

Wood Specification: Construction Waste Management

The objectives of construction waste management are to divert construction and demolition debris from landfill and give it a higher value purpose. Recyclable and recovered wood-based materials can be directed to various manufacturing processes, while reusable materials are diverted to the appropriate use.

Why Construction Waste Management Adds Value

- Reducing, reusing, and recycling clean wood waste reduces demand for virgin resources, minimizes the environmental impacts associated with resource extraction, processing, and transportation, and alleviates pressure on limited landfill space.
- The recycling of wood waste is straightforward and affordable. Most urban centres provide recycling services for clean (non-treated) wood waste. Wood chip products are typically sold as hog fuel and also sold for animal bedding, composting, and mulching.
- Reducing waste can reduce costs associated with transporting and disposing of waste. Changes in the economics of recycling—i.e., the advent of market competition for both raw and recycled materials, increased disposal costs, more stringent waste disposal regulations, and decreasing landfill capacity—have made the development of a waste management plan an important consideration in the design process.



Terminology

Source-separated collection: requires individual, clearly labelled bins for sorting each recyclable material on site.

Commingled collection: allows mixed recyclables to be collected on site and sorted at the depot. While convenient for small projects, diversion rates tend to be lower than source-separated recycling.

Construction waste management plan: a document specific to a building project which outlines measures and procedures that divert construction waste materials from landfill and incineration facilities.

Tipping fees: charged by a landfill for disposal of waste; typically quoted per tonne.

Resources

Recycling Council of British Columbia (www.rcbc.bc.ca): hotline and information about materials exchange (MEX); offers free help on recycling and waste diversion issues. MEX is a free province-wide service that facilitates the reuse and recycling of discarded products and materials.

www.dontwastewood.com: web-based resources aimed at keeping wood out of landfills. Includes a database of wood waste haulers, sellers and buyers.

Implementing a Waste Reduction and Recycling Program at a Commercial Construction Site (www.wastecapwi.org/casestudies/alliantcase.pdf): a case study that illustrates significant cost savings associated with diversion of wood waste.

Natural Resources Canada (www.nrcan.gc.ca/mms-smm/busi-indu/iar-ilr/faq-faq-eng.htm): includes a list of Canadian recycling councils and associations.

Building Materials Reuse Association (www.bmra.org): resources to facilitate building deconstruction and salvage of building materials in North America.

How to Include Construction Waste Management in Design

- Waste minimization informs the entire design and construction process. The creation of a waste management plan during the design phase embeds the goals of the project from the outset. For example, demolished wood on the site can either be repurposed in the new design or recycled, depending on its quality.
- Waste minimization starts with strategies established during the preliminary design phase that are aimed at not creating waste in the first place. Efficient design, the use of shop-fabricated components, modular construction, and ordering materials cut to size will ensure waste is minimized and may save money in transportation costs.
- Wood lends itself to dismantling, but designing for disassembly requires upfront thinking. Structural wood members in particular can typically be reclaimed and reused for the same or similar purposes with only minor waste.
- Ensure that products are installed in a way that will not generate waste in the future. For example, nailing rather than gluing the wood flooring offers easier removal later.
- Reuse materials where possible by developing a down-scale plan. A down-scale plan identifies the products to be reused and describes their subsequent destination for them, including contact information for service providers and details of the logistics.
- Consider how off-cuts can be used, such as for shims or as chips for landscape mulch.
- Generally, construction waste includes recycled and/or salvaged non-hazardous construction and demolition debris. Treated wood is not recyclable. To minimize the need to deal with treated wood waste, ensure the design includes adequate weather protection for exposed wood features, and plan for easy ongoing maintenance.

Wood Specification: Construction Waste Management

What to Ask Suppliers

- From preliminary design onward, it is important to liaise with suppliers regarding waste management solutions. Having a solid understanding of manufacturing processes, how materials are delivered, and the waste they generate during installation is necessary prior to finalizing the project specification documents.
- Work with manufacturers to minimize unnecessary packaging and make arrangements for pallets to be picked up after use.
- Ask suppliers for information about a product's recyclability and end-of-life impacts.
- Ask if suppliers have a take-back program to minimize the generation of waste in the future.

Procedure

- Document the diversion of construction waste by tracking all construction waste by type, the quantities of each type diverted, and the total percentage of waste diverted from landfill disposal.
- Some green building rating systems provide conversion factors to estimate the weight of construction waste if exact material weights are not available.
- Calculate construction waste, by weight or by volume, but be consistent throughout.

$$\text{percentage of diverted construction waste} = \frac{\text{amount diverted through recycling and salvage}}{\text{total waste generated by the construction project}}$$

Design: make design adjustments early, based on input from the contractor and other consultants, to minimize waste generation during construction. Consider standard product sizes, and application and installation processes and the waste they may generate.

Design: research the range of available waste management options and identify large-volume recyclables early in the design process.

Contract Documentation: determine which materials will be source separated on site and which (if any) will be collected in commingled bins.

Tender: ensure the general contractor understands waste diversion tracking and documentation and orients subcontractors to trade-specific responsibilities.

Construction: on a spreadsheet, tabulate diverted construction waste, record the contact information of the receiving facilities, and calculate diversion percentages.

Construction: coordinate with the contractor at frequent intervals during construction to ensure the project is on track to achieve the waste management goals.



Construction Waste, the Numbers

- 30 to 40% of all waste destined for Canadian landfills is derived from demolition and construction.
- Commercial construction generates waste at an average of 450 lbs/ft² (19 kg /m²) of building area, most of which is recyclable.

Metro Vancouver, British Columbia, as an example:

- Wood waste (everything from land-clearing waste to wood shingles and hardwood flooring) makes up 15% or about 256,000 tons (240,000 tonnes) of total waste.
- 48% of waste generated (by weight) from the construction sector is derived from the demolition and renovation of residential buildings.
- The current processing capacity for diverted wood waste is estimated at 535,000 tons/y (485,000 tonnes/y).
- Under a scenario of 2.5% economic growth, the region would be generating wood waste of more than 882,000 tons/y (800,000 tonnes/y) by 2029.

Sources: Metro Vancouver, Canada Green Building Council



Getting to Zero Waste

Achieving zero construction waste depends on designing products and industrial processes so their components can be dismantled, repaired, and/or recycled. The goal is to promote pre-fabrication, "right-sizing" of components, and the closing of the loop of the product life cycle. Zero waste means linking communities, businesses, and industries so the waste of one becomes another's feedstock. It means preventing pollution at its source. It means new local jobs in communities across the country. The role of wood as a product and as a feedstock for other processes is integral in the quest to reach zero waste.

Reusability and Recyclability of Wood Waste Depends on the Quality and End Purpose of the Wood

- Demolished wood components are often not reusable or recyclable unless they are taken apart. Check if the local recycling centres can handle nail removal.
- The use of wood waste as an alternate daily cover for landfills is not an acceptable means of waste diversion under green rating systems.
- While the use of used wood for firewood for wood-burning stoves and fireplaces is not a generally acceptable means of waste diversion, burning clean wood waste to generate industrial process heat and/or electricity is considered appropriate diversion methodology.