*** manual, and two projects included in the TJCOG survey used this approach to writing specifications.

Four Times Square is a 1.6 million-square-foot high rise building undergoing renovation in New York City. Contractors were required to "efficiently use resources and energy to the fullest extent possible." They were also required to track what was recycled and where it went. The demolition phase had been completed when the TJCOG survey was conducted, and recycling and salvage reduced project costs during this phase. Over 8,000 cubic yards of brick, concrete, and dirt; 1,800 tons of metals; and 1,000 doors and other architectural elements were recycled or salvaged.

The City of Issaquah, Washington, took a similar approach to waste reduction. In building a new police station, the city "encouraged" alternatives to landfilling "to the extent practical." This weak language, however, was followed up by strong verbal encouragement at the pre-demolition meeting and thereafter. Eighty-three percent of the demolition waste was recycled, and project costs did not increase.

3. Requiring a draft waste plan

WasteSpec offers the option of requiring the successful bidder to submit a draft waste management plan for approval by the owner. The specifier can choose which items must be included in the draft. Several projects in the TJCOG survey used this approach, which allows the parties to negotiate prior to arriving at a final plan.

Antioch University used ***WasteSpec*** on a 48,000-square-foot renovation for classroom and office space for its Seattle, Washington, campus. The successful bidder was required to submit a draft waste management plan that included recycling of several specified materials. Implementing the recycling measures resulted in a 25 to 50% reduction in project costs.

A YMCA renovation at the Presidio in San Francisco also used this approach without increasing project costs. This is particularly noteworthy because the local landfill fee was only $17 per ton.

A renovation involving two community centers in public housing in New York City used a similar approach, which resulted in bids no higher than they would have been otherwise.

Erickson's Diversified Corporation also specified a draft waste management plan for construction of its new corporate headquarters in Hudson, Wisconsin. The contractor hired an independent waste manager to work with the subcontractors and

contractor to set a realistic waste reduction goal and see that it was met. A 75% waste reduction goal was set and achieved without adding to project costs.

In Chapel Hill, North Carolina, Lowe's required the contractor to submit a draft waste management plan that included recycling of specified items during construction of its 133,000-square-foot hardware store. This project was the only one of those in the TJCOG survey that reported that costs did not drop or remain the same due to new waste reduction specifications. The contractor reported that they "broke even at best." He reported that the project saved money due to avoided landfill fees and revenue from recycling, but that these savings were offset by the cost of labor to remove contamination from the recycling containers. The town's recycling staff is working with the contractor to improve worker education and container signs in the future.

4. Requiring recycling of specific items

Another option is to forego a draft waste management plan and directly specify that certain items will be recycled. This approach was taken by four of the users of ***WasteSpec*** in the TJCOG survey.

A 10,000-square-foot renovation of a house museum in Villanova, Pennsylvania, required salvage, reuse, or recycling of a list of items during construction. Project costs did not increase due to these measures.

For construction of a 5,000-square-foot concrete block office building in Charlottesville, Virginia, the architect specified only that concrete scrap be reused on site. Before writing the specifications, he had spoken with local representatives and had determined that there were not local markets for recycled construction materials. This one waste reduction measure "probably reduced" project costs.

Western Michigan University required the contractor to separate and salvage or recycle waste during a 250,000-square-foot renovation and new construction project at its Kalamazoo, Michigan, campus. The demolition phase of the project was complete when the TJCOG survey was conducted, and the architect reported that waste was reduced without raising project costs.

The City of Austin specified that particular materials were to be recycled during the renovation of two public health clinics. The architect reported that bids on this project did not increase due to these provisions.

5. Subtracting waste costs and substituting a waste manager

When construction of a Tidyman's grocery store in Spokane, Washington, was put up for bid, each subcontractor was required to include a line item in its bid for disposal costs. This amount was subtracted from the final bid and an independent waste manager was hired to handle all waste recycling and disposal. Waste management costs were 56% less than they would have been with the original bids, and 48 tons of construction waste was recycled.

[Laura Jewell and Meredith Wingate, graduate students at the Nicholas School of the Environment at Duke University, provided critical assistance in conducting TJCOG's survey of ***WasteSpec*** users and developing the case studies.]

One-page case studies of ten of the above projects using ***WasteSpec*** are available from TJCOG.

To order a copy of ***WasteSpec***, photocopy and mail the order form on the following page.

WasteSpec Order Form

TO: Triangle J Council of Governments
P.O. Box 12276
Research Triangle Park, NC 27709

Fax (919) 549-9390

FR: _____
_____
_____
_____
_____

Please send me _____ copy(ies) of ***WasteSpec*** at $28.00
(which includes shipping & handling) per copy for a total of $_____.

Enclosed is my check for $_____ made out to Triangle J Council of Governments.
(Payment must be received in advance.)

I would like the accompanying disk to be formatted for (choose one):

_____ Microsoft Word for MacIntosh

_____ Microsoft Word for DOS

_____ Word Perfect for DOS

Please ship to the attention of _____
at the above address.

My phone number is _____;

My fax number is _____.