



Building Officials Newsletter

Building Standards
April 2000

Testing Interconnected Smoke Alarms

Article 9.10.18.4. of the NBC 1995 requires smoke alarms in a dwelling unit to be wired such that activation of one causes all others in the building to sound as well. The smoke alarms must conform to CAN/ULC-S531 "Smoke Alarms." This standard tells us that multiple-station type smoke alarms are needed when they will be interconnected. The standards sets some specific requirements:

- Actuation of a multiple-station type smoke alarm shall result in alarm sounding by all the interconnected units.
- Multiple-station type smoke alarms shall be capable of operating as single-station type under open, ground, or short circuit fault on the interconnect circuit.
- A multiple-station actuation shall result in an indication to identify which of the interconnected units initiated the alarm.
- A multiple-station actuation shall result in all units being restored to normal when the reset control is operated on the one which initiated the alarm.

Multiple-station type of smoke alarms have a three-wire connection: two for power and one to interconnect the units. They can be powered from one or more electrical circuits. Installers wire in the units, but are not required to test them. To determine whether the interconnected units and the installation have been selected and installed properly, all units should sound when one is activated by pushing the test button (or exposing the detector to smoke) and it should be possible to see where the alarm was initiated. If not, the installation should not be accepted. §

Accidental Death Rates

When we read that fire is the fifth leading cause of accidental deaths in the United States, behind vehicle accidents, falls, poisoning and drownings ("US Fire Death Rates Still High," *The Code Official*, July/August 1999), we wondered how Canada compared. The Canada Safety Council and the Saskatchewan Safety Council provided us with some numbers. The most recent come from a study by SmartRisk that shows 1995 figures.

Major Cause of Death	Number	%
Motor Vehicle	2,946	38.2
Falls	2,367	30.7
Poisoning	667	8.6
Drowning & Suffocation	404	5.2
Fires	314	4.1
Water Transport	109	1.4
Air & Space	54	0.7
Railway	40	0.5
Pedal Cycle	16	0.2
Other	804	10.4
TOTAL	7,721	100.0

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Attached to this Issue...

Survey on Saskatchewan's Building Code

Spring 2000 SBOA Conference — Panel Session Questions

The following questions and answers were exchanged during the Building Standards Panel Session at the Saskatchewan Building Officials Association Inc. (SBOA) spring conference in Swift Current. We look forward to having the same opportunity to hear what's on your minds at the fall conference, scheduled for October 25–27 in Saskatoon.

Q: Regarding insulated floor systems above cold air spaces, i.e., attached garages with rooms above, mobile homes, modular homes, etc.: Please comment on 1) the location and requirements for poly vapour barrier, 2) the air space above insulation, radiant heat/leakage from supply air ducts in forced warm air heating systems, and 3) will T&G subfloor also act as a vapour barrier and potentially cause problems if a poly vapour barrier is applied directly over top of floor insulation? The assembly consists of wood truss joists with T&G subfloor, batt insulation located at the bottom of the joists, and ductwork located in the space between the subfloor and the insulation.

A: As with any thermally insulated wall, ceiling or floor assembly, this floor is required to have a vapour barrier (Article 9.25.4.1.) and an air barrier (Article 9.25.3.1.). If a poly vapour barrier is used it must be located either on the warm side of the assembly, at a location where the ratio of thermal resistance outboard/inboard is appropriate for the heating degree days of the building location, or outboard of an air space that is vented to the outdoors and, for walls, drained (Article 9.25.1.2.). In the floor assembly under consideration, it is impractical to install the poly directly on the inside (warm) face of the insulation because of the discontinuity of the vapour barrier at the floor joists. If possible, the poly could be installed directly under the subfloor, although again it may be difficult to ensure the vapour barrier is continuous. The best solution would likely be to apply the poly to the underside of the joists and batt insulation, and then apply another layer of rigid insulation and drywall or insulating sheathing, such that the appropriate ratio of thermal resistance outboard/inboard of the vapour barrier is achieved. Dwayne Williams from CMHC in Saskatoon reminded us that this ratio is similar to the 2/3 to 1/3 rule of thumb which would exceed the minimum ratios that would be called for in Saskatchewan. Appendix C shows a range of degree days in Saskatchewan from 4850 to 7300, which

would call for ratios of 0.3 to 0.4 (Table 9.25.1.2.), whereas the rule of thumb would give you a ratio of 0.67. By calculating the required thermal resistance outboard of the poly vapour barrier, the builder could design an assembly that makes the most effective use of the materials, provides an interior finish (useful in the garage), keeps the batt insulation in place, and meets the requirement for an air barrier, too. Dwayne also noted that there is often a poor vapour barrier detail at the top of a common wall between a garage and a dwelling. He advises that, "Framers should drape poly over the top of the common wall prior to installing the joists. Once the insulation is installed into the floor joists and the ceiling vapour barrier installed, the poly that was draped over the common wall can be sealed to the poly vapour barrier on the ceiling of the garage and folded up and over the ends of the joists from within the dwelling." Thanks, Dwayne.

The ductwork within the floor assembly must be sealed to inhibit air leakage and must be prevented from sagging and moving as described in Sections 9.32. and 9.33. of the NBC 1995. Radiant heat from supply ducts should not pose any unusual problems because the ducts are located on the warm side of the insulation.

The T&G subfloor would not act as a vapour barrier. Any typical T&G material would have too great permeance, and joints between boards would likely contribute to leakage. Thus, there shouldn't be a problem with trapping moisture between two vapour barriers.

Q: RTM cabins are mainly built with 38 x 89 mm exterior walls and do not meet the requirements for thermal insulation. Most times the cabins are used only in the non-heating season, but at times people retire to these cabins and live in them year round. Do these cabins have to meet requirements for thermal insulation and for ventilation requirements in 9.32 of the NBC 1995?

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A: Appendix note A-9.1.1.1.(1) of the NBC 1995 provides advice on applying Part 9 of the code to cabins. It describes the possibility of allowing exceptions from the requirements based on seasonal or intermittent use of a dwelling unit. If you have reason to believe that the dwelling will be occupied year round, there is likely no reason for you to allow exceptions. However, if no heating system is installed you can reasonably conclude that the cabin will only be occupied in warm months, and possible exceptions may be made for thermal insulation, air barrier system, vapour barrier, double glazed windows, and interior finishes. If there is no space heating equipment in the cabin, it is possible to meet the non-heating-season ventilation requirements by having openable windows, and the extensive heating season ventilation requirements need not be applied. Even if a dwelling unit is occupied year round, the requirements for plumbing fixtures would not apply if a piped water supply is not available, and requirements for electrical facilities and mechanical ventilation would not apply if electrical service is not available. When you approve exceptions for a cabin, the approval should clearly note that the exceptions are conditional on those factors that convinced you to allow the exceptions. The owner should also be informed that if any of these conditions change (for example, if space heating equipment is installed) then the exceptions will no longer apply.

Q: Article 9.11.2.1. requires walls between dwelling units and other spaces in a building to have a minimum 50 STC rating. Typical walls in residential construction won't meet this requirement, i.e., a 2x4 stud wall with 15.9 mm Type X drywall will give a 1 hour fire-resistance rating, but only has an STC rating of 32; 2 layers of drywall with absorptive material gives only 38; 2x4s staggered on 2x6 plates with 1 layer of drywall gives only 47. The tables don't show 2x6 stud walls — will using them help?

A: Using 2x6 studs in place of the 2x4s in the walls described will not produce a significant increase in the STC rating. The designer will need to return to the tables to select a wall assembly that has a minimum 50 STC rating. Since airborne sound transfers through the wall by causing the wall and then in turn the air on the other side of the wall to

vibrate, more effective sound control can be achieved by increasing the mass of the wall (i.e., concrete block walls) or eliminating continuous, rigid paths through the assembly (i.e., double framed walls, resilient channels, or sheet metal studs). However, the *User's Guide – NBC 1995 Housing and Small Buildings (Part 9)* cautions that simply adding more layers of drywall can actually increase sound transmission. Wall assemblies using sound control or noise-deadening boards can increase the STC rating. Manufacturers of these products (such as Westroc and Georgia-Pacific that can be found through an online directory of building products at www.buildcore.com) usually provide specifications for wall assemblies and their fire-resistance and STC ratings.

Q: What is the proper procedure to report a product that does not appear to meet CSA or NBC standards and is sold nationwide to consumers who are using the product not realizing the contravention or the NBC? For example, a steel shell residential garage overhead door with a vinyl-backed polystyrene insulating core that doesn't meet Sentence 9.10.16.10.(2) of the NBC 1995?

A: The first thing to do is to ensure that the NBC requirements apply to the situation where the product is used. Just because a product doesn't comply with the code doesn't mean it can't be sold. There are many cases where a product need not comply to the NBC, such as plywood in a doll house or a farm building. Next, check to see if the product has any listings or test reports available from the supplier or manufacturer. If satisfactory information isn't available, you should notify the supplier and manufacturer about the NBC requirements and your concerns, and request that they provide information about code compliance to their customers at the point of sale or in the manufacturer's documentation. You can also contact Building Standards for assistance in evaluating code compliance and locating listing or testing information.

Q: Regarding Article 9.10.16.10., Protection of Foamed Plastics: Does the foamed plastic insulation require protection when located in a heated and ventilated crawl space under a dwelling unit?

(continued on page 4)

IMPORTANT NOTICE

*To Graduates of the pre-1995 version of the Building Code Training for Canadians—Series I course who have not obtained a Building Official Licence: We recently became aware that there may be individuals who successfully completed a now outdated version of BCTC but who did not complete a refresher session. Credit for the outdated course would not be adequate to obtain a new Building Official Licence now. However, we have realized that we did not give notice of expiry of its acceptability. Consequently, please contact Building Standards **immediately** if you are one of these individuals and would like to discuss obtaining a Building Official Licence.*

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A: This Sentence does not require protection of foamed plastics from concealed spaces within crawl spaces. It doesn't appear to make any difference whether the crawl space is heated or unheated. Foamed plastics produce an earlier flashover than in spaces lined with acceptable finishes, and reduce the time available for escape. This Sentence appears to recognize that this reduction is insignificant in concealed (unoccupied) spaces. However, if the crawl space is used as a plenum, Article 9.18.7.1. limits the flame spread to 150. Article 9.33.6.4. prohibits use of foamed plastics as part of air ducts or to insulate ducts.

Q: A local cafe has a mezzanine where the temperature gets quite warm and the owner would like to install a large fan to exhaust the warm air. Should he be concerned about this fan affecting the rest of the building?

A: Yes. Just as with the requirements for ventilation in houses included in Subsection 9.32., there would be a concern about developing negative pressure and causing other equipment in the building to backdraft or otherwise malfunction. As in houses, when a new piece of equipment that exhausts air is installed, make-up air must be provided. The owner should hire a mechanical engineer to test the existing setup with all the existing equipment operating and calculate the make-up air requirements, so that adequate ventilation is maintained when the new fan is installed. §

Solid-Fuel Fired Space Heaters

In February, Underwriters' Laboratories of Canada (ULC) released notice of Amendment No. 1 to ULC-S627-93 "Space Heaters for Use with Solid Fuels." The significant changes to the standard are as follows:

- A space heater intended to be vented through the throat of an existing masonry fireplace shall conform to the appropriate requirements of ULC-S627-93 and ULC-S628-93 "Fireplace Inserts,"
- The wording of a CAUTION requirement in the manufacturer's installation and operating instructions regarding prohibiting connection to any air distribution ductwork has been revised for consistency with requirements contained in CSA-B365, and
- The clearance to combustible marking requirement has been revised to specify a minimum character size in the interest of clarity. Multiple space heater models on a marking label is allowed provided these models have identical clearances, including clearances reduced by components provided or specified by a manufacturer.

ULC has adopted the provisions of the Amendment and all new submittals of solid fuel fired space heaters will be investigated in accordance with the requirements. All existing Listings will be required to comply as of July 31, 2000. ULC will be reviewing all currently Listed products and compliance to these new requirements will be required by June 1, 2000. §

As of March 27, 2000, you can find the UL's Listing Information System database with the click of a mouse on UL's Internet web site at www.ul.com/database. This includes products certified for Canada. With built-in search engines you can access the most current information in the UL database by company name or geography, file number, product name or guide information.

Supreme Court Decision

In early March, national newspapers reported on a Supreme Court decision about a renovation in a nearly 100 year old house in Toronto. A summary of the reports follows.

The owners wanted to lower the basement and hired a contractor to do the work including underpinning of the foundation. The contractor convinced the owners to allow him to begin work before a building permit was obtained. City inspectors visited the site after the foundation work was completed and covered, relied on the contractor's assurance that everything was fine, and approved the foundation. Within weeks, leaking or flooding of the basement began. Exposure of the underpinnings revealed that they were neither adequate nor what had been specified in the plans. The owners sued the City and the contractor to recover the cost of repairs. The trial judge found the City 14% responsible, the contractor 80% responsible, and the owners 6% responsible. The decision was overturned on appeal, and then reinstated by the Supreme Court. Since the contractor has apparently left the country, the City must also pay the contractor's portion.

The newspaper reports claim that this decision is significant for municipal liability. The reports say the decision tells municipalities that they are responsible for faulty inspections, they are under greater pressure to ensure that construction they approve is safe, and they are likely to be found liable if their employees ought to have foreseen potential damage. This doesn't seem like news to us.

In Saskatchewan, under *The Uniform Building and Accessibility Standards Act*, local authorities have the responsibility to administer and enforce the Act and regulations. They can meet this obligation by doing any or all of a number of things: enacting building bylaws, issuing building permits, appointing building officials, conducting plan reviews and inspections and identifying noncompliance, issuing orders, and conducting prosecutions. Protection afforded to local authorities comes from Section 26 of the Act, which says: "*No action or proceeding lies against the minister, the department, any employee of the department, the appeal board, a local authority or a building official for any matter or thing done or omitted to be done by any of them in good faith and with reasonable*

care or in exercising their powers or carrying out their duties under this Act or the regulations." Clearly, if work done under authority of the Act can be proven to be faulty, negligent, deficient, or malicious and this work contributes to a failure, the local authority can and usually will be found liable.

And although local authorities appear to be under greater pressure to ensure building safety, the Act does not require a local authority to ensure construction complies with the code—this is the owner's responsibility. Local authorities are simply being pressured to provide clear, efficient, and effective regulatory control of building construction. Those local authorities that choose to take reasonable steps to meet their responsibility, perform an audit function. They spot check what is planned and built. That is what is expected by the legislation and by the courts. Local authorities and building officials do not guarantee or warranty the work, nor are they expected to. This was confirmed by the Supreme Court decision through the division of the liability. The City was assessed 14% of the responsibility. Unfortunately for the City, joint and several liability implications left them "holding the bag" for 94% of the costs.

But none of this is new or startling for those who understand today's construction process. As the "leaky condo" issues in British Columbia have emphasized, construction of a building involves many different people with a variety of roles and responsibilities, compounded by a complex mixture of administrative, technical and legal rules. Local authorities that understand their role and responsibility and clearly define how they are going to meet the expectations of the Act will be assured a reasonable defence, if and when things go wrong. §

SPAG News

by Tim Macaulay, Saskatchewan Health

NOTE: The Saskatchewan Plumbing Advisory Group (SPAG) has not met since our last newsletter. Those who have questions regarding SPAG should contact Mr. Tim Macaulay, Saskatchewan Health at (306) 787-7128, fax (306) 787-3237, or e-mail tmacaula@health.gov.sk.ca.

You Wanted to Know...

Does a Building Official Licence authorize a licence holder to do a building code compliance inspection of an existing building for people who wish to purchase a building?

A Building Official Licence has no impact on this type of activity: a licence neither authorizes or prohibits a holder from doing pre-purchase inspections. When people phone Building Standards for advice about code compliance of an existing building, we first refer them to the municipal office where the building is located to see if there are any outstanding notices or orders from the building or fire officials. If the owners want to hire someone on their own and ask for our recommendation, we give them a list of licenced building officials because these officials have demonstrated their knowledge of the building code. However, the owners may hire whoever they believe will give them the best service.

Building officials who complete building code compliance inspections on existing buildings and provide recommendations and advice about upgrading the buildings should remember that they cannot also act as the appointed building official for the appropriate local authority during the upgrading of the same buildings, due to the provisions in Section 9 of *The Uniform Building and Accessibility Standards Regulations*. §

Watch for the Saskatchewan Building Officials Association's new website www.sboa.sk.ca coming soon ...

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Comments, suggestions and constructive criticism about this newsletter are welcomed.

For further information on items or for additional copies, please contact:

Building Standards
Saskatchewan Municipal Affairs,
Culture and Housing
310 - 1855 Victoria Avenue
Regina SK S4P 3V7
General Inquiries (306) 787-4113
Fax (306) 787-9273

Margaret Kuzyk, P.Eng., Chief Building Official
(306) 787-4517 mkuzyk@mach.gov.sk.ca

Laurie Labelle, Assistant Chief Building Official
(306) 787-4519 llabelle@mach.gov.sk.ca

Shelly Toniello, Administrative Coordinator
(306) 787-3642 stoniello@mach.gov.sk.ca

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