



Construction, Renovation, and Demolition Waste Management Guidebook

Prepared for

City of Guelph

Prepared by

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Overview and Purpose

The City of Guelph and Wellington County have partnered together in an effort to reduce construction and renovation waste and move towards a circular construction sector. A detailed examination of current building trends and associated waste was completed in 2022. The information gathered during that review revealed that much was unknown about the life cycle of building materials in the City and the County as a whole.¹

This Guidebook is for the City of Guelph and Wellington County residents as well as industry professionals who are working on a renovation, demolition, or construction project. It focuses on key construction and renovation waste types, as listed below, and aims to provide clear, concise instructions for construction waste material management and disposal. It emphasizes:

- Prevention of waste whenever feasible
- Reuse or recycling whenever practical
- Disposal of only what cannot be reused or recycled, and
- Purchasing products manufactured using materials that can be recycled.

Key construction and renovation waste types considered in this Guidebook:

1. Asphalt Shingles
2. Concrete
3. Drywall
4. Lumber
5. Masonry
6. Metal

Establishing a robust recycling and reuse program on construction and renovation sites can have the following benefits:

1. Reduced material use
2. Reduced waste management costs
3. Improved site efficiency and productivity
4. Improved site health and safety

This guidebook will assist in reducing the amount of waste generated during the entire construction and renovation process. Reducing waste can:

1. Demonstrate social and environmental responsibility.
2. Reduce overall project cost, which demonstrates financial responsibility.
3. Provide compliance with local, provincial, and federal regulations.



Photo Credit: AET Group Inc.

Regulations

Waste management is governed by provincial regulations as well as municipal regulations.

At the local level, the following by-law guides residents and those conducting projects/working in the City of Guelph:

City of Guelph By-law (2019) – 20392 – Waste Management²

- Acceptable waste that may be included in renovation materials, listed in Schedule B “Waste Resource Innovation Centre”
 - Public Drop Off (pg. 1)
 - Scrap metal, concrete, brick, rubble, drywall, shingles (asphalt), lumber waste (clean wood).
 - Household Hazardous Waste Depot (pg. 2)
 - Wastes from the use of paints, pigments and coatings, paints and stains.
- Unacceptable waste that may be included in renovation materials, listed in Schedule B “Waste Resource Innovation Centre”
 - *Asbestos*

Notes:

CRD Waste is NOT accepted in curbside collection carts.

HHW Depot is only available to City residents. Haulers and commercial users must arrange for removal of materials from site.

Did you know?

- The Waste Resource Innovation Centre (WRIC) has contracts with off-site recyclers to process the above listed materials for secondary uses rather than sending them to landfill.
- The Public Drop-Off accepts these materials, if separated, at a lower cost than landfill tipping fees.
 - Refer to the [City of Guelph](http://www.cityofguelph.ca) website for up to date prices.

At the local level, the following by-law guides residents and those conducting projects/working in the County of Wellington:

County of Wellington By-law – 5670-20³

- Authorizes the County of Wellington to establish, maintain and operate a system to provide for the curbside collection of household and commercial waste, organics and recyclable material.
- Note: CRD waste and Household Hazardous Waste are not accepted in curbside collection and should be taken to the County Waste Facilities.
- For more information, visit the [County of Wellington](http://www.countyofwellington.ca) website.

Did you know?

- County residents can use the City's Solid Waste Resources Centre for disposal of CRD Waste.
 - Refer to the [City of Guelph](http://www.cityofguelph.ca) website for more information.

Ontario Regulations

- The Province of Ontario has regulations in place which require detailed waste audits for construction and demolition contracts above 2,000 square metres of floor area.
 - Regulation 102/94 requires the completion of an on-site waste audit, and the development and implementation of a waste reduction workplan⁴
 - Regulation 103/94 requires the implementation of a source separation program for the reusable and recyclable materials listed in 102/94, as well as facilities sufficient for collecting, sorting, handling, and storing these materials⁵

Note:

Most single family dwellings are not included in this regulation.

Construction, Renovation, and Demolition Waste At-a-Glance

Construction, renovation, and demolition (CRD) waste represents a significant portion of the solid waste stream generated in Canada – 12% or 4 million tonnes.⁶

The table below provides a breakdown of construction waste quantities, displayed as a percentage of the whole:

Table 1 Construction Waste Quantities (%)⁷

Material	Percent of Total Weight	Percent of Total Volume
Asphalt	3.8	2.4
Cardboard/Paper	2.1	9.4
Commingled	16.6	21.6
Concrete/Stone	41.3	22.7
Drywall	4.4	4
Foam/Insulation	0.1	0.6
Glass	0	0
Metal	5.8	2.6
Organics	0.2	0.4
Other	0.2	0.3
Plastic	0.7	0.4
Waste	11	14.3
Wood	14	21.3

- In Guelph-Wellington it is estimated that 10-15% of building materials (excluding concrete) end up as waste due to off-cuts and over ordering.⁸
- The 2022 Material Flow Analysis by Metabolic estimated that of the 321,000 tonnes of material used on various construction projects throughout Guelph-Wellington within one year, 7,400 tonnes of building site waste was generated.⁹
- 75% of waste generated by the construction industry is salvageable and could be reused or recycled.¹⁰

Unsorted home construction waste, destined for the landfill.

Photo Credit: AET Group Inc.



Alternatives to Demolition

Before swinging that sledgehammer, ask yourself whether the structure could be renovated, retrofitted, or deconstructed for reuse, instead of demolished. Assess the structure for the following features, and if at least one of them is present, it is worth pursuing deconstruction.¹¹:

- Wood-framed, with heavy timbers and beams
- Specialty materials such as
 - Hardwood floors
 - Multi-paned windows
 - Architectural moulding
 - Kitchen cabinets
 - Appliances
 - Unique features (doors, plumbing, electrical)
 - High-quality brick (ideally, laid with low-quality mortar)
 - Structurally sound (weather-tight)

The most circular building is one that already exists. Look for opportunities to retrofit, renovate, or reuse the structure or its components through deconstruction.

The Case for Deconstruction

Table 2 The Case for Deconstruction

Time to Complete	8-12 weeks (not much more than demolition – 6-8 weeks)
Job Creation	Generates 6 jobs for every 1 demolition job
Diversion from Landfill	Deconstruction specialists can divert 50 tonnes of waste and salvage 10 tonnes of lumber from every large-scale project.
Sustainable	Reclaimed wood contains less embodied carbon than freshly-cut lumber. Less need for fresh lumber (reduces deforestation). Keeps high-quality lumber out of landfills.
Tax Credits	Find an organization that provides tax receipts for these services. For example, Habitat for Humanity provides deconstruction services and can provide a tax receipt when completed.

Sources: Job Creation, Diversion, Sustainable¹²

Contact your local **Habit for Humanity ReStore** for their deconstruction/salvage services as well as what they collect for recycling and reuse.

Managing Key CRD Waste Types: Tips and Best Practices

Waste is generated on all construction sites, including new builds, renovations, and demolitions. The below strategies will assist you in managing these materials:

1. Create a waste reduction workplan during the initial phases of the project.
 - a) Plan ahead in order to minimize waste generated on site (Table 3, below, can help you with your planning).
2. Utilize multiple bins/dumpsters to allow for ease of source separation of waste materials.
 - a) The common practice of a single dumpster is not sufficient.
 - b) Place bins strategically around the site so they are convenient for workers, and close to the point of waste generation.
 - c) Ensure signs are prominently displayed on bins (large enough to read from a distance, not hidden, simple design).



Multiple dumpsters, clearly labelled for different materials.

Photo Credit: City of Guelph

3. Set-up a “reuse” area for materials that can be reused on site.
 - a) lumber, forming materials, shingles, masonry bricks, cardboard boxes, etc.
4. Create detailed framing layouts to allow for optimized use of materials (accurate take-offs).
5. Reduce waste allowances from the traditional 10% to a more responsible 5%-0%.
6. Order materials as they are needed, avoid stockpiling at the beginning of a project.
 - a) Less material wasted due to weathering, improper storage, or on-site damage.
7. Select suppliers who will offer credit for unused materials.

8. Maintain accurate inventory records so that future orders can be adjusted as needed (avoid over-ordering).
9. Buy direct from the supplier and buy in bulk to avoid individual packaging.
 - a) It is estimated that 10% of construction waste is from packaging.¹³
10. Protect materials stored on-site from exposure to the elements.



Lumber exposed to water from snow and ice melt; vulnerable to water damage

Place on pallets and cover with waterproof material (eg: tarps)

Photo Credit: AET Group Inc.

The table below outlines commonly used materials on jobsites that have reuse/recycle potential. It can be used to inform the development of the waste reduction workplan mentioned above:

Table 3 Types of Materials Typically Generated and Recovered Successfully¹⁴

Construction/Renovation Phase	Finishing Phase	Site Operation – All Phases
Cardboard	Cardboard	Cardboard
Plastics	Plastics	Plastics
Wood pallets	Wood pallets	Glass
Wood	Drywall	Office paper
Form Wood	Asphalt shingles	Aluminum beverage cans
Ferrous Metal	Carpet and pad	
Nonferrous Metal		

Recycling and Waste Minimization Strategies – The Three Rs

No matter the size of the project, whether it be construction of a new office tower, or a private kitchen renovation, the Three Rs (Reduce, Reuse, Recycle) can be implemented to minimize waste. The following sections outline simple steps that can be taken on-site, or in the planning stages of a project, organized by material type.

Asphalt Shingles



Photo Credit: AET Group Inc.

Asphalt shingles can be recycled for use in lower grade infrastructure including trails and road shoulders.



Reduce

- Estimate shingle material carefully, and order only what you need, to avoid unnecessary waste.
- Follow manufacturers application instructions.
- Examine deliveries and return damaged materials to the supplier.
- Reduce shingle waste with efficient cutting techniques.
- Store shingles on pallets, protect with a tarp or keep in plastic packaging, and place in an area protected from potential damage.

Reuse

- Use shingle cut-offs for end pieces, on corners and as hip and ridge caps before cutting full shingles.
- Use damaged or leftover shingles as starter or rake on the next job.

Recycle

- Send back-unused bundles of shingles to the supplier.
- Shingle waste can be shipped to a road contractor, to be used in asphalt applications. Contact local companies to confirm services.
- The City of Guelph WRIC has a recycling program in place for asphalt roof shingles available at a lower tipping fee than the landfill. Separated materials can be brought to the Public Drop-Off for recycling. Please refer to the [City of Guelph](#) website for the latest tipping fees.
- Donate unused shingles and roofing paper to Habitat for Humanity ReStore.

Cardboard & Boxboard



Photo Credit: AET Group Inc.



This type of waste is generated from packaging for new items such as appliances, plumbing/lighting fixtures, and flooring.¹⁵

Reduce

- Avoid excessively packaged materials and supplies. Specify in your purchase orders that suppliers deliver goods with a minimum of packaging.
- Purchase as many materials in bulk to reduce the amount of cardboard waste.
- Give preference to suppliers who will retrieve their material packaging.

Reuse

- Utilize any sized boxes that can be used for storing other materials on the job site.
- Reuse cardboard to protect new flooring during construction.

Recycle

- Separate cardboard waste and store in a dry area to be recycled.
- Work with your waste hauler to provide a separate bin for cardboard.
 - Clean, separated cardboard has value, and could result in a reduced cost for haulage.
- Drywall compound boxes, with the plastic mud bag removed, can also be recycled (ensure no drywall compound is on the cardboard after removing the bag).
- Cardboard can be recycled as a component of building products such as roofing felt, fibreboard, and floor underlay.
- The City of Guelph WRIC can receive cardboard. Reach out to City Solid Waste to discuss programs for commercial sized loads.

Concrete



Photo Credit: AET Group Inc.



Reduce

- Avoid over-ordering and order only the amount needed for the project.
- Handle materials in a manner as to prevent loss or damage.

Reuse

- Deposit excess concrete into a designated receiving area for extra material (concrete washout).
- Remaining concrete can be turned into blocks, and fill material.

Recycle

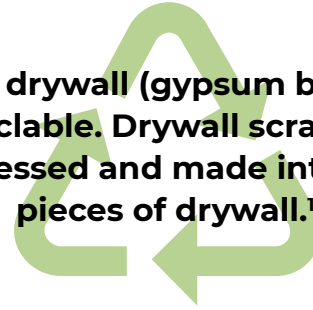
- Concrete rubble from demolished buildings, sidewalks, curbs, highways, etc. is collected, processed, and turned into recycled concrete aggregate, ready to be used in a multitude of ways.
 - Decorative gravel, sub-base for foundations, repairing roads, sidewalks.
- The City of Guelph WRIC has a recycling program in place for concrete and rubble.
 - Available at a lower tipping fee than the landfill.
 - Separated materials can be brought to the Public Drop-Off for recycling.
 - Refer to the [City of Guelph](#) website for the latest tipping fees.
 - Note: Concrete and masonry can be accepted together, unsorted.

Drywall



Photo Credit: AET Group Inc.

Clean drywall (gypsum board) is recyclable. Drywall scraps are processed and made into new pieces of drywall.¹⁷



Reduce

- Evaluate floor plans to see if room sizes can be standardized to minimize the off-cuts.
- Ensure that drywall orders are consistent with room dimensions to minimize cut-off waste.
- Place delivered material in each individual room consistent with the initial board count.
- Store on even footing, using pallets or blocking to keep it off the ground, and in a dry area.

Reuse

- Large drywall scraps can be used as filler pieces or on another project; review cut-off pile before cutting pieces from a new sheet.
- Reuse compound buckets for tool or material storage.

Recycle

- Clean drywall scraps can be recycled into gypsum products such as new drywall.
 - The City of Guelph WRIC has a recycling program in place for gypsum drywall.
 - Available at a lower tipping fee than the landfill.
 - Separated materials can be brought to the Public Drop-Off for recycling.
 - Refer to the [City of Guelph](https://www.cityofguelph.ca) website for the latest tipping fees.
- Clean compound boxes can be recycled with cardboard waste stream.
- Donate unused drywall sheets and tape to Habitat for Humanity ReStore.

Lumber



Photo Credit: AET Group Inc.

Lumber is the largest component of the waste stream for new house construction.



Not all wood is created equal! When it comes to recycling, there are two categories of wood to consider:

1. Clean
 - a. Wood that is “raw,” meaning it hasn’t been modified in any way.
 - i. Wood with nails or metal fasteners is still considered clean, as these items are typically removed in processing.
2. Dirty
 - a. Wood that has been modified (chemically treated, painted, etc.).
 - b. Examples: plywood, chip board, painted, pressure treated.

Reduce

- Optimize building dimensions to correspond to standard lumber dimensions.
- Modify framing details to optimize lumber and reduce waste.
- Develop detailed framing layouts to avoid waste when ordering lumber.
- Store lumber off the ground and level, under cover to minimize warping, twisting, and waste due to weather.
- Reduce orders by using the leftovers of the previous frame.
- Order fork unloads rather than dump loads, to avoid damage.
- Purchase kiln dried lumber to reduce warping and shrinkage.

Reuse

- By making all cuts at a central location, smaller lengths of lumber needed for blocking, backing, lateral ties, bracing, spacers in header construction, forming etc. would be readily available without cutting into a full piece.
 - Utilizing a centralized cutting procedure can reduce lumber usage by 15%.
- Use floor and roof sheathing end cuts to start the next run.
- Transport lumber leftovers to other frame sites.

- Improved inventory and storage procedures can allow useful lumber to move from one project to another.
- Larger pieces of leftover lumber (6' or more in length) can be donated to Habitat for Humanity.

Recycle

- Scrap cut-offs and warped and damaged lumber can be separated and recycled.
- The City of Guelph WRIC has a recycling program in place for clean wood/lumber.
 - Available at a lower tipping fee than the landfill.
 - Separated materials can be brought to the Public Drop-Off for recycling.
 - Refer to the [City of Guelph](#) website for the latest tipping fees.
 - **Notes:**
 - Clean wood/lumber ONLY. Pressure treated, painted, chipboard, plywood, etc. are NOT accepted.
 - Nails, screws, and metal fasteners are acceptable, as they will be removed during processing.

Different types and sizes of lumber, sorted and ready to be reused and/or recycled.

Photo Credit: AET Group Inc.



Masonry



Photo Credit: AET Group Inc.

Crushed brick and block can be used as an aggregate material in asphalt products, fill material for landscaping, and road base construction.

Reduce

- Estimate masonry material carefully to avoid waste.
- Place/store bricks and masonry supplies on pallets, covered, on level ground, to prevent damage or loss.
- Use standard sizes to eliminate unnecessary cutting, and be sure to measure and cut bricks and blocks carefully.

Reuse

- Unused brick and block such as half skids, should be picked up promptly on the job site, stored properly and/or used for another project.
- Use a supplier that will accept the return of unused materials.
- Most suppliers will take back undamaged wooden skids.
- Clean concrete and brick rubble can be used as fill on-site during foundation back filling.

Recycle

- Brick can be crushed and recycled as inert fill or as landscape top cover.
- The City of Guelph WRIC has a recycling program in place for concrete and rubble, including bricks.
 - Available at a lower tipping fee than the landfill.
 - Separated materials can be brought to the Public Drop-Off for recycling.
 - Refer to the [City of Guelph](https://www.cityofguelph.ca) website for the latest tipping fees.
 - Note: Masonry and concrete can be accepted together, unsorted.
- Donate unused bricks and precast items to Habitat for Humanity ReStore.

Metal



Photo Credit: AET Group Inc.



Reduce

- Order materials efficiently to minimize waste.
- Ensure that proper dimensions and cutting procedures are implemented to prevent unnecessary waste.
- Plan mechanical and electrical runs to reduce material.
- Pick up unused material immediately after work completion.

Reuse

- Store cuttings in a central location for reuse.
- At project completion remove surplus materials and take to the next job, or store off site for reuse.

Recycle

- Separate metals for recycling including sheet metal, copper piping, aluminum siding, iron and steel banding, galvanized flashing, rebar and metal piping. Separating metal scrap can be a worthwhile endeavor as there is economic value to these materials.
 - Separated materials could result in more money from scrap dealers, as it is easier for them to assess and process.
 - A mixed metal bin is a viable option but could result in less money for the mixed scrap metal.
- The City of Guelph WRIC has a recycling program in place for metal.
 - Available at a lower tipping fee than the landfill.
 - Separated materials can be brought to the Public Drop-Off for recycling.
 - Ensure appliances requiring refrigerant/Chlorofluorocarbon (CFC) pumpdown (e.g. air conditioner, fridge, freezer, dehumidifier, water cooler) are properly handled and recycled.
 - Refer to the [City of Guelph](https://www.cityofguelph.ca) website for the latest tipping fees.
- Donate scrap metal to Habitat for Humanity ReStore for their fundraising.

Conclusion

Residents of the City of Guelph and Wellington County can have a huge impact on the amount of CRD material that ends up in local landfills. With proper planning, coordination, and implementation, approximately 75% of the waste materials generated during CRD activities can be diverted from landfill.

By acting on the suggestions outlined in this guidebook and utilizing the numerous recycling programs available at the WRIC, contractors and residents can help move their community towards the goal of a Circular Construction Sector.

The benefits of adopting a circular construction model are evident:

- Less exploitation of natural resources
- Less waste generation
- Less landfill dependency
- Energy reduction
- Greenhouse Gas (GHG) reduction

Service Providers Mentioned in This Guidebook

<p>City of Guelph Waste Resource Innovation Centre (WRIC)</p> <p>110 Dunlop Dr., Guelph 519-767-0598 TTY: 519-826-9771 waste@guelph.ca WRIC Website</p> <p>Public Waste Drop-Off Hours</p> <p>Mon - Fri 9 a.m. to 4:30 p.m. Saturday 8:30 a.m. to 4 p.m. Sundays & Holidays - Closed</p>	<p>Habitat for Humanity ReStore</p> <p>Suite 100B – 104 Dawson Rd., Guelph 519-767-0906 info@habitatgw.ca www.habitatgw.ca/restore/</p> <p>Donation Centre Drop-Off Hours</p> <p>Tues – Sat 9 a.m. to 5 p.m.</p>
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Additional Opportunities for Reducing New Materials and Reusing Old Materials

Make use of opportunities for reducing new materials, and reusing old materials, by buying and selling on internet/social media exchange platforms.

Local recycling companies may accept CRD waste. Contact them directly for further information.

Reminder: CRD materials are not accepted in curbside collection carts.

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