

Chapter 6: Repair

Repairs are defined as items necessary for the effective performance or preservation of installed weatherization materials. Repair measures are required to be reasonable, cost effective, and performed only when needed to install a measure necessary to effectively weatherize a building. Examples include, but are not limited to, repairing minor roof leaks, electrical repairs, and fixing water leaks. Repairs may also include installing protective materials involved with weatherization measures, such as paint used to seal materials installed through weatherization.

Follow all applicable lead and asbestos-safe work practices when performing repairs.

6.1 Windows and Doors

Windows and doors typically make up a small percentage of a building's thermal boundary. It is rare that enough heat loss occurs through them to justify cost-effective repair or replacement.

Experience from blower door testing has shown windows and doors tend not to harbor large air leaks. Though conductive and convective losses through windows and doors are often quite high on a per-square-foot basis, these losses are not affected much by most simple weatherization improvements.

Replacing missing and broken glass, re-glazing glass, installing sash locks, and installing weather-stripping is usually considered air sealing, not repair work (see *Air-Sealing and Indoor Air Quality in Chapter 1 – Section 1.4*).

6.1.1 Window Repair and Replacement

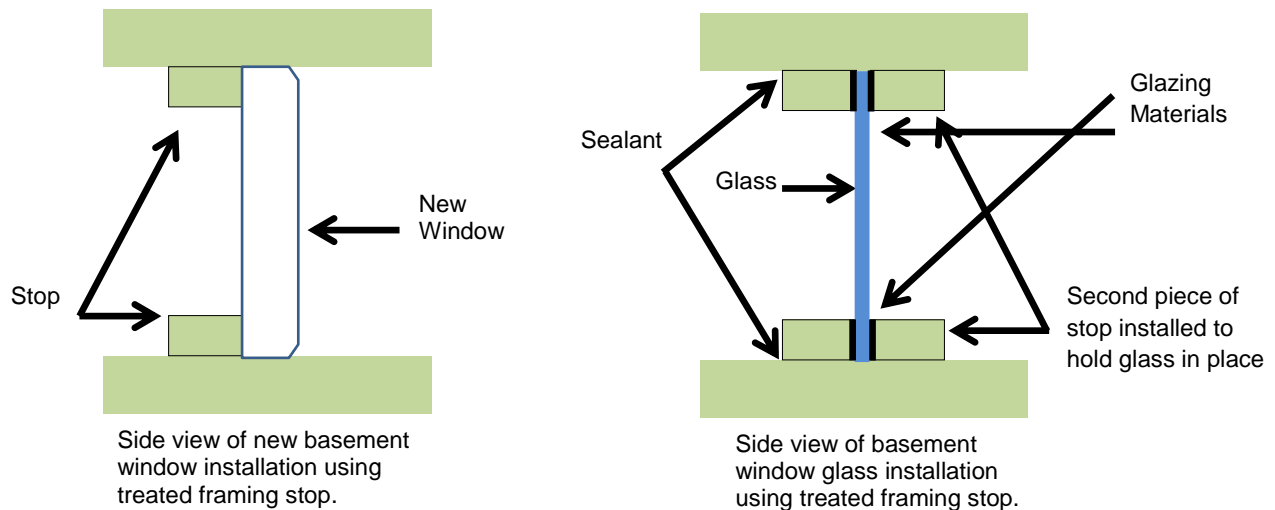
Observe the following standards for window repair and replacement:

1. Seal around a replacement window on the exterior and interior to prevent water intrusion and air infiltration.
2. When replacing or installing new exterior trim or stop, prime all bare wood.
3. When replacing a broken pane of glass, size the replacement pane $\frac{1}{8}$ " to $\frac{3}{16}$ " smaller than the opening, to allow for movement of the frame.
4. Install tempered safety glass when the location requires it.

Replacing or Repairing a Basement Window

Determining whether to repair or replace windows located in an unintentionally conditioned basement is based upon customer use. Covering the entire window with plywood or other sheathing should only be considered when it is clear that the customer is agreeable to this option.

Before installing a new basement window, remove rotted framing and replace with pressure-treated lumber. Seal around framing to prevent water intrusion. Standard-size vinyl basement windows are a good choice for replacement when the customer requires an operable window, or cut a custom-sized piece of glass for the opening, allowing natural light to enter. Install a stop inside the framing as needed to place new window or glass against. A second piece of stop is used to hold the glass in place from the inside, creating a fixed-pane window.



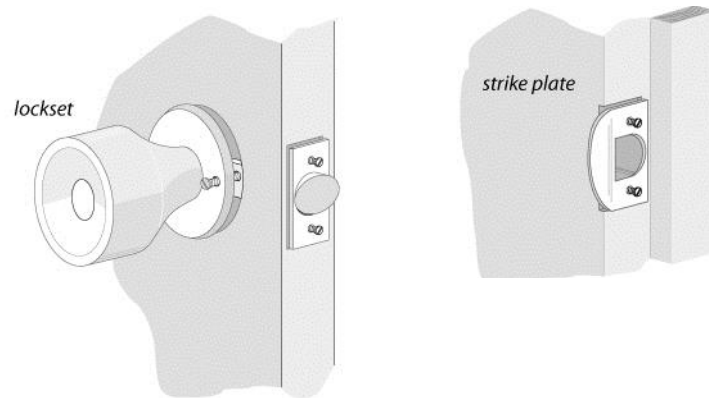
6.1.2 Door Repair and Replacement

Door operation affects building security and durability, so doors are often an important repair priority. Only primary doors may be replaced.

Door Repair

Door repair can also save energy if the existing door fits poorly. To improve the air seal of a door, limit door repair to the following work:

1. Replace missing or inoperable locksets. In some cases, a modernizer kit may be necessary.
2. Replace, install, or reposition the strike plate, as needed.
3. Replace, install, or reposition stops, as needed.
4. Replace deteriorated threshold.
5. Install a door shoe if needed to repair damage.



Minor door repair: Tightening and adjusting locksets, strike plates, and hinges helps doors work better and seal tighter.

Replacing a Primary Door

Follow these instructions when replacing a primary door:

1. Seal around the replacement door on the exterior and interior to prevent water intrusion and air infiltration.
2. If replacing or installing new exterior trim or stop, prime all bare wood.
3. After installation, confirm the door opens and closes smoothly, latches, and locks when shut.

Replacing or Fabricating a Basement Door

In older homes, basement exterior doors are often odd shapes and sizes. Sometimes, no door is present. If a door is present, it is sometimes in disrepair. Often weatherization installers fabricate a replacement door out of lumber — for air-sealing purposes, for security reasons, to preserve weatherization materials, or to maintain the integrity of the existing building materials.

Follow these instructions when fabricating a replacement basement door:

1. Use treated lumber.
2. Take precautions to reinforce the door, to prevent warping and to ensure longevity.
3. Seal around the replacement door framing on the exterior and interior to prevent water intrusion and air infiltration.
4. Insulating the fabricated basement door is optional. If insulated, insulation should be a minimum of R-5.
5. After installation, confirm the door opens and closes smoothly, latches, and locks when shut.

6.2 Dryer Venting

Dryers can cause significant moisture issues in homes if not vented to the exterior. Gas dryers are also a cause for health and safety concerns, as the combustion gases are exhausted into the home if the dryer is not vented to the exterior.

Educate the customer about proper dryer-venting maintenance. The customer should clean the exterior vent termination frequently. Once or twice each year, the customer should clean the rest of the venting system: the venting run, and the connection between the dryer and the ducting.

Follow these instructions when replacing dryer venting:

1. Vent all unvented dryers to the exterior, using a dedicated termination with backdraft damper/flapper. Best practice is to install a louvered (three- or four-flapper) hood, as these hoods typically have the strongest airflow and work the best to prevent pest intrusion.
2. Do not vent dryers into attached garages, under porches, under decks, or where the moisture will damage building components.
3. Follow the most direct route to the exterior when installing dryer duct, as feasible.
4. Use rigid metal duct with a smooth interior surface, as feasible.
5. Seal all duct connections.
6. Use a hose clamp to fasten the duct to the dryer's exhaust port. Do not use screws to make this connection. The screw tips will catch dryer lint, creating an obstruction and a fire hazard inside the ducting.
7. If dryers are vented to the exterior with existing metal-flex duct, the metal-flex duct may be left in place if deemed in good condition with no blockage.
8. If dryers are vented to the exterior with existing vinyl duct, re-vent the dryer to the exterior with UL listed metal ducting.
9. Insulate, to a minimum of R-8, sections of the dryer duct that run through unconditioned space, just as for exhaust-fan duct. Exception: Under mobile homes, ensure a downward pitch so moisture may drain outwards.

Final Inspection and Quality Assurance Standards

Acceptable installations shall meet the following standards.

General Repairs

1. The repairs are necessary for the effective installation, performance, and/or preservation of weatherization materials installed in the building.
2. The repairs are cost efficient and correct the problem(s) at hand.

Window Replacement

1. Window installation meets program instructions and the window unit is ENERGY STAR[®] certified.
2. The installed window opens smoothly and operates properly.
3. The installed window is installed square, plumb and true, as structurally allowable.
4. The installed window does not leak.
5. Installation meets all applicable best practices (e.g., flashed effectively, unit is back caulked, etc.)
6. Proper lead-safe work practices are documented in file.
7. The customer file contains photographs of the pre-existing window, and the photographs demonstrate the pre-existing window met the Wisconsin Weatherization Program guidelines for replacement.

Door Repair

1. All necessary door repairs were undertaken.

Door Replacement

1. The installed door opens and closes easily, latches tightly, and performs its function.
2. Replacement door meets R-value requirement.
3. Installation meets all applicable best practices (e.g., flashed effectively, back caulked, etc.)
4. Proper lead-safe work practices are documented in file.
5. The installed door does not leak.
6. The installed door is installed square, plumb and true, as structurally allowable.
7. The customer file contains photographs of the pre-existing door, and the photographs demonstrate the pre-existing door met the Wisconsin Weatherization Program guidelines for replacement.

Dryer Venting

1. Dryer venting is metal, not plastic, and newly installed venting is UL listed.
2. Horizontal venting is secured every four feet.
3. Screws or other penetrations that will catch lint were not used to connect ducting.
4. A termination with a damper was used.
5. The vent system is not connected to any other appliance.
6. The damper has no screen to catch lint.