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Design for Disassembly

for Residential Construction

Photo by JESHOOTS.com

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WHAT IS DESIGN FOR DISASSEMBLY?

Design for disassembly (DfD) is a strategy to design and build a structure with its end of life in mind. DfD also considers the end of life of products installed in the building and their replacement during the life of the building, including ongoing maintenance and renovations, as well as during the decommissioning of the building. During the design phase, the changes over time of the programming of the building are anticipated and accommodated, as is the deconstruction of the building itself. DfD principles cover all building components including structural elements, finishing products as well as mechanical, electrical, and plumbing systems (MEP).

This concept helps shift the mindset of the construction industry to look at buildings as a store of materials that can be harvested for reuse. The ability to do this could dramatically reduce the amount of waste produced on the regional scale. For example, in Metro Vancouver, the construction and demolition industry produces more than 30% of the total waste to the landfill[1]. Although we are seeing higher and higher volumes of materials go to recycling facilities, recycling still requires immense resources to process the materials. Through recycling streams, materials are typically downcycled, and the products made with these materials are not usually able to be furthered recycled at end of life and ultimately end up in the landfill. With this in mind, we want to create an industry for salvaged goods and opportunities to create a circular system where materials can be integrated into the design of new buildings. We have seen this done already in keystone projects such as the C.K. Choi building and others.

The goals of DfD strategies are to:

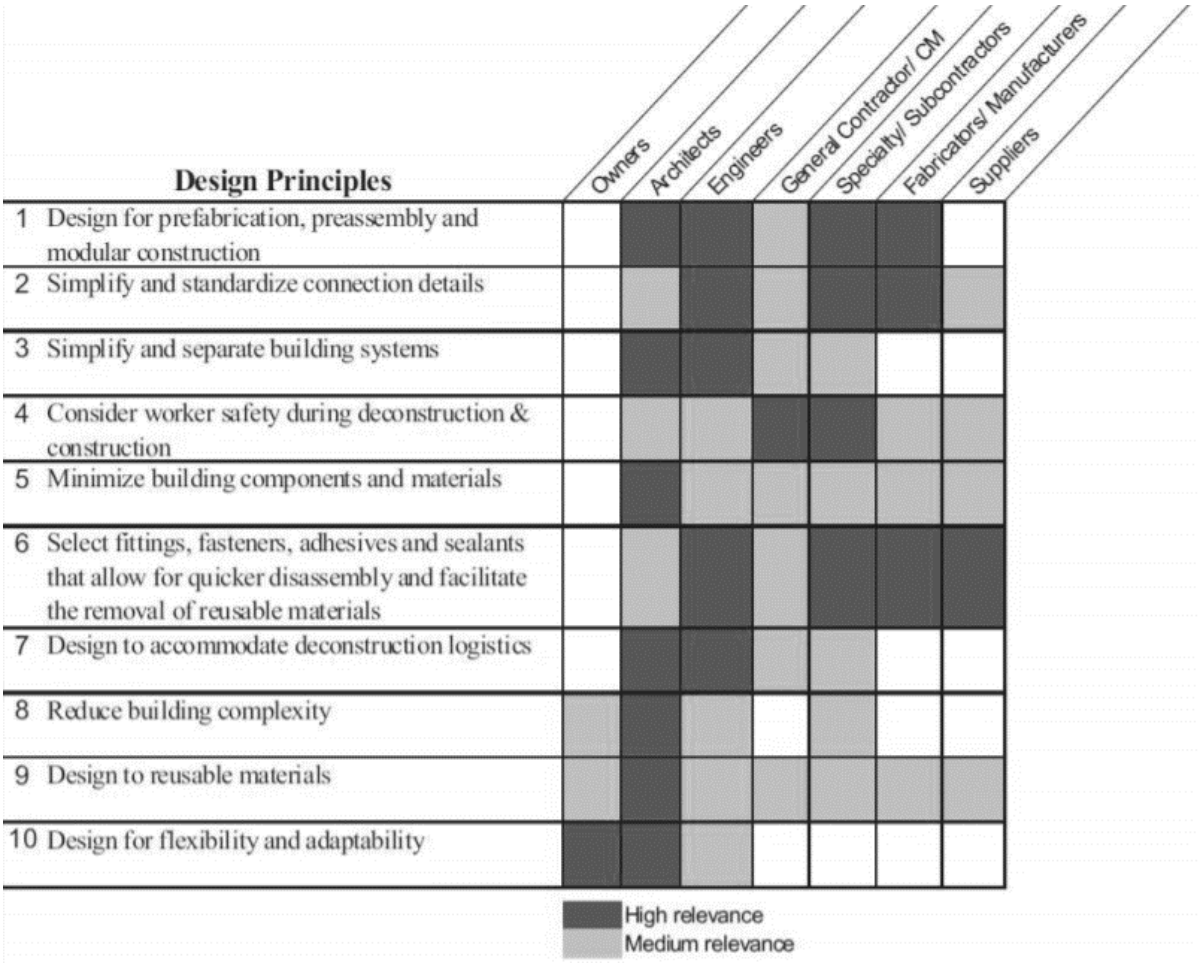
1. Simplify the deconstruction process
2. Reduce time and cost for deconstruction
3. Allow for maximum recovery of components and materials [2]

[1] Metro Vancouver

[2] 'A review of advances in design for disassembly with active disassembly applications,' Hoda Abuzied, Hesham Senbel, Mohamed Ayman Abbas. https://www.sciencedirect.com/science/article/pii/S2215098619305956

***Design for Disassembly Principles*:**

The following table shows the relevance of design for disassembly principles to the participants of a construction project. Designers have the most influence on whether these principles are implemented, but each participant has a role in ensuring that disassembly can occur, and each principle relies on more than one participant to ensure its incorporation and ultimate success.



Source https://www.researchgate.net/publication/270105210_Re-use_of_structural_elements_Environmentally_efficient_recovery_of_building_components

WHAT IS THE PURPOSE OF THIS REPORT?

The purpose of this research is to find resources for designers and architects to be able to implement DfD principles for residential construction in general, highlighting the opportunities to use wood. However, these resources include information that can apply toward all types of construction and building types.

We hope this report contains information that can immediately be incorporated into projects to increase their potential for deconstruction and disassembly. In BC, wood is an important building material, both because it is locally available and for the economic benefit it provides to communities across the province. Wood in construction also has the environmental benefit of sequestering carbon for decades, and with its high potential for reuse, we can extend that sequestration to centuries.

Finally, creating a truly circular building industry would require that salvaged and recycled material use is prioritized in construction. In order to "close the loop", we have included resources for designing with, and sourcing salvaged material.

MATERIAL RECOMMENDATIONS

Although Design for Disassembly is not a new strategy, its adoption, by the construction industry and the manufacturers that supply the industry, has been slow. North American construction methods favour speed and low-cost over the recoverability of materials. However, DfD can reduce the cost of maintaining and renovating a building, by using good quality materials and allowing for the easy replacement of components that have a shorter life spans than the building itself. It is in the owners' and operators' best interests to incorporate materials that lend themselves to DfD.

Specific product recommendations are challenging considering the current state of the market with DfD resources. However, there are many strategies and methods of design and construction that can provide guidance for design and construction teams.

Material selection:

- Choose durable materials that are long-lasting, good quality, and can withstand the disassembly process.
- Choose materials with recycling potential if they will not be reused at the end of their life.
- Choose materials that have an end-of-life plan in place:
    - A take back program to return the material to the supplier
    - Cradle to Cradle[3] certification
- Source salvaged goods to be used in the structural and finishing materials. A material that has already demonstrated it can be salvaged is usually a good candidate for future salvage as well.
- Retain all information of building materials and archive for reference throughout life of the building and at end of life.

[3] Cradle to Cradle Certification: "Products are assessed for environmental and social performance across five critical sustainability categories: material health, material reuse, renewable energy and carbon management, water stewardship, and social fairness. A product is assigned an achievement level (Basic, Bronze, Silver, Gold, Platinum) for each category." https://www.c2ccertified.org/get-certified/product-certification

Fasteners and connection points:

- Use bolted, screwed or nailed (mechanical) connected instead of glues or sealant (chemical) connections
- Simple forms allow for fewer parts needed and therefore, a simpler disassembly
- When using fasteners, use fasteners that require only standard tools to allow for simple and fast disassembly
- Make fastening points easy to access
- Retain all information on connection points and archive for reference throughout life of the building and at end of life.

Assembly design:

- Considering the layering of materials in building components to align with their anticipated life span[4]
- Design assemblies so that materials are independent of each other as much as possible. This way they are not reliant on other materials to allow for repairs and renovations that minimize waste in the future
    - Separate the cladding from the structure
- Separate MEP system from walls and other materials to make them easy to upgrade and change in the future.
- Retain all information on assembly design and archive for reference throughout life of the building and at end of life.

[4] "Shearing Layers" Stewart Brant. http://www.locatearchitects.co.uk/seda-lg.htm

RECOMMENDED CONSTRUCTION TECHNIQUES FOR WOOD

Mass timber construction can potentially be an advantageous construction technique in design for disassembly for residential construction as well as other building types for many reasons:

- Low weight-to-strength ratio for ease of handling at end of life
- Easier to design for connection points that are more easily disassembled than other construction techniques
- Reuse potential at its end of life

Photos: Josh Partee Photography

Designed by Path Architecture, Radiator is one of the first five-story timber-frame office buildings to be built in Portland, Ore., since the early 1900s. Fabricated steel bucket-style connectors with bolts were utilized for glulam beam-to-beam connections.

Source: 1https://www.awc.org/pdf/education/des/ReThinkMag-DES315A1-ConnectionOptionsForWoodFrameBuildings-1604.pdf

Mass timber techniques includes:

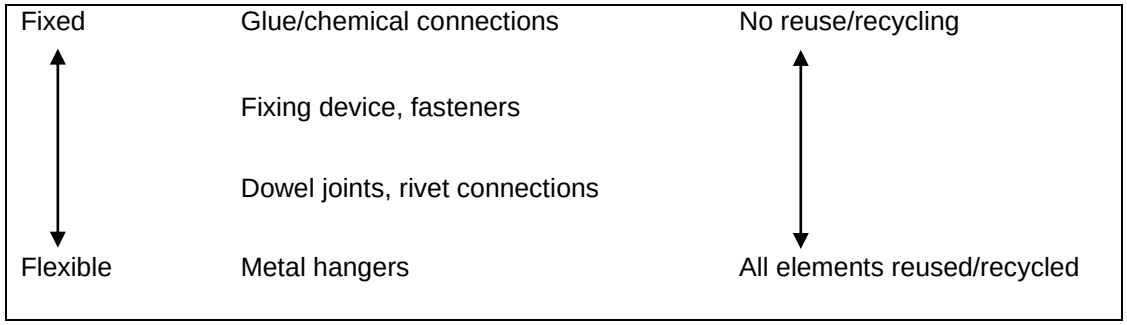
- Cross Laminated Timber (CLT)
- Nail Laminated Timber (NLT)
- Glulam Timber

When designing mass timber connection points, consider the following:

- Use connection points that use bolts instead of rivets
- Avoid using gang nail plates that are time consuming to disassemble.
- Avoid using dowels if possible. If dowels are required, avoid using bonding agents like glues.

The more fixed the building component connections, the more difficult the salvage of this material. The more flexible a connection point is, the more interchangeable its components are that make it easier to fix, replace, remove, recycle and/or reuse. The following table gives examples of connection types based on the protocol developed by Buildings as Material Banks[5].

Connection Types

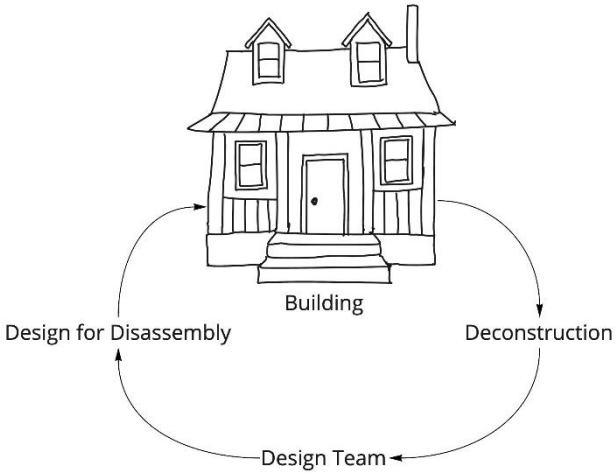


[5] 'Reversible Building Design Guidelines,' BAMB. https://www.bamb2020.eu/wp-content/uploads/2018/12/Reversible-Building-Design-guidelines-and-protocol.pdf

CLOSING THE LOOP WITH SALVAGED MATERIALS

Integrating salvaged materials into new construction is an important step in creating a circular economy within the construction industry.

1 Building Material Life Cycle



Using salvaged materials in the design and construction of a new buildings adds depth to the building. It provides a narrative to the project. Especially if the salvaged materials are sourced from the community or from the existing site, it connects the new building to its surroundings and to the past.

There are some fundamental changes to the design and construction process that are needed to be able to effectively use salvage in new construction:

- Salvaged materials need to first be inventoried and assessed, sizes and availability determined, and the building design based on these sizes and quantities. You are unlikely to be able to source significant quantities of salvaged materials suitable for a pre-existing design, with the exception of “standard” sized building materials such as bricks.
- Given the need to source some salvaged materials prior to design, storage of the materials from pre-design to construction needs to be arranged. Improperly stored materials are susceptible to water and weather damage.
- Utility is not equivalent to functionality. Building elements that can no longer function in their original application (exterior glazing for example) may still have utility in another (interior sidelites).
- Readily available non-building waste materials can be considered for construction if they are able meet the performance characteristics required for the application in which they would be installed. Everything from bottles and tires to shipping containers have been utilized in this way.

Structural elements have the highest potential for reuse with the most value. The following are basic recommendations for using salvaged timber in new buildings[6]:

1. Divide the spatial programme into smaller rooms or volumes
2. Split the structure into smaller sections
3. Avoid equal spans and dimensions
4. Split the structure according to the function
5. Utilize efficient forms that allow using smaller pieces for longer spans
6. Define ranges instead of fixed properties
7. Rotate and repurpose
8. Select the application according to the properties
9. Combine creatively
10. Let the patina speak

Additional resources for using salvaged lumber in new construction:

- Re-use of structural elements: Environmentally efficient recovery of building components
- Wood-Framed Building Deconstruction: A Source of Lumber for Construction?

Mass timber is starting to be used on more diverse building types such as high rise (Brock Commons, University of British Columbia) and commercial applications (Mountain Equipment Coop stores) though it is mostly used in residential applications[7]. Countries in the European Union are leading with Design for Disassembly in the construction industry and there is opportunity kickstart the local circular economy.

[6] 'Design for deconstruction and reuse of timber structures – state of the art review' InFutUReWood. https://www.infuturewood.info/wp-content/uploads/2021/02/InFutURe-Wood-Report-D2.1f.pdf

[7] InFutUReWood https://www.infuturewood.info/wp-content/uploads/2021/02/InFutURe-Wood-Report-D2.1f.pdf

CONCLUSION

It is critical when implementing DfD strategies within a project to have buy-in from the team. Being clear about any additional cost implications or cost savings is important in communicating with the owner group. It is also crucial to have a design team that are engaged in DfD principles to spearhead the effort and lead the team. A structural engineer who is interested in working on integrating salvaged structural lumber or other types of elements into a building is important in closing the loop. In order to ensure these techniques are carried through from design to construction, include as many of these strategies in the project specifications so that there is leverage to realize a truly circular project.

APPENDIX A - DFD RESOURCE MATRIX

Resources	Type of Document	Publisher	Access	Year released	Main points	Wood Construction	Residential Construction
A review of advances in design for disassembly with active disassembly applications	Research	Engineering Science and Technology, an International Journal	https://www.sciencedirect.com/science/article/pii/S2215098619305956		Does not directly apply to construction industry but covers basic DfD principles well	n/a	n/a
BREEAM UK New Construction	Rating System	BREEAM	https://www.breeam.com/NC2018/content/resources/output/10_pdf/a4_pdf/print/nc_uk_a4_print_mono/nc_uk_a4_print_mono.pdf	published 2018	see p. 288. Rating system, performance-based assessment method and certification scheme for new buildings	Mat 03 Responsible sourcing of construction products Mat 05 Design for durability and resilience Wst 06 Design for disassembly and adaptability	n/a
Building Deconstruction and Design for Reuse	Case Study	EPA	https://www.epa.gov/sites/production/files/2017-06/documents/building_decon_design_reuse.pdf	published 2010	Case Study of Wesley House		Case Study of Wesley House/Reichert House Deconstruction (p.1)
Deconstruction and Design for Disassembly: Analyzing Building Material Salvage and Reuse	Thesis	Carlton University	https://curve.carleton.ca/system/files/etd/75676d84-d07f-41e0-951e-cb93c90a7d5d/etd_pdf/3ba5a49f42fd83942d887562b90314c8/balodis-deconstructionanddesignfordisassemblyanalyzing.pdf	published 2017	Deconstruction Design for Disassembly (incl case studies) Digital Workflows Project using photogrammetry	Case Study - For Ord Barracks (p.28) Riverdale Village Apartments (p.30)	n/a
Design for deconstruction and reuse of timber structures	Report	InFutUreWood	https://www.infuturewood.info/wp-content/uploads/2021/02/InFutURe-Wood-Report-D2.1f.pdf	published 2020	Reuse in timber construction Timber building design: potentials and obstacles for the future reuse Principles, indicators and guidelines	Timber construction systems, light frame timber on site construction, light frame construction using I-joists, Post and beam, Log construction, post and plank construction, CLT construction, Prefabrication and automation, SIP, Isotimber	Residential case studies throughout
Design for Disassembly in the Built Environment	Pilot Fact Sheet	EPA	https://www.epa.gov/sites/production/files/2017-06/documents/design_for_disassembly_in_the_built_environment.pdf	published 2004	Case study of the pilot for Community Housing Resource Centre		3,000 square foot DfD residential home began in spring 2006 and was completed in June 2006. Case study pilot for Community Housing Resource Centre
Design for Disassembly in the Built Environment: a guide to closed-loop design and building	Guide	The Pennsylvania State University	https://www.lifecyclebuilding.org/docs/DfDseattle.pdf	published 2005	Key DfD Principles Detailed Strategies Design Process/Strategy Deconstruction Plan Model Deconstruction Specification	Case Study of Open_1 House, timber-frame construction	According to the US Census the average age of residential dwellings is 32 years old (US Census, 2004) Case Study - Marie Short House (p.26-29)
Design for Modular Construction: An Introduction for Architects	Guide	AIA	https://www.triumphmodular.com/wp-content/uploads/2020/06/AIA_Design_Modular_Construction_Intro_Architects.pdf	unknown	Modular construction and design for disassembly	Case Study - The Graphic (p. 35)	Case study Vancouver Affordable Housing Agency (p.6) 461 Dean Street (p.21) Caramel Place (p.5)

Resources	Type of Document	Publisher	Access	Year released	Main points	Wood Construction	Residential Construction
Innovation Project Success Story: Deconstruction	Case Study	EPA	https://www.epa.gov/sites/production/files/2016-03/documents/innovation_project_success_story_deconstruct.pdf	published 2009	Case Study of : - Deconstruction and Building with Reused Materials Training - Deconstruction for Urban Revitalization - Design for Deconstruction - Deconstruction and Material Reuse Putting it into practice	Case Study of Wesley House/Reichert House Deconstruction (p.3)	Case Study of Wesley House/Reichert House Deconstruction (p.3)
ISO 20887:2020 - Sustainability in buildings and civil engineering works — Design for disassembly and adaptability — Principles, requirements and guidance	Standard - International	International Organization for Standardization	https://scc.isolutions.iso.org/obp/ui#iso:std:iso:20887:ed-1:v1:en	updated 2020	Decision making framework Principles of DfD Documentation and Information Continuing implementation of DfD Feasibility Assessment of DfD options Developing end-of-life scenarios	n/a	n/a
LEED v4 BD+C Healthcare	Rating System	USGBC	https://www.usgbc.org/credits/healthcare/v4-draft/mrcx-1	updated 2021	rating system, prescriptive -based certification for new Healthcare buildings	n/a	n/a
Recycled Buildings: How to Design for Disassembly	Article	Archinect	https://archinect.com/features/article/150067785/recycled-buildings-how-to-design-for-disassembly	published 2018	DfD in the industry and starting from design process	n/a	n/a
Reversible Building Design Guidelines and Protocol	Guide	BAMB	https://www.bamb2020.eu/wp-content/uploads/2018/12/Reversible-Building-Design-guidelines-and-protocol.pdf	published 2018	Spatial flexibility of buildings Technical flexibility of systems and products Material flexibility that can make a transition from a linear to circular building	n/a	n/a
System for the Analysis and Design for Disassembly and Recycling in the Construction Industry	Conference Paper	University of Struttgart	https://www.researchgate.net/publication/305626924_System_for_the_analysis_and_design_for_disassembly_and_recycling_in_the_construction_industry	published 2016	Recycling Graph Editor is a system for the description of the composition of building parts for the application in the construction sector.	n/a	n/a
The Circular Economy in the Built Environment	Research	ARUP	https://www.arup.com/perspectives/publications/research/section/circular-economy-in-the-built-environment	published 2016	Building Environment: from Linear to Circular Circularity at Scale Enabling the Circular Economy	n/a	n/a
Venlo City Hall	Case Study	Venlo	https://www.ellenmacarthurfoundation.org/assets/downloads/Venlo_-Case-Study_Mar19.pdf	published 2019	Venlo City hall case study Team Participants, Finance, Time frame The Journey	n/a	n/a

Resources	Type of Document	Publisher	Access	Year released	Main points	Wood Construction	Residential Construction
CSA Z782-06 - Guideline For Design For Disassembly And Adaptability In Buildings	Standard - Canadian	CSA Group	https://www.orderline.com/z782-06-guideline-for-design-for-disassembly-and-adaptability-in-buildings	published 2006 updated 2012	Conceptual Framework: Systems, elements, component / assemblyDfD principles: definition, examples, metrics	n/a	n/a

APPENDIX B - SAMPLE DFD CHECKLIST

Project Name:

Instructions **COMPLETE THE *Design Service Life for Building* FIRST. Mark the check box where the building has the criteria described, otherwise leave check box blank.**			
Category	**Criteria**	**Threshold to Meet**	**Threshold Achieved**
Design Service Life for Building	Temporary	Up to 10 years	☐
	Medium Life	25 - 49 years	☐
	Long Life	50 - 99 years	☑
	Permanent	100 years +	☐
Durability, Flexibility & Adaptability	Do all elements of the ***structure*** selected have a service life equal or greater than:	50 - 99 years	☐
	Do all elements of the ***building envelope*** selected have a service life equal or greater than:	50 - 99 years	☐
	Are the ***interior finishes*** durable, maintainable and easily removable without damaging other building elements?	Yes/No	☐
	Can the ***mechanical, electrical and plumbing*** systems be accessed and replaced without damaging other building elements?	Yes/No	☐
	Are all ***building elements with a shorter service life*** easily replaceable?	Yes/No	☐
	Is the building interior easily reconfigurable for different uses?	Yes/No	☐

Material Fastenings	Have the number of fastenings been minimized?	Yes/No	☐
	Are fastenings mechanical?	Yes/No	☐
	Are fastenings accessible?	Yes/No	☐
	Can standard tools be used to unfasten?	Yes/No	☐
Closed Loop	≥ 50% of the building materials have recycled content?	Yes/No	☐
	≥ 10% of the building materials are salvaged?	Yes/No	☐
	>75% of building elements are reusable or recyclable?	Yes/No	☐

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Metro Vancouver extracted from *Construction and Demolition WASTE REDUCTION AND RECYCLING TOOLKIT, A guide for the building and construction industry*, additions in yellow							
3R Demolition 5735 Beresford Street Burnaby http://www.3rdemolition.com/ *604-435-2555*		✓	✓			**Both**	demolition, removal and disposal of asbestos, drywall and other hazardous materials.
4W's Demo Ltd 110-12860 Clarke Pl Richmond https://4wsdemo.com/ *604-723-9155*	✓	✓	✓	✓		**Both**	Call for details. Demolition, removal and disposal of asbestos, drywall and other hazardous materials.
604-Trash-it 8866 Hudson St Vancouver https://www.604-trash-it.com/ *604-872-7448*		✓	✓			**Both**	Will accept furniture with bed bugs.
Able Auctions 19757 92A Avenue Langley https://www.ableauctions.ca/ *604-881-2253*					✓	**Both**	Inventory closeouts for all types of businesses including building materials. Can provide pick up as well as drop off.
Allied Salvage & Metals (1985) Ltd. 11651 Twigg Place (Mitchell Island) Richmond https://www.alliedsalvagemetals.ca/ *604-322-6629*			✓			**Both**	

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Ancore Appraisals Inc. 9124 Queen Street Langley https://www.ancore.ca/ *778-926-0136*	✓					**Both**	Appraises building materials after deconstruction has occurred.
Assertive Demolition Ltd. 505-8840 210th Street Langley http://www.assertivedemo.com *604-888-6055*		✓	✓			**Both**	Complete demolition service.
Broadway Refrigeration and Air Conditioning Co. 2433 Holdom Ave, Burnaby http://broadwayrefrigeration.com/ (604) 255-2461			✓				
Clearview Demolition Ltd. 8285 Lickman Rd, Chilliwack https://clearviewdemo.ca/ (604) 792-3330		✓	✓				
D. Litchfield Demolition & Co. Ltd. 3046 Westwood Street Port Coquitlam http://www.dlitchfield.com/ *604-464-7525*		✓				**Both**	Provide onsite aggregate recycling services. Do not service small renovation projects. No longer sell reclaimed wood at showroom.
Dallas Watt Demo Ltd. 201-204 Cayer Street Coquitlam http://www.dallaswattdemo.com/ *604-777-4887*		✓	✓			**Both**	
Encorp Pacific 100-4259 Canada Way, Burnaby https://www.return-it.ca/ (604) 473-2400			✓				

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Fleck Contracting Ltd. 1550 Rand Ave Vancouver https://www.fleckcontracting.com/ *604-266-2120*		✓	✓			**Both**	
Green Coast Rubbish Inc. 506 Brand St North Vancouver https://www.greencoastrubbish.com/ *604-230-4530*		✓	✓			**Both**	Not a drop off location. Does not take any materials with bed bugs.
Habitat ReStore Burnaby - Douglas 2475 Douglas Road Burnaby https://www.habitatgv.ca/ *604-293-1898*					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim (Minimum of 6' long with no nails or paint
Habitat ReStore Burnaby - Enterprise **Heritage Lumber** 7977 Enterprise Rd Burnaby https://www.habitatgv.ca/restore-locations *604-681-5618*					✓	**Both**	Call first to organize pick up or drop off. Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim (Minimum of 6' long with no nails or paint
Habitat ReStore Langley 20104 Logan Avenue Langley https://www.habitatgv.ca/ *604-514-1223*					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim (Minimum of 6' long with no nails or paint
Habitat ReStore North Vancouver 340 Lynn Ave North Vancouver https://www.habitatgv.ca/ *604-985-5618*					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim (Minimum of 6' long with no nails or paint

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
J&S Custom Furniture Co. Unit 43 – 1640 East Kent Ave. south Vancouver http://jsreclaimedwood.com/ *778-317-3027*			✓		✓ Reclaimed wood furniture	**Both**	Wood from character building demolitions, old barns, industrial building tear-downs, unwanted pallets, and fallen logs
Jindal Appliances Limited 9463 120 Street Delta https://www.jindalappliances.com/ *604-581-8199*			✓ Appliances only		✓ Retail store	**Residential**	Rebuild, resell and recycle used appliances
Maple Leaf Disposal Ltd. 20380 Langley Bypass, Langley City https://mapleleafdisposal.com/ *604-533-4993*			✓				
Matcon 2208 Hartley Ave, Coquitlam https://www.matcon.ca/ *604-520-5909*			✓				
Kare Environmental 9311 River Drive Richmond https://karegroupcanada.com/ *604-232-9155 Ext 3*		✓				**Both**	Deconstruction and demolition services
Keep it Green Recycling Ltd. Port Coquitlam https://www.keepitgreenrecycling.ca/services/sustainable-lock-up/ *604-341-6495*					✓	**Both**	To schedule a drop-off or pick up email contactus@keepitgreenrecycling.ca or fill online form. Drop-off charge a fee based on truck size.
Maple Ridge New & Used Building Materials 23332 River Road Maple Ridge http://www.mrnu.ca/ *604-380-2111*					✓	**Both**	Variety of materials available, household and building. Not taking lumber.

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Nickel Brothers House Moving Ltd 1528 Broadway St http://www.nickelbros.com/ Port Coquitlam *1-866-813-9430*				✓		**Both**	House moving services
Octiscapes 2756 Woodland Dr http://www.octiscapes.com/ Vancouver *604-708-5790*		✓	✓			**Both**	
Pacific Blasting and Demolition 3183 Norland Avenue Burnaby http://www.pacificblasting.com/demolition/ *604-291-1255*		✓	✓			**Both**	
Phoenix Enterprises Ltd. 19429 54th Ave Surrey https://www.phoenixenterprisesltd.com/ *604-594-0224*		✓			✓	**Both**	Also take asbestos and drywall. Call for details.
Salvage Vancouver Woodworks & Wood Market 1278 E Hastings St Vancouver http://salvagevancouver.com/ *778-952-3969*		✓	✓		✓ Reclaimed wood furniture	**Both**	They hold a wood market once per month or by appointment.
Sea to Sky Removal Vancouver https://www.seatoskyremoval.ca/ *604-836-9258*			✓			**Both**	Services construction sites in Vancouver, Burnaby, Richmond, Port Coquitlam, Coquitlam, Port Moody, Surrey, North Vancouver, West Vancouver, Lions Bay, Squamish and Whistler. Also offer live loading and on-site source separation of recyclable and reusable materials

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Supreme House Movers Ltd. 25768 128th Avenue Maple Ridge http://www.supremehm.com/ *604-462-9885*				✓		**Both**	
Surrey New & Used Building Materials 17861 - 64th Avenue Surrey http://www.surreynewandused.com/ *604-576-8488*		✓			✓	**Both**	Call first for details. Variety of materials available, household and building. Not taking lumber.
****NEW* Mr. New & Used** *23332 River Road* *Maple Ridge* http://www.mrnu.ca/ *604-380-2111*		✓			✓	**Both**	Call first for details. Variety of materials available, household and building. Not taking lumber.
T&T Demolition #104 - 20119 113B Avenue Maple Ridge http://www.tandtdemolition.com/ *604-465-7211*		✓	✓				
The Barnhouse Company Unit 203-7426 Hedley Avenue Burnaby http://barnhouse.ca/ *778-231-0081*					✓	**Both**	Wood from barns and heritage homes. Call in advance to confirm acceptance of material.
Unbuilders 215-1610 Pandora St https://unbuilders.com/ Vancouver *1-833-862-8458*		✓	✓			**Both**	
Urban Repurpose *440 Brooksbank Ave* http://urbanrepurpose.ca/ *North Vancouver* *604-990-5576*					✓	**Both**	Call first. Take donations of clean and old weathered wood, brick, and carpet. Drop offs, only during operation hours. Drop offs are limited by available space, or safety concerns. Pick-up service available.

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Westcoast Wood Slabs 79 W 3rd Ave Vancouver https://www.chapelarts.com/showroom *604-682-1611*					✓ Reclaimed wood furniture		Call first. May take donations of solid wood lumber, fencing.
Western Reclaimed Timber 26324 River Rd Maple Ridge http://westernreclaimed.com/ *604-462-8845*		✓	✓		✓	**Commercial**	Specializes in reclaimed timber and lumber
Wood Shop Workers Coop 1245 Glen Drive Vancouver https://www.woodshop.coop/ *778 899-5353*					✓ Reclaimed wood furniture	**Both**	Call first. May take donations of solid wood lumber, fencing, demolition materials such as 2x4, 1x4 , rounds, and milled slabs on a case by case basis. We can't take donations of particle board, pegboard, laminate or other made to look like wood materials
SLRD, Squamish-Lillooet Regional District							
ASM Squamish Scrap Metals Ltd 1111 Industrial Way Squamish https://www.alliedsalvagemetals.ca/ *604 815-4177*			✓		✓	**Both**	Brass, Aluminum, Steel (ferrous) Copper (non-ferrous) & insulated copper wire, Stainless steel Motor breakage, Appliances
Cardinal Concrete Ltd. 2600 A Centennial Way Squamish https://cardinalconcrete.ca/ *604 898-5015*			✓		✓	**Both**	
Phase One Dismantling Services Squamish http://www.phaseonedismantlingservices.com/ *778 9960428*		✓	✓			**Both**	

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Rebuild Squamish 40350 Government Rd, Garibaldi Highlands Squamish https://squamishrebuild.ca/ *604 567-5551*					✓	**Both**	Call first to organize pick up or drop off. Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim
Re-Build-It Center 1003 Lynham Road (Function Junction) Whistler https://mywcss.org/social-enterprises/re-build-it-centre/ *604 9321125*					✓	**Both**	The store is open seven days a week.
CRD, Capital Regional District							
Brodd Demolition 250 7430439 http://broddemolition.ca/		✓	✓			**Both**	
DL's Recycling Centre 6844 Oldfield Rd, Saanichton 250.544.3103 https://www.dlsrecyclingcentre.com/		✓	✓			**Both**	
Demxx Yard 1688 Alberni Hwy, Coombs 250 9540296 https://demxx.com/					✓	**Both**	Demxx Yard: Lumber, Windows, Doors, Cabinets, Flooring, Live Edge and Cladding
H.L. Demolition & Waste Management Ltd 4481 Markham Street, Victoria 250 383 4444 https://www.hldemolition.com/		✓	✓			**Both**	

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Rockridge Industrial Services Inc 2899 Maurice Ln, Victoria INFORMATION A 2899 Maurice Ln, Victoria 250 658 1001 https://www.rockridgeinc.com/		✓	✓			**Both**	
Okanagan Region							
Habitat ReStore West Kelowna 1793 Ross Rd, Kelowna 1793 Ross Rd 1793 Ross Rd, West Kelowna 778 7554346 https://www.habitatforhumanityokanagan.ca/restore/					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim
Habitat ReStore Kelowna #800 - 2092 Enterprise Way, Kelowna 778 7554346 https://www.habitatforhumanityokanagan.ca/restore/					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim
Habitat ReStore Penticton 2498 Skaha Lake Rd, Penticton 778 7554346 https://www.habitatforhumanityokanagan.ca/restore/					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim
Habitat Vernon ReStore 2707C 43 Ave, Vernon 778 7554346 https://www.habitatforhumanityokanagan.ca/restore/					✓	**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim
Okanagan Demolition 3957 Lakeshore Rd, Kelowna 250 863 1032 https://www.okanagandemolition.ca/		✓	✓			**Both**	Doors, windows, pressure and non-pressure treated wood. They accept Lumber/Trim

Company Info	Deconstruction Appraiser	Deconstruction Services	Salvage Services	Structural/ House Moving	Used Building Materials Store	Residential and/or Commercial	Comments
Scott contracting and excavating West Kelowna, BC 250 768 1118 https://scottexcavating.ca/index.php		✓	✓			**Both**	
TNT Kelowna - 375 Moyer Rd., Kelowna 778 7554346 https://tntkelowna.com/demolition-services/		✓	✓			**Both**	
Prince George							
Allen's Scrap & Salvage 302 – 2nd Avenue, Prince George, BC 250 5621177 https://www.habitatforhumanityokanagan.ca/restore/		✓				**Both**	
Online Resource Marketplaces							
BIzBiz BC Marketplace http://bc.bizbizshare.com/					✓	**Both**	
Craiglist https://www.craigslist.org/about/sites#CA					✓	**Both**	
Facebook Marketplace https://www.facebook.com/marketplace					✓	**Both**	
Kijiji https://www.kijiji.ca/h-british-columbia/9007					✓	**Both**	
Used Victoria https://www.usedvictoria.com/					✓	**Both**	