

Chapter 18 - Insulation

Things to Consider

- Under filling wall cavities with cellulose or compressing batt insulation will reduce insulation rating.
- Fill all penetrations in the external shell; including the electric boxes in the attic.

Components

Walls	Band Boards	Attic
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Timing & Prerequisites

- This phase of the project cannot begin until the rough-in mechanical inspections have been passed.
- The House/Project Lead will work with the Habitat Supervisor to co-ordinate these volunteer activities.

Materials Needed

Walls & Band Boards

Insulation Netting
 Cellulose Insulation
 5/16" Staples
 Tall Kitchen Trash Bags
 Gasoline
 Packaging Tape
 Non-faced Insulation R-13
 Expanding Foam (Fire Retardant)
 Expanding Insulation Foam
 Low Expansion Door & Window Foam
 Cardboard Baffles
 Silicone Caulk
 2" Dow Board
 3" Cap Nails

Phase Specific Tools Needed

Description:	Quantity:
Framing	
○ BIBS blower, hose, & nozzle	
○ Fish Scale	
○ Pneumatic Staplers	
○ Caulking Guns	

Activities

Seal the Bottom Plates

1. Run a bead of silicone caulk at all exterior walls along the bottom plates at the floor on the first and second decks.

Seal the Plates and Subflooring

1. Fill all vertical holes in the top and bottom plates with fire rated expanding foam.
2. Fill all holes in the exterior wall OSB (e.g. around electrical boxes) with expanding foam.
3. Fill miscellaneous large cut-outs in the sub-floor with non-faced insulation.

Areas such as the hole where the drain for the tub runs must be stuffed with non-faced insulation.

Insulate Walls

The exterior wall cavities will be insulated using a Blown-in Blanket System (BIBS). This is a system which uses netting and cellulose insulation. The insulation is blown-in using the large blower; enough hose to reach from the truck to the house; and a nozzle. The BIBS provide an R-14 insulation value.

Insulation Netting

1. Cover the exterior walls with insulation netting. (See Figure 18.1).
2. Staple the insulation netting to the framing lumber every $\frac{3}{4}$ " using $\frac{5}{16}$ " staples and a pneumatic stapler. The staples should be installed close the edges of the cavities to be filled. Edges along doors and windows do not need to be stapled. (See Figure 18.2)
3. Cut holes in the netting (approximately 2" in diameter by making an X cut) at the center of each cavity.

Insulation Blower and Hose

1. The blower is large and must be transported on the stake-bed truck. Do not remove the blower from the truck.
2. Fill the gas tank with regular gas. The tank will need to be filled 2 or 3 times for insulating the walls.
3. Check the oil and fill if needed.
4. Place the insulation in the large hopper on top of the unit.
Note – Use a push stick to feed the hopper; not your hands.
5. Attach the hose to the unit. There needs to be enough hose to reach from the truck to the cavities to be filled. The part of the hose attached to

the blower will be 3" flexible hose. The hose will be reduced to 2" hose. The last 50 feet must be 2" hose.

6. Attach the elbow and nozzle to the hose.
7. Uncoil the switch cord and string it into the house. The switch will need to be located near the work area.

Insulation Installation Process (See Figure 18.3).

1. Insert the nozzle into the holes cut in the netting. Point the nozzle towards the bottom to fill the bottom of the cavity. Turn on the switch and fill the cavity. When the insulation is packed up to the hose, turn off the switch.
2. Turn the nozzle upward and fill the remainder of the cavity using the same process.
3. Remove the hose from the hole.
4. Stuff insulation from the ground into the hole until the void left by the hose is filled.
5. The holes can be taped shut, but is not necessary.

BIBS Testing

1. The BIBS needs to be tested to ensure the insulation has been installed properly so the R-14 value is achieved. Two (2) cavities on each level of the house are to be tested.
2. Cut out a 34" section of the BIBS's netting from the center of a full 14 ½" cavity.
3. Stuff the insulation from that section into a tall kitchen trash bag. Ensure all the insulation has been captured.
4. Using a fish scale, weigh the bag and its content. The section of insulation should weigh 3.2 pounds.
5. The Habitat Supervisor will record the weight on the BIBS log.
6. If the weight is under or over by more than ½ pound, adjust the blower to improve the packing of the insulation.
7. Install a new piece of netting over the testing hole and blow-in more insulation.

Figure 18.1 – Netting Installation

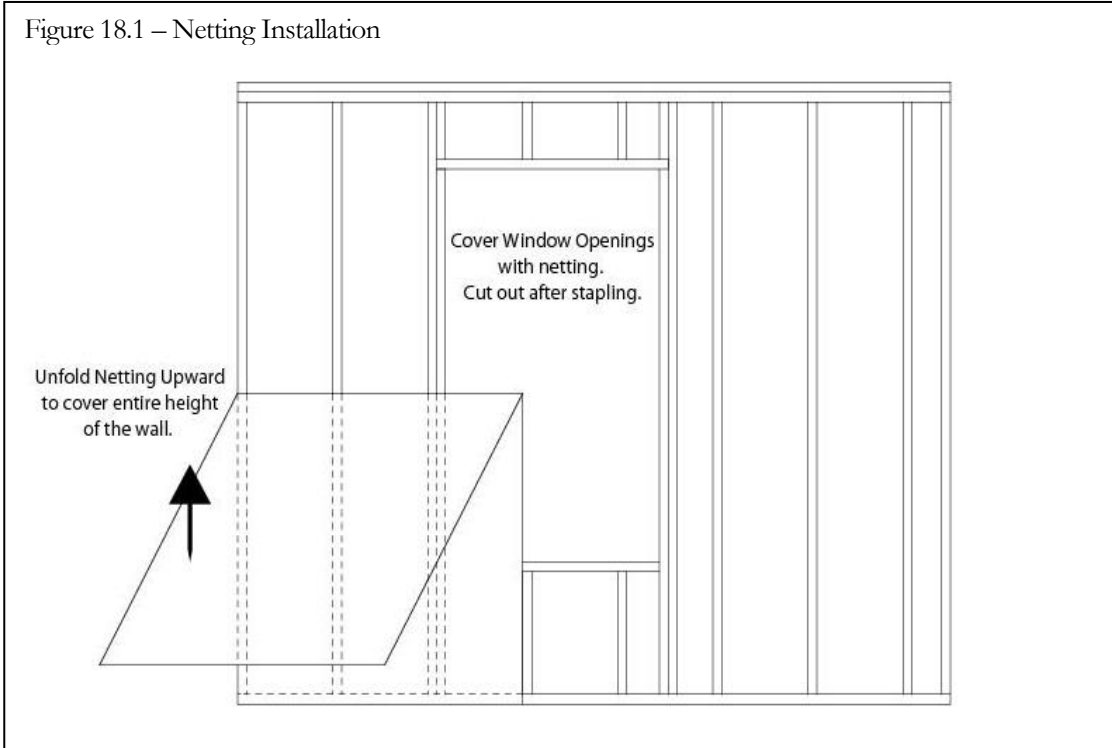
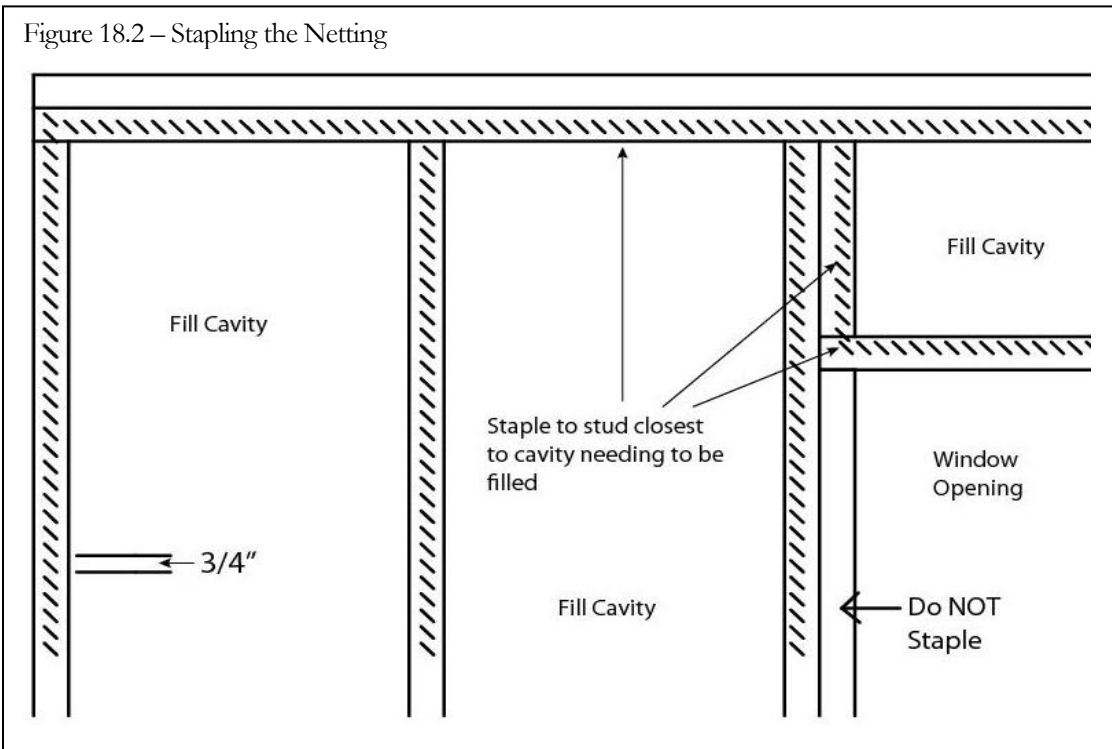
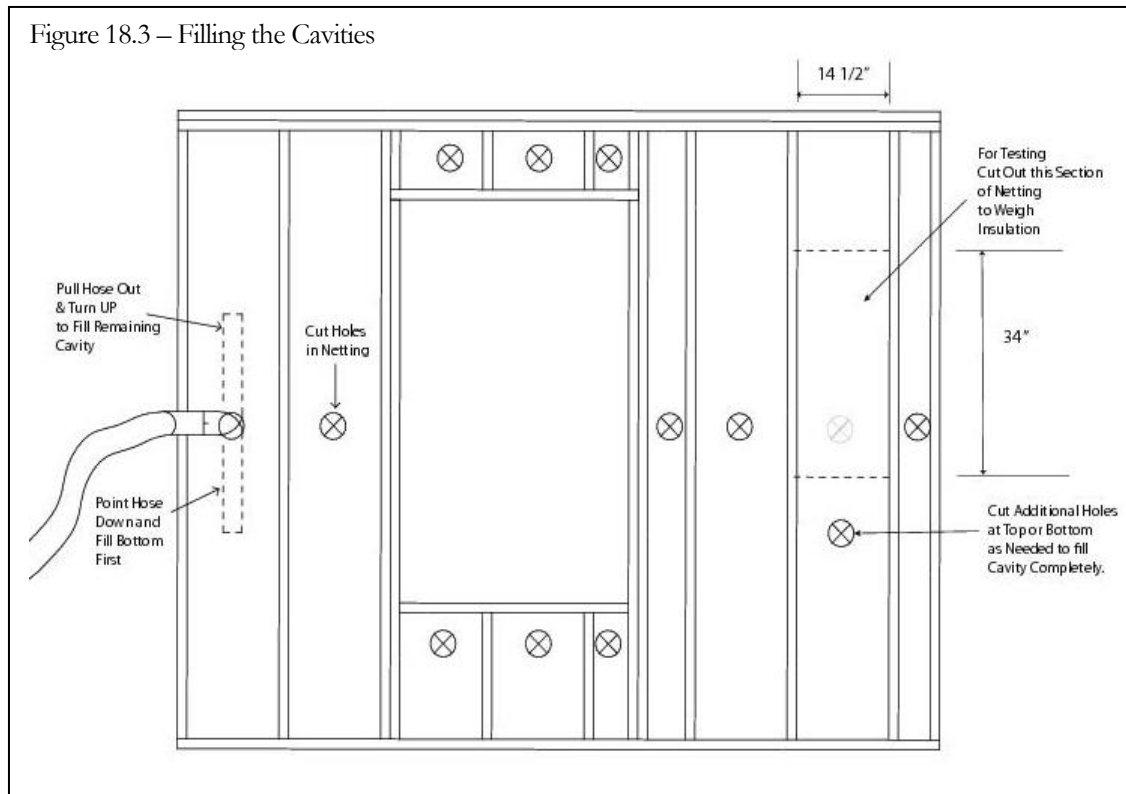


Figure 18.2 – Stapling the Netting





Insulate Band Boards between First and Second Floors

1. Cut 9 ½" pieces of non-faced R-13 insulation.
2. Stuff this material into the openings.
3. Go behind / around vent pipes, wires, etc.
4. Do not staple or cover in any way.

Insulate Around Windows and Doors

1. Install low expansion foam insulation into the cavities between the windows and the framing lumber. Do not overfill the cavities.
2. Install low expansion foam insulation into the cavities between the door casing and the framing lumber. Do not overfill the cavities.

Insulate the Drywall Penetrations in the Attic

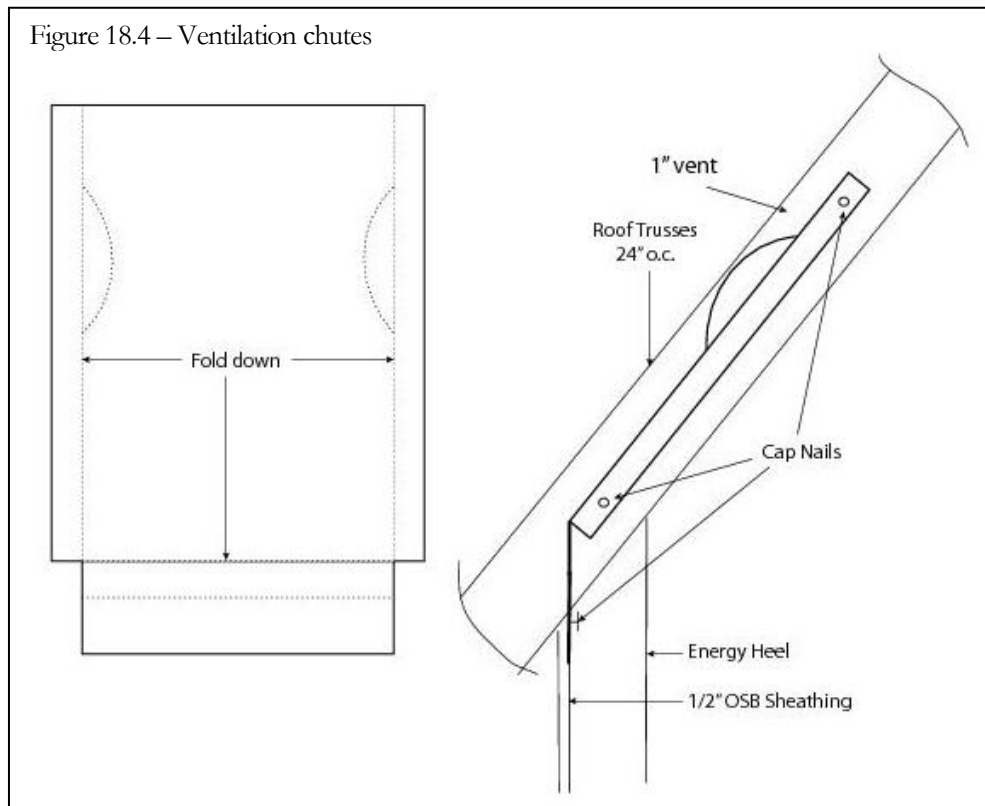
Before installing the cellulose insulation in the attic, seal the holes in the drywall below the attic where the electrical fixtures and detectors pass through using expanding insulation foam. Apply the foam from the attic; sealing the area around the boxes. Do not spray the foam into the seam as it will drop into the room below.

Install Positive Ventilation Chutes (Cardboard Baffles)

Before insulating the attic install ventilation chutes in the bays between each of the trusses/rafters. The chutes will keep the insulation from escaping into

the soffits and maintain 1" of ventilation under the roof. Each bay will need two (2) chutes since sixteen inches of insulation is taller than one baffle.

1. Fold the first baffle for each bay as shown in the Figure 18.4.
2. Nail the baffles in place with cap nails.
3. Fold a second baffle as before. Install it above the first baffle with the flap overlapping the first. Let the flap hang down.



Insulating the Attic

The cellulose insulation will be blown-in to a depth of 16". Measure and mark the vertical truss members to assist with controlling the depth of the insulation.

Feed the hose up through the attic access. Blow the insulation into place. Keep the spray low. Do not blow insulation into the ventilation chutes.

Insulate Band Boards in the Basement

The basement band boards will be insulated after all of the mechanicals have been completed.

1. Cut and install pieces of 2" Dow Styrofoam to fit into the cavities.
2. Spray expanding foam along and into the seams between the edges of the 2" Dow and the framing lumber.

3. Cut and install pieces of R-13 non-faced insulation over the 2" Dow board.

Insulate Beam Pockets in the Basement

If the house has a support beam, the pockets in the foundation wall will be insulated at the same time as the band boards. Stuff non-faced installation in around the beam.

Tips & Techniques

Cutting Non-Faced Insulation

1. Place the insulation on a piece of OSB.
2. Lay a wooden straight edge on top of the insulation along the line to be cut.
3. Use a utility knife to cut down through the fibers.
4. It will take several passes to cut completely through the material.

Quality Assurance Checklist

- Double check all of the top and bottom plates for holes which have not been filled with foam.
- Double check the area below the bathtub has been stuffed with insulation.