

Recommended building code changes

BUILDING EXTERIOR

Provide a wall drainage cavity

New code: Require walls be built using a rain screen approach with a minimum ¼” air space (drainage cavity) behind the siding

Reasoning: To provide drainage for unanticipated water leaks that commonly occur and cause wall component wetting and resultant degradation. This approach has successfully been used in Canada for years and is a code requirement in Vancouver, B.C.

Improve installation of metal flashing

New code: Require z-metal flashing over all plant-on trim (such as at window heads and over belly bands)

Reasoning: To avoid water intrusion and resultant decay that commonly occurs without such flashing

New code: Require soldered joints in metal flashing

Reasoning: To avoid water intrusion by capillary wicking through non-soldered joints, which commonly occurs and causes moisture damage

Eliminate sources of exterior moisture

New code: Require concrete slab-on-grade floors be edge sealed

Reasoning: To prevent moisture migration from wet soil into the concrete (by capillary wicking) that often causes mold growth in ground floor walls and flooring

Existing code: Enforce existing code requirement that bottom drip edge of siding be greater than 6 inches above soil or masonry

Reasoning: To minimize siding decay or other wall deterioration that occurs from splash back of rain water onto siding that is too close to the soil or masonry

Existing code: Prohibit direct contact of siding or any other wood component with concrete

Reasoning: To avoid serious siding wetting and decay from contact with wet concrete

New code: Provide air space between deck ledgers and siding

Reasoning: To avoid trapping moisture that commonly results in wall decay

New code: Require testing of agricultural sprinklers to determine that sprinklers are not directly wetting the cladding

Reasoning: To prevent the exceedingly common direct or indirect wetting of siding that causes mold or decay

New code: Paint/seal bottom edge of all siding (especially fiber-cement, OSB, T1-11 plywood and shingles)

Reasoning: To prevent water intrusion from rain water splash back that commonly causes siding deterioration

Reduce moisture intrusion in dwellings with concrete slab-on-grade floors:

New code: Seal slab edges to restrict moisture entry

Reasoning: To reduce water intrusion by wicking from wet soil into the concrete slab that causes mold and other degradation in ground floor walls and flooring

New code: Do not allow use of sand layer beneath slab-on-grade construction

Reasoning: Water often leaks into the sand layer and provides a large source (reservoir) of water that wicks up into the concrete slab and causes flooring and wall moisture problems such as mold growth

Existing code: Require downspout connection to sewer where available or carry gutter downspout water away from house

Reasoning: To minimize wetting of soil adjacent to concrete foundation or slab on grade that causes wetting of concrete and resultant water intrusion into crawl spaces or basements or slab on grade floors

New code: Require installation of hard-wired, plumbed dehumidifiers in all ground floor housing with slab-on-grade floor construction

Reasoning: To help remove moisture that naturally evaporates from the concrete slab into the living space as the concrete dries because of the polyethylene sheet layer below the concrete that forces moisture upward

Initiate a New Code-Required Building Envelope Inspection (and Certification) Program:

New code inspection: Require stud spacing be maintained at 16” o.c. maximum, plus or minus 2” during framing inspection

Reasoning: Studs are often unevenly spaced at much greater than 16” o.c., resulting in siding waviness or buckling. Requiring more uniform spacing would greatly reduce such problems

New code inspection: Inspect building paper or house wrap for proper lapping and sequencing

Reasoning: Proper lapping and sequencing is essential to provide drainage of water that inadvertently leaks behind siding from getting behind the weather resistive barrier (building paper or house wrap) and hence reduce the incidence of decay

and other building component deterioration

Licensing/certification: Require training and certification of all window installers regarding proper installation of windows

The most common building envelope errors occur because of improper window installation, leading to mold and decay of building envelope components. Proper window installation is relatively complicated, and fairly often windows are improperly installed because the installers don't know how to install them properly, leading to water penetration and significant moisture damage to wall components. Window installation is a skill that requires proper training. Any trades person who installs windows should be licensed and certified, just as electricians and plumbers are licensed and certified.

BUILDING INTERIOR

Reduce moisture content in wall cavity:

New code: Require framing be dry enough to avoid mold growth (less than 19%) prior to insulation and drywall installation

Reasoning: Wet framing can contribute to mold growth in the walls and possibly in the living space, as well as contributing to decay of wall components

Improve spot ventilation---bathroom exhaust fans:

New code: Require minimum flow rate of 80 cfm (cubic feet per minute)

Reasoning: The actual flow through 50 cfm fans now allowed in Oregon is insufficient to satisfactorily remove moisture from showering and bathing activities. More flow is required. The State of Washington has required a minimum flow rate of 80 cfm for years.

New code: Do not allow sale of noisy bathroom fans with sound (noise) level over 2.5

Reasoning: It is imperative that bathroom fans be used to remove moisture generated in the bathroom, and most occupants will not use noisy fans. Thus a limit on the maximum noise level should be established to assure that fans that are too noisy will not be allowed

New code: Require bathroom fans be located directly over the shower or tub area to maximize moisture capture

Reasoning: This simple measure will greatly improve moisture removal and help avoid indoor mold growth

New code: Require some type of fan control that automatically turns fan on and off without occupant action

Reasoning: It is well known that occupants do not leave bathroom fans on long enough to

remove moisture from showering or bathing. This code change would allow fans to run long enough (about an hour) to remove most moisture generated in bathrooms

New code: Do not allow operable bathroom window in lieu of installing bathroom exhaust fan

Reasoning: Occupants simply do not open bathroom windows during wintertime. A bathroom exhaust fan should be required instead

Improve spot ventilation---kitchen exhaust fans:

New code: Do not allow kitchen fans that simply recirculate humid air from cooking and do not exhaust that moisture to the outdoors

Reasoning: Moisture generated during cooking can be a significant source of problems if not exhausted outdoors. Kitchen fans that exhaust outdoors should be required in all residences

New code: Do not allow kitchen fans with some (noise) levels greater than 4.0

Reasoning: Because kitchen fans generally have greater air flows through them than bathroom fans, they are typically noisier. Occupants often will not use a kitchen fan if it is too noisy. Thus a limit on the maximum noise level will help assure that cheap, noisy fans will not be installed. Having a fan that occupants will use will help exhaust moisture generated during cooking

Raise indoor surface temperatures (to lower surface relative humidities):

New code: Require louvered doors in closets on exterior walls (that are not directly heated)

Reasoning: Closets are typically not directly heated and so are prone to be relatively cold and grow mold. That is especially true of closets on exterior walls. Replacing the solid closet door with a louvered door improves the indirect heating of the closet space and thus helps reduce the potential for mold growth

Required renter mold agreement and education:

Require all renters be provided a copy of the EPA document on mold: “A Brief Guide to MOLD, MOISTURE, AND YOUR HOME” (available free from EPA). Also require all renters to sign a written recommendation to raise shades or blinds as long as possible to minimize mold growth around windows

Reasoning: The most common location of mold in residences is around cold windows. Mold growth is exacerbated by closing blinds or shades, especially if they are kept closed 24/7. Making the occupants aware that opening the blinds or shades when possible will minimize mold growth should result in occupants being better educated about mold so that they actively take a part in reducing its incidence in their apartments