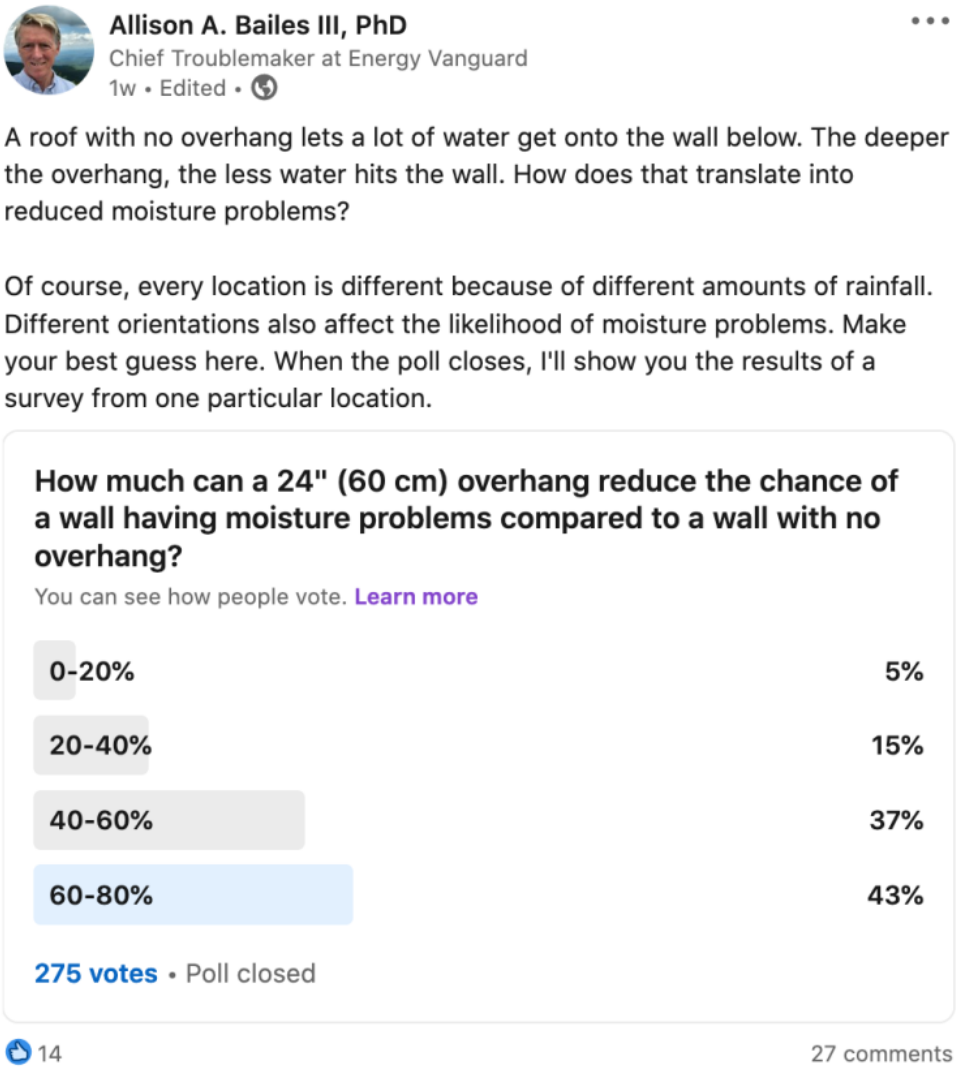
Roof Overhangs and Moisture Problems

2022-01-11 Allison Bailes Blog 0 Comments

moisture problems roof

Roof overhangs and moisture problems in the walls of a house ought to be related, right? After all, most of the water that lands on a house hits the roof first. From there, rainwater runs to the bottom edge of the roof and then makes its way to the ground. (I'm assuming a sloped roof.) Gravity may be the weakest of the fundamental forces, but it dominates with the flow of bulk rainwater hitting the top of a house.

I did a little survey on LinkedIn recently to see how people think of this issue. You can see the screenshot of my question and the results below.



A LinkedIn survey on overhang depth and moisture problems

80 percent of the people who answered think deeper overhangs significantly reduce the chances of moisture problems. Are they right? Let's look at the results of a more formal study.

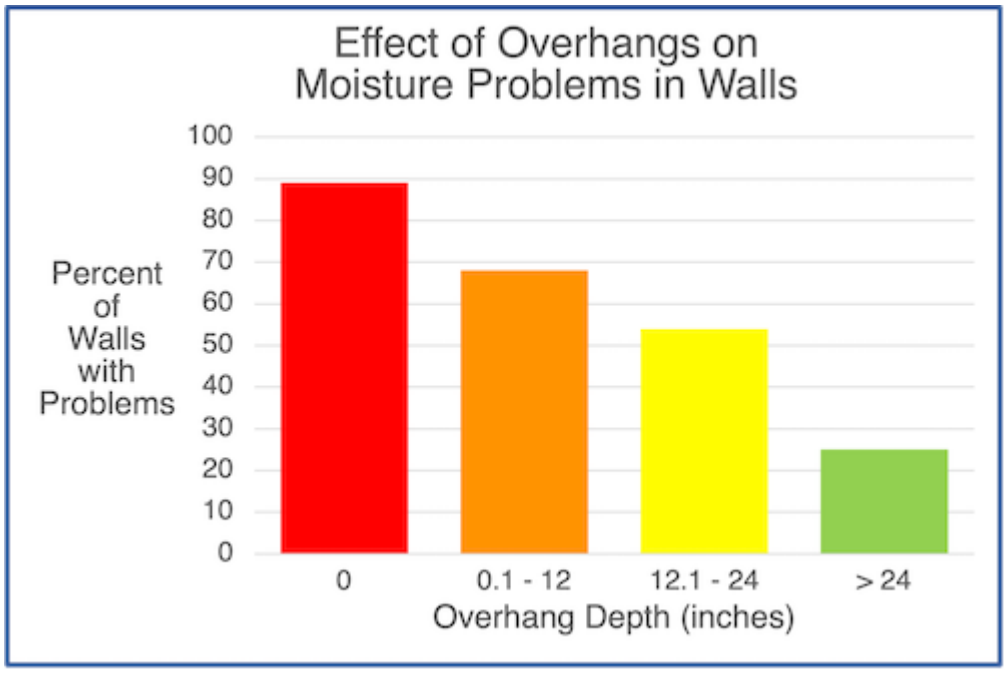
A study from British Columbia

In the 1990s, an interesting study came out of western Canada. Titled, *Survey of Building Envelope Failures in the Coastal Climate of British Columbia (pdf)*, they did a survey of 46 low-rise residential buildings. 37 of those buildings had moisture-related building enclosure failures. They looked at several factors related to the problems, including:

- Overhang depth
- Cladding type
- Drainage plane type

- Sheathing type
- Insulation type
- Orientation

Among the 46 buildings, they studied 72 individual walls. What I found to be the most interesting part of their data was their correlation of the roof overhangs and moisture problems. The chart below shows the percentage of the 72 walls that had moisture problems relative to the depth of the roof overhang above the wall.



Percent of walls with moisture problems based on depth of roof overhang [Adapted from their paper]

Nearly 90 percent of the walls with no overhang had moisture problems. In contrast, only 25% of the walls with a 24 inch (~600 mm) overhang had problems. Clearly, roof overhangs and moisture problems are related, at least in the buildings in this study.

Conclusions from the BC study

At the end of the report, the authors list 12 conclusions. Here are what I consider to be the most important of them:

- “Exterior water is the moisture source for by far the majority of the performance problems.”

- "The vast majority of the problems (90%) are related to interface details between wall components or at penetrations."
- "Exterior moisture penetration through or around windows is a significant contributor to moisture problems."
- **"Buildings with roofs overhanging walls perform significantly better."** [Emphasis added.]
- "In general, buildings with simple details…performed better."

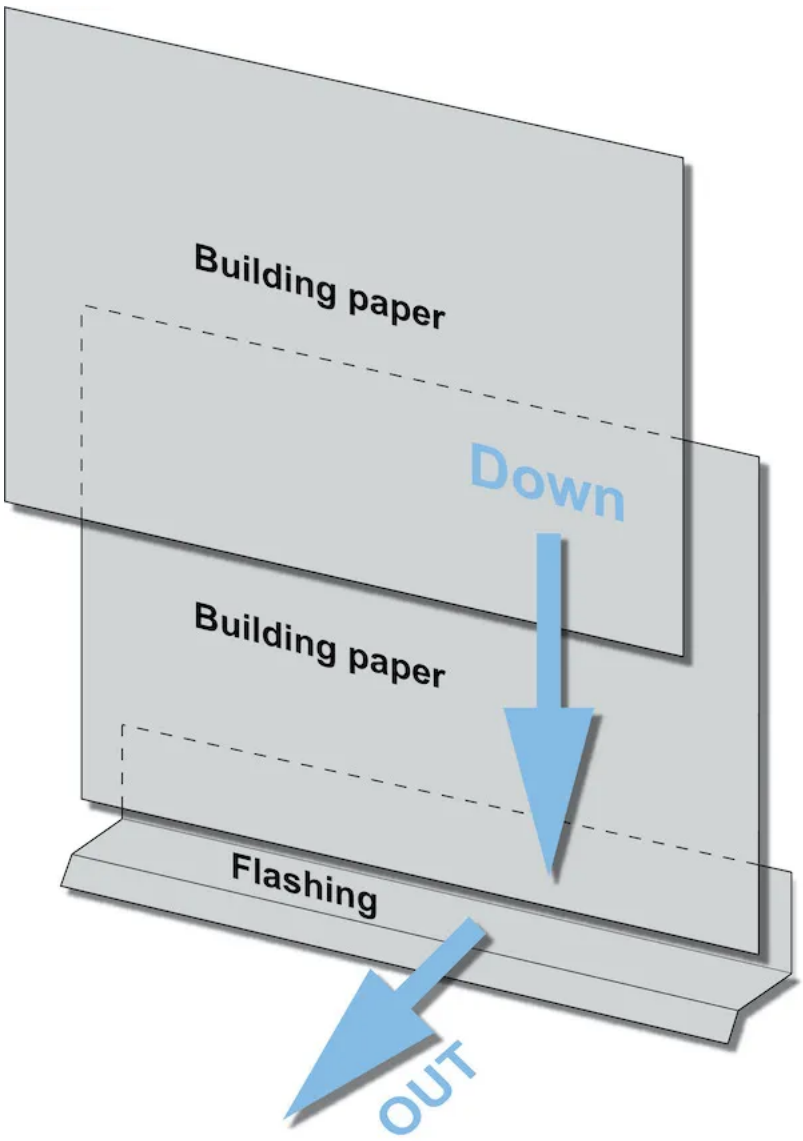
If I had written the report, I would have put more emphasis on the effect of overhangs than they did. They found that water from the outside caused far more problems than moisture from the inside. The best thing you can do to keep water off of walls is to extend the roof beyond the walls, and the farther the better. When you keep the water off the walls to begin with, the flashing, interface details, and penetrations through the wall don't matter as much because they don't see as much water.

It's important to keep in mind that this study is from coastal British Columbia. Not only do they have a high amount of rainfall (up to 160 inches per year in some places), but the cool weather reduces drying potential for building materials that get wet. In other climates,the results may be different. Also, it *is* possible to have no roof overhangs and avoid problems by making sure the water management details are designed and installed properly with appropriate materials.

Down and out is the rule for water management

Let's finish up with a quick review of good water management principles. You want to keep rainwater moving down and out. Overhangs help because they move the water out before it goes down. If the house has no gutters, the water will hit the ground some distance from the house. Then you need a slope in the yard to keep the water moving away. With gutters, the water gets channeled down to the base of the house. Again, you need slope or downspout extenders or both to keep the water away from the foundation.

For water that does hit the wall, this diagram from Building Science Corporation shows the principle of keeping the water moving down and out. Also see the article *Rain Control in Buildings* by Professor John Straube for more good recommendations.



Down and out is the rule for water management [Image courtesy of Joseph Lstiburek]

Failing to control the water

When you don't have overhangs or good down-and-out water management, bad things happen. I saw the house below near our office a couple of years ago, and you can see they had serious water damage. The large damaged area in the middle (to the right of the window on the left) happened because a lot of water came off the roof in that location.

The lack of overhangs along with poor water management led to significant damage in this house

Not only did that area get the water from the section of roof straight above, but the small gable over the right-side window channeled more water to that location. Without an overhang to move water out and then down, all that water went straight down the front of this house. Poor water management behind the siding led to these problems.

The window on the right was spared the massive downfall from the roof because of the gable. But with no overhang, it got more wind-driven rain. This wall faced west, the direction a lot of storms come from in Atlanta, so it does have moisture damage beneath the window. The damage on the right side also may have been aided by condensate from the window air conditioner.

In short, the depth of roof overhangs and moisture problems are related. Deeper overhangs mean you don't have to depend as much on the water management details having been designed and installed perfectly.

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Charles Leahy

2022-01-11 at 10:27 am

Your comment is awaiting moderation. This is a preview; your comment will be visible after it has been approved.

Nice article Allison! We always try to encourage at least 18″ overhangs. And this helps to show that building a great home doesn't have to be complicated if people follow a few basic rules.