



Chapter 3: The House Frame

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Shrinking Wood

LUMBER USED FOR FRAMING A HOME MUST NOT CONTAIN MORE THAN 19 PER CENT MOISTURE. DURING THE FIRST HEATING SEASON, SHRINKAGE CAUSED BY THE CONTINUED NATURAL DRYING OF THE WOOD MAY CAUSE THE FOLLOWING ISSUES:

- Thin cracks may appear in exposed wood structural members (e.g. joists and beams)
- Small gaps may appear between countertops, cabinets, vanities and the wall and minor joints may open in door and window trims, baseboards etc.
- Fireplace mantels may shrink slightly and separate from the wall or at joints
- Gaps may appear between individual wood floor pieces or between the floor and the baseboard, door jambs or stair treads
- Squeaks may develop in floor underlay, wood flooring and stair treads.

Wood expands and shrinks when the humidity level changes. Minor shrinkage is inherent to wood construction and does not impact the structural integrity of your home. In many cases, gaps from shrinkage can be attributed to temperature extremes

between the interior and exterior walls in the winter months (thermal bowing, truss uplift etc.). These gaps and cracks may become less noticeable when more temperate weather returns.

Main Support Beams & Telepost Adjustments

Adjustable steel posts or ‘teleposts’ are used to support main beams in the basement and transfer loads to the foundation. The bearing plate at the top of the telepost should be fastened to and rest snugly beneath the beam.



On a regular basis, homeowners should check that the supporting post is truly supporting the beam. Uneven pressure on a beam can cause issues down the road, so you should check the level of the beam with a four-foot level to ensure everything is properly positioned. If adjustments are necessary, hire a contractor specializing in this type of structural work.

If you are finishing the basement, consider a design that gives you easy access to adjust the teleposts and the beams above the teleposts. Ensure the new interior walls are built and installed

short of the supporting floor joists. A gap of 35 -50mm between the top of wall stud and bottom of floor joist (or beam) is recommended to allow for normal settlement or heaving.

Moisture beneath the concrete basement floor slab can cause the earth beneath the slab to swell and, consequently, lift the telepost. A downward adjustment of the telepost is required to bring the beam back to level. Settlement of the soil beneath the basement concrete slab would require an upward adjustment to level the beam.

If drywall is cracking or doors are starting to stick on the upper levels of your home, a telepost adjustment is likely required. Allowing for expansion and contraction along the main support beam will also reduce drywall cracking in the finished basement.

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Windows

Windows are typically composed of a vinyl frame or a wood frame covered by a metal skin on the exterior. The frames of vinyl windows and the exterior metal on a metal-clad window are virtually maintenance free. Interior wood finishes should be maintained as per the manufacturer's instructions. Weatherstripping between the fixed and opening parts of a window should be checked regularly and replaced when necessary. Clean windows yearly during moderate temperatures like the spring or fall using a solution of soap and warm water with a soft cloth. Do not use abrasive cleaners, razors or stiff brushes. Clean and lubricate hardware and tracks as recommended by the manufacturer



What is weatherstripping and how do I maintain it?

Weatherstripping provides a flexible seal around windows to prevent unwanted air from moving in or out of your home.

On windows that open outwards with a crank (casement or awning windows), the weatherstripping is usually a compressible, moulded strip of foam or rubber set against the frame towards the outside. The opening part of the window rests against the weatherstripping when the door or window is closed, forming an air and water seal.

On sliding windows, the weatherstripping is usually a flexible v-strip or a brush/bristle type and is placed between the track and the moveable window and at the point where the fixed and the sliding window meet.

Felt-type weatherstripping should be avoided as it can gather at one edge of the window over time and create an air gap. Weatherstripping that has lost its resiliency will not provide an effective seal and should be replaced. Check your windows each fall and reposition or replace this weatherstripping as required.

Weatherstripping will lose its flexibility if painted.



Why is my window leaking?

Water movement from the outside of the home to the inside through windows can occur if a window is not properly closed or if the weatherstripping around a window opening is damaged or worn. Windows can also introduce water into the building if the window's drain ports, designed to drain water out from an opening portion of a window, are plugged. Water leakage can pool on the interior casings and sill and, if left unattended, will stain the finishes or cause water damage.

Many windows provide a small drainage port on the outside-face of the bottom sill of the window. This round or oblong opening is often capped and drains any water that finds its way behind the weatherstripping or window/frame seal to the outside of the window. This opening must be clear of debris (e.g. fluff, insect webs etc.) so water can flow out.

The seal between the window glass and the window frame is designed to withstand a certain level of wind-driven rain. Should a major storm occur, it may produce leakage in windows that normally would not leak.

Water leakage should not be confused with condensation. Condensation occurs when water vapour in the air, inside the home, condenses on a cold interior window surface. If there is enough water vapour, it can condense and form ice on the window. When this ice melts, it will flow onto the sill and stain the finish or cause water damage.

Why is my window covered in condensation?

Condensation of moisture on interior windows occurs naturally when interior air with sufficient moisture (humidity) comes into contact with a cold window surface.

Air can only hold a limited amount of water vapour at any given temperature. As warm room air comes in contact with a cool window surface, the air cools and loses the ability to hold water. If the moisture in the air is high enough or if the surface of the glass is cool enough, the water in the air will deposit on the glass surface. This is called condensation.

Condensation typically appears on windows before any other surface

because windows usually have the least insulation value of anything on an exterior wall and react the quickest to changes in outdoor temperature.

When outdoor temperatures drop, you can reduce condensation in your home by limiting the amount of moisture in the indoor air. The number of occupants in the home will raise the humidity in the home and routine activities such as cooking, showering and laundry add moisture to indoor air. Plants, fish tanks and humidifiers are also examples of common household items that contribute to indoor moisture.



How can I reduce condensation on my window?

You can reduce moisture by venting moisture-laden air to the outside and by bringing fresh, dry air from the outside into the home. Ventilation is accomplished in many ways.

Exhaust fans placed near high sources of humidity, such as bathrooms and kitchens, are used to reduce localized humidity. Some new homes may also have a whole-home ventilation system. In its simplest form, this system consists of a central exhaust fan and a fresh air intake connected to the heating system.

The system may be operated by a timer or by a switch located in a central position in the home. A more advanced ventilation system will recapture heat lost in the ventilated air and will have dedicated ventilation ducts in various locations throughout the home.

Opening window coverings, even partially, during cold weather is an easy way to reduce condensation. Drapes can restrict

air movement near the window which will cause the glass surface to cool, creating the perfect environment for condensation.

Heat outlets placed near windows wash the window surface with warm air.

This increases the temperature of the window surface and reduces the potential for condensation. Do not deflect the movement of air away from windows or cover outlets with rugs or furniture. Finally, during periods of extreme cold, keep the furnace fan running to maintain a more even heat in the home.

Wood flooring manufacturers may recommend a certain humidity level be maintained to prevent warping, cracking and separating of wood flooring components. However, this floor maintenance must be balanced with the need to control window condensation and humidity in cold weather.

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My window has condensation between the panes of glass. Do I have to replace the window?

Heat moves through a dense material such as glass easily and quickly.

But, heat does not easily move through still air. By separating the pieces of glass in a window frame with an air space, the transfer of heat through a window to the outside is reduced. To work effectively, this separation must be airtight.

Window glass spacers are made from materials such as silicone foam, butyl rubber, metal or combinations of these materials. The spacer is bonded to the glass to form an airtight seal. This is achieved with adhesives, and in some cases, an additional layer of sealant. The spacer will contain a small amount of desiccant (a drying agent) that absorbs any moisture in the air trapped when the unit's sealed. The seal will also keep insulating gases such as argon between the window panes.

The panes of glass expand and contract when exposed to changing temperatures and amounts of sunlight. This occurs on a daily basis. Windows experience high temperatures when the sun shines through them. The temperature of the inside and outside panes of a window is rarely the same. These continuous changes in temperature place stress on the bonds of the adhesive between the edge spacer and the glass panes.

Over time, the seal between the spacer and the window glass will let go. When this happens, fresh air containing moisture will enter between the window panes. The desiccant drying agent will not be able to absorb all this moisture and air will begin to condense on one of the glass surfaces above the edge spacer. This is referred to as 'fog between the glass.' When this occurs, the sealed unit has failed. When the seal fails, the glass unit in the frame should be replaced. To repair/replace, contact the window manufacturer or a company that specializes in window repair/replacement.

FURTHER RESOURCES:

The City of Edmonton –
“Condensation Concerns Booklet”

Attic Ventilation

Attic ventilation serves two important purposes. First, it removes moisture that travels into the attic from the living space below through openings such as plumbing stacks, bathroom fans and attic hatches. Second, attic ventilation removes heat from the attic that can reduce the life of roof shingles. Attic ventilation is separate from ventilation used in the living space (e.g. bathroom exhaust fan).

Natural (passive) air flow is used to provide attic ventilation. With this method, air flows into the roof space through perforated soffits at the eaves and exits through passive (non-powered) vents located near the peak of the roof.

A continuous strip vent located along the peak or 'ridge' of the roof is called a ridge vent. A vent with a rotating top section on a round vent is called a rotating vent and a vent placed on the wall that encloses the attic at the end of the trusses is called a gable vent. The number of vents, and their positioning on the roof, is determined by the Alberta Building Code.

Passive roof vents function year-round and are generally maintenance-free. Do not block these vents in the winter months. In some cases, where attic spaces have complex roof designs, powered fans may be used. These units will require occasional motor maintenance.

Is it bad if there's moisture in my attic?



In high winds, even a properly installed roof vent may allow some moisture into the attic space. The moisture will usually evaporate without any staining or leakage to the interior of your home. It's possible for cellulose type insulation to be displaced during high wind events or storms. If leakage or staining does occur, inspect the attic to identify the source of the moisture.

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