



COLD CLIMATE HOUSING RESEARCH CENTER

CCHRC

CCHRC Product Testing Laboratory

Safe and Effective Exterior Insulation Retrofits

Home retrofits for energy efficiency are increasingly important as energy prices rise. A popular option is adding rigid foam to the home exterior. This decreases the heat lost through the wall, but there is a potential moisture problem as the foam acts as a second vapor barrier outside the wall. Because most homes have a vapor barrier on the interior side of the wall, this double vapor barrier situation can trap moisture in the walls and can potentially create mold and rot.

There are three main questions we will try to answer:

- Does a double vapor barrier cause moisture problems in the dry Fairbanks climate?
- Is there a minimum thickness of exterior insulation that can be added to prevent condensation problems?
- What is the most “materials efficient” way to retrofit an existing home with exterior foam?

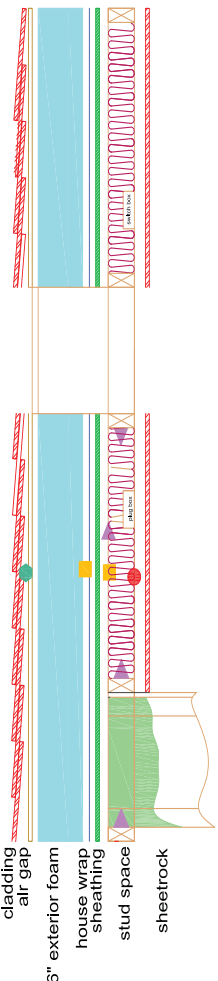
To answer these questions, we will use our Mobile Test Laboratory (MTL), a road-worthy trailer with nine test wall bays.

All nine test walls were built using typical building practices. Each test wall has a different ratio of insulation in the wall cavity (fiberglass batts) to the insulation on the exterior of the wall (rigid or spray-on foam). Also, some walls have no interior vapor barriers.

Each wall in the MTL has 15 sensors embedded in it. They will record temperature, wood moisture content, relative humidity, and heat flux through the wall.

The MTL will run the test from October 2009 through summer of 2010.

At the end of the study, we will produce a report on the moisture that can accumulate from improperly applying exterior foam insulation to an existing home. We are grateful to the Alaska Housing Finance Corporation for their support of this project.



A wall section diagram.



“Promoting and advancing the development of healthy, durable, and sustainable shelter for Alaskans and other Circumpolar people.”