

Moisture Protection of Wood-Based Sheathing on Exterior Walls Clad with Absorptive Materials

Moisture effects in modern residential exterior wall assemblies with absorptive cladding materials are not well understood. Wall construction techniques and materials are numerous, but direction as to what approaches are appropriate in each climate is minimal.

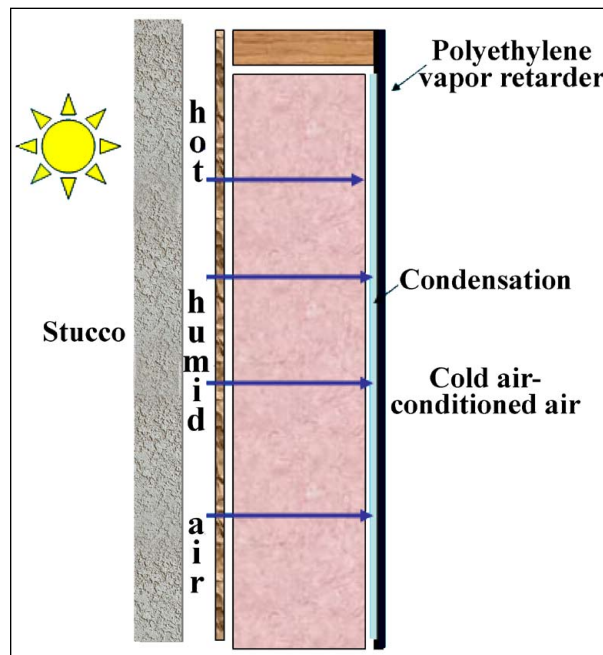
Background

Builders are often encouraged by architects and homebuyers to apply exterior claddings that are aesthetically pleasing without an understanding of how the wall construction will perform over time under local climatic conditions. In part due to this lack of understanding, moisture problems in many types of exterior walls have increased in recent years. Some recently developed wall assembly types, along with other common wall construction types, need to be tested to determine which are more resistant or more tolerant to moisture.

Objective

The objective of this research is to identify robust design rules and construction practices for moisture-tolerant exterior walls that are sheathed with

wood-based material and clad with absorptive siding material for a mixed humid climate.



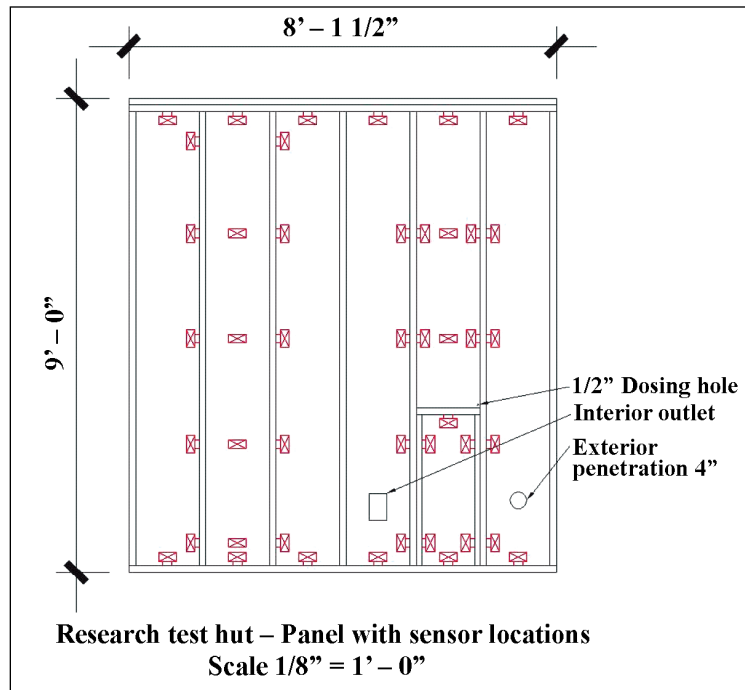
Absorptive claddings, such as stucco, may absorb rain-water and then dry rapidly in the sun. The water vapor that is produced can cause moisture problems at the interior side of the wall. This risk is highest if there is outside air leakage into the wall and a very cold air-conditioned indoor temperature. Effective venting of the space behind the stucco greatly alleviates this problem.

Approach

Preliminary computer-based moisture modeling will be used to determine a set of wall assemblies that can be expected to exhibit a range of performance characteristics. Selected assemblies will then be installed in a test hut constructed on the property of the National Association of Home Builders (NAHB) Research Center. The climate-controlled hut will simulate indoor conditions on the interior, with the exterior cladding exposed to the environment for one year. Detailed moisture, humidity, temperature, precipitation, solar, and wind monitoring will be used to determine which assemblies are more tolerant to a mixed humid climate.

Expected Outcomes

This research will result in guidance to builders as to construction practices that will produce durable, moisture-tolerant wall assemblies.



Timeline

The final test plan was delivered August 2006, and construction of the test hut is planned for January 2007. Monitoring is expected to begin early 2007 and continue for 12 months. A final report will be delivered May 2008.

Cooperators

NAHB Research Center
USDA Forest Service, Forest Products Laboratory
U.S. Department of Housing and Urban Development

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