The finish line

A Forest Products Laboratory finishing factsheet

Before You Install Exterior Wood-Based Siding

Moisture accumulation and extreme fluctuations in moisture levels can adversely affect the service life of components, such as wood siding and windows. Adverse moisture conditions can induce checking, warping, paint failure, and in severe cases, rotting of the wood.

Proper building design and construction can help prevent moisture accumulation or excessive moisture fluctuation within building components. The following are among the well-known practices to prevent moisture accumulation within exterior siding:

- Use dry materials during construction,
- Provide adequate clearance to grade and drainage at grade,
- Design with adequate roof overhang,
- Install appropriate flashings, and
- Install an interior vapor retarder in cold climates.

An additional less-used technique that can improve performance of wood-base horizontal lap sidings is to install vertical furring strips between the sheathing and siding.

Studies performed at the USDA Forest Service, Forest Products Laboratory (FPL), during the 1930s and early 1950s indicated how rain can wet the back of horizontal wood lap siding. Rain water was shown to reach the space between the siding and the sheathing, which confirmed that it was appropriate to use a water-resistant barrier, such as asphalt felt, over sheathing to prevent further penetration of rain water into the wall. Studies in the 1970s and 1980s suggested siding could be dried by solar heating, with some water moving from the siding into the wall. This may raise moisture levels within the wall, but limited data suggest that this vapor migration does not usually cause serious moisture problems.

During the 1980s, foam sheathing became popular because of its superior insulating properties. Foil-faced sheathing and extruded polystyrene sheathing retard movement of water vapor; their vapor permeability is much lower than sheathing systems such as asphalt felt applied over lumber, wood fiberboard, or plywood. Thus, water that wets the back of horizontal wood siding installed over foam sheathing is expected to stay in the siding for longer periods, particularly if the finish on the face of the siding retards evaporation. Although not conclusive, some experimental evidence shows that in warm, humid climates wood-based siding installed over foam sheathing stays at a higher moisture level and undergoes greater moisture fluctuation than similar wood-based siding installed over wood fiberboard sheathing. We expect that installation of wood-based siding applied over furring strips accelerates drying of rain-wetted siding, particularly when installed over foam sheathing.

During the 1950s, some U.S. builders began installing wood siding over wood furring strips (usually plastering lath). These builders reported improved paint retention when siding was installed in this manner. The practice of installing wood siding over furring strips is a tradition in Scandinavian countries, where the climate is damp and relatively nondecay-resistant woods (e.g., spruce and pine) are used for siding.

A limited amount of experimental data indicates that ventilating the siding results in lower moisture levels in the siding. The *Moisture Control Handbook,* published by Oak Ridge National Laboratory (Oakridge, TN), describes the **rain screen design** (Fig. 1) as a way to reduce the amount of rainwater entering into the walls. In addition to furring strips, a rain screen design with wood siding consists of a relatively airtight sheathing and an airspace between the sheathing and the siding that is open at the bottom and allows unrestricted air exchange with a ventilated soffit or overhang. Adequate airtightness of the sheathing can be attained by a variety of methods. The *Moisture Control Handbook* indicates that careful installation of asphalt felt over plywood or

oriented strandboard should provide adequate airtightness. Other sealing methods include using foam sheathing and tape or synthetic sheet air barriers, commonly called “housewrap”.

Some architects and one lumber trade association advise priming the backside of solid-wood siding with paint or a water-repellent. Research performed at the FPL during the 1950s conclusively indicated that back priming the siding with a water-repellent improved paint retention and overall performance of horizontal wood lap siding. However, the benefits of back priming the siding with paint has not been experimentally verified. If the lower portion of the siding back is primed, it is likely that the siding will absorb less moisture. Note that if the entire siding back is primed with paint, water that has been absorbed by the siding will be retarded from evaporating.

If your siding has already been installed, you can still reduce capillary rise of water between lap siding boards by inserting spaced wedges or shims under each course of siding. This increases the width of the opening, thereby reducing capillary rise and facilitating drying of the back of the siding after rain showers. However, wedges also provide larger openings for wind-driven rain and may not be appropriate for some locations.

In summary, ventilating horizontal lap siding may improve its service life. If the siding is installed using a rain screen design, the rain water will probably not penetrate past the siding. Installing horizontal lap siding using the rain screen method is also reasonably inexpensive and easy to execute.

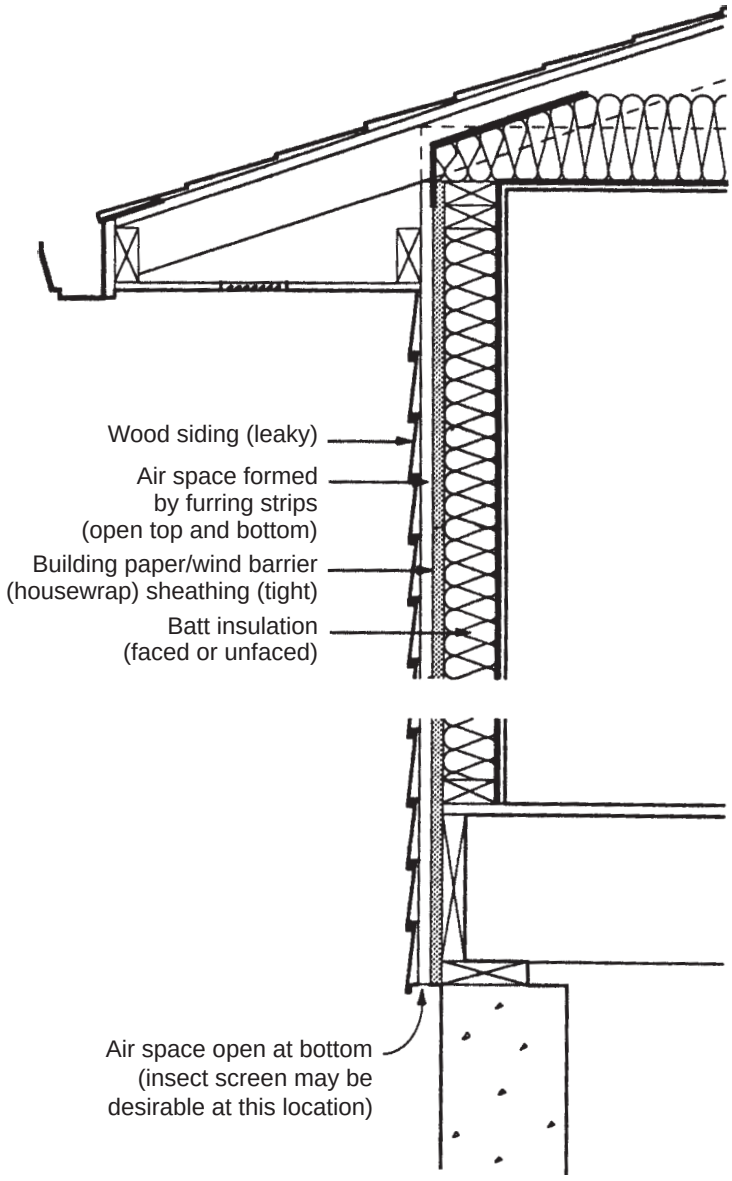

Figure 1—Wood frame wall designed as a rain screen

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December 1995