

**CHBA 43rd National Conference/Exposition
Business Session 5B
Field Research: Commonsense Solutions
to Practical Problems**

Moisture Problems



**Canada Mortgage
and Housing Corporation**

**Société canadienne
d'hypothèques et de logement**

MOISTURE PROBLEMS

Prepared by the Project Implementation Division, CMHC

A large number of housing units across the country, and in the Atlantic Provinces in particular, are being exposed to damage by wood rot caused by moisture trapped within exterior walls. Relatively little is known about how walls dry out or, conversely, why in some cases they do not.

In 1984, a joint task force was established by Canada Mortgage and Housing Corporation, made up primarily of representatives of CMHC and the Canadian Home Builders' Association (CHBA), to oversee a field research project in the Atlantic Region. The project involves the erection of test huts in three of the Atlantic Provinces, and the monitoring of the performance of eight different types of wall construction for a one-year period to determine the capability of each test panel to dry out pre-wetted framing members in the wall cavity. This field research project has been undertaken by the Project Implementation Division of CMHC, which will report its findings to the Task Force Steering Committee. The members of the Committee are listed at the end of this paper.

At the same time, the Research Division of CMHC is developing a theoretical computer-based model that simulates the pattern of ventilation and moisture migration (from the sheathing to the outside wall) in wood frame housing. An advisory committee of building science researchers is guiding this work.

The Test Huts

One test hut has been erected in each of the following three locations: Halifax, Fredericton and St. John's. The test huts are one-storey units and are being kept vacant for the sole use of this study for a one-year period.

Details of the Test Wall Panels

In each test hut, both the northern and southern exposed sides have been constructed using the eight different wall panels described below.

- Wall Panel 1. Conventional "38X140" stud wall, 1.2 m in width and 2.4 m in height, composed of 12.7 mm gypsum, 4 mil polyethylene vapour retarder, 38X140 mm @ 400 mm o.c. framing, and glass fibre insulation RSI 3.52, with building paper (breathable type) sandwiched between 9.5 mm waferboard sheathing and prefinished vinyl siding.
- Wall Panel 2. Identical to Wall Panel 1 with the exception that the vinyl siding will be applied over vertical 19X64 mm furring strips.
- Wall Panel 3. Conventional "38X89" stud wall, 1.2 m in width and 2.4 m in height, composed of 12.7 mm gypsum, 4 mil polyethylene vapour retarder, 38X89 mm @ 400 mm o.c. framing, and glass fibre insulation RSI 2.11, 38 mm "Glasclad" sheathing with the "Tyvek" exterior surface taped, and vinyl siding applied directly on top of the Glasclad.

- Wall Panel 4. Identical to Wall Panel 3 with the exception that the vinyl siding will be applied over vertical 19X64 mm furring strips.
- Wall Panel 5. Identical to Wall Panel 3 with the exception that the Glasclad sheathing will be replaced with 38 mm SM sheathing applied under Tyvek with taped joints.
- Wall Panel 6. Identical to Wall Panel 5 with the exception that vinyl siding will be applied over vertical 19X64 mm furring strips.
- Wall Panel 7. Conventional "38X140" stud wall, 1.2 m in width and 2.4 m in height, composed of 12.7 mm gypsum, 4 mil polyethylene vapour retarder, 38X140 mm @ 400 mm o.c. framing, with Sprayed-on Cellulose, with building paper (breathable type) sandwiched between 9.5 mm waferboard sheathing and vinyl siding.
- Wall Panel 8. 38X140 wall (ie: INSUL-WALL), 1.2 m in width, composed of 12.7 mm gypsum, 4 mil polyethylene vapour retarder, 38X89 mm @ 400 mm o.c. framing, with polystyrene insulation, building paper (breathable type) over framing, and vinyl siding.

All the test panels are constructed of lumber with a moisture content between 25 and 30 per cent. This content level was maintained until the sensing equipment was installed and the collection of data on the performance of the panels began.

Monitoring Equipment for Each Test Hut

- Interior
- 1 data logger complete with interfaces for sensors listed below (copies of all data to be supplied to the Corporation on Apple compatible AP II DOS 3.3 format, 5 $\frac{1}{4}$ inch floppy disks)
 - 1 relative humidity sensor
 - 1 temperature sensor
 - 1 pressure tap
 - 1 humidifier
- Exterior
- 1 relative humidity sensor
 - 1 temperature sensor
 - 1 wind speed and direction indicator
- Test Panels
- Moisture content, temperature, and pressure sensors will be installed in each test wall panel, and some wall panels will also contain relative humidity sensors.

Technical standards for the above equipment are as follows:

- Relative humidity Visala or equivalent
- Temperature +-9.5 degree Celsius
- Wind +- 10% of reading
- Wood moisture Delmhorst pins or equivalent

Collection of Data

The data collected from the sensing equipment in the three test huts will be recorded and analyzed to assess the following:

- 1) any difference in drying of identical panels attributable to orientation, that is, between the location on: a) the south wall, and b) the north wall;
- 2) any difference in drying attributable to differences in panel construction;
- 3) any difference in drying of identical panels attributable to site location, that is, between Halifax, Fredericton and St. John's.

Progress reports will be submitted by CMHC to the Task Force Steering Committee on a quarterly basis.

Task Force: Moisture Problems in Wood-Frame Housing - Atlantic Canada

Two names (the member and an alternative) are shown for the CHBA representatives.

CHBA Representatives:

Newfoundland	- Cyril Morgan
	- Dave Sheppard
Nova Scotia	- Art Gillespie
	- Barrie Romkey
Prince Edward Island	- Gary MacLeod
	- Greg Silvaggio
New Brunswick	- Ken McPhee
	- Bob Steeves
Ottawa	- John Archer

National Research Council, Division of Building Research Representative:

Halifax	- Dave Scott
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CMHC Representatives:

Saint John	- Jean-Yves Perreault
Ottawa	- Ken Rauch
	- Bob Stapledon
	- Jim White
St. John's	- Dave Morris

Non-Voting Members:

Newfoundland Labrador Housing Corporation	- Steve McLean
Canaxel Ltd. (Canadian Siding, Soffit and Raingoods Manufacturers Association)	- Ivan Estey