

Use less, waste less

Architects take projects in the right direction when we “design out” waste

by **Blair Seibert**, AIA, LEED AP, CSBA , GPR

Architects generally focus on the vision for a project. We imagine how it will appear, how it will function and how it will serve our client's needs. But these days, we have a greater responsibility: to consider the process of building a building as much as the result. That's because the way a building is designed has a lot to do with the waste it will generate. It disturbs me deeply knowing that 40 percent of the materials on a construction site will leave that site as waste. When they go to a landfill, all the energy and fossil fuels used to make them and move them is wasted.

As architects, we can change those numbers. We can choose approaches that “design out” waste, meaning we design projects in ways that make the best use of energy and materials. In the next three columns, I'm going to take a look at how we can serve the guidelines of “reduce, reuse, recycle.” Those three words tell us a lot about how we can better use materials, reduce costs for our clients and avoid waste. When we think about reducing, what can architects do to serve this mission? Why should we care?

First, some facts: When we waste virgin or recyclable materials we unnecessarily increase the demand for additional virgin materials. What's more, when we haul away

this waste, we contribute to smog and the problems of burning fossil fuels. With fewer landfills than just a decade ago, trash has to be taken farther away, expending more fuel and emitting more carbon dioxide.

Another disturbing figure comes from the EPA, which reports that approximately 22 percent of municipal landfill waste is construction waste. Once at the landfill, this waste contributes to methane gas emission and other problems.. While civil engineers have tried “capturing” hazardous bi-products of waste degeneration (such as methane gas) with clay soil and plastic liners, ground water systems have been contaminated in communities near landfills and rain on the landfills leaves as contaminated run-off. So a good first step is to stop throwing away materials that can be used by our project, or someone else's, and avoid tossing away these items' embodied energy. Utilizing the guidelines to reduce, reuse, recycle, let's explore the architect's first step: reducing the materials used in a project.

The possibilities are endless. An architect's job is to create things. As such, we can start a project on the right foundation by addressing waste from the beginning. We must admit that the act of building generates waste (almost anything generates waste!) , but by keeping the end in mind, we can reduce waste generation.

1 Remodel

Reducing waste starts with an analysis of whether a new building is needed at all. This is not exciting for an architect to hear but due to embodied energy, the greenest buildings already exist. Is there a building your client could remodel rather than starting from scratch? Can you help her find and purchase an existing building with good skin and bones that is just too small? Additions and remodels still provide work for architects and engineers. Maybe even more!

2

Maximize Results with Design Efficiencies

Architects have keen analytical skills. There are many ways to provide clients' spatial needs creatively. Consider ways of reducing the footprint of your projects. Beyond reducing the energy bills for the LIFE of their projects, shouldn't we encourage owners to consider multi-functional space over single use? Two story over one? What about reducing circulation space by incorporating it into rooms?

3

Think Modularly

Whether in architecture school or working on our own homes, we learn early on that building materials come in standard sizes. Yes, we can always cut the brick or chop off the end of the stud but for waste reducing design, the overall dimensions of a structure should fit within the dimensions of the industry standard building/framing system. If you think working this way is going to be boring, consider Frank Lloyd Wright's Usonian homes, his answer to cost effective housing. When working with brick or CMU it's almost impossible (and looks absolutely ridiculous) to work outside the dimensions of the building units. Therefore, working modularly is pretty simple. The real challenge comes from working modularly with the seemingly flexible stud.

Optimum Value Engineering or Advanced Framing

For many years the home building industry has been encouraging its members to exploit wood products for their actual engineered capabilities. This system is called Optimum Value Engineering or Advanced Framing in the Pacific Northwest. It has become popular and accepted by building code officials and inspectors. This "engineering based" system consists of many parts and pieces that can be taken in part or in whole and generates a building that consumes less material while maintaining structural integrity. The National Association of Home Builders has a great website with a detailed description of the following

OVE system explanation. They also have CAD details for download. I encourage you to visit:

<http://www.toolbase.org/TechInventory/TechCAD.aspx?ContentDetailID=625>

Panelizing

For many reasons, pre-fabricated panels or modules are becoming popular again. Even the Frank Lloyd Wright School of Architect in Scottsdale, Arizona has designed and built the Taliesin Mod.Fab, "a residential prototype that employs modular fabrication techniques, is big on modern aesthetics and quality, modestly sized, and flexible enough to operate on or off the utilities grid."



Taliesin Mod.Fab

When portions of buildings or entire buildings are made off site they not only reduce waste but improve the structural integrity of the building's construction and shorten the construction time. On a commercial scale, precast concrete panels have been around since the 1960s. Newer on the market are prefabricated panels with stucco, masonry and other finishes.

Prefabricated rooms

I've been working on a project that is utilizing prefabricated rooms. The completely "finished" jail cells for the 1,400 bed detention center will be installed by cranes in a matter of weeks rather than months. Another project considered using prefabricated bathrooms to save time and money. These single room bathrooms work well for hotels, apartments and condominiums.

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The AIA SFV Chapter is collaborating with The Valley Economic Alliance and The Mulholland Institute in a UDAT (Urban Design Assistance Team) for the Northridge Vision Project

An introductory charrette meeting is scheduled for Saturday, **March 12, 2011**, 10 am to 2 pm at the **Valley Economic Alliance**
5121 Van Nuys Blvd #200
Sherman Oaks, CA 91403

Architects and other professionals interested in working with the community of the San Fernando Valley to encourage revitalization and urban improvement are invited to participate.

Please contact the Chapter Officer to RSVP or Arturo Yanez AIA, AIA SFV President, at ayanez@fsyarchitects.com for any questions.

Visit www.northridgevision.org for additional information.

4 Manufacturer's Take-Back Programs

If you sole source products like clay roof tiles, bricks, ceramic tiles, etc., find out if the supplier has a buy back program or take back policy. Manufacturers for carpet and acoustical ceiling tiles have been doing this for years. Even if they will not pay you for the returned products, if they will pick them up for reuse or donation, it will save you from having to send to landfill (or finding a home for it, which we'll talk about in subsequent articles). Ask your product reps about this. If their company does not offer it now, they may offer it in the future if enough people ask. If the general contractor will be selecting any of the materials that are bought in bulk, include wording in the project specifications or general notes directing them to send unused items *back*.

With all of these options, architects can offer clients choices that will not only satisfy the project's needs, but also provide them with pleasing results. As architects, we can help reduce their costs, while guiding them toward more sustainable practices. In the end, their projects will work better, look better – and reduce their environmental impact.

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