Research & Development Highlights

Technical Series
90-213

Attic Moisture Survey

Introduction

Attic ventilation openings have been specified in building codes for decades. The openings are intended to allow moisture and summer heat to dissipate. However, recent attic research and evidence from sealed Arctic attics suggest that ventilation may be counterproductive in many situations. There has been a shortage of field data to substantiate the effectiveness of installed ventilation. Computer modelling of attic ventilation is also hampered by this lack of information.

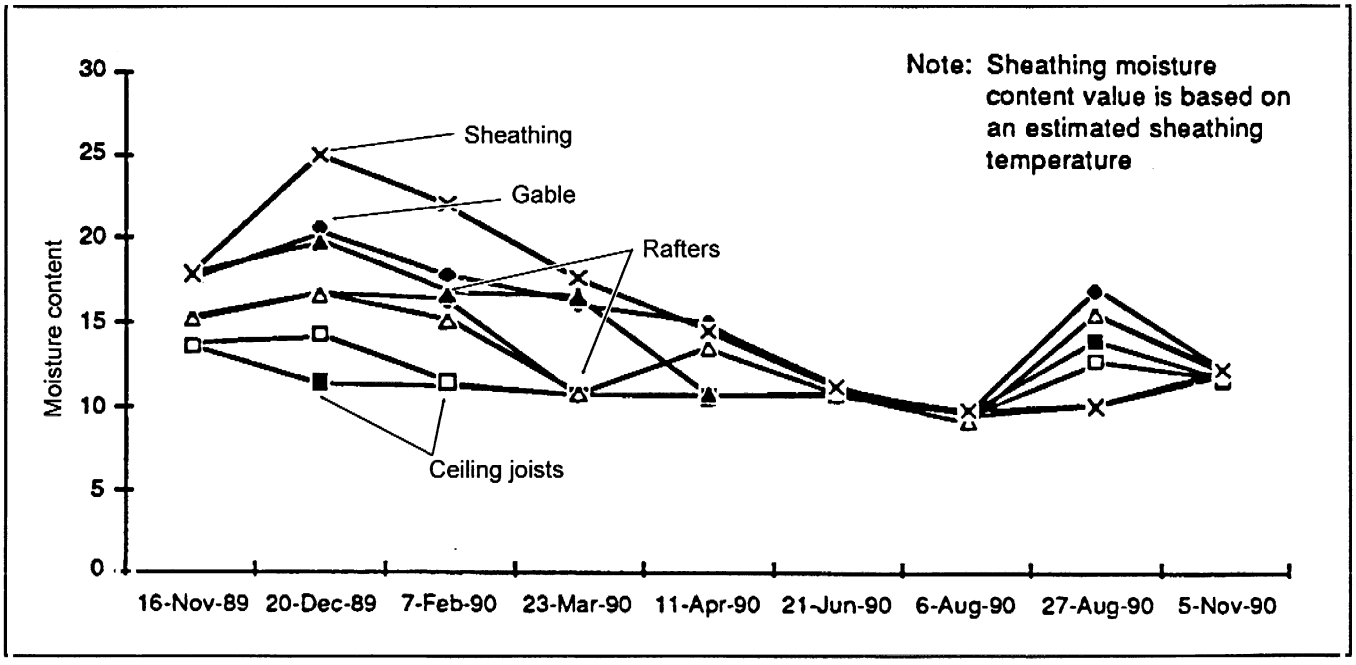
This research project was designed to discover some of the following attic characteristics: ventilation area (designed and actual); air change rate; air leakage between the house and attic; and seasonal moisture levels in the attic lumber and sheathing.

Research Program

Two earlier CMHC projects had established test protocols for attic air change and airtightness testing. The contractors for the selected a sample of 20 attics, 15 in Ottawa, Ontario and five in Prince Edward Island, intended to be representative of those areas. A single tightness test was performed. Attic air change was measured at least once in mid-winter and again in summer. Several houses had a series of six air change tests performed under various weather conditions. All attics had the wood moisture content monitored monthly for a year.

Findings

- The house-to-attic leakage area, known as interface leakage, ranged in most houses from 200 to *450* square centimetres, or up to half the total house leakage area. One R2000 house had a negligible leakage area, indicating that such tight construction is possible.
- Of the 20 houses, seven showed at least one month where attic wood moisture content exceeded fibre saturation (taken as 28 per cent). Efforts to correlate the attic moisture levels against attic characteristics, such as



Sample attic moisture data (House M-3)

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interface leakage, were not conclusive because of small sample size.

- Attic air change rates ranged from 1 to 33 air changes per hour. In some houses, these rates were weather dependent. Ottawa House #8 had rates that varied from 4 to 33 air changes per hour. On other houses, the attic ventilation was fairly consistent despite weather changes (for example, house #3 had six tests ranging from 11 to 15 air changes per hour).

Implications for the Housing Industry

This research is being continued in other CMHC projects, as well as internationally, using special test buildings and computer modelling. It is likely that a wider range of attic ventilation strategies will be permissible when the research is more complete and the results more conclusive.

Project Manager: *Don Fugler*

Research Report: *Survey of Moisture Levels in Attics* ***(1991)***

Research Consultant: *Buchan, Lawton, Parent Ltd*

A full report on this research project is available from the Canadian Housing Information Centre at the address below.

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