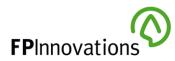
Design: Tips for Durable Wood Building Envelopes

Key Point	Don't, for example:	Do:
Kiln dried wood, glulam, LVL,	Store wood materials exposed	Protect wood from rain and soil during
LSL, plywood and OSB are too	to rain or on soil.	transport and storage.
dry to decay or support substantial	Ignore opportunities for	Prefabricate systems as much as possible
mould growth at time of	prefabrication.	under dry conditions
manufacturing.	1	
	Expose wood systems to rain	Install water-resistant barriers on walls and
	for extended periods.	roofs ASAP.
	Enclose wet wood into	Allow time or use supplementary heating to
	building assemblies	dry out wet wood.
Wood expands as it absorbs moisture and contracts as it dries. The expansion/shrinkage mainly	Design balconies and roof	Design slopes taking into account
	decks without considering	shrinkage, compression, other movement
	building movement.	and drainage requirements.
occurs in the cross sections, and is		
negligible in the longitudinal direction.	Design interfaces at cladding	Design so windows, interfaces, penetrations
	without considering building	and flashing accommodate movement.
	movement.	
	Design air barriers without	Design so the continuity of the air barrier
	considering building	will not be compromised by movement
	movement.	
	Rely entirely on caulking as a	Design so caulking is not the critical
	water shedding surface.	element of the water management system.
Wind-driven rain is a major	Expose walls unnecessarily.	Use pitched roofs and overhangs
source of moisture.	Use face sealed walls in high	Use pressure moderated rainscreen wall
	exposure situations.	systems where appropriate.
	Expect components under	Design to accommodate diagonal rainfall.
	overhangs to always stay dry.	
	Expose penetrations in walls	Detail penetrations to shed water
Wind-driven snow is a major	Create points where wind can	Detail to exclude snow.
source of moisture.	funnel snow into the building.	
Ground water is a major source of	Expect equal water pressure	Put extra effort into diversion and drainage
moisture. Water entering	on all sides of basements.	on the uphill side of a building.
basements and parkades can also	Put untreated wood in direct	Separate wood from concrete with a space
evaporate and move as vapour	contact with concrete below	or membrane or use treated wood in
into the building.	150mm above finished soil	concrete where moisture may wick through.
C	level.	
Air leakage and condensation is a	Expect wall systems to resist	Minimize air leakage through good
major source of moisture.	air leakage without careful	detailing.
	design and construction.	
Vapour diffusion and	Expect walls to resist vapour	Minimize vapour condensation in wall
condensation is a major source of	diffusion without careful	assemblies by placing vapour retarder on
moisture in colder climates.	design and construction.	warm side of insulation.
Dryer vents are a major source of	Discharge dryer vents into	Discharge dryer vents in areas that can mix
moisture.	enclosed spaces (e.g. soffits)	well with outside air and design for
	or to inaccessible locations.	accessibility to unblock the vents.
Impermeable surfaces divert rain	Expect water to find its own	Think like a raindrop and figure out where
to other envelope components	way safely off the surface	water will go
to other envelope components		
	Leave ends of flashing flat	Detail flashing with end dams
Water runs down hill	Funnel water into building	Slope surfaces away
	Interrupt the flow of water.	Install crickets around chimneys, posts on
		balconies etc.

	Slope penetrations to inside.	Slope penetrations to outside.
Impermeable building components may develop holes during transport and holes will be required for installation or as part of construction.	Expect windows to shed rain away from the wall	Detail openings to shed rain that penetrates the window frame.
	Expect membranes to keep out all water.	Detail for redundancy in moisture management.
	Design built-in planters or green roofs without well designed drainage systems	Install drainage to ground or stormwater for all built-in planters and green roofs.
Less water penetrates if liquid water does not stay in contact with the hole for long.	Discharge downpipes on flat roofs, balconies or walkways.	Conduct rain to ground.
	Put fasteners through horizontal membranes.	Avoid puncturing membranes. Fix railings to balcony fascia.
Wood takes up liquid water	Expose tops of wood columns	Cap tops of wood columns
mainly through end grain and cracks in the top surface.	Extend untreated wood beams beyond the roof line without protection.	Use flashing on top surface and ends with a ventilation space. Use surface and depot treatment.
Wood does not decay if it gets wet. It decays if it stays wet. Wood needs to dry to limit deterioration.	Put wood in situations where water will accumulate.	Position and detail to shed water and prevent water trapping.
	Put low permeance materials on both sides of wood components that may get wet unless it is durable wood.	Ensure the side of the wood system on which vapour is expected to exit has low permeance materials.
Wood dries faster if well ventilated.	Put wood in situations where ventilation does not occur.	Design so that there is adequate ventilation to facilitate drying.
	Seal tops of rainscreen cavities.	Provide flashed gap at top of cavities except under soffits or parapets due to wind-driven rain.
	Design unvented unheated walls	Design vents to facilitate drying of unheated walls.
Wood buildings are easily adapted for new uses and are often kept in use longer than concrete and steel buildings. Like all materials, wood needs regular maintenance and occasional repair.	Expect wood-frame buildings to be torn down in 30 years.	Design as though the building might last 200 years.
	Use less durable materials to support durable materials.	Use naturally durable or treated wood for structural components.
	Use short life material in places vulnerable to moisture behind long life material.	Use naturally durable or treated wood within clad unvented columns and parapets.
	Design walls inaccessible by ladder or cherry picker.	Design walls, attachments and landscaping for access.
Minimizing moisture ingress and accumulation will reduce but not eliminate termite attack.	Rely only on the building code for termite management in termite zones.	Use the 6Ss: Suppression, Site management, Soil barrier, Slab/ foundation, Structure durability, Surveillance + Remediation

Note: For more detailed information, visit <u>www.durable-wood.com</u> Suggestions and comments? Contact Jieying Wang <u>Jieying.wang@fpinnovations.ca</u>, (604) 222-5649







http://wood-works.org/

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