Designing Out Waste

Second in a series of three, focusing on "reduce, reuse, recycle" as a guideline for project design

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

So we've *reduced* the construction and demolition debris we generate, now what? Let's next consider how we can *reuse*.

When we think about creating, we usually start with a blank slate, and design from the ground up. But why not start in a different way? We can instead think about reusing buildings and materials, or even non-traditional building materials in building construction.

Reusing buildings can be a challenge, especially with code changes such as the Americans With Disabilities Act and the rigorous seismic standards used for buildings with vulnerable occupants. What's more, using existing buildings may lead to more uncertainties than we expect when we start from scratch. Still, the savings – and the act of preservation – make it worthwhile.

"You always find things during the design process that you may not have anticipated," said David Kriegel, managing partner of New York-based architectural firm Gran Kriegel Associates. "But you can save money on a site with a building already on it. You're saving money because you don't have to demolish the building, and there's also the 'green' aspect. We don't recycle enough in this country, and if we demolish these existing buildings, they would wind up in landfills." Though this statement is certainly true, it's hard to place a monetary value on what we gain when we preserve existing buildings.

I recently performed the environmental analysis portion of a Due Diligence Report for an elementary school. The school was designed more than 60 years ago. Its original layout consisted of two north-south oriented single classroom chains. Each line of classrooms had large overhangs and operable windows on the east and west sides. The design responded beautifully to its environment. It provided filtered daylight and natural ventilation. Its classroom design would likely be similar that created by an architect interested in environmentally friendly, passive design strategies.

Despite the fact that the community wanted to keep the buildings, it was very hard to place a bottom-line value on the building's preservation. For instance, what price can you place on historical context? What value is the embodied energy of its components?
Sure, we can determine the price of demolishing the building and hauling away the debris. But how could we capture the lost value of the embodied energies of the glass, concrete and stone cladding? How could we estimate its value to the people who attended it and who now see their own children there? What does the stability of a school building or ANY building mean to a community?

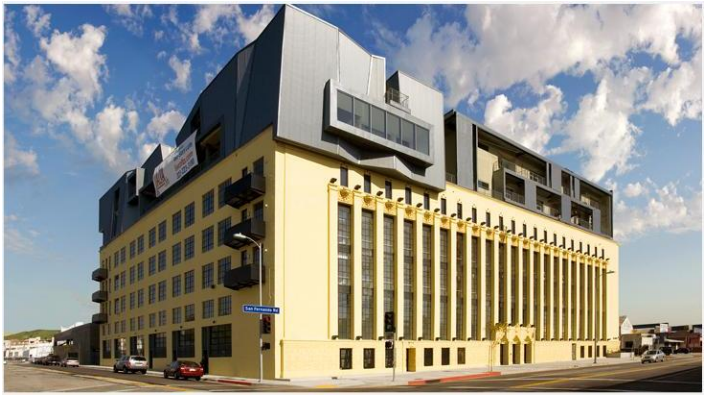
And do we really understand the real cost of the items we use every day – food, gas for our cars, furniture we so easily buy? We know what the price tags read, but that hardly represents the real environmental toll to produce them. These hidden costs include contaminated run-off from large corporate farms, oil on our beaches and hazardous wastes. Likewise, the cost to raze a building does not include the toll of carbon emissions that will enter the neighborhood's air from the multiple trucks at the site. But it's a negative effect. Until our culture grasps the full cost of its hunger for new goods and materials, we will continue to undervalue existing buildings.

Change of Use

Reusing a building for the same purpose presents fewer issues than using an existing building for a different use. In the past decade, it's become popular in urban areas to repurpose abandoned office and industrial buildings, and to make them residential lofts. The Alta Lofts in East Los Angeles (Lincoln Heights) is a great example. What was built as a four-story warehouse for the Fuller Paint Company in 1925 is now a six-story, 102 unit building. Pugh Scarpa's remodel provided two more floors, two roof gardens and a new courtyard that introduces natural light and breezes into the depths of the building. Retail and commercial spaces are available on the first floor.

The 600 block of South Spring Street in downtown Los Angeles has become a Mecca for condo seekers in historic district buildings. The E.F. Hutton office building at 639 South Spring St was originally constructed in 1931. The redevelopers of the building boast of the generous proportion of their 37 living unit building. Lofts range from 1,800 to 2,200 square feet. Amenities include oversized windows and 9'-14' ceilings, things one is unlikely to find in a new building.

Another surprising source for potential adaptation is old shopping malls. Many malls built on the outskirts of town in the 1960s and 70s have since been surrounded by development. The "dead malls" have lost their luster. Vacancy rates are high and residents and property owners are often receptive to some of the altered or mixed-use ideas. A number of developers are looking at empty or underused shopping malls in this country (they may total 1,500) that could be adapted for reuse. The price per square foot of old malls can be substantially less than that of new construction.



Alta Lofts in Lincoln Heights

These dead malls can be turned into educational, community centers and even parks. The Maryvale Mall in Phoenix, Az. in the late 90s was blighted and underwent rampant vandalism. The 320,000 square foot building on 25 acres was offered at a reduced price by the original developer, John Long, to the local school district. Today there are two schools with 1,600 students in the original structure. A physical education center is located where the skating rink use to be. A large playground and athletic fields are located in the parking lots. A performing arts center and auditorium are planned in the mall's former movie theater.

In other cities, school populations are shrinking and school properties are being morphed into different uses. Dunson School in southeast LaGrange, Illinois was renovated in into 28 low income senior citizens apartments in 2007. The 1916 Yankton High School in South Dakota became the Walnut Village Assisted Living and Senior Apartments.

Reusing Materials

Veteran Los Angeles green developer Ryan Flegal took on the task of adapting a lamp factory in South Los Angeles into five living spaces. His goal was to reuse the building along with as much material for the interiors for his "green lofts" as possible.

He started years before he found the property by gathering free, high-end cabinetry, shelving and doors from the closed Armani Store in Santa Monica. For the almost two years it took to remodel the manufacturing building, he collected industrial light fixtures, plywood, stainless steel tubing, skylights and kitchen cabinetry from reclaimed resources sometimes getting them for free! I asked him what reclaimed resources he was using these days. "Ebay and Craigslist are still on the top of my list" he said. "What makes these websites so easy to use is that you can limit your search to states, cities or even zip codes." Many businesses collect wood, Spanish tile and hardware for reuse, such as Habitat for Humanity's ReStores,. Ryan sent me a list of the sources he utilizes. The list is extensive. If you would like a copy ,please email me.

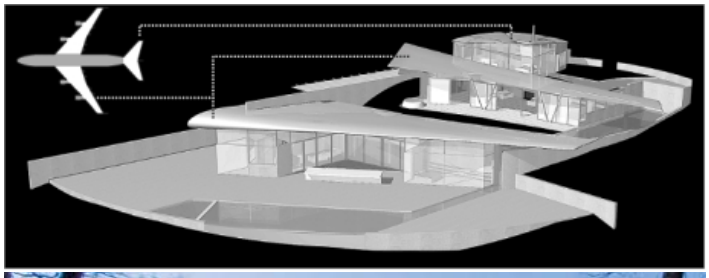
I asked Ryan for recommendations for architects trying to incorporate reused items into their projects. He said three items that are easy to find and reuse are doors in frames, kitchen cabinetry and hardware. Reuse takes more time, and time is money. But when you get your supplies free or up to 90 percent off retail then it can offset the cost of a lengthened schedule.

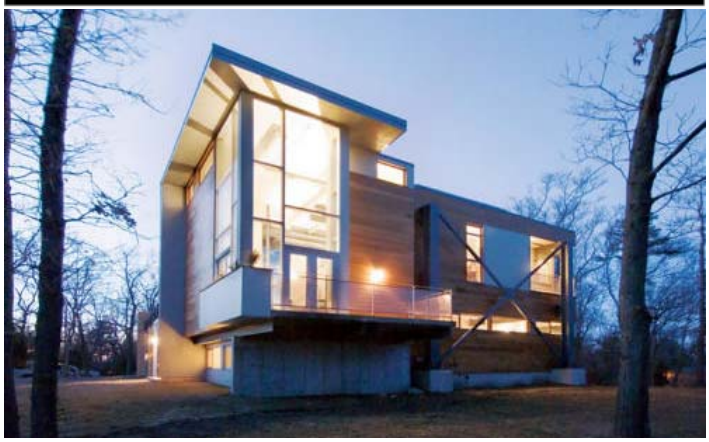
Non-Traditional Building Materials to Reuse

Let's say you like the idea of reusing things but you don't have a building to reuse. What do you do? Here's an idea: convince your client to buy a retired Boeing 747 as Santa Monica architect David Hertz did.

The Wing House in Malibu is a result of that conversation. For a complete story and pictures of the construction of the house see: http://www.studioea.com/projects/residential/wing_house/index.php

These projects reflect a new thinking that got a big boost when Metropolis Magazine presented a new challenge to designers in 2003 with the "Next Generation Design Competition." It aimed to promote environmental activism, social involvement and entrepreneurship in young designers.





The Wing House showing components from a Boeing 747 & Big Dig House (below)

The idea for the "Big Dig House" in Lexington, Mass. was the first winner of that prize. Completed in 2009, it contained 13 of the 17 concrete panels taken from the dismantled "Big Dig" Boston highway and is a unique reuse of infrastructure. The floors and garage roof consist of the overly sized slabs. The garage roof is so strong that three feet of soil sits atop it providing a garden with trees. Although oversized, the steel frame was also recovered for reuse for the home's structure.

Most of the expense came from the labor and the cost to move the free materials, but the cost was just $150 per square foot. What would normally take six weeks to build took four days To see a video of the construction of the Big Dig House go to: http://www.ssdarchitecture.com/works/residential/big-dig-house/

Whether you are reusing a building or building materials it's important to keep these things in mind:

- **Think about reuse from the start**
- **Be flexible with your specs**
- **Build reuse relationships**
- **Build extra time in your schedule**
- **Be creative - but test it out**

Reuse sounds pretty daunting but in the end your project will truly be a one of a kind. In addition, the texture and stories behind the materials you used add another dimension to your projects. □

[1] http://www.districtadministration.com/viewarticle.aspx?articleid=1188&p=2
[2] http://www.metropolismag.com/nextgen/about.php

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