



Building Officials Newsletter

Building Standards
October 1998

Mechanical Ventilation for Houses

Section 9.32 of the National Building Code of Canada (NBC) 1995 includes extensive prescriptive provisions for mechanical ventilation of dwelling units. Unfortunately, these provisions appear to be causing some concerns among builders and building officials.

It seems necessary to point out that the prescriptive requirements are only one way of meeting the intent of the NBC. A builder must choose which method of compliance will better suit his or her needs, and then follow that method through to completion.

Initially, the code was simply going to reference the standard CAN/CSA-F326-M91 "Residential Mechanical Ventilation Systems." The Canadian Home Builders' Association was among those who insisted that the NBC should include prescriptive alternatives to compliance with the CSA standard, to ease application of the code.

If a builder chooses to use the prescriptive provisions included in the NBC 1995, building officials should require strict compliance. Variations are allowed within the prescriptive provisions. The Canada Mortgage and Housing Corporation (CMHC) publication provides four examples of the permitted variations. However, any deviations from the prescriptive provisions should not be permitted. For example, Clause 9.32.3.5.(1) says that "*Where an exhaust air intake for the principal exhaust fan required in Article 9.32.3.4. is not located in a kitchen or where the principal exhaust fan has*

another air intake located in another room, a separate exhaust fan with a rated capacity not less than 50 L/s shall be installed in that kitchen." If intakes to the principal exhaust fan are located in the kitchen and even one other location, the kitchen will also require a separate exhaust fan. Similarly, according to Clause 9.32.3.5.(2), if the intake for a principal exhaust fan is not located in a bathroom, that bathroom will require a separate exhaust fan with a rated capacity not less than 25 L/s.

If a duplex has a self-contained ventilation system for each of the dwelling units, either the prescriptive requirements or CAN/CSA-F326-M91 may be used. If one ventilation system is going to be used for both units, the design must conform to the requirements of Part 6 of the NBC. §

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Licensing Update

The Building and Accessibility Standards Administration Regulations came into force on May 16, 1997. These regulations established the requirements and procedures for licensing building officials. We thought you might be interested to know how many building officials have taken advantage of the program.

We have had 96 applications for licences. To date, we have issued 61–Class 1, 6–Class 3, and 7–Restricted licences.

When applicants request a licence they are asked if they are willing to be included on a list for distribution to local authorities and others who are seeking enforcement services. At present we list 44 Building Officials with a Class 1 licence and 5 with a Class 3 licence who offer enforcement services on a fee-for-service basis. §

Tracking Competence Activities

Class 1, 2 and 3 Building Official licences expire after five years, but they may be renewed. Section 10 of *The Building and Accessibility Standards Administration Regulations* sets out the conditions that must be met to qualify for renewal of a licence. These conditions include completing training courses, attending information sessions, being a member of a code development committee, or participating in code related activities, all of which must be acceptable to the Chief Building Official.

To ensure that you have a complete record of activities, you are encouraged to begin keeping track immediately. Some recent examples of qualifying activities include the Saskatchewan Building Official Association's Spring Conference in Moose Jaw, and the National Research Council of Canada's "Mechanical Ventilation Requirements for Houses" seminar in Saskatoon. Remember to note the date, activity, number of hours, location, organizer, and information about the event content. A letter and sample form was recently sent to all licensees. §

Decay of Pine Shakes

Saskatchewan's adoption of the National Building Code of Canada (NBC) 1995 included recognition of pine shakes as a roofing material and references a standard for the product. It has been reported that numerous cases of decay of pine shake roofs have been discovered in Alberta, but we have not heard the same from Saskatchewan.

The referenced standard is CSA O118.3 "Northern Pine Tapersawn Shakes." Appendix D, not a mandatory part of the standard, includes Recommendations for Pressure Preservative Treatment. It says, "*The resistance to decay in all types of shingles and shakes used for roofs would benefit from pressure preservative treatment using a suitable wood preservative. The increase in service life of such a treated roof depends on:*

- (a) *the type and size of the shingle or shake;*
- (b) *the roof construction;*
- (c) *the climatic exposure;*
- (d) *the preservative and treating method; and*
- (e) *other specific geographic and biological conditions."*

"Untreated Northern Pine shakes have been proven durable in roofing applications in climatic zones receiving annual precipitation of up to 20 in. (500 mm). Field performance in areas receiving greater annual levels of rainfall has not been evaluated."

A quick look at Appendix C of the NBC 1995 reveals only one Saskatchewan location listed as having more than 500 mm annual total precipitation. (If your community is not included on the list, call Building Standards to see if additional information is available.) Annual rainfall statistics combined with the climate index maps included in the standard (and on Northern Pine shake packing labels) suggest that preservative treatment of northern pine shakes is not required in Saskatchewan. Nonetheless, if you are seeing evidence of premature decay or deterioration of pine shakes in your community, you might consider recommending that owners and builders avoid installation of untreated pine shakes. §

Log Home Construction

The National Building Code of Canada (NBC) 1995, as adopted and amended under *The Uniform Building and Accessibility Standards Act* applies to log homes built in Saskatchewan, except for those homes which meet the definition of farm building and those under federal jurisdiction. All the requirements that apply to any other type of dwelling unit would apply to a log home. The striking difference between log homes and typical “stick-built” dwelling units is that the NBC 1995 does not contain prescriptive solutions that apply to log homes. However, since the NBC is not intended to limit appropriate use of materials and construction procedures to those described, log construction can satisfy the requirements of the NBC based on demonstrated equivalent performance. Equivalence may be demonstrated by past performance, test or evaluation. The question then is, “What is acceptable past performance, test or evaluation?”

Although there are many log homes in existence, past performance is difficult to accept because of the many types of log construction. Further, it is doubtful that they meet all the performance requirements, such as vapour barrier and insulation. Thus we turn to “test or evaluation.” There are several sources of information that will help us answer this question.

In the past code cycle, the Canadian Codes Centre (CCC) received a “proposed change” that Part 9 of the NBC include requirements for log construction. The Standing Committee on Houses agreed that there is a need for requirements, but felt that specific provisions in the NBC were not justifiable. They recommended that a suitable standard be referenced by the NBC. The Canadian Standards Association (CSA) agreed to develop a suitable standard and a committee was formed.

A CSA committee has worked on developing a new standard, A824 “Log Homes and Buildings.” Information from a number of publications was consolidated into the draft. The document that they used the most was a Canadian Log Builder’s Association (CLBA) standard. However, the draft

has not been completed and the work of the committee has been put on hold.

The CLBA is a non-profit association, founded in 1974, dedicated to “furthering the craft of log building.” Two of their publications are “1996 Log Building Standards for Residential, Handcrafted, Interlocking, Scribe-fit Construction” and “Log Span Tables for Floor Joists, Beams, and Roof Support Systems.” These publications do not purport to provide compliance with the NBC, but are intended to set minimum standards based on the best practices of the handcrafted log construction industry. Further information about the CLBA can be found on the Internet at www.woodworking.com/loghomes/logassoc or by sending an inquiry to logbldassn@aol.com.

The Canadian Construction Materials Centre (CCMC) has done an evaluation report on log homes for 1867 Confederation Log Homes. This CCMC report #10585-R is based on their technical guide for “Milled-Log Buildings.” The report can be viewed at www.nrc.ca/ccmc. The CCMC technical guide was prepared for the evaluation of this specific product, thus the technical requirements and performance criteria are not valid for the evaluation of other products unless verified by CCMC under separate contract. However, it could be used to give guidance on what elements of the construction should be evaluated. These elements include thermal performance, moisture control, and structural performance. Of course, the remaining requirements of the NBC would still be applicable.

Although the National Model Energy Code of Canada for Houses (NMECH) 1997 is not in force in Saskatchewan, its Appendix C contains valuable information about calculation of thermal resistance of log walls. During preparation of the energy codes, the Institute for Research in Construction (IRC) completed analyses that resulted in the calculations that are described in Appendix C. These calculations might be useful in completing an evaluation of log construction.

(continued on page 4)

Steel Wide Flange Shapes

We understand that some unmarked steel wide flange shapes have been imported into Canada. These shapes are not identified with manufacturer's name, brand or trademark shown in raised letters at intervals along the length of the shape. The Canadian Institute of Steel Construction has advised us that these imported shapes do not comply with CSA G40.20, and thus do not comply with CSA S16.1 and cannot be used in a building structure unless prior approval by the designer is obtained. §

(cont'd from page 3 — Log Home Construction)

Canada Mortgage and Housing Corporation (CMHC) has several publications dealing with log home construction. These might be useful for guiding evaluation or construction, but do not provide a standard for evaluation.

- Log House Construction Requirements (This 1987 document is out of print.)
- Solid Log Wall Construction
- Air Leakage Performance of 11 Log Houses in Eastern Ontario & Western Quebec
- Log Structures: Selective Bibliography
- Log Walls Field Tests

The Manufactured Housing Association of Canada and the Canadian Manufactured Housing Institute has produced a directory of manufacturers that includes log home manufacturers. They divide the types of log homes into two categories: profiled (pre-cut) log homes and handcrafted (handhewn) log homes. The directory does not indicate any standards or performance criteria that have been met, so each manufacturer would have to be consulted separately.

Building Standards now has a substantial collection of information about log homes. If you are in Regina and would like to look at the collection, you are welcome to drop by. §

Telepost Sizing

With the prevalence of larger and more complicated house designs, it becomes increasingly difficult to rely on the "way things have always been done." A glaring example of this is columns in dwelling units.

Section 9.17 of the National Building Code of Canada (NBC) 1995 includes general provisions that apply to all columns and specific provisions for steel, wood, unit masonry, and solid concrete columns. Some of the provisions have become so much a part of the way houses are built that it is almost surprising to see them included. For example, "*steel pipe columns shall have an outside diameter of not less than 73 mm*" and "*the width or diameter of a wood column shall be not less than the width of the supported member.*"

But the most important provisions are too easily overlooked. This Section applies only to:

- columns supporting carport roofs, and
- beams carrying loads from not more than 2 wood-frame floors where the supported length of joists bearing on such beams does not exceed 5 m and the live load on any floor does not exceed 2.4 kPa.

If these conditions are not met, the columns must be designed by a professional designer in conformance with Part 4 of the NBC 1995.

Design of the columns is particularly important in situations where truss joist floor systems and unusual roof configurations are used. Rather than relying on the "way things have always been done" it is important for the building official to be able to identify when the columns need to be specially designed. Often in these cases, the column footings will need to be professionally designed, as well. §

**"A void shortcuts. They always take too much time in the long run."
— Unknown**

Grain Elevator Demolition

We have been asked for information about controlling demolition of grain elevators, and asked to review a proposed demolition bylaw. Like the municipality that called, many municipalities already have building bylaws under *The Uniform Building and Accessibility Standards Act* (the UBAS Act) that authorize demolition permits. However, the recent announcement by the Saskatchewan Wheat Pool about demolishing approximately 200 elevators in Saskatchewan means that the information provided to the caller will probably be useful to others.

Demolition bylaws are authorized by the UBAS Act. These bylaws must meet all requirements of the appropriate municipal act related to enacting a bylaw. And they must meet the requirements of the UBAS Act related to approval. The bylaw must be submitted within 30 days of its enactment, and the Minister of Municipal Affairs, Culture and Housing has 60 days to review and approve the bylaw. The bylaw does not come into effect until it is approved. A bylaw will not be approved if it conflicts with the provisions of the UBAS Act.

Specifically regarding demolition of grain elevators, the primary consideration is jurisdiction. Provincial statutes like the UBAS Act have no jurisdiction over federal property, federal buildings, or federally-regulated operations. A representative of Public Works and Government Services Canada confirmed that federal public works are not required by law to comply with provincial or municipal regulations. However, he mentioned that their standard practice is to require contractors working on their properties to comply with provincial and municipal, as well as federal, requirements.

An example about this jurisdictional issue comes from a 1984 Saskatchewan Court of Queen's Bench decision. A municipality was attempting to designate a railway station as a heritage building. Since the railway company no longer needed the station, it was slated for demolition. The Court concluded that the building was an essential part of the railway operation and that the town council lack power to pass such a bylaw respecting a railway station because the operation of the station fell under the exclusive jurisdiction of the federal Parliament. In this case, the railway planned to erect another building to house a train register and store materials, so the property was going to continue to be part of the railway operations.

Conversely, if a rail line and the adjacent buildings (i.e., station, grain elevator) have been abandoned and are no longer part of railway operations, it appears that the federal government no longer has any authority. The owners would be subject to provincial and municipal regulations.

Of course, the foregoing are only generalities. The best advice that we can provide to a municipality is to consult their legal counsel to evaluate their actual situation. If a municipality decides to enact a new bylaw or amend an existing one, we strongly encourage them to talk to Shelly Toniello in Building Standards and submit a draft bylaw before Council passes it.

Some concerns that Councils have voiced to us about demolition of grain elevators include economic impact on their communities, local employment, and recycling of the materials from the demolition. Since a demolition bylaw is only intended to address issues of public safety, it is unlikely that a Council could justify imposing conditions on a demolition permit that address these issues. However, it appears quite reasonable to impose conditions regarding spread of dust and debris during demolition, and clean-up of the site after demolition. We encourage municipalities that are facing loss of a grain elevator to contact the owners and negotiate arrangements that are suitable to both parties. §

First Revisions and Errata Issued

The National Building Code of Canada (NBC) 1995 First Revisions and Errata have been issued by the Canadian Commission on Building and Fire Codes. *The Uniform Building and Accessibility Standards Regulations* declare these revisions and errata in force when they are issued.

Although most of the First Revisions and Errata package addresses typographical errors, there are some significant changes. These changes affect a variety of provisions, including those dealing with:

- referenced standards,
- compressive strength of floor slabs,
- unprotected glazed area in exits,
- polyethylene for airtightness of floors on ground,
- heights of rooms or spaces in dwelling units,
- fire protection for gas and electric ranges,
- particleboard subfloor, and
- appendix figures showing limiting distances for spatial separations.

Please contact the National Research Council of Canada at 1-800-672-7990 if you have not yet received your revisions and errata package. §

Roof Truss Design in Part 9 Buildings

According to the National Building Code of Canada (NBC) 1995, wood design must use limit states methods — with one exception. The Truss Plate Institute of Canada (TPIC) document “Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses (1988)” which is referenced by the NBC 1995 uses working stress design methods. The 1996 edition of this document uses limit states design but, due to objections from home builders, has not yet been referenced. Until the 1996 edition is referenced by the NBC, working stress design methods described in the TPIC documents are still acceptable. §

Updated Sprinkler Standards Referenced

1996 versions of the NFPA automatic sprinkler standards 13, 13R and 13D are now referenced by the National Building Code of Canada (NBC) 1995. Although the standards should be referred to for details, a summary of significant changes follows.

NFPA 13 “Installation of Sprinkler Systems”

- The small room rule is permitted for rooms with certain openings to adjoining spaces.
- Horizontal sidewall and dry sidewall sprinklers are permitted for use on dry, preaction and combined dry pipe and preaction systems.
- A diagram shows the preferred arrangement of an antifreeze loop when supplied through a backflow preventer.
- A new exception permits omission of sprinklers from exhaust ducts connected to certain listed exhaust hoods.
- Fire department connections that service only portions of a building must be provided with signs identifying the protected portions.
- Residential or quick response sprinklers must be used in light hazard occupancies.
- Design areas and number of design heads for certain systems have been changed.
- Minimum 7 psi sprinkler operating pressure.

NFPA 13R “Installation of Sprinkler Systems in Residential Occupancies up to and including Four Stories in Height”

- Minimum 7 psi sprinkler operating pressure.
- Uniform criteria for placement of residential sprinklers near heat sources.

NFPA 13D “Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes”

- Special restrictions under which 1/2 inch diameter nonmetallic and copper tube may be used.
- Minimum 7 psi sprinkler operating pressure.
- Uniform criteria for placement of residential sprinklers near heat sources. §

Municipal Fire Pumps

With the increasing number of sprinklered buildings being constructed, it is important for building officials to check the water supply on which the sprinkler design is based. Many municipalities in Saskatchewan have manually switched fire pumps in their municipal water supply systems. If a flow test for a sprinkler design has been completed based on the normal water supply (without the fire pump activated), the sprinkler system should always operate as designed. However, if the design is based on a flow test done when the municipal fire pump is operating, the sprinkler system will only operate as designed when the municipal fire pump is activated. Building officials should take care to accept sprinkler designs based on appropriate flow tests — the flow test must reflect the normal water supply pressure or the municipal fire pump must be automatically switched so that it will operate when needed. §

Fire Alarm System Verification

Underwriters' Laboratories of Canada (ULC) has published updated versions of two standards: CAN/ULC-S536-97 "Standard for the Inspection and Testing of Fire Alarm Systems," and CAN/ULC-S537-97 "Standard for the Verification of Fire Alarm Systems."

S537-97 has been referenced by the First Revisions and Errata to the National Building Code of Canada (NBC) 1995. The changes address issues such as:

- Person(s) responsible for the verification.
- Current technologies (e.g. microprocessor based fire alarm control unit, software changes, addressable/analog devices).
- Major component changes to existing fire alarm system.
- Software changes and modifications.

The glossary has been extensively improved. Many new terms are for new technology (e.g. firmware, software sequential display, etc.). The verification procedures for wiring and control units and for field devices have been separated. A separate section addresses system modifications and the type of verification required. An enhanced appendix provides a simple checklist for the corresponding verifications that are specified throughout the standard. §

Ductless Hoods for Commercial Cooking Appliances

Whenever commercial cooking appliances are installed in a building, building officials look for compliance with NFPA 96 "Ventilation Control and Fire Protection of Commercial Cooking Equipment." Usually this involves a completely ducted system that vents grease laden vapours to the outdoors. Ductless hoods that vent into the room rather than through a duct system to the outside are becoming popular because they are easier and more cost effective to install.

Cooking appliances with integral ductless hoods include commercial deep fat fryers, griddles and other appliances that have recirculating hoods directly attached as part of the equipment. These systems incorporate an automatic fire extinguishing system. Separate ductless hoods are intended for installation with specific listed commercial cooking appliances, but are not attached as part of the appliance. They also incorporate an automatic fire extinguishing system. As with all hoods, the operating instruction must be carefully reviewed for information regarding proper maintenance of the fire extinguishing system — and the building design must provide sufficient ventilation, heating and cooling capacity for the occupancy.

NFPA 96-1994 recognizes ductless hoods. In addition to meeting the other requirements of the standard, additional emissions tests and evaluation of the fire extinguishing system as an integral part of the hood are required for ductless hoods.

Building officials should continue to look for listed equipment to provide ventilation and fire protection for commercial cooking equipment. §

Fabric Covered Buildings

The City of Regina recently received confirmation about their building permit requirements regarding a fabric covered building that was erected as an industrial cold storage building in the city.

The owner erected the building without having first obtained a building permit. When approached by the City building officials, the owner was unable or unwilling to produce a professional design for the building. The City was also looking for compliance with CAN/ULC-S109-M "Standard for Flame-Resistant Fabrics and Films," for adequate coverage of spatial separation requirements, and for anchorage of the building frame, in addition to the other applicable requirements of the National Building Code of Canada. Because the owner did not meet the building official's requirements, a building permit was not issued.

The Provincial Court of Saskatchewan ordered the owner to comply with the bylaw (obtain a building permit) or demolish the structure, and gave the owner three months to comply. §

**"Learn from the mistakes of others.
You won't live long enough to make
them all yourself."
— Unknown**

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