Wood Specification:
Salvaged Materials

Salvaging and reusing wood and wood-based products reduces demand for virgin materials and reduces waste, thereby lessening impacts associated with the extraction and processing of virgin resources.

A considerable portion of the wood used in construction (such as formwork, bracing, and temporary structures) and the wood in demolished buildings can be salvaged and reused. Reuse strategies divert material from the construction waste stream, thus reducing the need for landfill space and mitigating environmental impacts associated with water and air contamination.

Recently, the term salvaged has also come to include materials salvaged from forests affected by the mountain pine beetle. The use of pine beetle wood reduces greenhouse gas emissions because it continues to store carbon for the lifetime of the building (longer if it is reclaimed and used elsewhere), thus deferring the release of carbon dioxide that would occur if the wood were left in the forest to decompose. In places where large dams have been built, trees are also being salvaged from the lakes created as a result of dam construction.

However, green building rating systems usually do not currently recognize wood taken from a pine beetle-infested forest or from flooded lake areas.

Why Salvaged Materials Add Value

- Salvaged materials such as structural members and flooring add significant character to design. Frequently, salvaged wood products are sourced from old-growth timbers; these offer close grain finish and are extremely hard wearing.
- Some salvaged materials are more costly than new materials because of their "one of a kind" quality and because of the high cost of labour involved in the recovery and refurbishing processes.
- In some provinces (such as British Columbia), exchanges for used materials have been set up, e.g., the Recycling Council of British Columbia's Materials Exchange service (http://rcbc.bc.ca/services/materials-exchange). Some waste management companies have also established facilities for selling salvaged building materials at landfill sites.
- Reused materials refer to items that were "fixed" components on-site before construction began. To comply with most rating systems, these items must no longer be able to serve their original functions and must then be installed for a different use or in a different location.
- Demolished wood is considered salvaged wood. However most rating systems treat wood that continues to serve its original function (e.g., walls, ceilings, flooring) in a renovation project under a different category.

How to Include Salvaged and Reused Wood in Design

- The incorporation of salvaged materials as a design strategy affects cost estimates, the demolition phase (if salvaging from the project site), and the ultimate design development of the project.
- Coordination among the owner, design team, and contractor should begin early in the pre-design phase and continue through design development. Then knowledge of the site and building areas to be salvaged can be creatively and efficiently worked into the design, and opportunities to bring in salvaged materials from off-site can be incorporated into the project.
- Rating systems award credits for a prescribed percentage (by cost) of both on-site and off-site salvaged or reused materials.

Terminology

Refurbished materials: products that could have been disposed of as solid waste; refurbishing includes renovating, repairing, restoring, or generally improving the appearance, performance, quality, functionality, or value of a product.

Remanufactured materials: items that are made into other products; e.g., framing off-cuts that are chipped and used as landscape mulch.

Salvaged materials or reused materials: those recovered from existing buildings or construction sites and reused; e.g., structural beams and posts, flooring, doors, and cabinetry.

Resources

Recycling Council of British Columbia's Materials Exchange Program (www.rcbc.bc.ca): a free, province-wide service facilitating the reuse and recycling of discarded products and materials.

***Old to New Design Guide, Salvaged Building Materials in New Construction* (www.lifecyclebuilding.org/files/Old%20to%20New%20Design%20Guide.pdf):** detailed reviews of the use of salvaged materials in real-life case studies in British Columbia.

***Green Building Resource Guide* (www.greenguide.com/about.html) and Salvaged Building Materials Exchange (www.greenguide.com/exchange/):** a database of >600 green building materials and products selected for their usefulness to the design and building professions, and a searchable online database of green building products.

Building Materials Reuse Association (www.bmra.org): represents companies and organizations involved in the acquisition and/or redistribution of used building materials.

Used Building Materials Exchange (www.build.recycle.net): free online marketplace for buying and selling recyclables and salvaged materials.

Forest Facts: Mountain Pine Beetle (www.naturallywood.com/resources): summary of issues and solutions, and ideas for using beetle-affected wood.

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Procedure

- For rating system documentation purposes, maintain a list of reused and salvaged materials and corresponding costs.
- The percentage of salvaged and reused wood employed on a project is based on the cost of salvaged/reused materials divided by the total cost of materials. The cost will be the actual cost paid or, if the material came from on-site, the replacement value. The replacement value can be determined by pricing a comparable material in the local market (excluding labour and shipping). When the actual cost paid for the reused or salvage material (from either on-site or off-site) is below the cost of a comparable new item, use the higher value in the calculations.
- Furniture may be included if it is used consistently in the calculations of both salvaged materials and total materials used on a project.

percentage salvaged/reused materials =

$$\frac{\text{cost of reused materials (\$)}}{\text{total material cost (\$)}} \times 100$$

Pre-design: assess opportunities for reusing materials and the extent of site demolition involved and set goals accordingly.

Design: incorporate salvaged or reused materials into the design. Working with salvaged structural lumber requires the involvement of an experienced engineer. More than usual structural redundancy may need to be built into the design.

Contract documentation: identify resources and outline measures for the use of salvaged materials. Assemble a spreadsheet to track the proportion of salvaged materials in the project (as a function of materials cost, excluding labour).

Tender: work with the contractor to locate sources for these materials and document and track their cost and quantity during construction. This recordkeeping will aid the project team in the credit submission process.

Construction: advise the builder and trades of the scope and requirements of the salvaged products; alert them to specific responsibilities. Track materials and products that have been reclaimed, salvaged, or reused.

Triton Wood used in Mountain Equipment Co-op store, Victoria, B.C.

Wood Salvaged from Flooded Lands

There are about 45,000 dams in the world that are over 50 ft (15 m) in height. Most of these dams flooded land at a time when timber was considered a virtually unlimited resource. Clearcutting reservoir areas would have been time-consuming, so the typical practice was simply to flood standing forests; worldwide, a timbered area twice the size of New Jersey is underwater. Triton Logging (www.tritonlogging.com), a company based in British Columbia which specializes in recovering logs from under water, conservatively calculates that over 300 million trees, preserved in the anaerobic underwater environment, are ready for harvest. Fir, hemlock, cedar, and pine lumber are commonly salvaged from Pacific Northwest locations, while in tropical countries (e.g., in Panama and Ghana) valuable hardwoods are being retrieved in an environmentally benign fashion, while providing valuable local employment. In most cases, rating systems do not accept logs harvested from areas flooded by a hydroelectric dam as salvaged. Such wood may be considered as pre-consumer recycled content.

About Pine Beetle Wood

According to British Columbia's Ministry of Forests, roughly half of the province's pine trees are now destroyed by the mountain pine beetle. The most extensive damage has occurred in the central interior of the province, where over two-thirds of the region's lodgepole pine forests have been infested. Despite the fact that millions of cubic metres of mountain pine beetle wood are being salvaged for use in construction products, using mountain pine beetle wood is not yet explicitly recognized by green building rating systems. Nevertheless, there is growing awareness of the value of pine beetle wood in addressing "regional priority" credits.

What to Ask Suppliers

- Ensure that all costs are declared at the outset. Some salvaged materials are offered at prices that appear to be cost effective, but some costs may be hidden, such as the need for reprocessing.
- When dealing with salvaged wood products, clarify the presence of any toxic substances such as lead or asbestos, and ensure all costs and responsibilities for decontamination are taken into account.
- Confirm that documentation is available for the product's provenance and history.

In Richmond, British Columbia, the Olympic Oval's 6-acre (2.4-ha) roof is built with pine beetle wood.