



Sprinklers in Attics

Are sprinklers required in an attic? In a wood frame building that is required to be sprinklered in conformance with NFPA 13 “Installation of Sprinkler Systems,” the answer to this question is probably “YES.”

NFPA 13 requires sprinkler coverage in all concealed spaces, including attic spaces. However, some exceptions to this requirement have caused considerable debate and resulted in inconsistent application. The pertinent exceptions have changed over the past few editions of the standard as shown below. “Handbook commentary” means the appropriate edition of NFPA *Automatic Sprinkler Systems Handbook*.

NFPA 13 1989, 4-4.4.1 All concealed spaces enclosed wholly or partly by exposed combustible construction shall be protected by sprinklers. Exception No. 8 When the exposed surfaces have a flame spread rating of 25 or less and the materials have been demonstrated not to propagate fire in the form in which they are installed in the space. (Handbook commentary: “Exception No. 8 is intended to permit fire-retardant treated lumber or materials classed as limited-combustible.”)

NFPA 13 1991, 4-4.1.7.1.1 Same as 4-4.4.1 and Exception No. 8 in 1989 edition.

NFPA 13 1994, 4-5.1.1.1 Same as 4-4.1.7.1.1 and Exception No. 8 in 1991 edition.

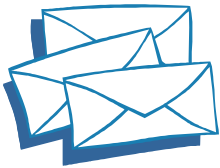
At this point, this clause was sometimes being used to allow deletion of sprinkler coverage in attics where the wood surfaces had been sprayed or painted with a fire-retardant coating. When it was identified that this interpretation was occurring and that there is a significant difference between wood members with fire-retardant coating and limited-combustible materials, the exceptions were changed.

NFPA 13 1996, 4-13.1.1 All concealed spaces enclosed wholly or partly by exposed combustible construction shall be protected by sprinklers. Exception No. 8 Where rigid materials are used and the exposed surfaces have a flame spread rating of 25 or less and the materials have been demonstrated not to propagate fire in the form in which they are installed in the space. Exception No. 9 Concealed spaces in which the exposed materials are constructed entirely of fire-retardant treated wood as defined by NFPA 703, Standards for Fire Retardant Impregnated Wood and Fire Retardant Coatings for Building Materials. (Handbook commentary: “Exception No. 8 is intended to permit the use of materials classed as limited-combustible without sprinkler protection.”)

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Readers' Letters

If you wish to comment on anything you've read in the Building Officials Newsletter, please send your letter to us by fax, e-mail or post-mail at the addresses listed on the last page.

Hi Margaret, How are things? I disagree with the April 2001 newsletter panel session answer regarding the "radon rock". I chased this around with Chris a bit before he left but we never did get to the bottom. I agree that there are two reasons for the granular material: 1) moisture related, and 2) part of a soil gas solution.

I don't disagree with the moisture statements and do realize in order to omit the material both moisture and soil gas requirements must be satisfied.

The newsletter article implies that if soil gas is to be protected against by soil gas barrier 9.13.8.1. and 9.13.2.2. then the granular material is also part of that soil gas barrier system. I disagree.

I see three ways to meet soil gas requirements and only one of them involves the granular material.

1. determine soil gas is not a problem in the area (by testing)
2. the 9.13.8.2. system using the granular material
3. the 9.13.8.1. and 9.13.2.2. barrier not requiring granular material

I believe the last line of the article should read "the granular material can be eliminated only when the 9.13.8.2. depressurization system is not being used AND site moisture conditions are such that the granular material is not required for drainage or dampproofing (i.e. dampproofing by CGSB POLY).

David Petersen, by e-mail

Hi, David. Well, I've had a chance to go back and look through the information that Chris gathered in preparing the answer to the code panel question on "radon rock" in the April 2001 newsletter. I think that the explanation that you included in your e-mail is mostly right, but that you need to add in the impact of Article 9.16.2.1. This is what our answer did, although it didn't say so (sorry). The way that the code provisions add up (unless it can be demonstrated that soil gas is not a hazard), you need:

- the soil gas barrier (poly) (Article 9.13.8.1.) PLUS the granular material (Article 9.16.2.1.). If the poly is not effective enough, then having the granular material under the slab provides a less costly retrofit of a depressurization system.

OR

- a subfloor depressurization system (Article 9.13.8.2.) PLUS the granular material (Article 9.16.2.1.). It just happens in this case that the granular material is part of the depressurization system.

The article that I pointed you to [www.cmhc-schl.gc.ca/publications/en/rh-pr/tech/00-130-E.htm] reinforces your assertion that the poly (along with sealing the cracks) can be used to meet the soil gas requirements. However, the code still doesn't let you eliminate the granular material—maybe a second line of defense? Chris developed a table to help clarify the dampproofing and soil gas requirements that I'll duplicate below.

While he was researching this information, Chris talked with the technical advisors in the Canadian Codes Centre and they agreed that these code provisions are confusing, and that they would ask the Standing Committee to consider a re-write for the next edition. So you can look in the proposed changes (due out for public comment next summer) to see if they will be able to improve things. Let me know if you want to discuss this further.

Margaret

	"typical" construction	with subfloor depressurization system	where demonstrated that soil gas is not a hazard
poly under slab for soil gas barrier	required [9.13.1.3.(1) and 9.13.8.1.(1)]	not required [9.13.1.3.(1) and 9.13.8.2.(1)]	not required [9.13.1.3.(2)]
granular material under slab	required [9.16.2.1.(1)]	required [9.16.2.1.(1) and 9.13.8.2.(2)]	not required [9.16.2.1.(2)]
poly under slab for dampproofing	not required [9.13.1.1.(3)]	not required [9.13.1.1.(3)]	required [9.13.1.1.(2)]

(continued from page 1 — Sprinklers in Attics)

NFPA 13 1999, 5-13.1.1 Same as 4-13.1.1 and Exception Nos. 8 and 9 in 1996 edition.

The change to the exceptions in the 1996 edition as explained by the Handbook commentary clearly indicated that Exception No. 8 could no longer be used to allow deletion of sprinkler coverage in attics where the wood surfaces had been sprayed or painted with a fire-retardant coating. Limited-combustible is defined by NFPA 220. Wood with a fire-retardant coating cannot meet the requirements for limited-combustible materials because surfaces that would be exposed by cutting through the material would have a flame spread rating greater than 25.

But Exception No. 9 was added. This specifically addresses fire-retardant treated wood, so the standard writers obviously agreed that there were cases where, if certain conditions were met, sprinkler coverage could be deleted in attics with exposed wood surfaces. Unfortunately, the reference to NFPA 703 has opened the door to another mistaken interpretation. Since NFPA 703 covers both fire-retardant impregnated and coated wood, and since NFPA 13 does not explicitly specify which method of treatment is required, the debate over use of coatings has re-occurred.

An informal opinion from an NFPA staff member says that the writers' intent was to limit Exception No. 9 to fire-retardant impregnated wood (compliance with Chapter 2 of NFPA 703). This conclusion is reinforced when we turn to publications from the Canadian Wood Council (CWC). The CWC's *Wood Reference Handbook* states that "Fire-retardant treated wood (FRTW) is material which has been pressure impregnated with special chemicals which improve the performance of wood products in a fire." Fire-resistant treated products must be labelled as achieving a flame-spread rating of 25 or less and showing no progressive burning for an additional 20 minutes of testing. Fire-retardant treated wood does not include wood that has had a fire-retardant coating applied because fire-retardant coatings are tested and listed for the flame-spread rating but not for the progressive burning test, and uses are limited to the description in their listings.

Thus, Exception No. 9 will permit deletion of sprinklers in attics where wood trusses and all other wood surfaces are made of wood that is impregnated with fire-retardant. Exception No. 9 does not apply when the wood surfaces have been coated with fire-retardant.

FRTW can be used for plywood, lumber, decking, trusses, millwork, and panelling. Several general cautions regarding FRTW should be noted:

- High humidity conditions should be avoided.
- More care may be required during installation to prevent frequent wetting or ponding.
- Treatment salts may leach out of the material, if exposed to the weather.
- Special chemical formulations and accelerated weathering testing are required for exterior installations.
- Treatment results in some reduction in the strength properties of wood.

It does not appear that trusses manufactured from FRTW are commonly available in Saskatchewan. Speculated reasons include that FRTW materials are difficult to obtain, the reduced strength of the wood is problematic, typical galvanized truss plates need additional corrosion protection, and the cost would be prohibitive. None of these claims have been verified.

Building officials are advised that care should be taken when approving a design that eliminates sprinkler coverage in an attic based on this exception in NFPA 13. All exposed wood surfaces, including trusses, must be fire-retardant impregnated and labelled as such. Chemical formulations must be suitable for the anticipated conditions of use. Designs must be based on strength and chemical properties of the treated wood. Special handling and installation procedures must be followed. If any of these conditions cannot be met, then "YES" sprinklers are required in the attic. §

Did you know that ... industry-termed "residential" roof trusses are designed to comply with Part 9 of the NBC while "commercial" roof trusses are designed to comply with Part 4. A building with non-residential occupancy that falls under Part 9 will not necessarily need to use "commercial" roof trusses. However, "residential" floor trusses can only be used for residential occupancies.

NBC 1995 Third Revisions and Errata

If you are registered holder of the National Building Code of Canada (NBC) 1995, this summer you should have received a copy of the Third Revisions and Errata package. If you did not receive a copy, this package is available in a downloadable PDF format on a link from the Canadian Codes Centre website at http://codes.nrc.ca/codes/home_E.shtml or you may be able to obtain a copy by phoning their Client Services office at (613) 993-2463 or 1-800-672-7990. §

British Columbia Supreme Court Decision

The BC Supreme Court released Reasons for Judgement dated August 21, 2001, in a case that is cited as *The Owners, Strata Plan NW 3341 et al v. Canlan Ice Sports Corp. et al.* The owners, Strata (condominium) Corporation, claimed damages for repairs to three buildings located in the Municipality of Delta, made necessary by wood rot in the exterior wall sheathing, studs and beams. The claim was made against the developer, the contractor, the structural engineer, a building design company, and the municipality. This decision involves only the Corporation's allegation of negligent approval of the application for the building permit, negligent inspection of construction, and negligence in the final act of issuance of the occupancy permit by the municipality. The full text of the judgement for this decision, numbered 2001BCSC1214 is available at www.courts.gov.bc.ca/jdb-txt/sc/01/12/2001bcsc1214.htm. §

Fire Alarm Systems Standards and Supplemental Verification Program

Underwriters' Laboratories of Canada (ULC) has released a new edition of ULC-S524-01 "Standard for the Installation of Fire Alarm Systems." The new edition was developed to adopt developments in technology that have taken place since the previous 1991 edition. The 1991 edition is still referenced by the National Building Code of Canada (NBC) 1995. Information about ordering ULC standards, including an electronic order form, is linked from the ULC website at www.ulc.ca/standards.

ULC has also notified us about a new supplemental program they have implemented. The existing ULC Fire Alarm Certification Program covers the annual inspection and test of fire alarm systems in accordance with CAN/ULC-S536 "Inspection and Testing of Fire Alarm Systems." Companies must have trained staff knowledgeable on the standard. An alarm company is ULC Listed after an investigation of their record keeping procedures, their personnel qualifications and a successful field examination is conducted on representative installations. The ULC Listing then allows a company to issue a ULC certificate to those building systems that are being inspected and tested according to the standard. Because CAN/ULC-S536 relates to maintenance and operation of fire alarm systems after they have been installed, this standard is referenced in the National Fire Code of Canada.

By contrast, CAN/ULC-S537 "Standard for the Verification of Fire Alarm Systems" covers the verification of fire alarm systems for new buildings or after changes have been made to existing systems. Because CAN/ULC-S537 relates to satisfactory operation of a newly installed or altered fire alarm system, this standard is referenced in Sentence 3.2.4.5.(2) of the NBC 1995. The standard states that the verification shall be conducted by qualified personnel in the employ of an organization acceptable to the local authority having jurisdiction. It also requires that the installing personnel be different from the verifying personnel and requires proof of the qualifications of the verifying personnel.

ULC has announced the implementation of a supplement to the existing Fire Alarm Certification Program, to cover Fire Alarm Verification. Companies wishing to be recognized for verifications in accordance with CAN/ULC-S537 must also be ULC Listed for annual inspection and test of fire alarm systems in accordance with CAN/ULC-S536. By listing companies that meet the necessary qualifications to perform verifications, authorities having jurisdiction will have access to a consistent and reliable evaluation on which to base their acceptance of verification personnel. §

Fasteners for Use in Wood Foundations

With the increasing use of power assisted nailing equipment, a wide variety of nail and staple products have become available. This has raised questions about the suitability of some of these products for use in wood foundations.

Section 5.5.1. of CAN/CSA-S406 “Construction of Preserved Wood Foundations” requires that **nails** for use either above- or below-grade must be hot-dipped galvanized or stainless steel conforming to CSA B111 “Wire Nails, Spikes and Staples.” B111 covers recommended sizes and other dimensional data for various kinds of wire nails, spikes and staples commonly used in the building and packaging trades, and general statements about material finishes and coatings. Section 5.5.2 of S406 requires that **staples** be made of Type 304 or 316 stainless steel.

Fasteners specified for use in preserved wood foundations need to have a high degree of corrosion resistance. Corrosion is “*the deterioration by oxidation or eating away of metal by chemical or electrochemical reaction resulting from exposure to weathering, moisture, chemicals, or other agents in the environment in which it is placed.*” Fasteners in preserved wood foundations will likely be exposed to moisture, and the preservative treatment applied to the wood may also contribute to corrosive action. If the fasteners fail, shear and racking forces imposed by backfill could cause the foundation to fail. To maintain structural integrity, it is essential to avoid deterioration of the nails and staples that hold a preserved wood foundation together.

Fastener Materials

Most standard nails and staples are made of steel (iron alloys). B111 also recognizes copper and aluminum fasteners.

Stainless steel fasteners are highly resistant to corrosion and rust. Chromium alloyed with the steel oxidizes on the surface of the fastener and protects it from further oxidation. If the moisture content where the fastener is located might exceed 20%, stainless steel fasteners are recommended.

Aluminum fasteners can be anodized for better corrosion resistance, but they are relatively soft and generally unsuitable for use with pressure treated

lumber. They have not proven to be satisfactory in either above- or below-grade applications.

Fastener Coatings

Coatings are used on steel and iron fasteners to enhance the physical or chemical properties. In B111, only galvanized coatings are described as intended for outdoor atmospheric corrosion protection. Galvanize means to coat steel or iron with zinc. There are several common methods of galvanizing steel and iron.

- “Hot-dipping” is a process where the metal is immersed in a bath of zinc.
- “Electroplating” is a process where the zinc is deposited by electroplating (a thin metal coating is deposited onto another metal by submerging the receiving metal into an electrolyte where electrons from the coating metal flow to and are deposited on the receiving metal).
- “Mechanical galvanizing” is a process where the metal is zinc coated by tumbling it in a container with powdered zinc and small glass beads.
- “Sherardizing” is a process where the metal is surrounded by a metallic zinc dust and then heated.

Hot-dipping is the only type of galvanizing recognized by S406. Hot-dipped galvanized nails perform well above- and below-grade when moisture content is less than 20%. Electroplated nails have not proven to be satisfactory in preserved wood applications. Some codes developed in the United States specifically prohibit use of electroplated steel nails in wood foundations.

Conclusion

With the wide availability of suitable fasteners and the possibility of problems developing, it does not appear that there are obvious reasons to consider acceptance of fasteners other than those prescribed in S406. Both S406 and B111 are scheduled for technical review by CSA committees next year, and recognition of alternate galvanizing processes will be considered. In the meantime, we recommend that building officials continue to enforce current S406 requirements for nails and staples used in wood foundations. §

SPAG News

by Tim Macaulay,
Saskatchewan Health

NOTE: There is no current news to report from the Saskatchewan Plumbing Advisory Group (SPAG). Those who have questions regarding SPAG should contact Tim Macaulay, Saskatchewan Health at (306) 787-7128, fax (306) 787-3237, or e-mail tmacula@health.gov.sk.ca.

Canadian Law Enforcement Training

For over 125 years, the Royal Canadian Mounted Police (RCMP) has earned a reputation of excellence in policing. Officers are fully trained in law enforcement techniques, conflict management and community relations. In response to requests for training from outside law enforcement agencies, the RCMP established the Canadian Law Enforcement Training Unit (CLET) in 1994. Located at the RCMP Academy at "Depot" Division in Regina, Saskatchewan, this unit is dedicated to providing the same quality training to interested agencies that the RCMP provides to its own members. Over 5000 people have completed training through CLET. Canadian clients include federal, provincial, and municipal government agencies, as well as tribal police services. One of their courses, the Law Enforcement Investigators Course Level 1, covers the Charter of Rights and Freedoms, information gathering, handling of exhibits, witness statements, interviewing techniques, warned statements, attitude, values and use/abuse of power, scenarios, court briefs, court room demeanour and court testimony.

If you have any questions, please visit their website at www.academy.rcmp-grc.gc.ca or contact the Canadian Law Enforcement Training Team at phone: (306) 780-5266, fax: (306) 780-3466, or e-mail: cletu_cfpc@rcmp-grc.gc.ca. §



Saskatchewan Municipal Affairs
and Housing
www.municipal.gov.sk.ca



Saskatchewan Building Officials Association
www.sboa.sk.ca

Comments about Bedroom Window Advisory

After release of advisory A-15 with the July 2001 issue of this newsletter, we received several comments that we'd like to pass on to you.

One reader told us that "There is still a bit of a problem with bedroom windows, where, with emphasis on larger, unobstructed window openings, the windows tend to become wider and/or longer. In the case of the latter, the sill of the window will come closer to the floor, introducing the danger of a small child tumbling out of a wide-open window." The reader notes that Sentence 9.7.1.6.(2) of the National Building Code 1995 sets a minimum sill height for certain situations, and recommends that this should be suggested for all cases.

A window installer said he is concerned about "clarity when it comes to residential replacement of existing windows," and provided suggestions about changes that should be incorporated into the building code. We recommended that the suggested changes be submitted to the national codes process following the guidelines and using proposed change forms that can be found at www.ccbfc.org/ccbfc/codechanges_E.shtml. Another installer was also concerned about replacement of existing windows. We advised that the building code is written to apply to new construction and renovations, and is intended to be reasonably applied to replacement of existing building components provided there will be no negative effect on the structural integrity or life safety of the building. If a window is being replaced by a larger window, a building permit would likely be required because of the structural implications. But if a window is being replaced by one of an identical size, a building owner may simply be advised about the current requirements, so that they may make an informed decision about the safety of their home. Installers should check with the appropriate local authority for specific permit and application requirements.

Two local authorities called to verify the intent of the suggested October 1, 2001 implementation date. This date was suggested to give some lead time for orders and installations by builders and for application to permit approvals by local authorities. (Also see *Fall 2001 SBOA Conference* question at the top of page 9.) §

News from the CCBFC Standing Committees

As part of the improved code development process for the National Building Code of Canada (NBC), Building Standards now receives agenda packages for all the Standing Committee meetings at the same time as the committee members. The Standing Committees prepare the requirements of the building, fire and plumbing codes, and report to the Canadian Commission on Building and Fire Codes (CCBFC). We receive this information to keep us up-to-date with code development activities, and to allow us the opportunity to provide Standing Committees with Saskatchewan's perspective on issues. Since we do not know the issues that you are dealing with locally, we will do our best to keep up with the agenda packages and pass some of the information on to you. The following is a partial list of items that were on agendas for Standing Committee meetings. If you have interest in more detail about what the Standing Committee planned to discuss, please contact us.

Standing Committee on Fire Safety and Occupancy, June 2001 meeting

(bracketed references to National Building Code of Canada 1995)

- fire alarm system provisions: storage garages [3.2.4.1.(5)], audible signal devices [new 3.2.4.19.(x).], signals to the fire department [A-3.2.4.7.],
- occupancy provisions: public corridor separations [3.3.1.4.(4)], corridors [3.3.1.9.(5), 3.3.2.5., 3.3.3.5.], exits through lobbies [new 3.2.2.4.(2)(x)],
- mezzanine provisions: calculating building height [3.2.1.1.(3), A-3.2.1.1.(3), 3.2.1.1.(4), 3.2.1.1.(5), 3.2.1.1.(6)], enclosures above [new 3.2.1.1.(x)], floors as fire separations [new 3.2.1.x.], termination at vertical fire separations [3.2.8.2.(1)], F2 occupancy in interconnected floor space [3.2.8.2.(6)], means of egress [3.4.2.2.],
- means of egress provisions: exit level definition [1.1.3.2.], emergency lighting [3.2.7.3.(1)], emergency power for lighting [3.2.7.4.(3), 3.2.7.6., A-3.2.7.6.], safety within floor area [A-3.3.], bleachers [new 3.3.2.x.], width and height of exits [3.4.3.], treads and risers [3.4.6.7.], emergency power [3.6.2.9., and NFC 6.7.1.1., A-6.7.1.1.],
- barrier-free design provisions: handrails [3.4.6.4.], stair risers [new 3.4.6.7.(x)], revolving doors [3.4.6.14.], universal toilet room [new 3.7.4.2.(x), 3.8.3.12., A-3.8.3.12.], lavatories [new 3.7.4.3.(x), 3.8.3.11.(1)], bathtubs [new 3.7.4.x., new 3.8.3.(x)], signs [3.8.3.1.], doorways and doors [3.8.3.3.], water closet stalls [3.8.3.8.], counters [3.8.3.14., A-3.8.3.14.], emergency power for life support [new 3.2.7.(x)],
- combustibility provisions: combustible insulation [3.1.4.2.(1)], nonmetallic raceways [3.1.5.19.(1)],
- compartmentation provisions: definitions – arena

- occupancy, care occupancy, detention occupancy, general assembly occupancy, outdoor assembly occupancy, party wall, performing arts occupancy, storage garage [1.1.3.2.], buildings divided by firewalls [A-2.1.6.1.], major occupancy classification [Table 3.1.2.1], separation of major occupancies [3.1.3.1.], occupancy combinations [3.1.3.2.], fire separations [3.1.8.1.(1), A-3.1.8.1.(1), 3.1.8.3., 3.1.8.4.], closures [3.1.8.10.], penetrations [3.1.9., A-3.1.9., 3.1.9.1., A-3.1.9.1.], firewalls [3.1.10.1., 3.1.10.2.], firestopping [3.1.11.5., 3.1.11.7.], protection of electrical conductors [3.2.6.9., 3.2.7.10., A-3.2.7.10.], separation of suites [3.3.1.1.], public corridor separations [3.3.1.4.], concrete filled hollow steel columns [D-2.6.6.],
- spatial separations provisions: walkway [1.1.3.2., new 3.2.2.x.], area of exposing building face [3.2.3.2.], increased openings in exposing building face [new 3.2.3.7.(x), 3.2.3.11.], covered vehicular passageway [3.2.3.17.],
- miscellaneous provisions: access routes [3.2.5.4.],
- report of task group on degrees of combustibility,
- report of task group on bulk merchandising operations,
- terms of reference for task group on special care facilities. §

Research Highlight of the Week

Canada Mortgage and Housing Corporation's (CMHC) October 1 Research Highlight is titled *Field Tests of Ventilation Systems Installed to Meet the 1993 OBC and 1995 NBC*. The report describes results for ventilation system compliance in 49 test houses. This report and all 2001 Highlights can be found on CMHC's website at www.cmhc-schl.gc.ca/en/burema/himu/himu_004.cfm.§

Fall 2001 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) fall conference in Regina. We look forward to having the same opportunity to hear what's on your minds at the spring conference, scheduled for April 10-12, 2002 in Prince Albert.

Q: Does the NBC 1995 allow for drilling through built-up beams to allow the passage of electrical and plumbing penetrations?

A: Subsection 9.23.5. includes provisions about notching and drilling wood framing members. Joists, wall studs, top plates, and roof trusses are mentioned, but beams are not. Beams should not normally be notched or drilled, but if it becomes necessary to do so, the same rules regarding holes or notches in joists may be applied. Where members carry bending loads, the areas of highest bending stress occur at the top and bottom edges, so Article 9.23.5.1. limits holes to not more than 1/4 the depth of the member located at least 50 mm from the top or bottom edge. Simply supported bending members have maximum bending stresses at the centre of the span, so Article 9.23.5.2. limits notches to the top 1/3 of the member located within 1/2 the depth of the member from the support. When a beam has been notched or drilled, check the appropriate span table (Table A-8, A-9 or A-10), to determine if the beam is carrying its maximum load or if it has sufficient reserve strength to withstand the strength reduction caused by notches or holes. If holes or notches do not conform to the limitations for size and location, or if the holes or notches comply with the limitations but the member does not have any reserve strength, or if there are many holes, reinforcement should be required.

Q: When an existing house has been relocated, how feasible is it to enforce all parts of the code such as mechanical ventilation, graded lumber, hardwired and interconnected smoke alarms, lintel spans, thermal barriers, roof space ventilation, etc.?

A: A-1.1.2.1. of the NBC 1995 describes application to existing buildings. "Application to existing buildings requires careful consideration of the level of safety needed for that building." "The successful application of Code requirements to existing construction becomes a matter of balancing the cost of implementing a requirement with the relative importance of that requirements to the overall Code objectives." To assist building owners and building

officials with this analysis for buildings that fall under Part 9 of the NBC 1995, the Canadian Commission on Building and Fire Codes and the National Research Council of Canada has issued *User's Guide – NBC 1995 Application of Part 9 to Existing Buildings*. This Guide examines the principles for regulating existing buildings and provides numerous case studies. Regarding application to a relocated house, the Guide advises that new elements such as a new foundation and new central heating equipment should conform to current requirements. The existing structure, interior finishes and sources of potential fire should be inspected. Any obvious deterioration or safety risk should be repaired. If the wind and snow loads in the new location are the same or less than occurred in the original location, the building structure will probably be adequate.

In general, for the items identified:

- mechanical ventilation, in conjunction with new central heating equipment, should be upgraded to current requirements.
- graded lumber should not be required unless the existing structure needs replacement or reinforcement due to deterioration or additional loads specific to the new site.
- hardwired and interconnected smoke alarms should be required because early warning of a fire is essential for the safety of the residents.
- lintel spans should not be a concern except where the existing lintels show signs of distress or will be subject to additional loads specific to the new site.
- thermal barriers should be upgraded in conjunction with new exterior or interior finishes.
- roof space ventilation should be upgraded because the presence of moisture is probably the most significant factor in deterioration of a building structure.

Each relocated house must be analysed and the current requirements applied judiciously on a case-by-case basis.

(continued on page 9)

(continued from page 8 — Fall 2001 SBOA Conference)

Q: Your bedroom window advisory included an implementation date of October 1, 2001. How should we handle permits that were approved before this date and the windows haven't been installed yet? Have you had any responses from window manufacturers about the advisory?

A: The implementation date was suggested to give some lead time for orders and installations. If your municipality has not established a written policy on how to implement the advisory, you should continue to allow and require what was common practice in your community, for permits issued before October 1. For permits issued after October 1, if implementation of the advisory requires changes to your common practice, you should alert permit takers to the change, provide them a copy of the advisory if desired, and enforce installation accordingly. A letter and copy of the advisory was mailed to approximately 150 window manufacturers and suppliers in the province, so changes should not be a surprise to them. The only response we had from a manufacturer was notice from a company that posted the advisory on their website for information to their suppliers.

Q: The partnership agreement between SBOA and the Southeast Regional College regarding the training course expires in 2002. If the agreement is not extended, would this have an impact on the acceptance of the Building Code Training for Canadians course for licenses?

A: The Building Code Training for Canadians course is the only course currently recognized by the licensing regulations. Expiration of the partnership agreement would not automatically jeopardize this recognition. However, if the SBOA advised that this course was no longer suitable for such recognition or advised that another course would be more suitable, the reference in the licensing regulations would be critically re-examined.

Q: Now that the Ryan v. Ripplinger case has been concluded, will there be any effect on the provisions of The Uniform Building and Accessibility Standards Act (the UBAS Act) and regulations?

A: Since the referenced case was decided under the jurisdiction of *The Saskatchewan Human Rights Code*, the decision is not expected to have a direct impact on the UBAS Act or regulations under the

Update on Licences

As of September 28, 2001, Building Standards' records show 111 licensed building officials, falling into the following classes:

Class 1	92
Class 2	7
Class 3	12

Licence holders are reminded to keep a list of completed training and development activities to submit when they receive notice to apply for their 5-year renewals. §

Act. We have not been advised of any intent to reconsider the current provisions. *The Saskatchewan Human Rights Code* will continue to have priority over the UBAS Act and regulations.

Q: When the next edition of the building code is released in 2003, will the licence exams change?

A: Yes. The exams will be updated to reflect the contents of the new building code, and put into effect to coincide with its adoption. §

Voluntary Sprinkler Recall and CPSC Sues Over Defective Sprinklers

The United States Consumer Product Safety Commission (CPSC) has recently announced two significant actions related to possible failures of sprinkler heads.

In July 2001, CPSC and Central Sprinkler Company, an affiliate of Tyco Fire Products LP, announced a voluntary replacement program for O-ring fire sprinklers. The company will provide free parts and labour to replace 35 million Central fire sprinklers with O-ring seals. The program also includes approximately 167,000 O-ring models sold by Gem Sprinkler Company and Star Sprinkler.

Central discovered the performance of these O-ring sprinklers can degrade over time. The sprinkler heads can corrode or minerals, salts and other contaminants in water can affect the rubber O-ring seals and could cause the sprinkler heads not to activate in a fire. These sprinklers have been installed in a wide variety

(continued on page 10)

Cold Weather Concreting

Cast-in-place concrete can be placed throughout the winter if appropriate precautions are taken. Article 9.3.1.10. of the National Building Code of Canada (NBC) 1995 says that when the air temperature is below 5°C, concrete must be kept at a temperature of not less than 10°C or more than 25°C while being mixed and placed, and maintained at a temperature of not less than 10°C for 72 hours after placing. No frozen material or ice can be used in this concrete. Use of special concrete mixes may affect the application of these requirements, but for the majority of concrete used in housing and small buildings under Part 9 of the NBC, these requirements will apply.

All materials and equipment needed for adequate protection and curing should be on hand and ready for use before concrete placement is started. Forms, reinforcing steel, hardware, and embedded items must be clear of snow and ice when the concrete is placed. A suitable combination of protective covers, insulation, enclosures, windbreaks, portable heaters, and insulated forms should be ready to maintain the concrete temperature. To verify that the precautions are adequate, thermometers will be needed to measure the temperature within enclosures and the temperature of the concrete when delivered and in place.

(continued from page 9 — Voluntary Sprinkler Recall/CPSC Sues over Defective Fire Sprinklers)

of buildings, including houses, apartments, hospitals, day care facilities, schools, dormitories, nursing homes, supermarkets, parking garages, warehouses, and office buildings.

Central has published a manual to help its customers understand the massive replacement program and determine if they are affected. The manual can be found at www.sprinklerreplacement.com, or a claim packet can be obtained by phoning Central at 1-800-871-3492.

In a related announcement in October 2001, the CPSC stated that its staff filed a complaint against Sunbeam Corporation and Grucon Corporation and their subsidiaries, seeking a recall of approximately 700,000 Star ME-1 sprinkler heads manufactured between 1977 and 1995. CPSC alleges that these sprinklers are defective and are likely to fail to operate properly in a fire. These sprinklers have been installed in day care centres, nursing homes, health care facilities, supermarkets and other buildings. Discussions with the companies failed to result in a voluntary recall and replacement plan.

Star ME-1 sprinklers manufactured in 1975-76 were recalled by Mealane Corporation in 1999. The same sprinklers manufactured from 1996-98 are part of Central's voluntary recall announced in July 2001.

For copies of these announcements and more information about the CPSC, please visit www.cpsc.gov. §

Concrete gains strength as the cement hydrates (combines with water). Temperature affects the rate of hydration. Low temperatures retard hydration. If concrete is frozen and kept frozen above minus 10°C, it will gain strength slowly. Below that temperature, cement hydration and concrete strength gain cease. Concrete that has been frozen just once at an early stage can be restored to nearly normal strength by providing favourable subsequent curing conditions. However, it will not be as resistant to weathering nor as watertight as concrete that has not been frozen.

The type of protective cover and the amount of insulation required depends on the anticipated air temperature and wind velocity, the size and shape of the concrete structure, and the amount of cementing material in the concrete mix. Corners and edges need more protection than plane surfaces. Covering and heating only the inside of a foundation wall in -40°C temperatures (as has been observed) will likely be insufficient.

Heated enclosures must withstand wind and snow loads and be reasonably airtight. There should be sufficient space between the concrete and the enclosure to allow free movement of air. The air can be heated by various methods, but the concrete must be protected by formwork or an impermeable membrane from direct exposure to combustion gases or drying.

Once the required curing period has elapsed, the concrete should be allowed to gradually cool before removing the protection and formwork. It is good winter practice to leave forms in place as long as possible. §

Ice Resurfacing Machine Storage Areas in Arenas

Gas, propane or diesel fuelled ice-resurfacing machines used in skating and hockey arenas are usually stored within enclosures in the arena building where they are used. The National Building Code of Canada (NBC) 1995 provides direction on how these storage areas must be constructed.

Skating and hockey arenas are A3 assembly occupancies. The buildings that house them are required to be designed by professional designers and be constructed in conformance with Part 3 of the NBC 1995. Whether the building is required to be sprinklered or be constructed of noncombustible construction depends on the building area and height. If the building is required to be constructed of noncombustible construction, the enclosure for the machine would also have to meet the requirements for noncombustible construction.

The area used for storage of an ice-resurfacing machine is, in building code terminology, a storage garage. A storage garage is a special type of F3 occupancy. A storage garage for an ice-resurfacing machine in an arena would typically be less than 10 per cent of the total building area and would not have to be considered as a major occupancy (Article 3.2.2.8.). However, it would have to be separated from the remainder of the floor area by a 1.5 hour rated fire separation (Article 3.3.5.6.). This requirement would apply to the walls and ceiling of the storage garage that are adjacent to the remainder of the arena. Exterior walls of the storage garage would not typically require a fire-resistance rating unless the building face was near enough to the property line or another building to trigger spatial separation requirements (Subsection 3.2.3.). Wall and ceiling assemblies with a 1.5 hour fire-resistance rating can be selected from listings produced by testing agencies, or calculated based on information available in Appendix D of the NBC 1995. All openings in the fire separation would have to be protected by labelled closures. It is likely because of this requirement that ice-resurfacing machines do not usually have direct access through an overhead door (which would have to be a labelled closure) to the adjoining ice surface. The storage garage would need a mechanical ventilation system that would either monitor and limit the concentration of carbon monoxide or provide during operating hours a continuous supply of outdoor air to the storage garage (Article 6.2.2.3.). The ventilation system would have to be designed so that the pressure in the storage garage is less than the pressure in adjacent portions of the building (Article 6.2.2.3.). If the storage garage is located below grade, sprinklers would be required (Sentence 3.3.5.4.(7)). If the building is more than 3 storeys in building height, access provided from the storage garage through the fire separation to an adjacent area would have to be protected by a vestibule (Article 3.3.5.7.).

If the ice-resurfacing machine is propane-fuelled, there are specific requirements in the natural gas and propane codes that also apply. These requirements deal with storage and handling of propane cylinders, servicing and parking propane-fuelled vehicles indoors, ventilation and detectors required when the ice-resurfacing machine is parked indoors over a pit, and ventilation of exhaust fumes from areas where the machine operates including the ice surface. For more information contact the Gas and Electrical Inspection Division of SaskPower in Regina at (306) 566-2500 or local offices in Saskatoon, Moose Jaw, Swift Current, Estevan, Yorkton, Tisdale, North Battleford, and Prince Albert.

Ventilation systems for arenas fall under Part 6 of the NBC, and are required to be designed by professional designers. Ice-resurfacing machines produce toxic gases that can reach unsafe levels if there is inadequate ventilation, if the machine is not properly tuned, or if there is high usage of the machine (i.e., during hockey tournaments). Saskatchewan Health and Saskatchewan Occupational Health and Safety have examined health problems associated with unacceptably high carbon monoxide and nitrogen dioxide levels. During each hour the ice is used by the public, the average carbon monoxide level is not to exceed 25 parts per million (ppm) and the average nitrogen dioxide level is not to exceed 1 ppm. Information about symptoms, air quality standards, air testing guidelines, operational guidelines, and recommendations for controlling emissions in arenas are available by contacting Occupational Health Officers in Saskatchewan Labour at 787-4496 (Regina), 933-5052 (Saskatoon), or 1-800-567-7233, or by contacting Public Health Inspectors in health district service area offices in Swift Current, Moose Jaw, Weyburn, Regina, Rosetown, Saskatoon, Yorkton, Melfort, Prince Albert, North Battleford or La Ronge. §

Update on Objective-Based Codes

The Canadian Commission on Building and Fire Codes (CCBFC) and the provinces and territories have completed a national public consultation on the format, structure, publication cycle and objectives of the new objective-based codes.

The public response to the consultation indicates that there is broad support for objective-based codes and for the coordinated approach being used to develop them.

A variety of comments were received, many of them suggesting ways in which the new codes can be made to work better. An analysis of these comments is being carried out and will be reviewed by the provinces and territories and the CCBFC at their fall 2001 meetings. The findings from this analysis will be reflected in complete objective-based versions of the 1995 code documents that will be subject to a coordinated national/provincial/territorial public consultation in 2002.

Specific questions can be directed to Mr. John Haysom at (613) 993-0043, fax (613) 952-4040, or e-mail john.haysom@nrc.ca.

For more detailed information about the new objective-based codes, the consultation process and the codes development system, visit the Commission's Web site at www.ccbfc.org.

(Excerpted from Construction Innovation Volume 6, Number 3, Summer 2001, published by the NRC's Institute for Research in Construction and available at www.nrc.ca/irc/newsletter/toc.html.) §

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