Deconstruction of a timber-framed building in Manitoba. PHOTO CREDIT: Re-Use Consulting

Reclaiming the Future: What's New in Used Wood

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What's new and why are we talking about reclaimed wood design and construction? The growth of green building and a focus on building materials that have a low impact on the environment have led many to rethink the materials they specify for construction. If you are an architect, material specifier, or builder, you've seen the tidal wave of "green" products now available and know that nearly every material manufacturer now claims that their product is the greenest. Due to the simple fact that it is reused, reclaimed wood has positive environmental attributes most other recycled, exotic, or alternative materials can't match. The availability of reclaimed wood products has increased significantly and it's easier to specify these materials than ever before.

Some history

In many ways, reclaiming and reusing wood is not new. It's more of a forgotten art that is regaining popularity. Salvaging and reusing lumber from building removal was once commonplace. In the days before heavy machinery took down buildings and most labor was done by hand, it was just as

easy to dismantle a building and salvage the materials as it was to demolish and throw it away. The advent of excavators, cheap landfills, and tight construction timelines has resulted in a contemporary institutionalization of demolition as a building removal practice and has resulted in an escalation of waste and disposal. Fortunately, the tide is changing and a there is increased appreciation for reclaimed building materials as well as an increased availability of reclaimed lumber products in the marketplace.

What is reclaimed wood?

There is a whole range of words used to talk about reclaimed wood: salvage, heritage, old growth, reused, vintage, antique or simply, used wood. At its most basic, reclaimed wood is simply material that has been previously used on a building project. This post-consumer material is generally reliant on some form of added value processing, such as the removal of nails and remilling, but has not been subject to a level of processing that would classify it as recycled wood (such as grinding for wood chips or pellets.)

Why use reclaimed wood?

Wood, whether reclaimed or new, possesses many positive environmental attributes including renewability, low embodied energy, and the ability to sequester carbon. Lifecycle analyses have shown the advantage wood building materials have over other common building materials (e.g., steel, concrete) from an embodied energy and carbon footprint standpoint. Recent research points to the added environmental benefits of reusing lumber and its positive impact on reducing greenhouse gas emissions.

As with all product decisions, price and quality play a significant role. The wide planks and tight grain common in reclaimed wood are hard to find in the new wood products market. It is this ready source of quality wood that drives the higher end of the reclaimed wood market, while the ubiquity of wood products emerging from residential and commercial scale building removals drives the remainder of the market, with an emphasis on affordability as compared to new retail pricing. For instance, a five-panel wood door could cost upwards of $200 new, while a reclaimed five-panel wood door is available for $35-$75 in U.S. reuse stores.

In addition to the clear environmental and economic benefits of reusing wood, communities throughout the U.S. and Canada are utilizing deconstruction to promote job creation in the face of extreme residential vacancies.

In 2010, over 64 million metric tons of solid wood was disposed of in landfills in the United States and Canada. The enormous scale of this waste provides a clear imperative to divert as much wood material as possible to the reuse market, and begs the question – why isn't there more reuse?

Where can I find reclaimed wood?

The availability of reclaimed wood has increased significantly over the last 30 years, with nuances of the supply responding to local development and real estate factors, as well as to demand for the materials. The primary practice for harvesting materials is deconstruction, or dismantling of wood-framed houses, factories, and other wood structures. This practice of removing building materials without destroying them is returning to popularity after nearly a century of dependence on demolition and landfilling of construction and demolition (C&D) debris. According to deconstruction expert Dave Bennink of Re-Use Consulting; "More and more, I am finding that building owners are willing to use deconstruction and salvage as either an alternative to demolition, or at least as one part of their building removal strategy. We are becoming smarter about how we deconstruct, closing the gap in schedule and cost implications from demolition."

As the increased rate of deconstruction supplies more salvaged materials to the market, there are a growing number of retail opportunities where customers can access reclaimed wood products. The most familiar access point for residential and small contractor customers is typically a local reuse store. Sourcing materials from

A deconstruction training project organized by Lancelot Coar, Professor of Architecture at University of Manitoba and Dave Bennink of Re-Use Consulting.
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Corporations like Kohler used reclaimed wood to communicate their commitment to sustainability at the Greenbuild Expo.
PHOTO CREDIT: BMRA

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single-family homes, churches, and small commercial office renovations, these outlets generally stock dimensional lumber (2 x 4s to 2 x 12s), tongue and groove wood flooring, panel doors, and other wood finish materials. (A directory of reuse stores around the U.S. and Canada is available at www.bmra.org.)

Commercial demand is a quickly growing segment of the market, with material brokers, online inventories, and larger manufacturing companies emerging to meet that demand. These operations are designed to accommodate a range of lot sizes and qualities across multiple regions to source consistent and functional material based on the demands of new construction and renovation projects. These products can range from the structural trusses of a new elementary school, to the plywood used for the presidential inauguration platform. According to Scott Royer of Windfall Lumber, a supplier of reclaimed lumber to retail and commercial outlets, "Because the availability of reclaimed wood has increased greatly in the past 10 years, designers and architects have a much greater opportunity to successfully specify it. More and more, designers are requesting applications for reclaimed wood for structural and non-structural applications in commercial buildings."

Is the supply of reclaimed wood sustainable?

A significant amount of lumber is potentially available for future reuse. Since the turn of the 20th century, more than 3 trillion board feet of lumber and timber have been sawn in the United States, much of it still residing in existing structures. As the building infrastructure in North America ages, there will be increasing opportunities to reclaim materials from decommissioned buildings. Of the roughly 100 million housing units in the United States, most (55 per cent) are 29 to 69 years old. About 15 per cent of the housing stock is at least 70 years of age.

The U.S. Environmental Protection Agency estimates more than 270,000 houses are demolished each year in the United States. Assuming these houses average about 1,000 sq.ft. in size, it is estimated that these demolished houses contain about 1.7 billion board feet of framing lumber. The wood sheathing, trim, and finish wood materials in these houses add to this total. In short, there is a long-term and consistent supply of reclaimed wood products.

What are people doing with it?

The supply of reclaimed wood materials is only one half of the equation. The real value of these materials is only fully realized when they are re-used in a new construction or renovation project.

The two most established reclaimed wood markets are timber framing and wood flooring. Timber framed construction is a higher end construction method and uses the larger timbers found in old warehouses and factories to construct modern gothic framed wood structures. Timber framers like using reclaimed timbers as the wood has developed a nice patina and is well seasoned after decades in a building. Manufacturers in the reclaimed wood flooring market remill old timbers, barn siding, and other reclaimed wood to

produce a variety of flooring from wide range of species. The distressed nature of some of these products adds to its appeal.

There is a growing use of salvaged wood for feature walls in interior commercial offices and restaurants, as well as a demand for reclaimed wood doors, flooring, wall paneling, and upcycled furniture. This upcycled furniture ranges from bars made from reclaimed bowling lanes to reception desks constructed of stacked structural timbers.

In both commercial and residential installations of reclaimed wood, materials are used for their designed purpose (e.g. a door as a door) as well as for creative adaptations, such as the use of a five-panel door on its side to form wainscoting.

Future reuse

To achieve a world of wood design and construction that fully embraces and achieves a landfill-free reality, it is imperative that the industry not just embrace reclaimed wood products, but also design to enable future reuse. This practice, called Design for Deconstruction (DfD), employs construction details and practices that anticipate a building's end of life, and ensure that the assembly of the building has not limited its ability to be disassembled and the component materials repurposed. Typical challenges revolve around the use of mechanical connections such as screws or nails, rather than adhesion or glue connections and avoiding the unintended lamination of wood products to non-wood products such as spray foam insulation.

By embracing reclaimed wood products and designing for future reuse, there is an opportunity for the wood design and construction community to retain our old growth resources, utilize a truly green product, and keep a valuable commodity out of the landfills.

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