HRAI TECHNICAL COMMENTARY

The Heating, Refrigerating and Air Conditioning Institute of Canada (HRAI) is a not-for-profit national trade association serving the HVACR industry and the public interest. HRAI provides a wide range of informational and educational opportunities for building officials. Just as contractors, building owners, and building managers need to keep up to date in our every-changing HVACR industry, building officials also need to know the "facts" and need to keep current. HRAI continues to work closely with OBOA and salutes the various municipalities across Canada who have joined the association as associate members. HRAI, through its national network of chapters, provides a means for building officials, contractors, wholesalers, manufacturers and consultants to work together.

OBOA members should note that HRAI offers a wide range of HVACR technical manuals, design manuals, and software for applications such as heat loss/gain, duct design and air handling, commercial and residential courses, brochures (CFC's/HCFC's, ventilation, and tips for choosing a contractor), as well as posters and videos.

HRAI's training program includes courses in Residential Mechanical Ventilation, Installation and Design. Together, the material which forms the basis of these courses is referred to as the "HRAI Ventilation Manual". This material covers the National Building Code Ventilation requirements as they apply to single-family housing as well as ventilation design according to the CAN/CSA F326 Standard and the R-2000 Ventilation Guidelines. Ventilation courses are run throughout the year in Ontario and across Canada on a scheduled as well as a "demand" basis for all interested industry personnel, including building officials. HRAI will also conduct special courses arranged and designed just for building officials. For more information on materials and courses call HRAI at 905-602-4700 (fax 602-1197).

HRAI is pleased to provide the support for the timely and ongoing information in this column for OBOA members.

Residential Ventilation Issues

Part 6 vs Part 9 Ventilation in the OBC

The revised OBC ventilation rules in subsection 9.32.3 of the OBC are quite detailed as to what is permitted and what is not. Sentence 9.32.3.2.(1) however, allows the ventilation system to be installed according to part 6 of the OBC, as an alternative to sub-section 9.32.3. In Part 6, it is not immediately obvious to the code reader as to what is required for ventilation system design and installation in a residence.

Thankfully, the differences between Part 9 and Part 6 ventilation systems in most detached residential buildings will be differences of detail only.

While the ventilation system may be provided according to Part 6 at the election of the applicant, there are also situations where Part 6 must be used.

These are when the building;

*is classified as "Type III" according to sentence 9.32.3.3.(1).

*has more than four bedrooms. (Sentence 9.32.3.4.(1)

*contains a solid fuel appliance and a CO detector or HRV-based ventilation system is installed.

Part 6 design methods may also be used for the design of ductwork only, while the ventilation system as a whole continues to be designed and installed according to Section 9.32. In some situations, Part 6 design of a duct may be required, because the actual duct is outside the limits of the sizing table in sub-section 9.32.3.. In other situations, the designer may elect to use Part 6 duct design, simply because it will result in a smaller duct. The design of ducts is the only situation where the designer may "jump-out" of sub-section 9.32.3..

Sentence 6.2.1.1.(1) gives many references that may be used to represent "Good Engineering Practice" for the design of Heating, Ventilation and Air Conditioning Systems, however sentence 6.2.2.1.(2) requires self-contained mechanical ventilation systems serving single

dwelling units to also meet the requirements of Section 9.32. Although at first this appears to be a circular reference, the interpretation given in the appendix is that "the reference to Section 9.32 for conformance is intended to ensure that the principal design objectives of section 9.32 are met using the good engineering practice found in part 6.

There is only one reference in 6.2.1.1.(1) which is suitable for the design and installation of self-contained ventilation systems for single dwelling units, and that is CSA-F326. Some designers may attempt to use the ASHRAE Fundamentals, which refers to ASHRAE Standard 62-89 for the design of such ventilation systems, but the ASHRAE standard does not contain a sufficient amount of information to allow the designer to meet the principal objectives of Section 9.32. The **HRAI Digest** refers to the **HRAI Residential Mechanical Design Manual**, which is based on CSA-F326. Many of the references are however, suitable for the design of ductwork only, in conjunction with a system which is designed and installed in accordance with section 9.32.

Although an article such as this is too short to be able to describe the rationale, the actual resulting installation for a CSA F326 system will be very similar to a Section 9.32 system. Perhaps the most obvious differences will be the controls, which are not required to be centrally located by F326, and the absence of a CO detector when a solid fuel combustion appliance is installed. CSA F326 specifies that the dwelling unit not exceed - 5Pa depressurization under certain conditions when spillage-susceptible combustion appliances (including solid-fuel) are installed. This requirement may be met by test or design, but a test is appropriate for most new houses.

The principal other differences are more of form than of substance.

Subsection 9.32.3 relies on the plans-examiner and inspector to review compliance with the rules. CSA-F326 relies on the designer to prepare an appropriate design, and the installer to actually measure the final ventilation flow on completion, and to provide a performance certificate to this effect. The performance certificate commonly used for this is the **HRAI "Ventilation System Record"**. A certificate for certifying the result of a depressurization test (-5 Pa Test) is also available from HRAI.

This and other topics are covered in detail in the 2-day OBOA workshop: **"Residential Ventilation Systems for Building Officials"**.

**Dara Bowser is an HRAI Ventilation Instructor, an associate member of the CSA Technical Committee on Residential Mechanical Ventilation. Dara has been involved in residential ventilation as a consultant, manufacturer, and trainer for the past 12 years.*