



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 Articles 9.14.2.1., 9.15.4.6., Sentence 9.20.8.3.(1), Articles 9.23.2.2., 9.23.2.3., 9.23.5.1., 9.23.7.2., 9.27.3.2., 9.33.3.1. of Regulation 403, as amended by O. Reg. 22/98, 102/98, 122/98, 152/99, 278/99, 593/99, 597/99, 205/00, 283/01 and 220/02 (the “Ontario Building Code”).

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the foundation wall located under the garage of the subject Group C occupancy, which has not been provided with a drainage layer, complies with Article 9.14.2.1. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the existing north foundation wall of the subject Group C occupancy that measures approximately 26.08 m in length, and which has not been provided with a crack control joint, provides sufficiency of compliance with Article 9.15.4.6. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the use of wood and grout as an end bearing for certain steel beams located in the basement of the subject Group C occupancy provides sufficiency of compliance with Sentence 9.20.8.3.(1) of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the basement walls in the subject Group C occupancy, which are supported on wood shims that are in contact with the concrete floor provide sufficiency of compliance with Articles 9.23.2.2. and 9.23.2.3. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the holes drilled in the framing members of the existing Group C occupancy provide sufficiency of compliance with Article 9.23.5.1. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the bottom plate beneath the bearing wall in the basement, and the sill plate located in the garage of the subject Group C occupancy, provide sufficiency of compliance with Article 9.23.7.2. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute

with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the installation of flashing forming part of the as-constructed cladding system on the subject Group C occupancy provides sufficiency of compliance with Article 9.27.3.2. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

AND IN THE MATTER OF an application by Peter Popadiuk, owner, for the resolution of a dispute with John Schonewille, Chief Building Official, Town of Grimsby, to determine whether the central heating and air-conditioning system installed in the subject Group C occupancy provides sufficiency of compliance with Article 9.33.3.1. of the Ontario Building Code at 6 Sophie Court, Grimsby, Ontario.

APPLICANT	Peter Popadiuk 6 Sophie Court Grimsby, Ontario
RESPONDENT	John Schonewille Chief Building Official Town of Grimsby
PANEL	Len King, Vice-Chair Tony Chow Donald Pratt
PLACE	Toronto, Ontario
DATE OF HEARING	July 3, 2003 and November 4, 2003
DATE OF RULING	November 4, 2003
APPEARANCES	Peter Popadiuk, owner 6 Sophie Court Toronto, Ontario The Applicant Tom Richardson Sullivan Mahoney Barristers & Solicitors St. Catherines, Ontario Designate for the Respondent

RULING

1. The Applicant

Peter Popadiuk, owner, has received a building permit and Order to Comply under the *Building Code Act*, S.O. 1992, c. 23, as amended, and has constructed a residential dwelling at 6 Sophie Court, Grimsby, Ontario.

2. Description of Construction

The Applicant has constructed a Group C single detached dwelling. The structure is two storeys in building height and approximately 290 m² in building area. There are eight separate areas of dispute. These are listed below:

9.14.2.1. Foundation Wall Drainage

The construction at dispute involves the portion of the basement foundation wall where the garage of the subject occupancy abuts the dwelling. The wall is described as an interior foundation wall between the attached garage and the subject dwelling. While a drainage layer has been installed on all of the exterior walls of the subject dwelling, it has been omitted on the interior foundation wall in question on the basis that this wall is not exposed to the elements and, thus, exterior sources of moisture.

9.15.4.6. Crack Control Joints

The construction at dispute involves the north foundation wall of the subject occupancy and the omission of a crack control joint for this wall. The as-constructed foundation wall measures approximately 26.08 m in length. As per the provisions of the Ontario Building Code (OBC), a crack control joint shall be provided in a foundation wall that is more than 25 m in length. In this regard, the subject foundation wall exceeds the maximum length for a wall to be constructed without a crack control joint by 1.08 m.

9.20.8.3.(1) Bearing of Beams and Joists

The construction at dispute involves the adequacy of the load bearing material that has been used to support the steel beams located in the basement of the subject occupancy. Certain steel beams have one, or both, ends supported by a poured concrete foundation wall. At the top of these walls, pockets were created to support the ends of the steel beams. To level out these ends, sections of 2 x 4 wood studs were placed under the steel beams and then packed with grout. As such, the load of the beams is supported by wood and grout.

The Respondent, through an Order to Comply, has indicated that the current situation needs to be rectified and has provided two methods of achieving compliance: i) provide a professional engineer's review of the end bearings for the steel beams, or, ii) provide protection for the wood. The Applicant is of the opinion that the recommendation of providing protection for the wood is inappropriate and will not provide assurance with respect to the wood and grout performing as an adequate load bearing material.

9.23.2.2. and 9.23.2.3. Protection from Decay and Dampness

The construction in dispute involves the basements walls in the subject occupancy that are supported on wood shims, which are in direct contact with the concrete floor. As per the provisions of the OBC,

wood framing members, which are in direct contact with concrete, shall be pressure treated with a wood preservative or shall be separated from the concrete by polyethylene film or Type S roll roofing in order to provide protection from decay and dampness. The wood shims in question have not been provided with a wood preservative or protective layer as identified in the Code.

9.23.5.1. Holes Drilled in Framing Members

The construction at dispute pertains to the dimensions of the holes that have been drilled into the framing members of the subject occupancy. Specifically at dispute are the size of the holes that have been drilled into the floor joists to provide for the passage of certain heating ducts. The Applicant maintains that the holes which have been drilled into the framing members are significantly larger than that permitted by Code. The Respondent party, on the other hand, has identified the framing members at dispute to be “Wood I Joists”, which are a pre-engineered product that are not subject to the Code’s requirements of cutting, notching, and drilling.

9.23.7.2. Levelling of Sill Plates

The construction at dispute pertains to the adequacy of wood shims as a method of levelling the bottom plate located beneath the bearing wall in the basement and a sill plate located in the garage of the subject occupancy. As required by the Code, sill plates shall be levelled by setting them on a full bed of mortar in situations where the top of the foundation wall is not level. Alternatively, in cases where the top of the foundation wall is level, sill plates may be laid directly on the foundation wall provided the junction between the wall and the sill plate is caulked or the sill plate is placed on a layer of mineral wool. The use of wood shims is not identified as a method of levelling sill plates in the Code.

9.27.3.2. Installation of Flashing

The construction at dispute involves the installation of the flashing, which forms part of the as-constructed cladding system at the subject occupancy. Specifically at issue is the omission of flashing forming part of the as-constructed cladding system, which has not been provided between the foundation and the exterior cladding system, nor around the doors and windows of the subject occupancy.

It should be noted that the as-constructed home has an exterior insulation and finish system (EIFS), as its cladding system. In particular, the specific EIFS system used in the subject home was the Dryvit system, which employs a stucco finish. The Applicant asserts that several deviations from the manufacturer’s prescribed EIFS installation method occurred during construction. As a result, the Applicant maintains that the as-installed cladding system, including its flashing details, does not meet the intended level of performance.

9.33.3.1. Interior Design Temperature

The construction at dispute pertains to the adequacy of the as-installed central heating system in the subject occupancy. As per the Applicant, the as-installed heating system is not capable of maintaining an indoor design temperature of 22°C (72°F) in two of the rooms found in the dwelling. The OBC stipulates that required heating devices shall be capable of maintaining an indoor air temperature of not less than 22°C (72°F) in all living spaces.

3. Dispute

The issue at dispute between the Applicant and Respondent is whether the as-constructed Group C

occupancy complies with Article 9.14.2.1. and provides sufficiency of compliance with Article 9.15.4.6., Sentence 9.20.8.3.(1) and Articles 9.23.2.2., 9.23.2.3., 9.23.5.1., 9.23.7.2., 9.27.3.2., and 9.33.3.1. of the OBC.

The following describes the eight issues at dispute with respect to the as-constructed home at 6 Sophie Court, Grimsby, Ontario:

9.14.2.1. Foundation Wall Drainage

Sentence (1) of Article 9.14.2.1. of the OBC stipulates that drainage shall be provided at the bottom of every foundation wall that contains the building interior, unless it can be shown to be unnecessary. Further to this is Sentence 9.14.2.1.(2), which states that a drainage layer is required to be installed adjacent to the exterior surface of a foundation wall when the insulation on the foundation wall extends more than 900 mm (2 ft 11 in) below the adjacent exterior ground level. Sentence (5) is the exception to Sentence 9.14.2.1.(2) however. It states that the drainage layer may be omitted when the foundation wall is not required to be dampproofed or when the foundation wall is waterproofed. At issue is whether the portion of the basement foundation wall where the garage abuts the house is required to be provided with foundation wall drainage in accordance with Article 9.14.2.1. of the Code.

9.15.4.6. Crack Control Joints

Sentence (1) of Article 9.15.4.6. stipulates that a crack control joint shall be provided in foundation walls more than 25 m (82 ft) long at intervals of not more than 15 m (49 ft. 3 in). As noted earlier, the subject dwelling contains a wall measuring 26.08 m in length and which does not contain a crack control joint.

9.20.8.3.(1) Bearing of Beams and Joists

Sentence (1) of Article 9.20.8.3. requires that the bearing area under a beam is designed in order to carry its intended load. As previously stated, the steel beams located in the basement of the subject dwelling are supported by wood and grout and encased in mortar. The Respondent has provided two proposed methods for achieving compliance: i) provide a professional engineer's review of the steel beams, or, ii) provide protection for the wood. The Applicant is of the opinion that the recommendation of providing protection for the wood is inappropriate and will not provide assurance with respect to the wood and grout performing as an adequate load bearing material. At issue is whether these proposed methods for achieving compliance will provide for an appropriate bearing material for the steel beams in question.

9.23.2.2. and 9.23.2.3. Protection from Decay and Dampness

Sentence (1) of Article 9.23.2.2. of the Code is germane to the issue at dispute. It states that the end of wood joists, beams, and other members framed into masonry or concrete shall be treated to prevent decay where the bottom of the member is at or below ground level. Alternatively, a 12 mm (½ in) air space shall be provided at the ends and sides of the member. In other words, where the bottom of a support member is below ground level, the ends of the member must be treated to prevent decay or the ends and side of the member must be surrounded by an air space to prevent contact with the concrete which could lead to dampness and decay.

Sentence (1) of Article 9.23.2.3. is also relevant as it requires, with certain exemptions not applicable here, that wood framing members, which are not pressure treated with a wood preservative, and that are supported on concrete in contact with the ground or fill, be separated from the concrete by not less than 0.05 mm (0.002 in) of polyethylene film or Type S roll roofing. The purpose of this Code provision is to prevent the wood framing member from decaying, and thus, compromising its structural integrity.

At issue is that the shims supporting the framing members have not been protected through either treatment or physical separation from the concrete.

9.23.5.1. Holes Drilled in Framing Members

Article 9.23.5.1. of the Code provides a description of the holes that are permitted to be drilled in roof, floors, and ceiling members. It states that holes drilled into framing members shall not be larger than one-quarter the depth of the member and shall be located not less than 50 mm (2 in) from the edges, unless the depth of the member is increased by the size of the hole. It should be noted that the size limitations outlined in Sentence 9.23.5.1.(1) apply to conventional wood-frame construction in which the framing members are spaced not more than 600 mm (23 5/8 in) o.c. as outlined in Sentence 9.23.1.1. of the Code.

At issue is that the Applicant claims that certain framing members, in particular the floor joists, have oversized holes cut into them to permit the passage of mechanical equipment. Despite this, the Respondent party is of the opinion that the joists in question are not subject to the Code's specifications for cutting, notching, and drilling, since they are a pre-engineered product.

9.23.7.2. Levelling of Sill Plates

Sentence 9.23.7.2.(1) of the OBC outlines the appropriate methods for the levelling of sill plates. As per this provision of the Code, sill plates must be laid in a full bed of mortar in instances where the top of the foundation wall is not level. The purpose for this is to compensate for irregularities in order to reduce air leakage and to provide an even bearing for the supported loads. Alternatively, in instances where the top of the foundation is level, the sill plate may be laid directly on the foundation provided the plate is sealed at the foundation to prevent air leakage as noted.

As previously described, wood shims have been used as a method of levelling the bottom plate located beneath the bearing wall in the basement and the sill plate located in the garage of the subject occupancy. To establish whether the shims in question will adequately transfer the loads to the foundation, an engineering analysis is required since the detail is not within the scope of Part 9 of the OBC. Notwithstanding the structural adequacy of the shims, the space below the sill plates still allows the leakage of air.

9.27.3.2. Installation of Flashing

Article 9.27.3.2. of the Ontario Building Code outlines the appropriate methods for the installation of flashing. As per Sentence 9.27.3.2.(1), flashing shall be installed at every horizontal junction between two different exterior finishes, except where the upper finish overlaps the lower finish. Specifically at issue is the omission of flashing forming part of the as-constructed cladding system, which has not been provided between the foundation and the exterior cladding system, nor around the doors and windows of the subject occupancy.

Regarding the entire cladding system installed at the subject house, it should be noted, however, that the use of EIFS is not governed under the OBC, and is instead regulated under a Ruling of the Minister of Housing, Ruling No. 98-02-052 (12788-R), approving the use of Dryvit insulation. The purpose of this Ruling is to set out installation requirements and intended performance levels. It should be noted that as a product/system regulated under a Minister's Ruling, Dryvit is considered external to the OBC and, thus, in the view of the Commission is not appealable to the BCC. However, when a material is approved under a Minister's Ruling, other parts of the Code may still apply unless the Ruling specifically addresses the matter. On matters where the OBC still governs, such as in this case regarding the

flashing, these items may be appealed to the BCC.

9.33.3.1. Interior Design Temperature

Sentence 9.33.3.1.(1) of the OBC lists the various indoor air temperatures that a Part 9 building is required to maintain. As detailed in this particular provision of the Code, houses intended for year-round use must be equipped with a heating system capable of maintaining an indoor temperature of 22°C (72°F) in all living spaces and unfinished basements. This indoor air temperature is based on outside design temperatures recorded for locations in Ontario and listed in Table 2.5.1.1. of the Code. Since the subject occupancy at dispute is located in Grimsby, Ontario, as per Table 2.5.1.1. the building's heating system must be capable of maintaining an indoor temperature of 22°C (72°F) when the outdoor design temperature is -16°C (3.2°F). According to the Applicant, there are certain areas within the house to which the heating system cannot maintain an average temperature of 22°C (72°F).

4. Provisions of the Ontario Building Code

9.14.2.1. Foundation Wall Drainage

- (1) Unless it can be shown to be unnecessary, drainage shall be provided at the bottom of every *foundation* wall that contains the *building* interior.
- (2) Except as permitted in Sentences (4), (5) and (6), where the insulation on a *foundation* wall extends to more than 900 mm (2 ft 11 in) below the adjacent exterior ground level
 - (a) a drainage layer shall be installed adjacent to the exterior surface of a *foundation* wall consisting of
 - (i) not less than 19 mm (³/₄ in) mineral fibre insulation with a density of not less than 57 kg/m³ (3.6 lb/ft³), or
 - (ii) not less than 100 mm (4 in) of free draining granular material, or
 - (b) a system shall be installed which can be shown to provide equivalent performance to that provided by the materials described in Clause (a).
- (3) Where mineral fibre insulation, crushed *rock* or other drainage layer medium is provided adjacent to the exterior surface of a *foundation* wall, it shall extend to the footing level and facilitate drainage of ground water to the *foundation* drainage system. (See Appendix A.)
- (4) Except when the insulation provides the drainage layer required in Clause (2)(a), when exterior insulation is provided, the drainage layer shall be installed on the exterior face of the insulation.
- (5) The drainage layer required in Sentence (2) is not required
 - (a) when the *foundation* wall is not required to be dampproofed, or
 - (b) when the *foundation* wall is waterproofed.
- (6) The drainage layer in Sentence (1) is only required where the *foundation* wall is constructed after the day this Regulation comes into force.
- (7) Where drainage is required in Sentence (1), the drainage shall conform to Subsection 9.14.3. or 9.14.4.

9.15.4.6. Crack Control Joints

- (1) Crack control joints shall be provided in *foundation* walls more than 25 m (82 ft) long at intervals of

not more than 15 m (49 ft 3 in).

- (2) Joints required in Sentence (1) shall be designed to resist moisture penetration and shall be keyed to prevent relative displacement of the wall portions adjacent to the joint.

9.20.8.3.(1) Bearing of Beams and Joists

- (1) The bearing area under beams and joists shall be sufficient to carry the supported load.

9.23.2.2. Protection from Decay

- (1) Ends of wood joists, beams and other members framing into masonry or concrete shall be treated to prevent decay where the bottom of the member is at or below ground level, or a 12 mm ($\frac{1}{2}$ in) air space shall be provided at the end and sides of the member.
- (2) Air spaces required in Sentence (1) shall not be blocked by insulation, *vapour barriers* or air tight materials.

9.23.2.3. Protection from Dampness

- (1) Except as permitted in Sentence (2), wood framing members that are not pressure treated with a wood preservative and which are supported on concrete in contact with the ground or *fill* shall be separated from the concrete by not less than 0.05 mm (0.002 in) polyethylene film or Type S roll roofing.
- (2) Dampproofing material referred to in Sentence (1) is not required where the wood member is at least 150 mm ($5\frac{7}{8}$ in) above the ground.

9.23.5.1. Holes Drilled in Framing Members

- (1) Holes drilled in roof, floor or ceiling framing members shall be not larger than one-quarter the depth of the member and shall be located not less than 50 mm (2 in) from the edges, unless the depth of the member is increased by the size of the hole.

9.23.7.2. Levelling of Sill Plates

- (1) Sill plates shall be levelled by setting them on a full bed of mortar, except that where the top of the *foundation* is level, they may be laid directly on the *foundation* provided the junction between the *foundation* and the sill plate is caulked or the sill plate is placed on a layer of mineral wool not less than 25 mm (1 in) thick before being compressed. (See also Article 9.23.2.3.).

9.27.3.2. Installation (of Flashing)

- (1) Flashing shall be installed at every horizontal junction between 2 different exterior finishes, except where the upper finish overlaps the lower finish.
- (2) Except as provided in Sentence (4), flashing shall be applied over exterior wall openings where the vertical distance from the bottom of the eave to the top of the trim is more than one-quarter of the horizontal overhang of the eave.
- (3) Flashing shall be installed so that it extends upwards not less than 50 mm (2 in) behind the sheathing paper and forms a drip on the outside edge.

- (4) Where a window or exterior door is designed to be installed without head flashing, the exterior flange of the window or door frame shall be bedded into a non-hardening type caulking material and the exterior flange screwed down over the caulking material to the wall framing to form a waterproof joint.

9.33.1.1. Design and Installation Requirements (See Appendix A.)

- (1) The design and installation of central heating systems including requirements for combustion air, shall conform to the requirements in Part 6 and to this Section.
- (2) The design and installation of *air-conditioning* systems shall conform to Part 6.
- (3) Repairs, adjustments or component replacements that change the capacity or extent of safety of an existing heating, ventilating or *air-conditioning* system and that alter the method of operation shall conform to this Code.

5. Applicant's Position

9.14.2.1. Foundation Wall Drainage

The Applicant began by stating that Delta-MS was used in the construction of the subject occupancy. He noted that the use of Delta-MS in construction is authorized by Minister's Ruling 98-02-052, and is an approved drainage and dampproofing material that is applied against the foundation wall to protect against water that may come into contact with the foundation wall. As per the Applicant, the manufacturer of the Delta-MS membrane (Cosella Dorken Products Inc.) specifies that the material be added to all exterior walls. The Applicant stated that despite the manufacturer's specifications, the builder of the subject occupancy failed to install the material on the portion of the foundation wall running under the attached garage. He added that although it may appear that the omission of a wall drainage membrane below the garage is not a critical issue, it does, in his opinion, compromise the integrity of the sub grade drainage system. In this regard, the Applicant submitted that this omission of a drainage layer has left the basement of the subject occupancy vulnerable to water leakage.

9.15.4.6. Crack Control Joints

The Applicant stated that the final grading plan for the subject occupancy indicates the north wall of the home to be 26.08 m in length. He submitted that Article 9.15.4.6. of the Code states that a crack control joint shall be provided in walls that are more than 25 m long at intervals of not more than 15 m. The Applicant stated that despite this, no crack control joint was installed on the subject wall even though it exceeds the required length by 1.08 m. The Applicant also added that in a letter from the Respondent party, dated March 14, 2003, the Respondent states that a crack control joint is not required in a foundation wall if it has been laterally supported. The Applicant then stated that he believes the Respondent party has mistakenly tried to apply the conditions under Article 9.20.10.1. of the OBC (Lateral Support Required) to Article 9.15.4.6.

9.20.8.3.(1) Bearing of Beams and Joists

The Applicant submitting that he first noted the deficiency with the steel beam end bearings in question when the subject home was being constructed. At that time he observed that the steel beams were resting on 2 x 4 wood blocks and asked the builder whether the wood would be removed upon completion. As per the Applicant, the builder submitted that the wood shims would be removed; however, upon returning to the home the next day, the entire unit was covered in mortar making it

difficult to decipher whether the wood had, in fact, been removed.

The Applicant then continued by stating he retained an engineering firm to review the subject occupancy once construction was complete. It was during this review that the retained engineering firm exposed a steel beam-bearing pocket and found that the beam was still sitting on a piece of 2 x 4 wood. The Applicant submitted that this was brought to the Respondent party's attention shortly thereafter who, in turn, later issued an Order to Comply to the builder of the subject occupancy. The Applicant then stated that while he believes that the Order to Comply was issued correctly, he disagrees with the remedy proposed by the Respondent party. As he noted, the Order to Comply required either a professional engineer's review of the steel beam end bearings or protection for the wood. The Applicant indicated that he believes that the only suitable method for compliance is to have the wood removed, because, in his opinion, the use of wood and grout is not a suitable bearing for steel beams.

9.23.2.2. and 9.23.2.3. Protection from Decay and Dampness

The Applicant advised that the wood shims, located beneath some of the bearing walls in the basement of the subject Group C occupancy, are situated beneath the polyethylene film used to damp proof the sill plate and, therefore, are in direct contact with the concrete floor slab. As such, the Applicant submitted that the wood shims are subject to rotting and are in direct violation of the OBC.

9.23.5.1. Holes Drilled in Framing Members

The Applicant began his submission on the drilled holes in the floor joists of the subject occupancy by referring the Commission's attention to a series of photographs that were included with the original application for a hearing before the Building Code Commission. He submitted that the photos clearly indicate that the holes have been drilled to allow for the passage of heating ducts. The Applicant then stated that he believes that the holes are greater than that which is permitted by the Code in Article 9.23.5.1. He submitted that, in his opinion, the size of the drilled holes severely compromise the integrity (namely, strength and stability) of the framing members, as a significant proportion of the core area of the joists has been removed. When questioned on the exact measurements of the drilled holes at dispute, the Applicant submitted that he was unable to provide precise details, as the subject occupancy is now completely constructed and, as such, the floor joists in question are now concealed by drywall.

The Applicant then continued by stating that the Respondent party, when questioned on the adequacy of the drilled holes at dispute, stated that the floor joists provided in the subject occupancy are not traditional wood joists, but rather "Wood I Joists". As per the Applicant, the Respondent maintained that "Wood I Joists" are a pre-engineered product, which are not subject to the Code's requirements of cutting, notching, and drilling. The Applicant also maintained that the Respondent party directed him to refer to the product's specifications, which permit the joists to be cut and drilled in accordance with pre-approved specifications. The Applicant then submitted that he felt the Respondent's response was ambiguous and questioned how the Respondent party could consider the holes at dispute acceptable.

9.23.7.2. Levelling of Sill Plates

The Applicant directed the Commission's attention to a photograph that depicted the use of wood shims as a method of levelling the sill plate located in the garage of the subject occupancy. As illustrated in the photograph, the Applicant stated that the sill plate located in the garage is not in direct contact with the foundation wall, as required in OBC Article 9.23.7.2., but is rather sitting on wood shims. The Applicant also stated that there are two particular instances where wood shims have been used as a method of levelling the bottom plates located beneath the bearing walls in the basement of the subject occupancy. The Applicant maintained that he believes the use of these shims severely compromises the

integrity of the subject occupancy, especially if they experience dampness and decay.

As further evidence citing his position, the Applicant cited a report authored by 2M Architects, which stated that “the wood shims alter the structural forces on the bottom plate with respect to the masonry base, thus effectively rendering the nature of the single bottom plate into a structural member required to horizontally transmit the load weights to the shims”. As per the Applicant, this has resulted in the bottom plate performing a structural function it was not designed or constructed to carry. He concluded by submitting that not only are the shims in direct contact with the concrete foundation, and thereby subject to dampness and decay, but also seriously compromise the integrity of the subject dwelling.

The Applicant continued by stating that he retained an engineering firm to review the structural adequacy of the wood shims in question. As per the engineer’s report, the instance of wood shims under a load bearing wall supporting a steel beam is unusual, as the normal practice is to use steel shim plates that have greater load-capacity. The Applicant stated that the engineer’s report confirms his belief that the shims are structurally inadequate and maintained that, at a minimum, the shims in question should be provided with dampproofing material.

9.27.3.2. Installation (of Flashing)

The Applicant noted that he decided to use stucco as an exterior cladding for the subject occupancy because that was his wife’s preference. He continued by stating that there is an abundance of evidence that suggest there are failures associated with stucco as an exterior cladding. In this regard, the Applicant maintained that he wanted to use a product that had a good reputation and, as such, chose an exterior insulation and finish system (EIFS), known as the stucco Dryvit system. As per the Applicant, the building contract clearly specified that a Dryvit system was to be used.

The Applicant continued by stating that he noticed several cracks in the flashing upon moving into the subject occupancy. As a result of these failures, the Applicant arranged for a Technical Representative from Dryvit to inspect the installation. As per the Applicant, the Dryvit Technical Representative noticed discrepancies between the as-installed cladding system and the standardized Dryvit installation. Specifically, the Dryvit Representative noticed that the contractor did not install a secondary moisture barrier and chose to use nails, not adhesive or screws as required in the specifications. In addition, other materials, accessories and caulking were not used according to specifications. The Applicant then stated that these deviations, identified by Dryvit, were also confirmed by Morrison Hershfield Limited, a consulting engineering firm who, as per the Applicant, specialize in EIFS. Morrison Hershfield Limited also noted that there is no flashing between the foundation and the EIFS, nor around the doors and windows. In this regard, the Applicant maintained that the as-installed cladding does not conform with either the manufacturer’s specifications or industry practice.

The Applicant then stated that both the Dryvit analysis and the study conducted by Morrison Hershfield Limited were submitted to the Respondent for his review. The Respondent’s reply, in a letter dated March 14th, 2003, advised that the Town of Grimsby Building Department is of the opinion that while the as-constructed system may not have been installed in strict accordance with manufacturer’s specifications, there appears to be no evident Code contraventions.

9.33.3.1. Interior Design Temperature

The Applicant began by submitting that the subject occupancy has two rooms that do not receive sufficient heating and air-conditioning as a result of inadequate duct work: i) the ensuite (or master bathroom) and ii) one of the bedrooms. He then stated that temperatures in these rooms are below 15°C in the winter months, even though the house is kept at 22°C.

The Applicant noted that an application for a building permit requires the name of the heating, ventilation, and air conditioning (HVAC) contractor, as well as heat loss calculations and heating verification sheets to be submitted prior to installation of an HVAC system. Furthermore, he advised that the terms of the application state that there must be notification when there is substantial completion of the HVAC and air-contamination extraction equipment. Despite this requirement, the Applicant submitted that none of the aforementioned was completed prior to construction, nor was any inspection of the HVAC system carried out by the Respondent.

The Applicant continued by advising that the Respondent, in a letter dated March 14th, 2003, acknowledges these inadequacies, but submits that compliance with OBC Article 9.33.3.1. is not required. He then concluded by stating that the as-installed HVAC system does not achieve the level of performance expected by the Code.

6. Respondent's Position

9.14.2.1. Foundation Wall Drainage

The Respondent submitted that he does not believe that a drainage layer should be installed on the basement foundation wall under the garage of the subject occupancy, since, in his opinion, the interior wall of the garage is not part of the exterior of the building envelope and, thus, is not subjected to the elements. He stated that, in his opinion, usually a drainage layer is required to address the infiltration of moisture from exterior ground surfaces that are exposed to the elements. In this regard however, the Respondent argued that there is no need for a drainage layer, such as that required for a typical exterior wall, because in this instance the exterior walls of the garage protect the garage floor from exterior sources of moisture.

9.15.4.6. Crack Control Joints

The Respondent advised that the northerly foundation wall of the subject occupancy measures approximately 26.08 m, which includes approximately 17 m of full height basement foundation and an additional 9 m (approx.) of reduced height foundation wall for the garage. He argued that due to the change in height between the full height basement wall and the reduced height garage wall, he is of the opinion that there are two walls: one being the dwelling foundation and the other being the garage foundation. The Respondent then stated that he feels the foundation possesses the necessary characteristics to perform its intended functions and, therefore, a crack control joint is unnecessary due to the intersecting walls.

9.20.8.3.(1) Bearing of Beams and Joists

The Respondent stated that his position on the end bearings for the steel beams in question was simple. He noted that he did, in fact, issue an Order to Comply, which proposed two possible methods for remedying the situation at dispute: i) provide a professional engineer's review of the end bearings for the steel beams, or, ii) provide protection for the wood. The Respondent stated that if the Applicant did not want to provide protection for the wood in contact with the concrete foundation wall then a professional engineer's review of the steel beams end bearing was required. He then went on to state that he felt it was not outside of his purview to request such a report from the Applicant party, as Section 18.-(1)(c) of the Building Code Act states that a municipal inspector may require information from any person concerning a matter relating to a building or part thereof.

9.23.2.2. and 9.23.2.3. Protection from Decay and Dampness

The Respondent submitted that his position on the adequacy of the wood shims, located beneath the load bearing wall in the basement of the subject Group C occupancy, was similar to that of the end bearings for the steel beams, which are also in question. He submitted that while an Order to Comply was not issued on this matter, the Applicant could either provide a professional engineer's review on the adequacy of the wood shims or provide protection for the wood in contact with the concrete floor slab.

9.23.5.1. Holes Drilled in Framing Members

The Respondent began by submitting that it is difficult to determine whether the holes that have been drilled into the floor joists of the subject occupancy are in compliance with the OBC, based on the lack of detailed information with respect to their exact sizing. Furthermore, he stated that the drilled holes in question were not identified as a problem in the inspection report for the subject occupancy and, in this regard, he was not aware of the fact that the drilled holes were an issue.

The Respondent then stated that the floor joists provided in the subject occupancy are not traditional wood joists, but rather "Wood I Joists", which are a pre-engineered product that are not subject to the OBC's requirements for cutting, notching, and drilling. He then continued by stating that in viewing the Applicant's photos, it appears that a 127 mm (5 in) diameter duct passes through a circular hole of approximately 178 mm (7 in) in diameter located roughly 1.2 m (4 ft) from the steel beam support. As per the Respondent, the manufacturer's specifications identify this as an acceptable practice.

9.23.7.2. Levelling of Sill Plates

The Respondent submitted that wood shims were provided under the sill plate located in the garage and under certain bearing walls in the basement of the subject occupancy in order to provide reasonable support to the structure in terms of level walls. He then went on to state that the situation of the shims coming into contact with the concrete floor had been corrected and called upon a witness who confirmed that he did, in fact, attempt to ensure that the shims beneath the sill plate would be protected from dampness and decay. When questioned as to how the shims were protected, the witness submitted that he pulled down the vapour barrier from the bottom of the sill plate and then ran the shims under the sill plate above the vapour barrier so that the vapour barrier separated the shims from the concrete floor slab.

9.27.3.2. Installation (of Flashing)

The Respondent submitted that throughout his review of the documents that have been submitted by the Applicant, with regard to the installation of the Dryvit system, it has not been clearly demonstrated that Code contraventions have been identified. The Respondent then advised that he did not have the opportunity to be on site to witness the installation of the as-installed cladding system, nor was he required to perform any mandatory inspections throughout the process. Furthermore, he added that a more definitive review of the claims of Code infractions is required before it can be determined whether the as-installed cladding system fails to provide sufficiency of compliance.

The Respondent called upon an a witness who was questioned as to whether or not the as-constructed cladding is, in fact, a Dryvit system. The witness submitted that Dryvit products were used, but that the process employed during installation deviated from the Dryvit specifications. He stated that flashing was not installed between the foundation and the EIFS, nor around the doors and windows, as it is not required by the manufacturer.

9.33.3.1. Interior Design Temperature

The Respondent indicated that he was aware of the fact that the Applicant had brought the concerns regarding his HVAC system to his homebuilder's attention. The Respondent advised that he responded to these concerns in a letter addressed to the Applicant, dated March 14th, 2003, in which he stated that a review of the HVAC system had been carried out and changes to the system were made in accordance with Section 6 of the Code and good engineering practices. The Respondent stated that he appended to his March 14th, 2003 letter a copy of the review conducted by A-Plus Air Systems, who were retained to analyze the as-installed HVAC system. The Respondent stated that the review conducted by A-Plus Air Systems outlines actions that were taken to balance the system so that it performed as close to its intended design as possible and, furthermore, suggests additional remedial measures.

The Respondent then called upon a representative from A-Plus Air Systems as a witness to speak to the as-installed HVAC system. The witness submitted that in order to further improve problem areas, and meet design requirements, some round runs would have to be replaced and/or added, some balancing dampers would have to be added, and some registers would need to be replaced. When questioned as to why these additional measures were not carried out, the witness submitted that the home builder advised him not to proceed as a result of contractual disputes with the Applicant party.

The Respondent party concluded by stating that although he acknowledges there is still room for improvement of the as-installed HVAC system, he believes that this is not a technical issue with respect to the requirements of the Code, but, rather, a contractual dispute between the Applicant and the home builder.

7. Commission Ruling

The following are the decisions of the Building Code Commission with respect to the as-constructed Group C occupancy located at 6 Sophie Court, Grimsby, Ontario.

9.14.2.1. Foundation Wall Drainage

It is the decision of the Building Code Commission that the foundation wall located under the garage of the subject Group C occupancy, which has not been provided with a drainage layer, complies with Article 9.14.2.1. of the Ontario Building Code.

9.15.4.6. Crack Control Joints

It is the decision of the Building Code Commission that the existing north foundation wall of the subject Group C occupancy that measures approximately 26.08 m in length, and which has not been provided with a crack control joint, provides sufficiency of compliance with Article 9.15.4.6. of the Ontario Building Code.

9.20.8.3.(1) Bearing of Beams and Joists

It is the decision of the Building Code Commission that the use of wood and grout as bearing for the steel beams located in the basement of the subject Group C occupancy does not provide sufficiency of compliance with Sentence 9.20.8.3.(1) of the Ontario Building Code.

9.23.2.2. and 9.23.2.3. Protection from Decay and Dampness

It is the decision of the Building Code Commission that the basement walls in the subject Group C

occupancy, which are supported on wood shims that are in contact with the concrete floor, does not provide sufficiency of compliance with Articles 9.23.2.2. and 9.23.2.3. of the Ontario Building Code.

9.23.5.1. Holes Drilled in Framing Members

It is the decision of the Building Code Commission that there was insufficient evidence submitted to come to a determination with respect to the whether the holes drilled in the framing members of the existing Group C occupancy provide sufficiency of compliance with Article 9.23.5.1. of the Ontario Building Code.

9.23.7.2. Levelling of Sill Plates

It is the decision of the Building Code Commission that the bottom plate located beneath the bearing wall in the basement and the sill plate located in the garage of the subject Group C occupancy, which are supported on wood shims, do not provide sufficiency of compliance with Article 9.23.7.2. of the Ontario Building Code.

9.27.3.2. Installation (of Flashing)

It is the decision of the Building Code Commission that the installation of flashing forming part of the as-constructed cladding system on the subject Group C occupancy does not provide sufficiency of compliance with Article 9.27.3.2. of the Ontario Building Code.

9.33.3.1. Interior Design Temperature

It is the decision of the Building Code Commission that the central heating and air-conditioning system installed in the subject Group C occupancy, does not provide sufficiency of compliance with Article 9.33.3.1. of the Ontario Building Code.

8. Reasons

9.14.2.1. Foundation Wall Drainage

The soil adjacent to the basement foundation under the garage slab and within the enclosed garage, is not exposed to the elements and, hence, the foundation wall between the basement and garage is not considered an exterior wall. As such, the need to provide a drainage layer is not required.

9.15.4.6. Crack Control Joints

The existing north foundation wall, which measures approximately 26.08 m in length, although in excess of the 25 m requirement outlined in Article 9.15.4.6. of the Code, provides sufficiency of compliance since:

- i) The exterior of the existing foundation wall has a drainage layer, which will help prevent the infiltration of water if it cracks; and,
- ii) The wall exceeds the maximum length that requires a crack control joint by only 1.08 m or 4.1%.

9.20.8.3.(1) Bearing of Beams and Joists

The compliance order issued March 17th, 2003, by the Town of Grimsby addresses the use of wood to

support the end of the steel beams in the basement or cellar of the as-constructed building at dispute. The engineer's report, which dealt with only one of the beam pockets, confirms the Town of Grimsby's compliance order and recommends a method of repair to comply with the order. The engineer's recommendation is to remove the wood supporting the steel beam and replace it with non-shrink, cementitious grout. The Building Code Commission believes that this method of repair would provide sufficiency of compliance with Sentence 9.20.8.3.(1) of the Ontario Building Code.

9.23.2.2. and 9.23.2.3. Protection from Decay and Dampness

The as-installed wood shims are not protected as described in Articles 9.23.2.2. and 9.23.2.3. of the Ontario Building Code.

9.23.5.1. Holes Drilled in Framing Members

Neither the Applicant, nor the Respondent party, were able to give exact measurements of the holes cut into the floor joists since the subject Group C occupancy is completely constructed and the area in dispute is now concealed by drywall.

9.23.7.2. Levelling of Sill Plates

Sentence 9.23.7.2.(1) of the Ontario Building Code requires that sill plates are levelled on a full bed of mortar. The sill plates for the subject walls are supported on non-compliant wood shims.

9.27.3.2. Installation (of Flashing)

Minister's Ruling #99-07-66 (12874-R) states that the use of Dryvit Outsulation must be in accordance with the CCMC Evaluation Report No. 12874-R. The evidence submitted to the Building Code Commission indicated that the as-constructed Group C occupancy does not comply with CCMC Evaluation Report "CCMC 12874-R" in several respects. Since the system, as installed, is not in accordance with the Minister's Ruling, it must then demonstrate sufficiency of compliance with the applicable requirements of the Ontario Building Code. The evidence presented to the Commission indicates that the flashing requirements as outlined in Article 9.27.3.2. had not been complied with. However, with respect to the other applicable cladding requirements found in the Ontario Building Code, there was insufficient information to determine whether other aspects of the cladding system, apart from the flashing details, provided sufficiency of compliance with the Ontario Building Code.

9.33.3.1. Interior Design Temperature

The evidence that was submitted to the Building Code Commission indicated that bedroom #1 receives no air flow from the heating system. As well, the ensuite bathroom has insufficient air flow based on calculations as per the Applicant's evidence.

The ensuite bathroom to the master bedroom has insufficient air flow based on calculations and cannot be heated to 22°C as per the Applicant's evidence.

Dated at Toronto this **4th** day in the month of **November** in the year **2003** for application number **2003-14**.

Len King, Vice-Chair

Tony Chow

Donald Pratt