



**Ruling No. 08-24-1198**  
**Application No. 2008-21**

## **BUILDING CODE COMMISSION**

**IN THE MATTER OF** Subsection 24(1) of the *Building Code Act*, S.O. 1992, c. 23, as amended.

**AND IN THE MATTER OF** with Sentence 9.19.1.1.(1) of the Regulation 350/06, as amended,  
(the 2006 Building Code).

**AND IN THE MATTER OF** an application by Michael & Connie Pun for the resolution of a dispute with Ann Borooh, Chief Building Official, City of Toronto, to determine whether the proposal to install a roof assembly, where medium density, closed-cell spray polyurethane foam will be installed to insulate the roof, and where no vents will be installed in the roof assembly, provides sufficiency of compliance with Sentence 9.19.1.1.(1) of Division B of the 2006 Building Code at 12 Highland Crescent, Toronto, Ontario.

<b>APPLICANT</b>	Michael & Connie Pun Homeowners Toronto, ON
<b>RESPONDENT</b>	Ann Borooh Chief Building Official City of Toronto
<b>PANEL</b>	Tony Chow, Chair Leslie Morgan Alison Orr
<b>PLACE</b>	Toronto, Ontario
<b>DATE OF HEARING</b>	July 24, 2008
<b>DATE OF RULING</b>	July 24, 2008
<b>APPEARANCES</b>	Cathy Garrido Altius Architecture Inc., Toronto, ON <b>Agent for the Applicant</b>  Andrew Wild Senior Building Inspector City of Toronto <b>Designate for the Respondent</b>

## **RULING**

### **1. Particulars of Dispute**

The subject building is a three storey building, Group C, Residential Occupancy (i.e. single detached dwelling) of combustible construction.

The Applicant has received a building permit under the *Building Code Act* to renovate an existing residential dwelling and is proposing to insulate the third floor attic roof by filling the void space between the roof joists and roof sheathing with medium density, closed-cell spray polyurethane foam without providing any roof venting.

The construction in dispute involves whether the proposal to install an un-vented roof assembly, using a medium density, closed-cell spray polyurethane foam to insulate the roof, provides sufficiency of compliance with Sentence 9.19.1.1.(1) of Division B of the 2006 Building Code at 12 Highland Crescent, Toronto, Ontario.

### **2. Provisions of the Building Code in Dispute**

#### **9.19.1.1. Required Venting**

- (1) Except where it can be shown to be unnecessary, where insulation is installed between a ceiling and the underside of the roof sheathing, a space shall be provided between the insulation and the sheathing, and vents shall be installed to permit the movement of air from the space to the exterior.

### **3. Applicant's Position**

The Agent for the Applicant stated that the subject home was built 90 years ago and the home was currently undergoing renovations. The Agent submitted that venting was originally planned to be provided when insulating the existing roof in the attic space, part of which is a cathedral ceiling. However, due to site conditions and new spray foam technology, the Agent explained, an un-vented roof assembly was proposed instead.

The Agent asserted that Sentence 9.19.9.9.(1) of the Building Code allows for an un-vented roof assembly when venting "can be shown to be unnecessary" and that this was in fact the case in this circumstance. The Agent argued that a 2 lb, medium density, closed-cell spray polyurethane foam, applied to the void space between the roof joists and roof sheathing, provides an air and vapour barrier and therefore, venting is not required. However, she added that a 6 mil poly vapour barrier and ½ in gypsum board would also be installed. The Agent also informed the Commission that there was a warranty agreement in place with the shingle manufacturer and that the medium density, closed-cell polyurethane foam spray installation would not void the shingle warranty.

Further, the Agent submitted that the subject polyurethane foam spray meets the material standard, CAN/ULC S705.1-01, "Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification" and is listed in CCMC Evaluation Number 12380-R, which confirms that the product's physical properties and durability are suitable for this application.

In addressing some of the Respondent's concerns regarding the application of the spray foam, the Agent stated that the product must be installed in accordance with the instructions provided by the manufacturer along with the CAN/ULC-S705.2, "Standard for Thermal Insulation Spray

Applied Rigid Polyurethane Foam-Medium Density-Application”, which outlines how the subject polyurethane product should be applied onsite. The Agent added that, in accordance with the Application Standard, the installers must be trained and licensed to apply the product in order to ensure that no air spaces will be trapped in the roof assembly. Further, the Agent informed the Commission that the licensed installer would conduct density, adhesion and cohesion substrate verifications and keep a daily work record, including the results of testing in accordance with the Standard, which the Respondent could request to review. The Agent also added that inspections could also be conducted by a third party organization under an independent quality assurance program delivery agent used by CUFCA, the Canadian Urethane Foam Contractors Association Inc.

The Agent also presented a “Branch Opinion” dated May 1997 regarding Section 9.19. of the Ontario Building Code, issued by the Ministry of Municipal Affairs and Housing, which stated, “It is the opinion of the Housing Development & Buildings Branch that, where a roof assembly is filled with rigid insulation (no gaps or empty spaces in between), Subsection 9.19 of the OBC need not apply”. The Agent maintained that with a licensed installer the subject foam spray would provide a continuous air barrier.

The Agent concluded that given the above, along with the building science and technology documentation submitted to the Commission, the proposal to install a roof assembly, where medium density, closed-cell spray polyurethane foam will be installed to insulate the roof, and where no vents will be installed in the roof assembly, provides sufficiency of compliance with Sentence 9.19.1.1.(1) of the Building Code, as venting has been shown to be unnecessary in this circumstance.

#### **4. Respondent’s Position**

The Respondent submitted that the performance level required, in order to omit the ventilation space, can not be obtained when the application of the medium density, closed-cell spray polyurethane foam is performed onsite in an uncontrolled environment. To substantiate this claim, the Respondent submitted a letter, SCH-11, 2307 dated January 27, 2006 received from the National Research Council of Canada (NRC), which expresses this same opinion.

Further, the Respondent submitted a letter dated April 3, 2006 received by the Town of Oakville from the Ministry of Municipal Affairs and Housing, Building and Development Branch, which advises that the insulation installer must prove without doubt to the Authority having jurisdiction, that the installation of the product forms a perfect seal within the assembly, and additionally provide a warranty agreement from the roof shingle manufacturer. The Respondent stated that he was concerned with the application of the product on existing buildings. He stated that, in this case, as the existing structure is old, there are spaces and natural gaps in the rafters. Therefore, it can not be guaranteed to be clean and free of defects. Further, he expressed concerns regarding the overhead application of the spray foam insulation specifically that it was not compatible with the factory application and that gravity could affect its distribution.

The Respondent stated that as a result of the lack of ventilation, the building materials within the roof assembly (i.e. roof sheathing, roof shingles, and roof rafters) may not perform as intended. He concluded that in his opinion, the indoor air quality may be affected if moisture becomes trapped in the assembly and is not able to dry out. He further argued that any trapped moisture would cause the existing roof structure to deteriorate over time.

The Respondent stated that it was his opinion that there is insufficient evidence for this application to justify omitting the air space to satisfy the roof ventilation requirement set out in Sentence 9.19.1.1. (1) of the Building Code.

## **5. Commission Ruling**

It is the Decision of the Building Code Commission that the proposal to install a roof assembly, where medium density, closed-cell spray polyurethane foam will be installed to insulate the roof, and where no vents will be installed in the roof assembly, provides sufficiency of compliance with Sentence 9.19.1.1.(1) of Division B of the 2006 Building Code at 12 Highland Crescent, Toronto, Ontario on condition that:

- a) a membrane shall be installed on the warm side of the roof so as to serve as both an air and vapour barrier, and
- b) test reports conducted in accordance with Clause 4.3.10 of CAN/ULC-S705.2-05 shall be submitted to the Chief Building Official.

## **6. Reasons**

- i) Sentence 9.19.1(1) of the Building Code states, "Except where it can be shown to be unnecessary, where insulation is installed between a ceiling and the underside of the roof sheathing, a space shall be provided between the insulation and the sheathing, and vents shall be installed to permit the movement of air from the space to the exterior". It is the Commission's opinion, based on the evidence and testimony presented, that venting in the subject roof assembly has been shown to be unnecessary.
- ii) Sentence 9.25.2.5 of Division B of the Building Code requires that spray-applied polyurethane insulation be installed in accordance with CAN/ULC-S705.2-05. The Commission heard that the closed-cell spray polyurethane foam will be installed in accordance with CAN/ULC-S705.2-05 Standard for thermal insulation as referenced by the Code.
- iii) CAN/ULC-S705.2-05 Standard requires a licensed installer to perform the application of the subject foam spray. The licensed installer must have successfully completed a training course approved by the manufacturer and the designated Certification Organization. The Commission was advised that in accordance with CAN/ULC-S705.2-05, a licensed installer trained to spray the subject foam insulation would be performing the installation to ensure that no air spaces will be trapped in the roof assembly.
- iv) Further, the Commission was advised that a continuous vapour barrier (6 mil poly vapour barrier) would be provided as per Subsection 9.25.4 of the Building Code.

Dated at Toronto this **24<sup>th</sup>** day in the month of **July** in the year **2008** for application number **2008-21**.

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Tony Chow, Chair

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Leslie Morgan

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Alison Orr