Research & Development Highlights

Technical Series
90-217

Advances in Basement Technology

Introduction

Home buyers in Canada continue to show a strong preference for houses with basements.

Yet home buyers frequently complain of problems associated with basements. It is possible to produce a basement that is reasonably problem-free and suitable for living space.

However, many are not built with such rigorous care. Basements have therefore retained a nagging reputation for being damp, dark and dingy places that are largely unfit for comfortable habitation.

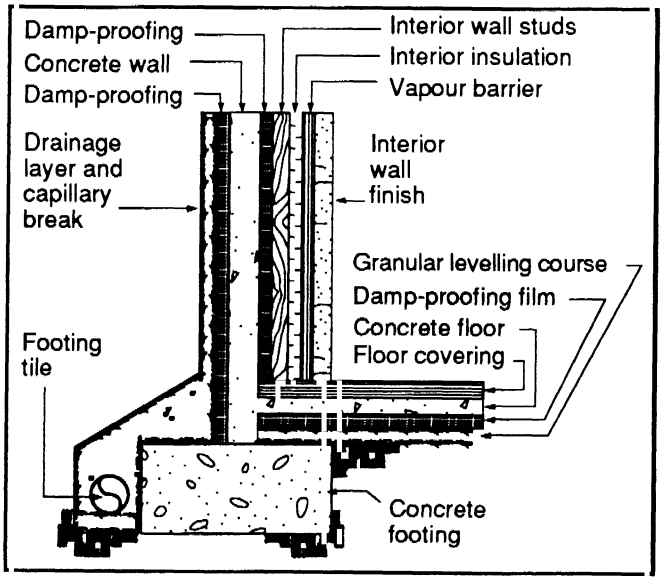
Since basement areas of new houses in Canada likely constitute between 25 and 35 percent of the total space in single-family residential dwellings, advancing the technology of basement construction would significantly improve the quantity and quality of potential living space and thus contribute to the affordability of homes in Canada.

The challenge that faces the housing industry is to advance basement technology through innovations in materials, systems and construction practices. The objectives of this study were to: review current basement construction practices and problems; identify knowledge gaps and research needs that should be addressed to advance basement design; and identify and evaluate a number of basement systems that hold significant promise for improving the liveability of basements.

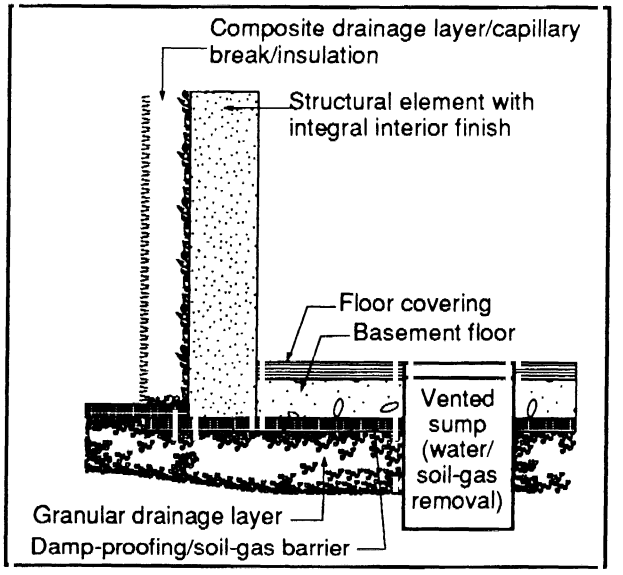
Findings

The many factors fundamental to improving basements have been categorized into functional issues, engineering issues, builder issues and marketing issues. For comparison purposes, it would be desirable to define a perfect or "ideal" basement. However, an "ideal basement system" is likely to remain elusive. No single technology or system is likely to satisfy all of the distinct preferences of both home buyers and home builders.

Major advancements in basement technology will likely only be achieved by looking beyond the individual, layered elements of traditional basements to basement systems as a whole.



Construction of a typical liveable basement (the "benchmark" basement)



Proposed rationalized basement system

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A rationalization of the layered elements of traditional basement systems is the key that should unlock significant advancement in basement technology. The multiple wall elements can effectively be reduced from eight layers to two layers. In addition, more judicious positioning of these elements within the system will manifestly improve the performance, reliability and cost of liveable basements.

Conclusion

Modest improvements to basements are possible through closer adherence to existing building codes and standards, additional emphasis on quality control, more diligent inspections by code enforcement authorities, and through continued improvements in the individual elements of traditional basement systems.

Project Manager: Peter Russell

Research Report: Advances in Basement Technology

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

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The Canadian Housing Information Centre
Canada Mortgage and Housing Corporation
700 Montreal Road
Ottawa (Ontario)
KIA 0P7

Telephone: (613) 748-2367
Fax: (613)748-2098

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