Ontario

Ruling No. 10-05-1241
Application No. B-2009-42

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 Article 9.25.2.2. and Sentence 9.20.6.4.(2) of Division B, Sentence 2.1.1.2.(1) of Division C, and Article 1.2.1.1. of Division A of Regulation 350/06, as amended, (the Building Code).

AND IN THE MATTER OF an application by Graham Dewar, Airkrete Canada Ltd., for the resolution of a dispute with Bruce Poole, Chief Building Official, City of Guelph, to determine whether the unlisted insulation material proposed as an "alternative solution" under Division A, Article 1.2.1.1. of the Building Code for an existing two storey, residential building, provides sufficiency of compliance with the acceptable solutions prescribed in Article 9.25.2.2. and Sentence 9.20.6.4.(2) of Division B of the Building Code, and Sentence 2.1.1.2.(1) of Division C of the Building Code, at 190 Dublin Street North, Guelph, Ontario.

APPLICANT	Graham Dewar Airkrete Canada Ltd., Pickering, ON
RESPONDENT	Bruce Poole Chief Building Official City of Guelph
PANEL	Tony Chow, Chair Mina Tesseris Neal Barkhurst
PLACE	Toronto, Ontario
DATE OF HEARING	February 11, 2010
DATE OF RULING	February 11, 2010
APPEARANCES	Jeff Truman Truman Services Toronto, ON **Agent for the Applicant** Nick Rosenberg Plans Examiner City of Guelph **Designate for the Respondent**

RULING

1. Particulars of Dispute

The Applicant has applied for a permit under the *Building Code Act*, *1992*, to renovate an existing residential dwelling and use an unlisted insulation in the retrofit of the home at 190 Dublin Street North, Guelph, Ontario.

The subject building is a two storey, combustible, Group C occupancy with a building area of 111 m².

The construction in dispute involves the proposal to use an unlisted, cement-based, foamed-in-place product to insulate the stud cavity of the exterior walls of the main floor office area of the existing dwelling. The dispute revolves around the requirements of Sentence 9.20.6.4.(2) and Article 9.25.2.2. of Division B of the Code.

Sentence 9.20.6.4.(2) of the Building Code requires that a 25 mm air space behind masonry veneer be maintained. In this case, the subject air space is proposed to be filled with the subject insulation.

Article 9.25.2.2. of the Building Code references the standards to which insulation products used in Ontario must conform. In this case, the subject insulation is not a listed product and does not conform to the requirements of the listed standards. However, the Applicant has proposed an alternative solution under Division A, Article 1.2.1.1. of the Building Code. The dispute focuses on whether the proposed alternative solution, demonstrates that the subject insulation achieves the same level of performance as required by the applicable acceptable solution with respect to the objective and functional statements thereby, providing sufficiency of compliance with both Sentence 9.20.6.4.(2) and Article 9.25.2.2. of the Code. Supporting documentation and various testing reports have been submitted in support of the alternative solution. Also at dispute, is whether the types of tests that have been submitted in support of the subject alternative solutions achieve sufficiency of compliance with Article 2.1.1.2. of Division C, of the Code.

2. Provisions of the Building Code in Dispute

9.20.6.4. Masonry Veneer

(1) Except for masonry veneer where each masonry unit is supported individually by the structural backing, masonry veneer shall be of solid units not less than 70 mm thick.

(2) Veneer described in Sentence (1) over wood frame walls shall have not less than a 25 mm air space behind the veneer.

9.25.2.2. Insulation Materials

(1) Except as required in Sentence (2), thermal insulation shall conform to the requirements of,

(a) CAN/CGSB-51.25-M, “Thermal Insulation, Phenolic, Faced”,

(b) CAN/CGSB-51-GP-27M, “Thermal Insulation, Polystyrene, Loose Fill”,

(c) CAN/ULC-S701, “Thermal Insulation, Polystyrene, Boards and Pipe Covering”,

(d) CAN/ULC-S702 “Mineral Fibre Thermal Insulation for Buildings”,

(e) CAN/ULC-S703, “Cellulose Fibre Insulation (CFI) for Buildings”,

(f) CAN/ULC-S704, “Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced”,

(g) CAN/ULC-S705.1, “Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material Specification”, or

(h) CAN/ULC-S706, “Wood Fibre Thermal Insulation for Buildings”.

(2) The *flame-spread rating* requirements contained in the standards listed in Sentence (1) shall not apply.

(3) Insulation in contact with the ground shall be inert to the action of *soil* and water and be such that its insulative properties are not significantly reduced by moisture.

(4) Type 1 expanded polystyrene insulation as described in CAN/ULC-S701, “Thermal Insulation, Polystyrene, Boards and Pipe Covering”, shall not be used as roof insulation applied above the roofing membrane.

Division A, Article 1.2.1.1 Compliance with Division B

(1) Compliance with Division B shall be achieved,

(a) by complying with the applicable *acceptable solutions* in Division B, or

(b) by using *alternative solutions* that will achieve the level of performance required by the applicable *acceptable solutions* in respect of the *objectives* and *functional statements* attributed to the applicable *acceptable solutions* in Supplementary Standard SA-1.

(2) For the purposes of Clause (1)(b), the level of performance in respect of a *functional statement* refers to the performance of the *functional statement* as it relates to the *objective* with which it is associated in Supplementary Standard SA-1.

Division C, Article 2.1.1.2. Tests

(1) Where no published test method to establish the suitability of an *alternative solution* proposed under Article 2.1.1.1. exists, then the tests used for the purposes of that Article shall be designed to simulate or exceed anticipated service conditions or shall be designed to compare the performance of the material or system with a similar material or system that is known to be acceptable.

3. Applicant’s Position

The Agent for the Applicant acknowledged that the subject insulation material does not meet the prescriptive requirements of Article 9.25.2.2. and Sentence 9.20.6.4.(2) of Division B of the Building Code. However, it was his opinion that the alternative solution report, prepared by a professional engineer, submitted to the Commission for review, demonstrates that the subject insulation material achieves the level of performance required by the objective and functional statements associated with the above prescribed requirements and thereby, achieves sufficiency of compliance with the Code.

The Agent, referring to the engineer’s alternative solution report, denoted that the subject wall assembly at 190 Dublin Street North was assessed for its thermal properties and an analysis showed that the subject insulation would provide an insulating value in compliance with the Ontario Building Code. The Agent also highlighted that the report showed that the subject cementitious-based, foamed-in-place insulation does not contain formaldehyde or any other non-desirable contaminants.

The engineer’s report noted that the air space behind the exterior masonry cladding specified by Sentence 9.20.6.4.(2) of the Code is required so as to provide a drainage pathway for moisture that penetrates the masonry veneer. The report stated that in this case, because the insulating material in question is permeable, it would not impede moisture from draining from the wall

system. Further, it was the engineer's opinion that any water penetrating the brick veneer would be free to drain in the same manner as it currently drains in the existing wall assembly and since there is no air to drive vapour towards the interior of the home, the insulation material would not introduce moisture to the framing components of the structure.

The report indicated that although condensation could occur within the insulation material under typical winter conditions, the subject insulation would not support microbial growth. The report concluded that a review of the tests submitted which included: thermal conductivity and resistance, shrinkage, microbial resistance, water permeability coefficient report, and a non-Urea Formaldehyde test report support the proposed alternative solution and demonstrate that the subject insulation will achieve the same level of performance as the prescriptive requirements of Sentence 9.20.6.4.(2) and Article 9.25.2.2. of the Code.

The report concluded that the Building Code's objective and functional statements associated with Sentence 9.20.6.4.(2) and Article 9.25.2.2., which include protecting occupant comfort and health and maintaining the structural integrity of the wall system are achieved. The engineer's report further concluded that the subject insulation material will provide superior long term performance compared to other insulating materials that are currently referenced by the Code.

4. Respondent's Position

The Designate for the Respondent submitted that in his view, the proposed unlisted cement based foam insulation does not comply with either Sentence 9.20.6.4.(2) or Article 9.25.2.2. of the Code.

The Designate pointed out that the current Ontario Building Code does not have a standard applicable to cement based foam insulation. He indicated that the Applicant's supporting documentation and various testing reports submitted in support of the alternative solution, have been carried out by American testing agencies and are out of date. He maintained that updated testing reports were requested, and more specifically, current testing reports completed by a recognized Canadian testing agency that include results of long term testing for water permeability, microbial resistance, shrinkage and off-gassing.

The Designate acknowledged that the Code accepts test data form American based agencies, however, maintained that the insulation standards referenced by Article 9.25.2.2. of the Code are from Canadian based issuing agencies. Further, the Designate argued that the 1979 standard, CGSB-27M-1979, referenced in the Applicant's alternative solution is for a product that in his opinion, is no longer in use in current construction practices and further, all the standards for insulation referenced in the Code are dated between 1997 and 2003 and are more commonly used in today's construction industry.

The Designate argued that in this case, the air space behind the brick veneer was not being maintained as required by Sentence 9.20.6.4.(2) and since the subject insulation is a porous material which will not impede moisture, water could enter the wall cavity. The Designate submitted that the main concern was with regards to water traveling through the insulation and coming into contact with wood framing members and plaster and/or lath that could lead to mould forming on these materials or further, could cause water damage to the building structure, electrical systems and/or the brick veneer.

The Designate maintained that the Building Materials Evaluation Commission or the Canadian Construction Materials Centre would be appropriate agencies to evaluate and possibly make a ruling concerning the approval of an innovative product such as the subject insulation material.

5. Commission Ruling

It is the Decision of the Building Code Commission that the unlisted insulation material proposed as an “alternative solution” under Division A, Article 1.2.1.1. of the Building Code for an existing two storey, residential building, does not provide sufficiency of compliance with the acceptable solutions prescribed in Article 9.25.2.2. and Sentence 9.20.6.4.(2) of Division B of the Building Code, and Sentence 2.1.1.2.(1) of Division C of the Building Code, at 190 Dublin Street North, Guelph, Ontario.

6. Reasons

i) Both parties agree that the subject insulation does not meet the prescriptive requirements of Article 9.25.2.2. and Sentence 9.20.6.4.(2) of Division B of the Building Code.

ii) Article 2.1.1.1 of Division C of the Building Code permits acceptance of an alternative solution pertaining to materials and systems or building designs not authorized by the Code, which are proven to provide an equivalent level of performance that would be achieved by conforming to the requirements of Article 1.2.1.1.

Article 1.2.1.1. of Division A of the Building Code requires that compliance with Division B be achieved either through compliance with the applicable acceptable solutions in Division B or through an alternative solution that will achieve the same level of performance as required by the applicable acceptable solution in respect of the objectives and functional statements attributed to the applicable acceptable solution in Supplementary Standard SA-1.

It is the Commission’s opinion that the tests and evaluations provided did not sufficiently demonstrate that the subject insulation would achieve the same level of performance as required by Article 9.25.2.2. and Sentence 9.20.6.4.(2) of Division B. Specifically, objective OS2.3 and functional statement F80 forming part of Article 9.25.2.2. and functional statement F61, and objectives OS2.3 and OP2.3 forming part of Sentence 9.20.6.4.(2) were not adequately addressed by the tests submitted. The installation of the proposed insulation will remove the 1 inch air space behind the brick veneer required by Sentence 9.20.6.4.(2). As the proposed insulation is not impermeable, it could allow water or moisture to enter the wall assembly, which could then cause damage or deterioration of building elements.

Dated at Toronto this **11th** day in the month of **February** in the year **2010** for application number **B-2009-42.**

Tony Chow, Chair

Mina Tesseris

Neal Barkhurst