E3A: Insulating the Roof

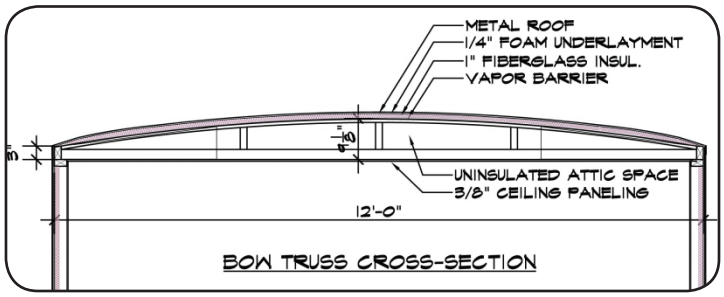
STEP 8

Steps in the Mobile Home Series

Specialized equipment and training are needed to complete these actions. Contracted services should be used for actual insulation work.

Most early mobile homes are very poorly insulated. Many have only 1 inch of fiberglass insulation in the roof cavities. The early roofs used a lightweight bow truss, a layer of insulation over the trusses with a seamed metal roof. The cavity under the insulation was usually left un-insulated, so insulating the roof cavity is one of the best ways to reduce heat loss in an older mobile home. It is a very cost effective, straightforward process.

During the energy audit, you or the auditor will check to see how much insulation is in the roof cavity. A lot of mobiles have rounded "bow truss" roofs that are deeper in the center compared to next to the outside walls. The depth of insulation is tested by drilling a small hole in the ceiling in the center of the home (using the ceiling in a closet, if possible) and one near the outside walls. The cavity is probed to find out how much insulation exists in each spot and how much space is available for filling with insulation. The auditor will use that information to calculate the existing and proposed changes in heat loss through the ceiling, and will calculate the volume of the roof cavity to determine how much insulation can be added.



Source: Jim Baerg

Before insulating, any gaps to the interior from the furnace and water heater flues must be closed. This can be done by installing a metal shield using screws and high temperature caulk. Within the roof cavity, insulation baffles are installed around the flues (if necessary) to keep the insulation 2 inches away from the hot flue. Defective bathroom fans are replaced, as necessary.

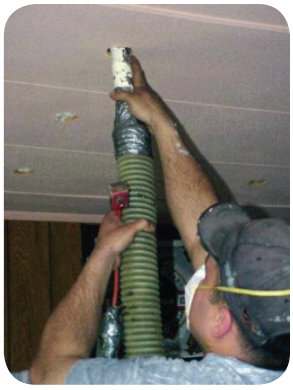
After examining the roof inside and out, the insulation contractor will decide on which type of insulation method is most appropriate. There are three principal options; interior blow, edge blow or ridge blow. There are advantages and disadvantages to each method. Your insulation contractor may have a preferred method.

Interior Blow

Interior blows, where holes are drilled in the interior ceiling, have several advantages. The most important consideration is that this method doesn't damage the metal roof, so future roof leaks are minimized. If the weather is particularly bad, working indoors can be attractive. The crew will need good access to every room in the whole house. Homeowners should expect some mess and inconvenience during this process.

E3A-MH.8
Printed February 2013

Insulation is blown into the attic cavity from holes drilled along a line at the center of the ceiling. The contractor will mark the center at each end of the room and snap a line along the center of the mobile home. The contractor will locate each truss along that center line and place a mark on the ceiling centered between each truss. At the first mark the contractor will drill a hole using a 2-1/2 or 3 inch saw bit. If the outside edges of the roof can be reached with the hose from this hole, the contractor will proceed with marking and drilling 3" holes along the entire length of the line from one end of the house to the other. The contractor will insulate the attic to 1.5#/ft^3 density and will keep track of how many bags of insulation are used to maintain the proper density. Installers can monitor the integrity of the interior ceiling paneling while blowing to avoid over-filling with insulation and stressing interior ceiling panels.



As truss bays are filled with insulation, caulked plugs or plastic caps are placed in each hole. Alternatively, a 1 x 4 inch board can be screwed over the line of holes when insulating the room is completed. For further information on this process you can watch the following video: http://wxtvonline.org/2010/06/mobileattic-int/

Lifting the Lid or Edge Blow

A second method of insulating roof cavities is called "Lifting the Lid" or doing an "Edge Blow." In this method, the roof metal, which is essentially one big piece, is unscrewed along the whole length of the mobile. The edge of the metal roof is lifted up and a rigid pipe connected to the insulation hose is then inserted all the way to the far side of the roof in each truss bay.

There are a few issues to consider with this method. First, opening up a roof exposes the inside of the mobile home to the weather. Some installers worry that by disturbing the roof, the home will be more vulnerable to future leaks. This work is typically done on the downwind side of the mobile in case of a gust of wind.

The first step a contractor will take is to set up a couple of sections of scaffolding at one end of the mobile home. All screws along that side which hold the metal down to the side wall of the mobile home will then be removed. The roof metal is peeled over and the gutter is removed and gently set aside (to be reattached later). The edge of the roof metal is cleaned and any excess tape or caulk is scraped off. A visual inspection is performed to check the roof quality and construction. The contractor will then probe the cavity through to the opposite side of the roof, identify any strong backs, lateral stiffeners or other framing obstructions, and locate the placement of the existing insulation. Any wiring that goes from the walls to the roof cavity will also be identified.

A pipe is then run through to the opposite side of the roof and the insulation is blow in. When the pipe is within a foot of the roof edge, the insulation blower is turned off. The pipe is pulled out from the roof opening and the last foot of the roof cavity is filled with a piece of fiberglass batt insulation. This process is repeated for each truss bay. When a section of roof is completed, the roof metal and gutter are re-attached. Appropriate caulking will insure a leak-proof joint. This method can be watched at: http://wxtvonline.org/2010/06/mobileattics-lid/

Ridge Blow

The third method for insulating the roof cavity is called a "Ridge Blow." In the Ridge Blow, a series of holes are cut in the roof metal along the center line of the roof at each truss bay. Again, working outside avoids creating a mess on the interior, but potentially could lead to a roof leak. On the other hand, most roofs need some additional roof patching or sealing, so this method affords an opportunity to fully examine the whole roof for failed sealant or opened seams. In this method, all roof flues and vents, the metal seams and the whole roof edge are checked for cracks and deterioration. (Note for homeowners inspecting roofs: occasionally, walking on the roof can break one of the roof trusses, so it is advisable to use, and walk on some plywood walking boards while up on the roof. The roof is the strongest along the edge, just above the outside wall.)

As with the "Interior Blow," an insulation contractor will snap a line along the centerline of the roof and identify the location and spacing of the trusses. After cutting the first

hole, the contractor will inspect the cavity and then figure out the best type of hose and method to use. The opening can be 4 to 6 inch round holes or 8 to 12 inch square holes. The contractor will feed the hose into each hole towards the edge of the roof and insulate the cavity to 1.5#/ft3. Each truss bay is insulated in both directions. After filling the bay, the crew member will remove the hose and repeat the process at the next truss bay.

The opening in the metal roof is sealed using a 4 step process. First, apply a thick bead of roofing sealant to the metal roof 2 inches away from, and around the hole. The hole is then covered with 26-gauge metal patch that is 6 inches larger than the hole. The metal patch is screwed to the roof with hex-head screws every 2 inches. A "peel n Stick" patch, 6 inches larger than the metal patch, is then laid down, heated with a propane torch and squished to the lower metal with hand pressure. Finally, roof sealant is applied to the patch with a brush, overlapping the edges of the patch. At the same time, any potential leakage spots on the rest of the roof, such as roofing seams, edges, vents and roof penetrations are coated. You will find this video invaluable: http://wxtvonline.org/2010/06/mobileroof-drill/

Insulating the roof cavity of mobile homes is relatively straightforward, inexpensive and yields big savings. People are warmer and the home is easier to keep warm.

Notes

Notes