

Now let's look at some common window problems.

8.1 Conditions

1. Leaks
2. Lintels sagging or missing
3. Frames
 - Rot
 - Rust
 - Racked
 - Deformed
 - Installed backwards
 - Drain holes blocked or missing
4. Exterior drip cap missing or ineffective
5. Exterior trim
 - Missing
 - Rot
 - Rust
 - Damaged, cracked or loose
 - Sills with reverse slope
 - Sill projection inadequate
 - Drip edge missing
 - Glazing compound cracked, missing, loose or deteriorated
 - Caulking or flashing missing, loose, deteriorated, rusted or incomplete
 - Paint or stain needed
6. Sash
 - Rot
 - Rust
 - Inoperable
 - Stiff
 - Won't stay open
 - Sash coming apart
 - Loose fit
 - Weatherstripping missing or ineffective
7. Interior trim
 - Rot
 - Stained
 - Missing
 - Cracked
 - Loose
 - Poor fit

8. Glass
 - Cracked
 - Broken
 - Loose
 - Missing
 - Lost seal on double or triple-glazed
 - Excess condensation
9. Hardware
 - Rust
 - Broken
 - Missing
 - Loose
 - Inoperable
10. Location
 - Sills too low
11. Screens
 - Torn
 - Rust
 - Loose
 - Missing
12. Storm windows missing
13. Too small for egress
14. Ice dams at skylights

8.1.1 Leaks

Windows may leak air or water. Water leaks are immediate problems.

CAUSES Leaks are usually installation problems or manufacturing defects.

IMPLICATIONS Water leakage is an immediate problem with respect to damage to windows and wall assemblies below, as well as interior finishes.

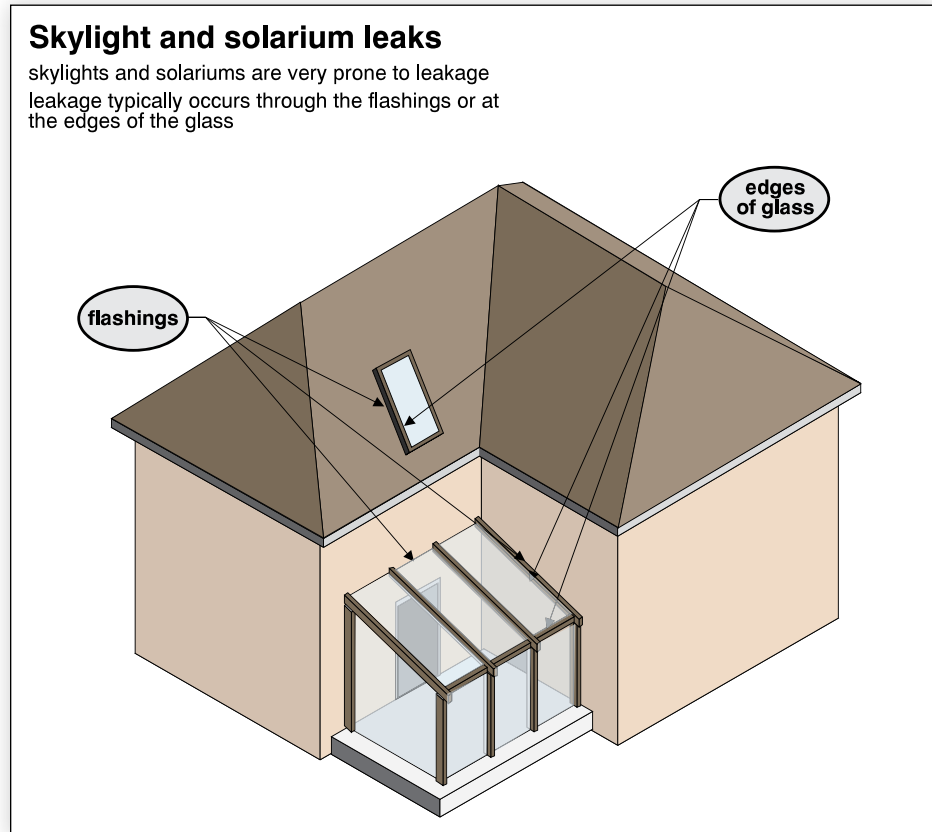
Air leakage affects heating and cooling costs, and may result in concealed rot damage.

STRATEGY We've already talked about being very careful to look around and below windows, especially at the corners. Look also for evidence of leakage at the top of the windows. You will sometimes see rust or water stains across the top of a window.

During warm, dry weather it is sometimes difficult to determine whether water damage around the bottom of a window is the result of condensation or leakage. If you can't be certain, allow for both possibilities.

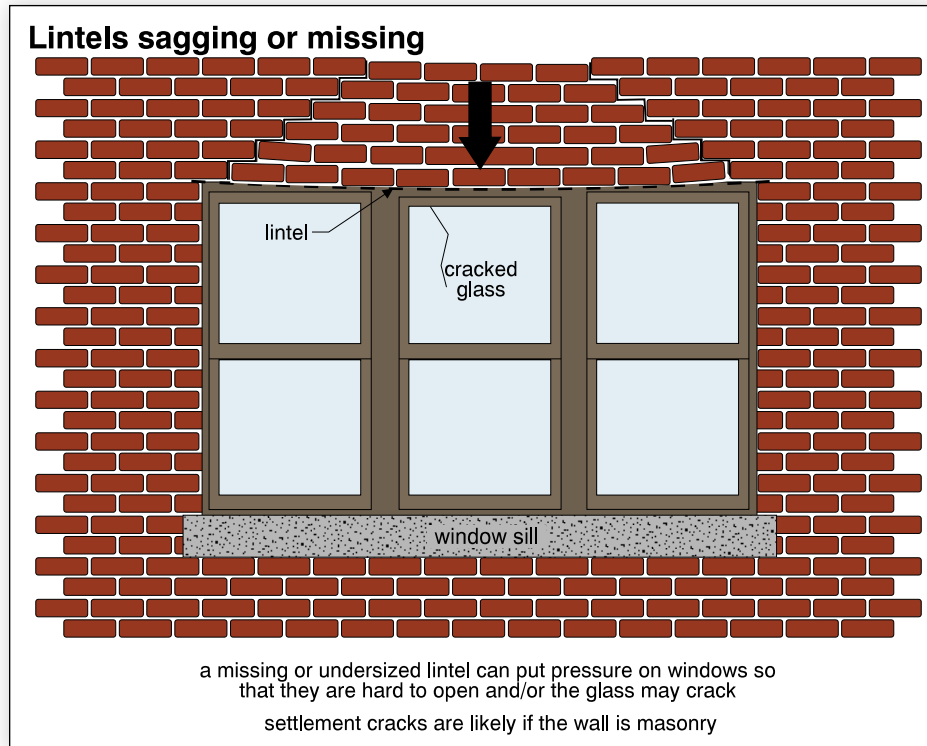
SKYLIGHTS
AND SOLARIUMS

The sloped glazing at skylights and solariums is susceptible to leakage because water gets hung up on the lips and edges supporting the glass. Flashings at curbs and solarium/wall intersections are also common leak spots. Look carefully for stains or water marks on the interior below and around the glazing and flashing. Wood sashes, muntins, mullions and framing members are **very susceptible to rot**. Check carefully, and probe if possible (don't damage finishes).



8.1.2 Lintels sagging or missing

This may be more visible from the outside of the building. It's common on large windows or groups of windows. If the lintel or arch is missing or ineffective, you will often see a sag across the top of the window or window group.



CAUSE Missing or undersized lintels are an installation issue.

IMPLICATIONS Windows may be difficult to operate and glass may crack. In severe cases, the wall section above may fail.

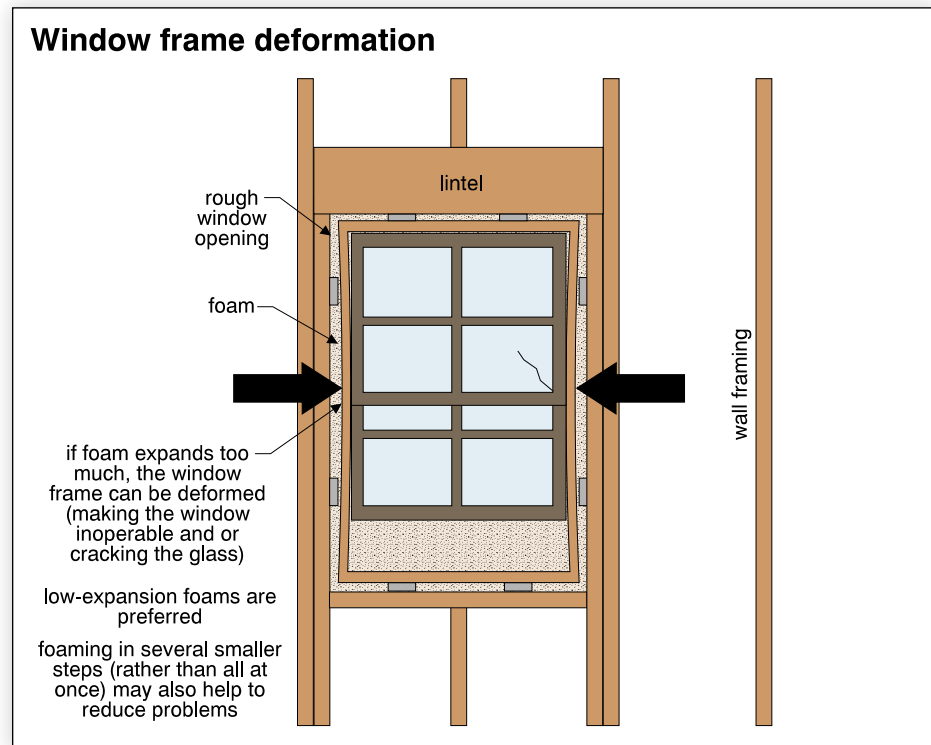
8.1.3 Frames

- Rot
- Rust
- Racked
- Deformed
- Installed backwards
- Drain holes blocked or missing

CAUSES

- Rotted and rusted windows are a maintenance issue.
- Racking is due to structural movement.

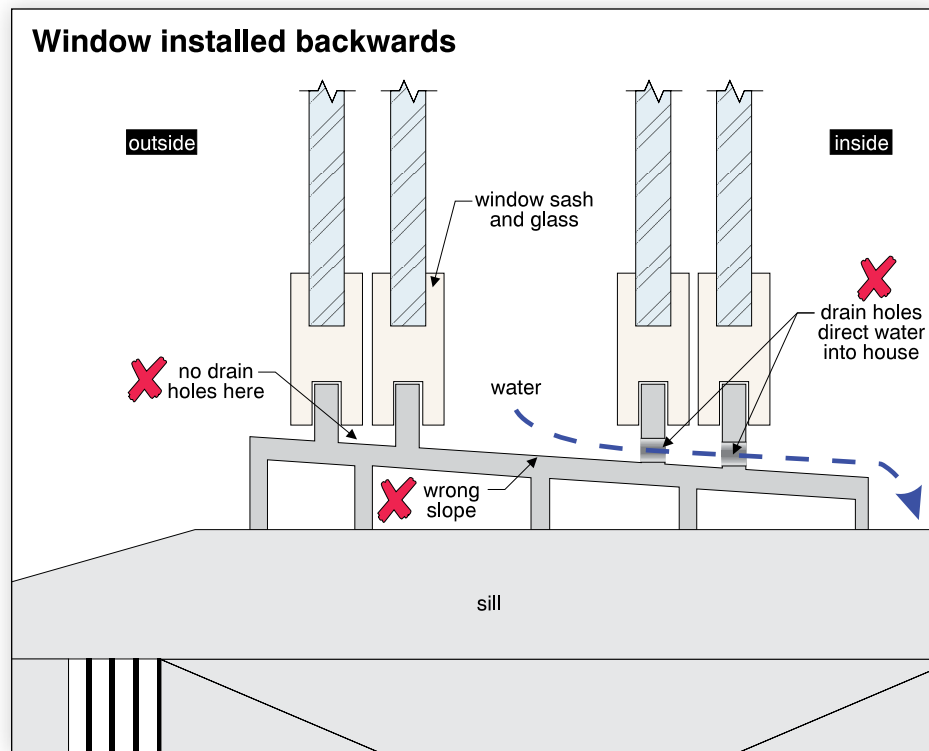
- Deformation of window frames is often the result of foaming the windows to insulate and air-seal the gap between the window frame and the house wall. Low-expansion foams, rather than high-expansion foams, are preferred. Foaming should be done in several small steps, rather than all at once, to avoid this problem.



- Installing windows backwards is obviously an installation issue.
- Blocked drain holes are a maintenance issue.
- Missing drain holes are manufacturing defects.

IMPLICATIONS The implications of rot, rust, racking and deformed frames are poor weather-tightness and operability. The window may not open or close. It also may crack and, if not corrected, windows may have to be replaced.

The implications of windows installed backwards are water leakage into the building. The sill will probably have a reverse slope and there will be no drain holes in any tracks that may catch water. Drain holes may be present inside the window but, of course, that will just direct water into the house.



The implication of blocked or missing drain holes is, again, water leakage into the home.

STRATEGY If you can get to the exterior sections of the frame, check for rot and rust. Probing wood sections, especially where there are horizontal edges that can collect water, or end grains exposed at corners is a good way to check for this. Don't be too enthusiastic and damage the wood by probing.

SIGHT ALONG FRAMES Check for racked or deformed frames by sighting along the top, bottom and sides of windows.

SILL AND DRAIN Check the sill slope and look for drain holes to ensure the window has not been installed backwards. Hardware may also provide a clue that the window has been installed backwards.

8.1.4 Exterior drip cap missing or ineffective

CAUSES Missing or ineffective drip caps are an installation issue.

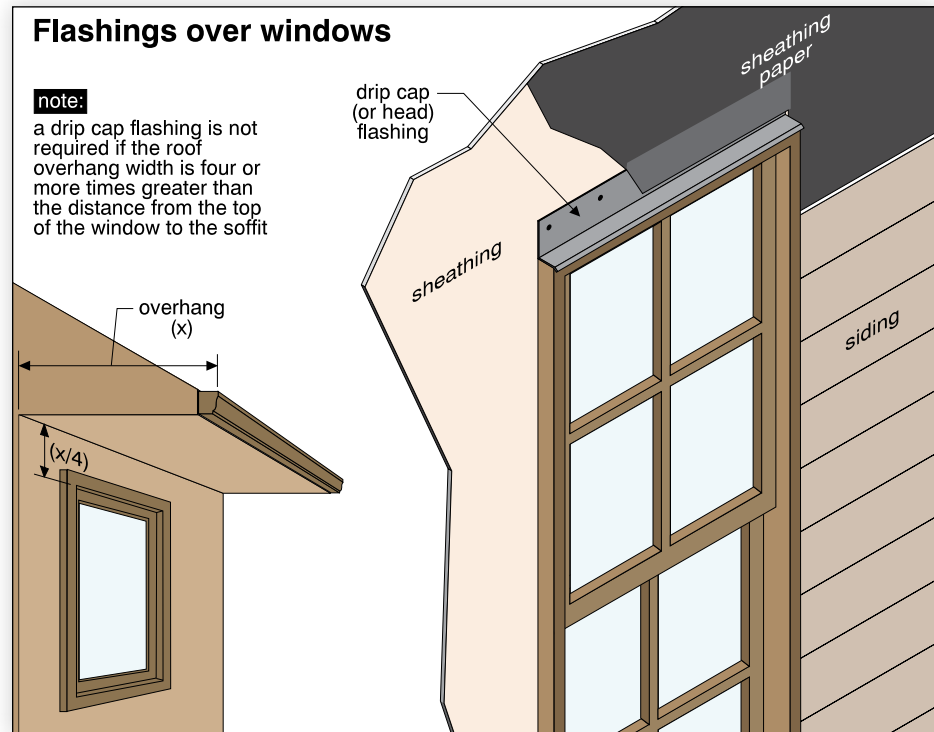
IMPLICATIONS The implication is water leakage into the window and wall system.

STRATEGY Look for metal caps that protect the tops of every window in wood-frame walls. You won't see this in masonry or brick veneer construction because the windows are recessed into the wall.

PROJECTION AND SLOPE Look for a projection of the cap beyond the window. We are looking for water to fall past, not onto, the window. The cap will be nearly horizontal but should slope to drain water away from the wall.

WIDTH The drip cap should be slightly wider than the window and should not allow water to drain off the side and get behind siding.

CAN SOMETIMES BE OMITTED If the windows are protected by the roof overhang, no drip cap may be needed. As a general rule, if the distance from the top of the window to the soffit is less than one quarter of the soffit width, we don't need a drip cap.



8.1.5 Exterior trim problems

Exterior trim includes brick molds, casings, sills, muntins and mullions. Problems include –

- missing
- rot
- rust
- damaged, cracked or loose
- sills with reversed slope
- sill projection inadequate
- drip edge missing
- putty (glazing compound) cracked, missing, loose or deteriorated
- caulking or flashing missing, deteriorated, loose, rusted or incomplete
- paint or stain needed

CAUSES These are either installation or maintenance issues.

IMPLICATIONS These problems may impact window performance. Leakage of water and air and operation problems are likely results.

STRATEGY You may have identified several of these conditions from your exterior inspection. If you look out through windows, you may pick up these from the interior.

8.1.6 Sashes

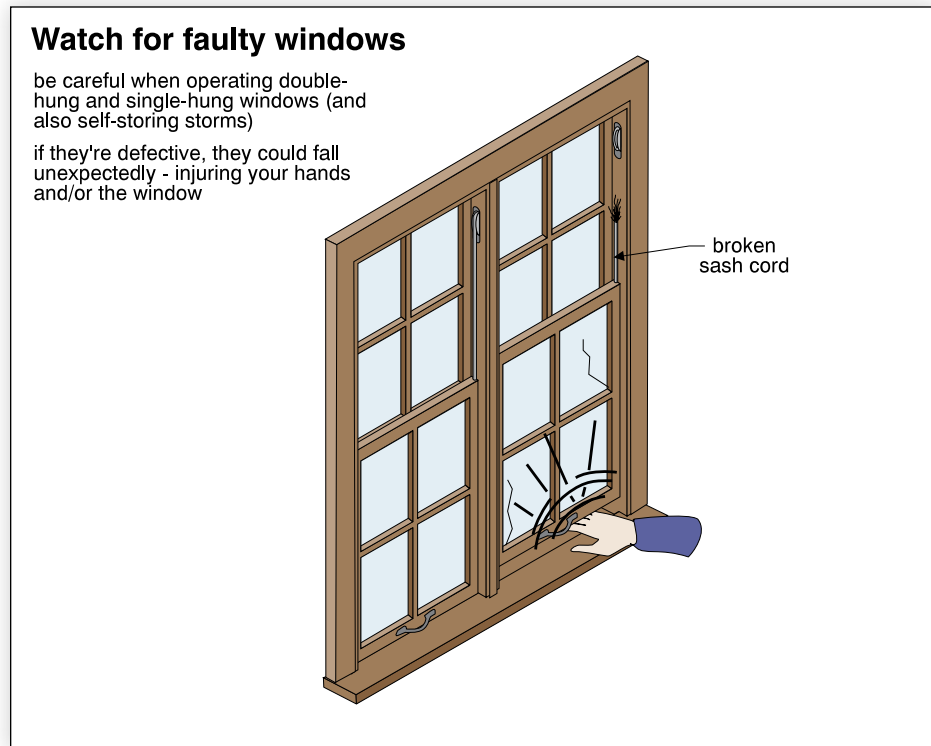
- Rot
- Rust
- Inoperable
- Stiff
- Sashes won't stay open
- Sash coming apart
- Loose fit
- Weatherstripping missing or ineffective

IMPLICATIONS Window leakage (air and water) and difficulties in operation are the implications.

STRATEGY Just as we looked at the frames, we should look at sashes for rot and rust. We recommend testing all operable windows if possible. You may find windows are painted closed or do not move easily.

CASEMENT PROBLEMS Crank-operated casement windows sometimes do not close tightly. To get the window to close, you may have to grab the top part of the sash and pull it in as you operate the crank. In some cases, you may have to go outside and push the window closed. Obviously, you'll be recommending adjustment or trimming if you encounter these problems. You should make sure you get the window closed tightly, if that's how you found it.

SINGLE AND DOUBLE-HUNG WINDOWS In **The Home Reference Book** we discussed several ways that double-hung windows were held open. This includes sash cords and counterweights, springs and coiled tape. You should be careful operating single and double-hung windows. The mechanism that holds the window up when opened may be defective. If the window falls, it can cause serious injury if your hands are below. The window and its glass can also be damaged.

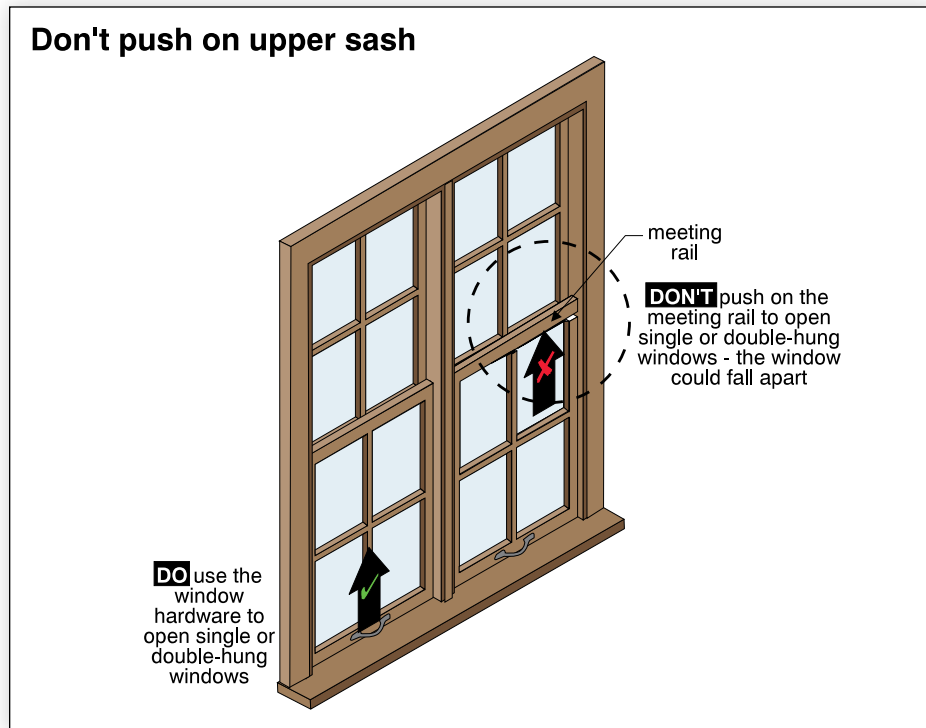


SELF-STORING
STORM WINDOWS

The same problem exists with single-hung, self-storing storm windows. Many of these systems use spring-loaded pins that sit in slots or holes to keep the window up. If the pins are not properly seated, the window can fall.

DON'T PUSH
ON UPPER SASH

There is a strong temptation to push on the upper horizontal part (**meeting rail**) of the sash to open a single or double-hung window. Resist this temptation. Most windows have hardware on the lower rail to open the window. Pushing on the upper rail will eventually lead to separation of the upper rail from the stiles on either side of the sash. The window literally falls apart. Watch for this problem as you operate single and double-hung windows and don't contribute to the problem. Use the hardware to pull the window open.



CHECK WEATHER STRIPPING AND FIT

As you operate windows, you'll get a sense of how snugly they fit. When the window is closed, look around the perimeter for obvious gaps or discontinuities in the weather stripping.

8.1.7 Interior trim

- Rot
- Stained
- Missing
- Cracked
- Loose
- Poor fit

CAUSES These are maintenance issues for the most part. Interior trim may be missing because it was never provided.

IMPLICATIONS These are primarily cosmetic problems, although rot or staining may indicate concealed damage to the structure behind.

STRATEGY Look at casings and the interior stool and apron (fancy names for interior sill and trim) for problems. In some cases, the interior stool is used for storing plants, which are watered regularly. This can cause water damage.

8.1.8 Glass

- Cracked
- Broken
- Loose
- Missing
- Lost seal
- Excess condensation

CAUSES These window problems are usually maintenance related. Lost seals may be the result of a manufacturing defect. Excess condensation on windows is usually a lifestyle and air quality issue.

IMPLICATIONS Cracked, broken, loose or missing glass can be both a heat loss and heat gain problem, and can be a risk of injury. If the glass is loose, it often rattles whenever someone walks through a room. People may be cut on broken glass.

LOST SEALS Lost seals are not particularly serious from an energy efficiency standpoint. The window will still perform reasonably well. However, visibility is often reduced, and the glass may look cloudy, even if there's no condensation present at the moment. Once the seal is gone, condensation will appear and disappear between the panes. This, however, leaves the interior surfaces of the glazing dirty, and the cloudy appearance develops.

EXCESS CONDENSATION Excess condensation will usually only occur during cold weather. It is the result of high humidity levels in the house. We talked extensively in the Insulation section about how we can control moisture levels inside the house. Eliminating moisture sources and using exhaust fans are obvious steps to control indoor moisture levels.

8.1.9 Hardware

- Rusted
- Broken
- Missing
- Loose
- Inoperable

CAUSES These are maintenance issues for the most part. Missing hardware may be the result of an incomplete original installation.

IMPLICATIONS Windows may not operate at all if hardware is missing or inoperable. Operation may be difficult. As mentioned with double-hung windows, if people push on the meeting rail, rather than using the appropriate hardware, the sash will eventually come apart.

LOSS OF SECURITY Window hardware typically includes locking mechanisms. If these are not effective, there is a loss of security for the home.

STRATEGY As you operate windows, you will recognize hardware problems. If the hardware is working but is obviously rusted or loose, note that in your report.

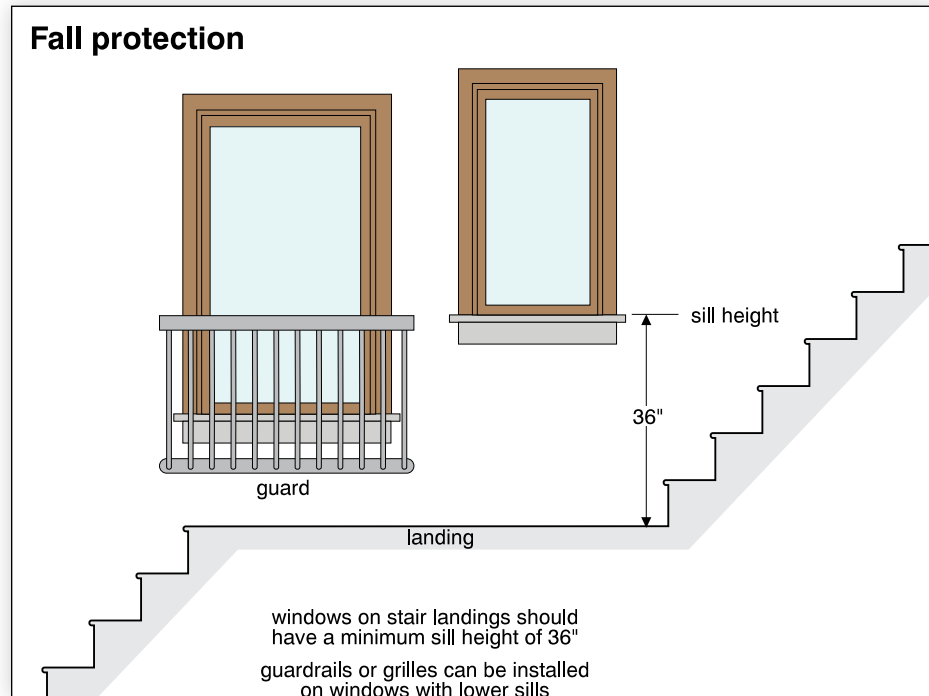
8.1.10 Location

- Sills too low

Windows at stair landings, for example, should have their sills at least 36 inches above floor level.

CAUSE Windows installed with low sills are an installation issue.

IMPLICATIONS If the sills are too low, someone stumbling on the stairs may fall out through the window.



STRATEGY Check that the windows are at least 36 inches above floor level. When they are lower and there is a risk of falling, you can recommend a guard or rail.

8.1.11 Screens

- Torn
- Holes
- Rust
- Loose
- Missing

Screens are typically nylon, aluminum or copper.

CAUSES Screen problems may be original installation issues, but are most often maintenance and mechanical damage problems. Rusting is a result of the screen's exposure to the environment.

IMPLICATIONS Screens are designed to keep insects and pests out of the home. If they can't do their job, insects will find their way into the house.

STRATEGY As you're looking at windows, it takes no more time to note whether the screens are intact.

8.1.12 Storm windows missing

In many climates, storm windows are usually provided. These may have been replaced with double-glazed windows. If single-glazed windows are noted in a heating climate, you may suspect there are storm windows available.

CAUSES Storm windows may never have been provided for the home, or may have been lost or damaged. It's more common, however, that storm windows are stored somewhere, in or near the house.

IMPLICATIONS Heat loss or heat gain are obvious implications of missing storm windows. Excessive condensation levels on the interior surfaces of primary windows is another implication. Adding storm windows will keep the interior glass warmer and reduce condensation. Storm windows also reduce drafts and may improve comfort as a result.

STRATEGY Look for evidence that storm windows have been installed on the outside in the past. There are often clips used to hold them in place. Check basements, garages and other outbuildings as you move through these areas. Very often you will come across storm windows.

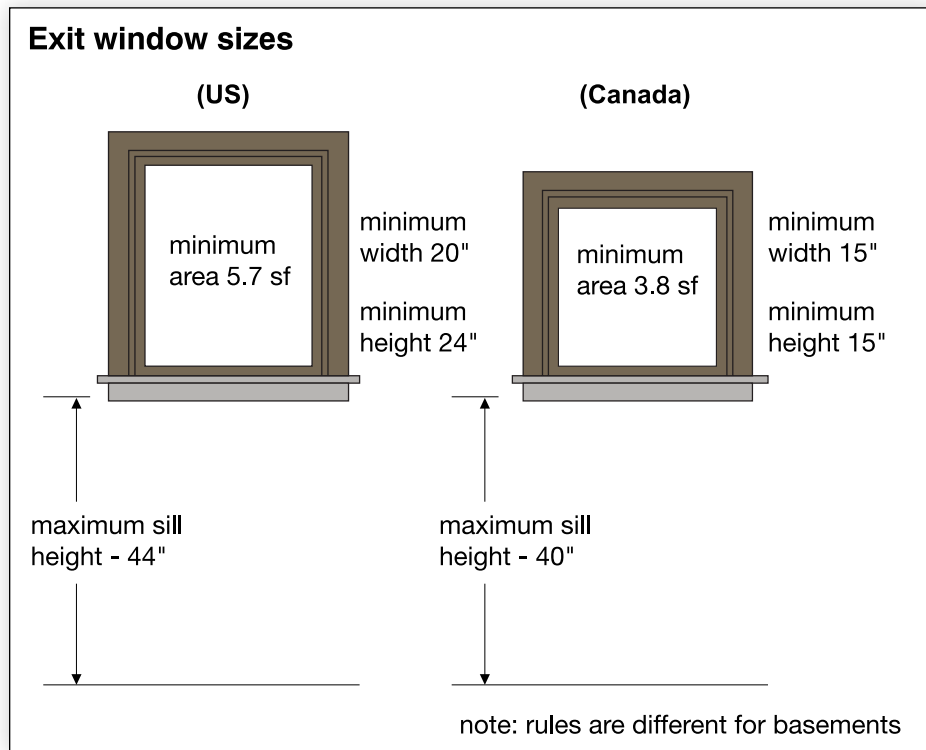
Most home inspectors don't go so far as to ensure there is a storm for each window, although you can usually get a sense of this. Tell your client that there are no storm windows in place but there are some stored in the house. Some clients will ask sellers to assure them that there are storm windows for all the windows.

8.1.13 Too small for egress

In many areas, windows have to be available for use as emergency exits. In some jurisdictions, every bedroom has to have a window that can be used as an emergency exit. In other jurisdictions, only one exit window is needed on each floor with bedrooms.

There are several size rules, depending on jurisdiction. In the US, the minimum requirement is 5.7 square feet. In Canada, the minimum requirement is 3.8 square feet.

The idea is that someone should be able to crawl out the window if there is a fire that prevents leaving the bedroom through the door.



SILL HEIGHT There are also conventions as to how close to the floor the sill must be. We don't want the window so high on the wall that people could not climb through it. Maximum sill heights for windows used as emergency exits range from 40 to 44 inches.

KEEP BEDROOM DOORS CLOSED While we're talking about emergency exits, it's interesting to note that some jurisdictions require every bedroom to have a door. While this seems like a trivial requirement, there's a very good reason for it. If bedroom doors are closed, this greatly reduces the rate at which fires can move through a house. The bedroom door will block smoke and fire spread and reduce the oxygen supply to a fire. The closed bedroom door can give the occupant an extra few precious minutes to awaken and get out of the house.

CODE COMPLIANCE INSPECTION? Home inspectors do not do code compliance inspections. You don't have to refer to the code to let people know the common sense wisdom of providing an emergency escape route. Some inspectors recommend rope ladders and point out bedrooms that do not have a secondary escape route from the house.

BASEMENT BEDROOMS Bedrooms in basements can be dangerous. If a fire starts near the stairwell, there may be no way out of a basement. Many areas require basement bedrooms to have windows that meet the size and height requirements we've talked about. There are also requirements for the size of the window well outside the window, since basement windows are often below grade level. Again, common sense is a much more valuable tool than trying to memorize numbers.

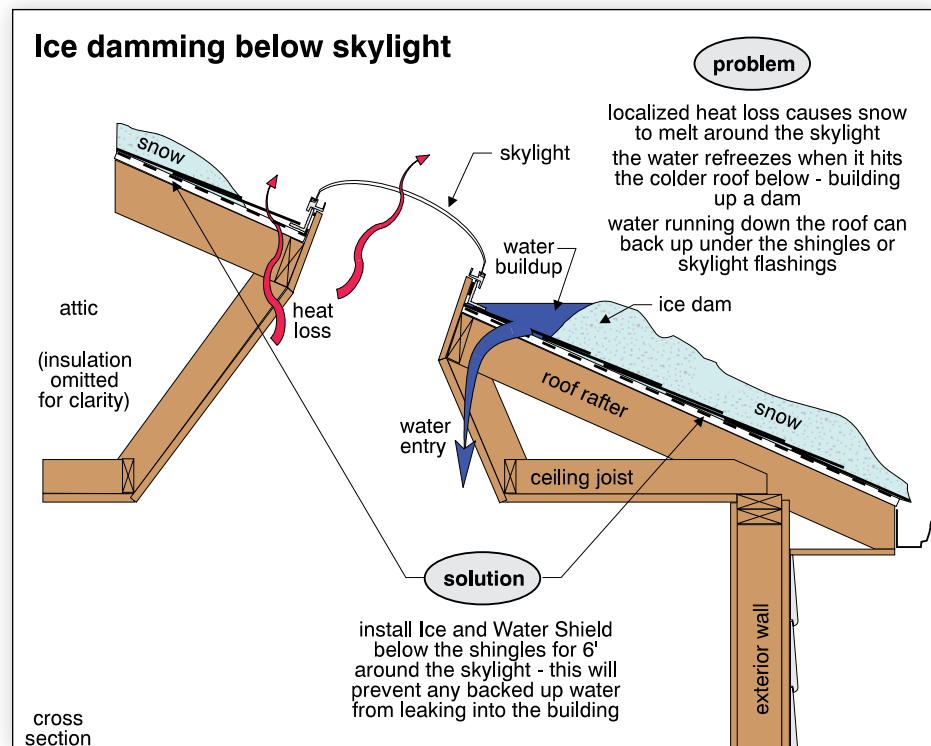
8.1.14 Ice dams at skylights

We talked about skylights in the Roofing Course. We also talked about insulating skylight wells in the Insulation section of this Course.

CAUSES Ice dams can occur around skylights because of the heat loss through the glass or acrylic area. Even if the light well and skylight curb are well insulated, there's going to be considerable heat loss through the glazing, whether it's glass or acrylic.

IMPLICATIONS Heat loss around the skylight will melt snow on the roof, immediately adjacent to the skylight. This melted snow starts to run down the roof and re-freezes. It's easy to understand how, as this water freezes, a dam can be built up around and below the skylight. This can cause water to back up through the roof shingles and leak into the building.

ICE AND WATER SHIELD Some skylights are installed with an apron of Ice and Water Shield, the self-adhering modified bituminous membrane often used as eave protection. This apron may extend out six feet around and below the skylight, under the roof shingles. This watertight membrane prevents leakage into the building even if water backs up under the shingles. This membrane is self-healing, so that when roofing nails are driven through it, the membrane won't leak around the nails.



STRATEGY Skylights are vulnerable to leakage. Many inspectors immediately describe leakage as the problem when they see water damage around the skylight. In cold climates, you should allow for the possibility that condensation may be a contributor. The issue that many don't think of, however, is the ice dam. Damage is usually localized below the skylight and slightly to the sides. Damage only occurs when the weather conditions are right.