



Construction Standards

.1 Typical Construction and Deconstruction Waste Management Practices

.1 The University is targeting a minimum overall construction waste diversion rate of 75% as outlined in UVIC's *Sustainability Action Plan*. It is generally expected the provisions of this section will be implemented and administered by the Consultant for all projects, however, it is recognized that the function of this section in its entirety may be excessive for smaller scale projects. As such, pending approval from FMGT, the Consultant may amend the requirements of this section to suit project specific needs. Notwithstanding any adjustment to the administrative and/or functional process described herewith, all projects shall aim to generate the least amount of waste possible.

.1 New Construction:

Processes shall be employed to limit construction generated waste, including that caused by damage due to mishandling, improper storage or inadequate protection. Special provisions shall also aim to minimize over-packaging and excessive quantity estimating.

.2 Deconstruction or Renovation:

Complete deconstruction, or partial in the case of renovation projects, shall be carried out in such a way as to salvage for reuse and recycling the largest amount of materials possible.

.2 UVIC's objective is to minimize waste disposal in landfills or incinerators. On new construction projects this means careful recycling of job site waste, and on deconstruction projects this also means careful removal for salvage.

.3 The requirements of this section shall be considered a minimum standard for all LEED and Non-LEED projects. Additional commentary regarding Waste Management requirements for LEED projects can be found within Section 1.6 – Sustainability Requirements.

.2 Regulatory Requirements

.1 Where feasible, the University typically removes all hazardous materials prior to the start of a Project. However, where removal and disposal of hazardous materials are required as part of a construction project, such work shall conform to applicable codes and regulations. The handling and disposal of all hazardous and banned materials shall be in accordance with the BC Environmental Management Act and Hazardous Waste Regulation, and regional and municipal regulations. Hazardous and banned materials may include, but are not limited, to asbestos, drywall (banned from disposal), underground storage tanks, Polychlorinated Biphenyls(PCBs), abandoned chemicals (gasoline, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead-based paints, smoke detectors, and mercury containing switches.

.2 Only licensed brokerage, storage, transfer and disposal facilities which comply with the requirements of local municipal or Capital Regional District (CRD) Bylaws, or those licensed or regulated by other jurisdictions shall be used by the Contractor for the recycling and disposal of waste materials.

.3 For a list of compulsory materials to be recycled, and a list of materials strictly prohibited for landfill disposal, refer to the CRD website: <http://www.crd.bc.ca/waste/>



.3 Project Waste Management Provisions

.1 The Contractor's submittals to the Owner and the Consultant shall include the following:

.1 Construction Waste Management Plan (WMP)

.1 Part 1 - Pre-Construction Material Quantify Estimates

Prior to commencing the Work, provide an estimate of deconstruction and construction job site generated waste materials to be salvaged, recycled or disposed of. Materials shall be quantified using industry standard units of measurement. A reference table of common waste generation rates for construction projects is included at the end of this section. This table can be utilized for estimating construction generated waste quantities if the Contractor does not have sufficient historical data or established programs to generate their own estimates.

Along with the Pre-Construction Estimates, the Contractor shall provide a written submission, to the satisfaction of the University, describing in detail the following:

- .1 The intended destinations for the various waste materials identified.
- .2 The intended job site separation and collection facilities and procedures.
- .3 The proposed deconstruction methodology and sequencing (if applicable).
- .4 The schedule for deconstruction (if applicable).
- .5 The location, security and protection of storage areas (if materials are to be stored on site).
- .6 The details on materials handling and removal procedures on project sites with space constraints.

.2 Part 2 – Project Update

Provide a monthly update of actual deconstruction and construction job site generated waste materials. Indicate whether these materials were salvaged, recycled, or disposed of, and the receiving facility.

Note: A sample WMP is attached to the end of this section for reference. A Contractor generated form containing the same general information is also acceptable. Included with the sample plan is a reference guide of suggested storage and handling procedures for salvageable materials.

.4 Waste Management Implementation

.1 Meetings:



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- .1 The Contractor shall coordinate and conduct Project Waste Management meetings. Meetings shall include Subcontractors and Suppliers affected by the WMP. Review of the WMP and each subsequent update of the plan shall be a regular meeting agenda item. At a minimum, waste management goals and issues shall be discussed at the following meetings:
 - .1 Pre-bid meeting.
 - .2 Pre-construction meeting.
 - .3 Regular job-site meetings.

- .2 **Administration:**
 - .1 **Manager:** The Contractor shall designate an on-site representative responsible for instructing workers and overseeing, documenting, and updating the WMP.
 - .2 **Distribution:** The Contractor shall distribute copies of the WMP to all Subcontractors and Suppliers.
 - .3 **Instruction:** The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling procedures to be used by all parties at the appropriate stages of the Project. For deconstruction projects the Contractor shall provide on-site direction to identify materials intended for salvage, outline procedures for removal, storage and handling, and confirm requirements for reusing salvaged materials within the project.
 - .4 **Separation facilities:** The Contractor shall establish and label a specific area to facilitate separation of materials for recycling and salvage. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
 - .5 **Application for Progress Payments:** The Contractor shall submit with each Application for Progress Payment an updated WMP with the "Part 2 - Project Update" section completed for the invoicing term. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment.
 - .1 Submit to the Consultant and/or Owner way-bills, invoices and other documentation confirming that all materials have been delivered to the required locations.
 - .2 Any materials salvaged by the Contractor, Subcontractors, employees or agents for their own re-use elsewhere, or any items gifted to a third party for re-use must be accounted for. In these situations where way-bills, invoices or other documentation are not available, The Contractor shall still declare the materials, quantities, and destination within the WMP. Upon request, the Contractor shall submit a written declaration that such materials have been, or are intended to be salvaged. It is important that the overall quantities of all waste materials are inventoried within the WMP to verify the University's minimum 75% waste diversion goals.
 - .6 **Project Waste Summary:** The Contractor shall submit with the final Application for Payment a summary WMP for the Project. The submission shall generally be a



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summation of the monthly WMP submissions which will provide an overall synopsis of the total project Waste Management performance. Failure to submit this information will render the application incomplete and will result in holdback of the final payment.

Waste Management Plan Construction and Deconstruction Projects



Name of Company	Contact Person	Tel:	UVIC Project Officer
Project Site	Project Type	<input type="checkbox"/> New Construction <input type="checkbox"/> Partial Deconstruction <input type="checkbox"/> Complete Deconstruction	Total Square Footage

Pre-Construction Estimates <small>(Complete this section prior to commencing the Work)</small>		Project Update <small>(Complete this section each month for submission with application for progress payment)</small>				
Material	Estimated Generation	For Period:	Recycled	Disposed	Facility	Comments
Wood - Glulam Beams	400 bd.ft.	350 bd. ft			Storage	Delivered to Owner's Storage Compound

Certified By:

Name	Title	Signature	Date
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Explanatory Note:
 Column 1: - "Material" - enter materials targeted for salvage, recycling, and/or disposal
 Column 2: - "Estimated Generation" - enter the estimated volumes, quantities or number of salvageable, recyclable, and waste materials to be generated (ie. cu. yd., cu. m., tonnes, bd. ft. etc.) For partial or complete deconstruction projects, quantity estimates shall be based on in-situ materials. For new construction, additions, renovations etc., estimates for construction generated waste materials shall be calculated based on the waste generation rates provided, or based upon the Contractor's historical data.
 Column 3: - "Salvaged" - enter the volumes or quantities of materials, or number of items salvaged (refer to units above)
 Column 4: - "Recycled" - enter the volumes or quantities of materials recycled (refer to units above)
 Column 5: - "Disposed" - enter the volumes or quantities of materials disposed (refer to units above)
 Column 6: - "Comments" - enter any additional comments or details

New Construction Projects Typical Waste Generation Rates (for WMP estimating purposes)

Material	Residential/Commercial High-rise Construction		Institutional Low-rise Construction		Commercial Low-rise Construction		Residential Low-rise Construction	
	cu.yd./ 1,000 sq.ft.	tonnes/ 1,000 sq.ft.	cu.yd./ 1,000 sq.ft.	tonnes/ 1,000 sq.ft.	cu.yd./ 1,000 sq.ft.	tonnes/ 1,000 sq.ft.	cu.yd./ 1,000 sq.ft.	tonnes/ 1,000 sq.ft.
wood	3.3	0.40	7.0	0.86	5.6	0.68	6.0	0.73
drywall	3.6	0.92	0.9	0.22	0.2	0.05	1.1	0.27
metal	0.2	0.09	0.4	0.21	--	--	--	--
concrete/ asphalt	1.7	1.79	0.7	0.99	--	--	0.04	0.05
corrugated cardboard	--	--	--	--	7.1	0.14	2.4	0.05
other	5.6	1.54	0.2	0.54	1.0	0.27	0.5	0.14
Total	14.4	4.74	9.2	2.82	13.9	1.14	10.04	1.24

Explanatory note:

Waste generation rates vary depending on project type and size, subtrade efficiency, accurate material estimation, on-site materials storage procedures and product packaging.

Estimate the volumes or quantities of materials generated on the site by multiplying the floor area of your project with the generation rates listed for the different materials.

Handling & Storage Procedures

Item or Material by Division	Suggested Action
03 CONCRETE	
Cast-in-place Concrete	Recyclable - usually too large for salvage and reuse
Precast Concrete	Recyclable - usually too large for salvage and reuse
04 MASONRY	
Concrete Block	Salvageable - if not concrete filled - recyclable if filled with concrete
Paving Stones	Salvageable - stack and palletize for easy removal
Brick	Salvageable - if set with lime-based mortar - recyclable if set with concrete
Decorative Concrete Block	Salvageable - if not concrete filled - recyclable if filled with concrete
05 METALS	
Reinforcing Steel (rebar)	Recyclable - usually imbedded in concrete, therefore not reusable
Steel Flashing and Trim	Recyclable - usually not in suitable condition for reuse
Interior Metal Wall Studs	Recyclable - usually too time-consuming to save in suitable condition for reuse
Structural Steel	Salvageable - includes I-Beams, H-Beams, Square Tubing, Pipe, and Chanel Iron - ensure care is taken to keep straight - separate by size and type
Cast Iron	Recyclable - usually too old and brittle for reuse
Copper	Recyclable - rarely salvageable due to the high likelihood of damage while salvaging
Aluminum Soffit and Trim	Recyclable - usually not in suitable condition for reuse
Misc. Steel	Salvageable - includes Pipe, Q-decking, Square-tubing, and Wilson joists - prior to reuse must determine the item's structural ability to meet current Building Code - recyclable if item is bent or structural ability is compromised
06 WOOD, PLASTICS & COMPOSITES	
Regular Wood Framing	Salvageable - all lumber should be slated, stacked and banded according to dimension and lengths - stacks should be kept uniform (ensure piles can be accommodated on truck deck, recommend stacking 2 piles side by side to a maximum width of 4' per pile including dunnage and maximum height of 3' to 4')
Pressure Treated Wood Framing	Salvageable - same as regular wood framing
Regular Plywood Sheathing	Salvageable - stack in piles keeping full sheets together and partial sheets together in lots of 50 pieces - separate by thickness - recommend stacking nail side to nail side - materials should be kept dry by covering with plastic sheeting (which also allows for air flow)
Pressure Treated Plywood Sheathing	Salvageable - same as regular plywood sheathing - do not mix with regular plywood sheathing
Laminated Beams	Salvageable - beams should be kept dry by covering with plastic sheeting (to allow for air flow) - beams should be supported in such a manner as to keep them straight and should be slated to allow air flow when stacked
Wood Truss Joists	Salvageable - joists should be supported in such a manner as to keep them straight and should be slated to allow air flow when stacked - protect from rain
Heavy Timbers/Posts	Salvageable - all timber should be sorted according to dimension and length - timber should be slated to allow air flow - all damaged ends should be trimmed - protect from rain
Washroom Counters	Salvageable - if fixtures are removed, counters can be stored vertically – protect from rain
07 THERMAL & MOISTURE PROTECTION	
Roofing Gravel	Salvageable - reusable
Fiberglass Bat Insulation	Salvageable - protect from rain
Rigid Fiberglass Insulation	Salvageable - protect from rain
Polystyrene Rigid Insulation	Salvageable - stack and band for easy transport
Copper Flashing	Recyclable - usually too time-consuming to save in suitable condition for reuse
Roof Drains, Metal	Recyclable - usually too time-consuming to save in suitable condition for reuse

08 OPENINGS	
Doors, Metal	Salvageable - remove with full frame and hardware - apply a metal self tapping screw through the top of the door to hold it in the frame as a unit - label keys belonging to each door
Doors, Wood	Salvageable - remove with full frame and hardware - nail the door through the frame to keep from falling out of jam - label keys belonging to each door
Bi-Fold Doors, Metal	Salvageable - remove all hardware parts and attach to door (e.g. in plastic zip lock bags) - wrap track on edge of door with duct tape
Bi-Fold Doors, Wood	Salvageable - remove all hardware parts and attach to door (e.g. in plastic zip lock bags) - screw track on edge of door
Overhead Doors	Salvageable - must be removed carefully (as doors have spring assembly) - all door hardware should be kept together with door- (hinges, screws, rollers, guides etc.) - door panels should be stacked face to face - track should be marked left and right - note, it is very important to keep all parts
Metal Sliding Doors	Salvageable - dependent on size and condition of doors and hardware - recyclable otherwise if too large or not in suitable condition
Mechanical Closures	Salvageable - dependent on age and physical condition
Panic Hardware	Salvageable - keep all parts together (e.g. in plastic zip lock bags)
Patio Doors	Salvageable - remove and stand vertically with drains to the bottom
Aluminum Windows	Salvageable - dependent on size - smaller windows should always be salvaged but larger windows can be difficult to resell (especially if fixed/non-opening) - recyclable otherwise by removing glass and recycling frame
Steel Windows	Salvageable - dependent on size - smaller windows can be salvaged but limited marketability - recyclable otherwise by removing glass and recycling metal frame
Sealed Glass Units	Salvageable - limited marketability - store vertically or horizontally - ensure panels are level or supported in order to prevent damage to the seal
Unframed Glass Mirrors	Salvageable - store vertically on either a carpet, cardboard, or rubber surface for protection - recommend storing face to face
Store Fronts	Salvageable - best to be keep in one unit - store on A-frame rack and tie back
Skylights	Salvageable - ensure that seal is not broken - store where not affected by wind
09 FINISHES	
Carpet/Carpet Tiles	Salvageable - dependent on condition
Terra Cotta Tile	Salvageable - dependent on quantities available, since sometimes difficult to match if product is obsolete
Wood Base Board	Salvageable - remove, denail (if possible), stack face to face, and hold together with duct tape - keep sizes and lengths together (if possible)
Hardwood Flooring	Salvageable - if tongue and groove flooring - remove, denail, stack face to face, and hold together with duct tape - keep lengths together (if possible) - thin strip flooring is not salvageable (i.e. too thin for refinishing)
Gypsum Panels	Recyclable
Wood Paneling	Salvageable - dependent on condition (otherwise not cost effective) - recyclable otherwise (with clean wood)
Metal Suspension System	Recyclable - usually too time-consuming to save in suitable condition for reuse
Specialty Wood Finishes	Salvageable - includes mantels, built-in shelving, bookcases, crown moldings, and window sash - keep all trim work where possible
Cabinets	Salvageable - includes kitchen and bathroom cabinets - if possible, photograph the cabinet in place prior to removal to indicate potential reuse and to give purchasers a better idea of how the cabinets would look in place

10 SPECIALTIES	
Toilet Partitions	Salvageable - must ensure all hardware is available
Framed Glass Mirrors	Salvageable - store vertically on either a carpet or rubber surface for protection - recommend storing face to face
Towel Racks, Soap Dispensers, and Other Washroom Accessories	Salvageable - for commercial products ensure all keys to open units are included
Shower Stalls	Salvageable - if acrylic stalls - ensure the stall is suitable condition and not cracked or overly worn
Chalk boards and White boards	Salvageable - limited marketability
Metal Lockers	Salvageable - for ease of handling and resale, break into units of 6 or less
Old Hardware	Salvageable - includes glass door knobs, hinges, and antique items
11 EQUIPMENT	
Household appliances	Salvageable - dependent on condition - includes fridges, stoves, stove hoods, dish washers, freezers, washers, and dryers - recyclable otherwise
12 FURNISHINGS	
Metal File Cabinets	Salvageable - dependent on condition - recyclable otherwise
Metal Shelving Unit	Salvageable - when dismantling ensure all bolts, nuts and additional parts are kept together - recommend marking sections in order to make it easier to re-erect
Commercial Metal Racking	Salvageable - when dismantling ensure all bolts, nuts and additional parts are kept together - recommend marking sections in order to make it easier to re-erect
Metal Desks	Salvageable - dependent on condition - recyclable otherwise
Wood Desks	Salvageable - dependent on condition - recyclable otherwise
14 CONVEYING EQUIPMENT	
Winches	Salvageable - dependent on mechanical condition - recyclable otherwise
22 PLUMBING	
Toilets	Salvageable - limited marketability due to current Plumbing Codes (white toilets offer the best resale opportunities) - recyclable otherwise (sink with concrete and taps with metals)
Urinals	Salvageable - ensure there are no cracks and the hardware is working - recyclable otherwise (sink with concrete and taps with metals)
Ceramic Sinks	Salvageable - dependent on condition - recyclable otherwise (sink with concrete and taps with metals)
Stainless Steel Tanks	Salvageable - dependent on previous usage (sometimes required to destroy for contamination reasons) - recyclable otherwise
Janitor Sinks	Salvageable - dependent on condition - recyclable if made of old cast iron
Bath Tubs	Salvageable - dependent on condition and colour (white bath tubs and old claw foot tubs offer the best resale opportunities)
23 HVAC	
Radiators	Salvageable - dependent on size (for ease of handling, 20 to 25 ribs would be the maximum suitable size for salvaging) and condition - recyclable otherwise
Hot Water Tanks	Salvageable - if year 1995 or newer - recyclable otherwise
Suspended Blow Heaters	Salvageable - if year 1990 or newer - recyclable otherwise
Wall Mount Radiators	Salvageable - dependent on condition - recyclable otherwise
Wall Mount Electric Radiators	Salvageable - dependent on condition - recyclable otherwise
Mechanical Water Pumps & Tanks	Salvageable - dependent on condition - recyclable otherwise
Oil Interceptor	Recyclable
Oil Storage Tank	Salvageable - dependent on previous usage (sometimes required to destroy for contamination reasons) - recyclable otherwise
Ventilation Ducting	Salvageable - dependent on size and condition - recyclable otherwise
Metal Ducting\Ventilation	Salvageable - dependent on size and condition - recyclable otherwise
Stainless Steel Ducting\Ventilation	Salvageable - dependent on size and condition - recyclable otherwise

23 HVAC Cont'd	
Copper Ducting\Ventilation	Salvageable - dependent on size and condition - recyclable otherwise
Aluminum Ducting\Ventilation	Salvageable - dependent on size and condition - recyclable otherwise
Piping	Salvageable - dependent on size and condition - recyclable otherwise
Exhaust Hood, Galvanized Metal	Salvageable - dependent on size and condition - recyclable otherwise
Exhaust Hood, Stainless Steel	Salvageable - dependent on size and condition - recyclable otherwise
Supply Air Units	Salvageable - dependent on age, condition, and marketability - specialty item
Return Air Metal Grill	Salvageable - dependent on condition or if considered a specialty item - recyclable otherwise (with metals)
Fresh Air Metal Diffuser	Salvageable - dependent on condition or if considered a specialty item - recyclable otherwise (with metals)
Fire Bells	Salvageable - dependent on condition or if considered a specialty item - recyclable otherwise (with metals)
Air Receiver Tank	Salvageable - based on marketability - specialty item
Compressor Tank	Salvageable - based on marketability - specialty item
Compressor Motor	Salvageable - dependent on age and condition - recyclable otherwise
After Cooler	Salvageable - based on marketability - specialty item
Boilers (hot water heating)	Salvageable - dependent on age, size and condition - recyclable otherwise
HVAC Roof Systems	Salvageable - dependent on age and condition - recyclable otherwise
Gas Furnaces	Salvageable - dependent on size and condition and if year 1995 or newer - recyclable otherwise
26 ELECTRICAL	
Transformers	Usually tested for PCBs and if confirmed, then handled as a special waste - salvageable otherwise
Switch Boxes	Salvageable - dependent on age, size and condition - recyclable otherwise
Receptacle Switches	Salvageable - dependent on age and condition - landfilled otherwise
Receptacle Plugs	Salvageable - dependent on age and condition - landfilled otherwise
Heat Detectors	Salvageable - dependent on age, size and condition - landfilled otherwise
Exhaust Fans	Salvageable - dependent on age, size and condition - recyclable otherwise
Electrical Ceiling Blade-Fans	Salvageable - dependent on age, size and condition - recyclable otherwise
Incandescent Light Fixtures	Salvageable - dependent on age, size and condition - recyclable or landfilled otherwise
Fluorescent Light Fixtures	Usually tested for PCBs and if confirmed, then handled as a special waste - salvageable otherwise - dependent on age and condition
Battery Lighting Fixtures (wall mount)	Salvageable - dependent on age (as sometimes batteries are limited to holding a charge) - landfilled otherwise
Exit Lights	Salvageable - dependent on age (as sometimes batteries are limited to holding a charge) - landfilled otherwise
Panel Boxes	Salvageable - dependent on age, size and condition - recyclable otherwise
Commercial Vapor Lights	Salvageable - dependent on age and condition - landfilled otherwise
Street Lights on Poles	Salvageable - dependent on age, size and condition - recyclable otherwise
32 EXTERIOR IMPROVEMENTS	
Asphalt Paving	Salvageable - reuse for temporary road construction
Chain Link Fencing	Salvageable - roll up chain link and cut off posts to maximum length possible - all accessories (tops, clamps, bolts, straps, etc.) should be kept together in a container and labeled
Wood Fencing	Salvageable - if possible, dismantle in sections for easy re-erection - cut posts off at ground level