

Chapter 14 - Air Sealing

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Things to Consider

- Under filling wall cavities with blown fiberglass or compressing batt insulation will reduce insulation rating.
- Fire Rated Gaps and Cracks insulating foam will be used to fill gaps in the building shell and framing between floors.

Safety Issues

- Disposable gloves are required for applying insulating foam.

Components

Walls

Band Boards

Attic

Timing & Prerequisites

- There are three points in the project where air sealing will be addressed (Pre-Mechanicals, Post Mechanicals, and Post Drywall). All three points are addressed in this section.
- The House/Project Lead will work with the Construction Superintendent to coordinate these volunteer activities.

Materials Needed

Non-faced R-13 / R-19 Insulation
 Faced R-13 / R-19 insulation
 1/2" OSB
 Gaps and Cracks Insulating Foam (Fire Retardant)
 Gaps and Cracks Insulating Foam
 Door & Window Insulating Foam
 Silicone Caulk
 Insulation Foam Gun Cleaner

Phase Specific Tools Needed

Description:

Quantity:

- Caulking Guns
- Latex Gloves (to be used with expanding foam)
- Insulation Foam Gun

Pre-Mechanicals Activities

Insulate Bathtub Enclosures

Critical Issues

- The bathtub enclosure sheathing cannot be installed until a “Partial Framing” inspection has been completed on the wall framing.

Safety Issues

- Gloves and dust masks must be worn when handling batt insulation.

- Make sure there are studs aligned with the flanges of the enclosure. If the wall studs do not align with the flanges of the tub, insert another stud at the appropriate place. The flange should be completely supported by a wall stud.
- Insulate exterior wall bays behind the bathtub area. For 2x4 walls, install R-13 faced-insulation into the wall bays behind the bathtub. For 2x6 walls, install R-19 faced-insulation.

Insulate Double Walls and Chases

- Insulate exterior wall bays of any double walls such as laundry area walls with R-13 faced-insulation.
- Insulate areas of any exterior wall which will be concealed by a chase with R-13 faced-insulation.
- These areas must be inspected before they are covered with OSB. Include these areas in the “Partial Framing” inspection for the framing and insulation behind the bathtub. This inspection must be passed before installing the sheathing.

Pre-Inspection Checklist

- Wall cavities are filled completely with no gaps at top or bottom.
- Basement slab has been sealed. (see Chapter 3 – Foundations).
- Take pictures.

Schedule Partial Framing Inspection

- After insulating the exterior wall behind the bathtubs, double walls, and chases; call the Construction Supervisor to schedule a “Partial Framing” inspection. This inspection should include:
 - Framing and insulation behind the bathtub.
 - Framing and insulation in the outside portion of any double exterior walls.
 - Insulation in exterior walls behind chases.
 - Porch framing.
- This inspection must be passed before installing the sheathing.

Seal Bathtub Enclosures

- Install ½” OSB sheathing on the walls behind the showers and then foam/caulk all seams.
 - Cover all of the stud bays which have been insulated with faced-insulation with ½” OSB. Cut the sheets to break in the middle of the studs. Install the OSB with 8d common nails; 7” apart along the studs.
 - Apply a bead of silicone caulk to the seams of the OSB. For large gaps in the OSB, use Gaps and Cracks foam insulation.

Cap Mechanical Chases and Soffits

- The tops of any chases and soffits must be covered with ¾” OSB or with two (2) layers of ½” OSB. Any sides adjacent to exterior walls must be covered with ½” OSB.
- Apply Gap and Crack insulating foam to the seams along the edges of the OSB.

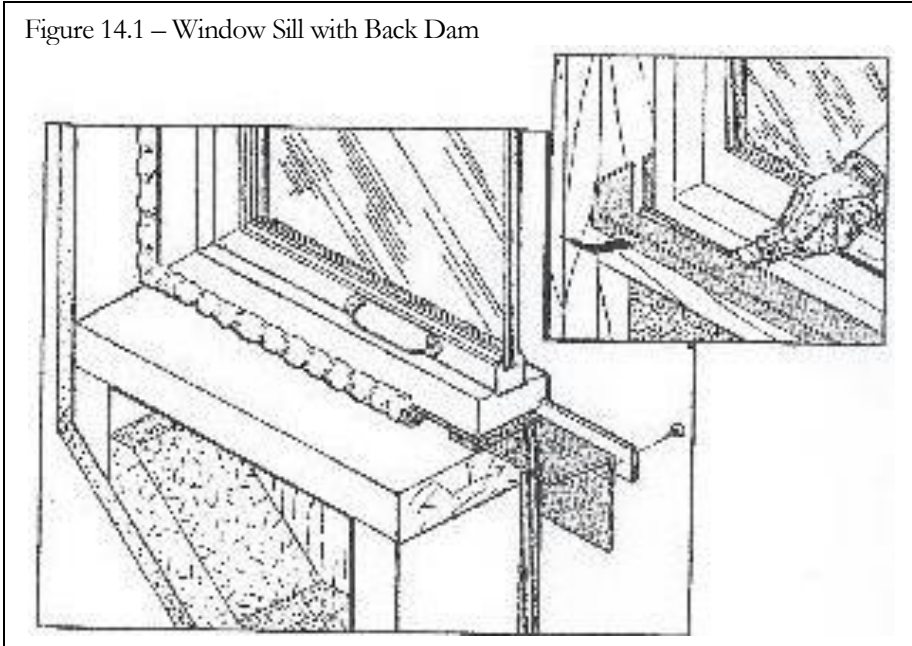
Finish Installing Double Exterior Walls and Chases

- Once the insulation behind double laundry room wall and any chases have been inspected, install the remaining framing.
- For double laundry room walls, install ½” OSB over the insulation and second 2x4 wall framing.
- For chases, install ¾” OSB on the top and ½” OSB on the sides facing any exterior wall before installing the chase.

Install Window Back Dam

- Cut off the portion of the sill pan which extends inside of the window. Cut it even with the back of the window.
- Seal the gap under the windows with Window and Door foam insulation. (See figure 14.1).

Figure 14.1 – Window Sill with Back Dam



Insulate Around Windows

- Install Window and Door foam insulation into the cavities between the windows and the framing lumber. Do not overfill the cavities. **Wear latex gloves.**
- Cover the window panes with plastic wrap before foaming around the window will reduce cleanup.

Insulate Around Doors

- Install Window and Door foam insulation into the cavities between the door casing and the framing lumber. Do not overfill the cavities. **Wear latex gloves.**

Mark the Roof Trusses with Insulation Height

Using a “Sharpie” or other bright marker, make a line on the roof trusses for the height to which the insulation is to be installed 16” from the bottom of the trusses. This depth of the insulation will depend on which manufacture is used. Johns Manville will usually be 16”; Owens Corning usually is 13”. Mark the side of the trusses which faces the attic access.

Pre-Mechanical Checklist

- Ensure drywall stops are on all vertical studs of inside corners.
- Ensure all seams around windows and doors are sealed.
- Ensure ADA grab bar blocking is installed in baths.
- Ensure air barriers are installed behind shower enclosures against exterior walls.
- Ensure air barriers are installed in chases and interior soffits adjacent to exterior walls or unconditioned space.
- Ensure all walls and floors separating conditioned from unconditioned space are insulated before enclosing cavity.
- Install six-sided assemblies that allow for the required R-value at all walls separating conditioned from unconditioned space.
- Ensure a rigid air barrier is attached to the underside of cantilevers and air seal.
- Ensure work site is clean and materials are properly stored before proceeding.

Post Mechanicals Activities

This phase of the project ~~will be~~ cannot begin until the rough-in mechanicals have been completed.

Inspect the Framing for Missing Components

Before beginning the next phase of air sealing activities, inspect the framing components. During installation of the HVAC, plumbing and electrical systems, studs and plates may have been removed. **Ensure the appropriate load bearing framing is in place, including doubled studs under all load bearing girders and beams to the foundation.**

Replace missing studs with new studs at a new location which does not interfere with the mechanicals. Be sure to notch the studs to allow any electrical wiring to pass through the middle of the stud.

Seal the Bottom Plates

Run a bead of silicone caulk along the seam between bottom plates and the floor of all exterior walls, on both the first and second floor decks.

Seal the Top Plates

Run a bead of silicone caulk along the seam between first and second top plates of all exterior walls, on both the first and second floor decks.

Seal the Holes in Plates and Subflooring

- Fill all vertical holes in the top and bottom wall plates with fire rated Gaps and Cracks foam insulation.
- Fill all holes in the soffits and chases where the pipes and wiring pass through the OSB with fire rated Gaps and Cracks foam insulation.
- Fill all holes in the exterior wall OSB (e.g. around electrical boxes) with Gaps and Cracks foam insulation.
- For small gaps around wires and pipe running through the subflooring, fill the gap with fire rated Gaps and Cracks foam insulation.
- For large gaps around pipes running through the subflooring, fill the gap fire rated Gaps and Cracks foam insulation. For large holes (e.g. around the bathtub drain), stuff the holes with non-faced insulation.
- Very large holes should be covered with OSB before stuffing with insulation.
 1. Cut pieces of 1/2" or 3/4" OSB which are 3" larger than the openings. Cutting 2 pieces makes it easier to fit the pieces around the plumbing.
 2. Cut out the area to fit around the plumbing.

3. Attach the OSB to the underside of the sub-floor using 1 ¼" wood screws; place 1 screw through the OSB pieces into the subfloor every 3".
4. Fill the gap between the OSB pieces and the plumbing with fire rated Gaps and Cracks foam insulation.

Seal Gaps in the Framing

- Fill all gaps between framing members (e.g. king and jack studs) with silicone caulk.

Post Mechanical Checklist

- Ensure all dropped ceilings/soffits, shafts and chases have been air sealed.
- Ensure all floor system cavities between conditioned and unconditioned spaces have been air sealed.
- Ensure seams between sub floor and bottom plates of exterior walls have been air sealed with caulk.
- Ensure all gaps and voids between conditioned and unconditioned space have been air sealed.
- Ensure all penetrations between conditioned and unconditioned spaces have been air sealed.
- Ensure window and door rough openings have been air sealed with low expanding foam or caulk where opening is 1/4" or less.
- Ensure fire-rated sealant has been used to air seal any vertical penetration.
- Ensure holes for bath tub drains have been air sealed with rigid material and foam/caulk.
- Ensure walls between porch attic spaces and interior spaces are sealed on the exterior with Styrofoam insulation, tape, and Gaps and Cracks foam insulation.
- Ensure walls adjoining 1st floor attic spaces and 2nd floor interior spaces are sealed on attic side and insulated.
- Ensure tape and mastic has been used to seal duct boots of floor registers to subfloor.
- Ensure ductwork has been sealed at connections to drywall for any wall return or supply registers.
- The Habitat Superintendent will take pictures of completed items and put them on Buildertrend.
- Ensure work site is clean and materials are properly stored before proceeding.

Post Drywall Activities

This phase of the project cannot begin until the drywall phase has been completed.

Air seal light fixtures and bath fans

- In the attic, apply Gaps and Cracks foam insulation around the electrical and fan boxes, filling the gap between the drywall ceiling and the boxes.

Air seal drywall to top plate

- In the attic, apply Gaps and Cracks foam insulation along the edges of the wall top plates, filling the gap between the drywall ceiling and the 2x4s.

Air seal holes in basement ceiling drywall.

- For houses with open web first floor trusses, and dry walled basement ceilings, fill the openings between the drywall, ceiling, and HVAC and plumbing lines with non-faced insulation.

Post Drywall Checklist

- Ensure drywall has been sealed to top plate with caulk, foam or equivalent material.
- Ensure light fixtures and bath fans have been sealed before installing attic insulation.
- Ensure the holes in the basement ceiling drywall, if any, are filled.

Care and Use of Insulation Foam Guns Videos

