

Call for Inquiry into
Failure to Enforce the Ontario Building Code
with respect to
Small Diameter High Velocity
Heating, Ventilation & Air Conditioning Systems

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Executive Summary

This is a call for the Minister of Municipal Affairs and Housing to initiate an Inquiry under the Ontario Building Code Act to investigate the failure to enforce the Ontario Building Code with respect to Small Diameter High Velocity Heating, Ventilation and Air conditioning (SDHV-HVAC) systems.

According to CTV's W5 in 2012 more than 50,000 of these systems had been installed in the GTA alone and they continue to be sold today in Ontario. Consumers who purchase new homes assume that the regulatory and warranty agencies involved will prevent sub-standard systems such as these from being installed. Consumers also expect that when it becomes known that a certain system is found to be sub-standard that something will be done about it. Sadly, although representations have been made to the agencies who could take action on this, nothing has been done.

This situation is significant because it shows how Ontario's system of new home regulation, quality assurance and mandatory warranty does not protect new home purchasers even when significant breaches of the Ontario Building Code occur.

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1 Call for Inquiry

1.1 The *Building Code Act* of Ontario states as follows:

Inquiry

30. (1) *If it appears to the Minister that there is or may be a failure in construction or demolition standards or in the enforcement of this Act or the building code, the Minister may designate a person to conduct an Inquiry into the failure. 1992, c. 23, s. 30 (1)*

(1).Application of Public Inquiries Act, 2009

2) *Section 33 of the Public Inquiries Act, 2009 applies to the Inquiry. 2009, c. 33, Sched. 6, s. 43.*

1.2 I am calling on the Minister of Municipal Affairs and Housing to designate a person to conduct an Inquiry as it should appear to the Minister that a failure to enforce the Ontario Building Code exists based on the following information.

1.3 MPP Ted Chudleigh has previously called for an investigation into this matter both in writing¹ to the then Minister of Consumer and Government Services and the Legislature².

2 Why an Inquiry is Required

2.1 After several years of research and investigation of which I have personal knowledge, I have concluded that with respect to *Small Diameter High Velocity Heating, Ventilation and Air Conditioning Systems* (SDHV-HVAC Systems) there is an on-going failure to enforce the requirements of the *Ontario Building Code* (OBC) for residential new construction in Ontario.

2.2 Certain SDHV-HVAC systems which have been sold for more than a decade in Ontario and usually result in installations which do not conform to the Ontario Building Code. These systems fail to comply with the OBC with respect to design as well as with respect to performance. Performance shortfalls of 20% to 50% of the required heating capacity are often measured when installations are investigated.

2.3 These systems have been subject of two separate License Appeal Tribunal (LAT) hearings both of which concluded that the systems failed to meet the minimum standards of the OBC.³

¹ Letter July 5, 2010, MMP Chudleigh to Minister Aggelonitis

² Transcript of the Legislature of Ontario, Feb 27,2012

³ LAT-3512-ONHWPA-May09-2008 and LAT-5558-ONHWPA-Oct20-2011

- 2.4 This problem has been the subject of a W5 Documentary called “Cold Comfort” which aired in March of 2012. According to W5's research, over 50,000 of these systems had been installed in the Greater Toronto Area (GTA) as of March 2012 ⁴.
- 2.5 This issue has been reported in the Toronto Star in 2012 ⁵.
- 2.6 Numerous expert reports have concluded that these systems do not meet the minimum requirements of the Ontario Building Code⁶.
- 2.7 No evidence has been advanced from any credible source that these systems are in compliance with the OBC. These systems continue to be sold in Ontario. I do not know if these systems now comply with the Ontario Building Code, however I am not aware of any significant changes which would bring these systems into compliance.
- 2.8 Beginning in 2008, I brought this matter to the attention of several agencies, organizations and government departments who have the ability to investigate these issues, however no agency, organization or government department has done so.

The agencies to which I have made submissions on this matter include:

- Tarion
- a Municipal Government
- the Ministry of Government and Consumer Services
- the Professional Engineers of Ontario
- the Heating, Refrigerating and Air Conditioning Institute of Canada
- the Ombudsman of Ontario
- the Ministry of Municipal Affairs and Housing

- 2.9 The Building Code Act is clear that Municipalities are responsible for the enforcement of the Ontario Building Code. At present, enforcement of the residential HVAC requirements in the OBC are interpreted as being optional, however in the five instances of non-compliance set out in this document, each of the three municipalities concerned had a policy of enforcing all of the residential HVAC requirements of the Ontario Building Code.
- 2.10 Notwithstanding the obligation of Municipalities to enforce the OBC, other agencies and organisations have tangential obligations to enforce the OBC. These include:
- a) Tarion, whose legislation obliges it to warrant that all new homes are constructed in accordance with the OBC.
 - b) The Professional Engineers of Ontario, who qualifies and disciplines Engineers who prepare designs that are expected to comply with the OBC.

⁴ W5 Episode March 3, 2012, “Cold Comfort”, transcript updated December 13, 2012

⁵ New Home Buyers Out in the Cold When Complaining About Heating Systems, Ellen Roseman, April 27, 2012

⁶ Experts Reports are footnoted in the following text

- c) The Heating Refrigeration and Air Conditioning Institute of Canada who qualifies and trains HVAC designers to prepare designs which are expected to comply with the OBC.
- d) The Ministry of Municipal Affairs and Housing which administers the BCIN qualification system which issues qualifications to HVAC designers who are expected to prepare designs which comply with the OBC.
- e) The Building Code Commission which is expected to rule on disputes between owners and builders and Municipal Building Officials concerning matters of OBC interpretation and whether or not an order by the Chief Building Official of a Municipality has been properly issued.

2.11 This matter affects a significant number of ordinary consumers in Ontario who have purchased homes with these systems installed as follows:

- 2.11.1 These substandard systems result in substandard heating conditions⁷ in the winter and poor air conditioning performance in the summer.
- 2.11.2 The value of the homes can be significantly reduced and the owners may be liable for legal action on the sale of their home⁸.
- 2.11.3 Failure to disclose the fact that the HVAC system is defective may also make a consumer liable for damages.
- 2.11.4 This issue brings into question the effectiveness of the agencies, organizations and government departments which receive mandatory fees and general tax revenue ostensibly to protect the interests of new home purchasers. In these cases the consumers did not receive the protection that these agencies, organizations and government departments promise them. Furthermore, when the agencies, organizations and government departments concerned were approached concerning these issues, they took no action, even to investigate to determine whether or not action should be taken.
- 2.11.5 While this instance of failure to enforce the Ontario Building Code is specific to SDHV-HVAC systems, it raises a concern as to whether other such systems, now or in the future will escape enforcement by the agencies whose duty it is to enforce the Ontario Building Code.

2.12 The HRAI Residential Air System Design Manual (RASD) does not contain guidelines for the design of SDHV-HVAC systems⁹.

⁷ Heating conditions as below those which are considered in most municipal property standards by-laws

⁸ Ontario Small Clams Court File Number SC-11-00001194-000

⁹ Residential Air System Design Manual, 2014 Edition, HRAI

- 2.13 The Ontario Building Code does not contain mandatory performance testing requirements for the air-handling equipment used for these SDHV-HVAC systems, and other hot-water air-handler units, but it does contain mandatory performance standards for many other HVAC products such as furnace, heat pumps and heat Recovery ventilators.
- 2.14 Brenda Lewis, Director of the Building Branch of the Ministry of Municipal Affairs and Housing directed me to consider whether or not the Elliot Lake Commission of Inquiry was relevant to this issue. My conclusion is that an Inquiry into the issue of SDHV-HVAC non-compliance would be significantly different in scope and nature than the Elliot Lake Commission. The recommendations of the Elliot Lake Commission are not applicable to the SDHV-HVAC issue.

3 Specific SDHV-HVAC Problem Cases

3.1 Notice Concerning Legal Issues

The following series of statements that have not all been proven in court or a public Inquiry. Some of these issues have been considered and found as fact by the Licence Appeal Tribunal (LAT), the Building Code Commission (BCC) and the Association of Professional Engineer of Ontario (PEO), however other matters have not been so tested and so remain as my opinion. I am keenly aware that Ontario does not have “Whistle-Blower” legislation and therefore the following has been prepared so as not to identify specific persons or corporations. I am prepared to provide substantiating documents to appropriate government departments, agencies or the media provided that adequate privacy safeguards are in place. It is my belief that when an Inquiry occurs evidence and documents not heretofore available may be released under the witness protection provisions of the Public Inquiries Act and these statements will be substantiated.

3.2 Development “A”

In a major municipality in the GTA a development of 51 homes was built using this system in the year 2000. Concerning this development:

3.2.1 The original design documents¹⁰ submitted to the municipality were deficient in several ways but were accepted. In particular, the Municipality accepted a combination water heater (which also heats the home) which had insufficient capacity according to the OBC.

3.2.2 The investigation report¹¹ for one these homes concluded;
“The heating system is not adequate to heat the building. The cause of this can be attributed to faulty design, faulty installation and the possible failure of the installed equipment to provide the rated performance published by the manufacturer.”

3.2.3 Complaints by home-owners directed at the municipality eventually resulted in a meeting between a group of home-owners, the Mayor and the Chief Building Official for the municipality. The home-owners group requested that the Chief Building Official refer the engineer who signed the HVAC design documents to the PEO as per the Chief Building Official’s ability in this regard afforded by the Building Code Act¹². The Chief Building Official declined to do so but agreed to engage a third party engineer to evaluate whether or not there was cause to do so.

¹⁰ HVAC Design Typical Home, Development A, May 25, 2000

¹¹ Bowser Technical Report EP-1, June 14th, 2004

¹² Building Code Act 8.(9) “Upon reasonable grounds, the chief building official or registered code agency may refer drawings, plans or specifications accompanying applications for permits or the reports arising out of the general review of the construction of a building to the Professional Engineers of Ontario or the Ontario Association of Architects for the purpose of determining if the Professional Engineers Act or the Architects Act is being contravened. 2002, c. 9, s. 14 (4).

3.2.4 The municipality engaged a third-party engineer who wrote a report dated April 15, 2005¹³. which was submitted as evidence to the LAT but not originally released to the residents of the development. This report concluded:

“The hot water tanks used for the “Combo” system heating and hot water tank have only limited output as we discovered, insufficient capacity to meet the heating and domestic hot water obligations.”

Another conclusion states:

“We also found that the _____ air handler used to heat the air for heating does not deliver the airflow capacity necessary for adequate heating in larger homes, nor does it deliver sufficient air to handle the large cooling system that some of the residents have installed.

“Certified” test ratings must be provided”.

3.2.5 The same third party engineer prepared a second report dated and May 18, 2005¹⁴ which was distributed to the residents of the development under cover of a letter from the Manager of Inspection Services of the municipality. This report had a different conclusion with respect to the air handler saying:

“We also found that the _____ air handler used to heat the air for heating will provide enough heat but it does not deliver the airflow capacity sufficient air to handle the cooling system without special coils and controls.”

The requirement to provide certified test ratings is not found in the second report.

3.2.6 Some home-owners filed a complaint against this engineer with the PEO. At the hearing¹⁵, the Chief Building Official testified and explained that he had directed the engineer to revise his report from the April to the May version. The Chief Building Official stated at the hearing that the report was required to state whether the heating systems met the requirements of the OBC. It can be inferred from this that the Chief Building Official did not honour his commitment to engage a third party expert to review whether or not the original HVAC designs should be referred to the PEO.

3.2.7 The letter from the Manager of Inspection Services of the municipality which covered the May 18,2005 report (item 3.2.5 above) delivered to the residents stated:

“The engineer views the HVAC issues as systemic to all houses and therefore is attempting to have the HVAC deficiency identified and corrected in one home before proceeding with the other homes.”

¹³ Report on Heating Systems for _____, April 15,2005

¹⁴ Report on Heating Systems for _____, May 18,2005

¹⁵ Engineering Dimensions December 2011, pp 35-50

- 3.2.8 The municipality subsequently issued orders against all of the home-owners for replacement of the combination water heaters. When one of the home-owners disputed the order to the Building Code Commission, the municipality withdrew the order by hand delivery shortly before the scheduled BCC hearing and at the hearing the BCC declined to hear the dispute. The orders remained in place for the other home-owners who did not dispute the order to the BCC.¹⁶
- 3.2.9 One home-owner was refused a warranty by Tarion and disputed the finding to the LAT, but later settled and signed a non-disclosure agreement.
- 3.2.10 One home-owner contacted Mike Holmes and their home was repaired and made the subject of a “Holmes on Homes” episode¹⁷.
- 3.2.11 One home-owner was refused a warranty by Tarion and disputed the finding to the License Appeal Tribunal (LAT). The LAT heard the dispute (10 days of hearings) and found in favour of the home-owner but did not award sufficient funds to repair the system adequately.¹⁸
- 3.2.12 Following this decision, Tarion engaged the services of a third-party engineer to investigate and to recommend solutions. Four homes were remediated on a trial basis. The report¹⁹ by this expert concluded that none of the systems as found met the minimum standard of the OBC and that the measured heating output shortfall in the four homes tested ranged between 33% and 47% . Other conclusions of this report include:
- “The measured heating output of the air handling units range between 34,000 and 47,570 btuh. These results show a shortfall in heating output capacity of up to some 40% compared to manufacturer’s specifications.”*
- and
- “Based on these results it is believed that a shortfall in heating output capacity is common to all such units installed in the development.”*
- 3.2.13 The third party engineer engaged by Tarion recommended complete replacement of the heating equipment as well as significant modifications to the ductwork system.

¹⁶ Building Code Commission Ruling 06-53-1123, Application #B-2006-43

¹⁷ Holmes on Homes Season 7, Episode 3, March 2008, “Re-Inventing”

¹⁸ LAT-3512-ONWPA-May09-2008

¹⁹ Investigation, Findings and Modifications report, February 2009, TAR801CK

- 3.2.14 After receiving the report from the third party engineer, Tarion decided to repair the HVAC deficiencies in 14 out of the remaining 51 homes, being those homes which had filed a complaint with Tarion prior to the expiry of the two-year reporting period set by Tarion. The remedial work for the 14 “deemed warranted” homes was completed by Tarion over the period January 2009 to July 2010 and included complete replacement of the heating equipment and significant modifications to the ductwork system.
- 3.2.15 The other 35 homes in the development were not warranted by Tarion even when they are constructed in the same way that the 14 warranted homes were constructed.
- 3.2.16 A civil suit²⁰ has been filed against the SDHV-HVAC manufacturer and the engineer engaged by Tarion to investigate and recommend remedial work. The plaintiff is the original HVAC contractor for the project and is claiming that the systems provided by the subject manufacturer were sub-standard. The plaintiff is also claiming that the third party engineer engaged by Tarion recommended “excessive” repairs.
- 3.2.17 Although Tarion directed and paid for the remediation work on the 14 “deemed warranted” units, the statement of claim in above noted civil suit, states that the cost for the remediation was born by the original HVAC contractor.
- 3.2.18 In one case, the original purchaser of a new home in this development subsequently sold the home but was sued successfully in small claims court by the second purchaser of the home on the basis that the HVAC system was substandard.²¹ The original purchaser of the home was held responsible for the failure of the Ontario building and regulatory system to provide a home that complied with the OBC.
- 3.2.19 Several owners have elected to make partial improvements to their home at their own expense, and other continue to endure HVAC systems which do not properly heat and cool the homes.
- 3.2.20 It is notable that winter-time conditions recorded in these homes fail to meet the requirements of the subject municipality’s property standards by-law. Therefore, although the owners purchased homes that were approved by the municipal building code enforcement department, they are not able to rent their homes because to do so would be a violation of the same municipality’s property standards by-law²².

²⁰ Ontario Superior Court Statement of claim, file # CV-12-445903, \$850,000

²¹ Ontario Small Clams Court File Number SC-11-00001194-000

²² By-Law 1983-6, Provision of Heat in Rented or Leased Accommodation

- 3.2.21 An engineering company which carried out some investigations on behalf of the original HVAC Contractor and which made some recommendations was the subject of a complaint to the PEO. This engineer was disciplined and found to be guilty of professional misconduct²³. The PEO declined to pursue allegations of incompetence against this engineer, even though this allegation was made in the prepared statement of allegations made by the PEO at the hearing.
- 3.2.22 Several other PEO member engineers were the subject of complaints and two of the complaints resulted in discipline hearings concerning the engineer who certified the original design²⁴ and the third party engineer engaged by the Municipality²⁵. Other engineers against whom complaints were lodged were engineers who were employed by the Municipality including the Chief Building Official and engineers who testified and who gave written opinions at the LAT hearing for the same project²⁶. None of the engineers against whom complaints were lodged were publicly found to have breached the standard of practice of the PEO. At the time the hearings occurred beginning in October 2008, the LAT Decision had been published (May 2008), and it had been established beyond a reasonable doubt that the SDHV-HVAC systems in this development failed to provide sufficient heating and did not comply with the OBC. The perception of many observers was that the PEO had no interest in finding that any of its members was responsible in any way for these failures.

²³ PEO v Chung-Wai Chan P.Eng Engineering Dimensions, September/October 2009

²⁴ PEO v J.D. Hubbert P. Eng Engineering Dimensions, November/December 2011

²⁵ PEO v P.S.C.Lim P. Eng Engineering Dimensions, May/June 2011

²⁶ LAT-3512-ONWPA-May09-2008

3.3 Development “B”

In another Municipality in the GTA a development of 82 condominium town homes was built in 2001.

- 3.3.1 Design documents for this development were prepared by the same engineer who prepared the design documents for Development “A” above. The design documents were accepted by the municipality.
- 3.3.2 Several condominium owners were denied a warranty of their SDHV-HVAC systems by Tarion and subsequently appealed to the LAT. At least one owner carried out substantial repairs to his SDHV-HVAC system in order to bring it into compliance with the OBC. Tarion and the builder settled the LAT appeal of this owner and negotiated a non-disclosure agreement.
- 3.3.3 An investigation report²⁷ prepared for a condominium owner concluded that:
“The heating and cooling system as found did not comply with the requirements of the OBC and good engineering practice.”
and
“The originally installed heating system was not able to meet the heating or cooling loads of the building.”
- 3.3.4 Most of the owners in this development have opted not to complain publicly about their deficient HVAC systems due to their concern over a loss of property values that may result if it became known that their property had deficient HVAC systems.²⁸
- 3.3.5 It is notable that the technical problems with this development are the same as the problems encountered with Development A reviewed above and involved the same systems and equipment. Tarion officials knew or ought to have known that the systems and problems were the same, but they refused all warranty claims even when they acknowledged and provided warranty repairs for 14 homes in the Development “A”.

²⁷ Bowser Technical Report EP-4, September 10th 2008

²⁸ This was reported to the Ministry of Consumer and Government Services staff person Jenny Shiller in December 2014 by a former president of the Condominium.

3.4 Development “C”

A development of 32 Condominium Town homes was built in 2006 in a municipality which has a policy of enforcing all residential OBC HVAC design and installation requirements.

- 3.4.1 The design documents²⁹ were certified by a person who is not an engineer but has qualifications under the “HVAC House” requirements of the OBC (BCIN Qualification). The individual also holds a certificate in “Residential Air System Design” issued by the Heating Refrigerating and Air Conditioning Institute of Canada (HRAI). The HRAI Residential Air System Design Manual³⁰ does not contain guidelines for SDHV-HVAC design.
- 3.4.2 Several condominium owners complained to Tarion. Two owners were refused a warranty by Tarion despite the findings and published LAT decision regarding the same systems as for Development “A” described above.
- 3.4.3 The two home-owners who were refused a warranty appealed the decision to the LAT.
- 3.4.4 The Investigation report³¹ for one of the two units concluded as follows:
“The HVAC system does not deliver the amount of airflow required to heat the dwelling unit as a whole, nor is it able to deliver the air necessary to heat individual areas of the home. The primary reason for this is the fact that the ductwork is too small. Basic calculation shows that an adequate amount of air cannot reasonably be moved by the existing ductwork.”
- 3.4.5 One of the owners went through the full LAT process and won a decision in her favour. (9 days of hearings)³²
- 3.4.6 Even after the Decision was rendered for the first owner, Tarion refused for a time to settle with the second owner despite the fact that the two homes and systems were virtually identical.

²⁹ Development C HVAC Design Documents, June 13, 2006

³⁰ Residential Air System Design Manual, 2014 Edition, HRAI

³¹ Bowser Technical Report EP-5, March 19th 2010

³² LAT-5558-ONHWPA-Oct20-2011

3.5 Development “D”

A development of 20 Condominiums Town homes was built in 2007 in a municipality in the GTA.

- 3.5.1 The design documents were certified by an engineer and accepted by the Municipality.
- 3.5.2 Many of the owners complained to the builder and Tarion and were refused a warranty. One owner appealed the decision to the LAT. Tarion and the builder settled with the owner after the beginning of the LAT process and a non-disclosure agreement was signed.
- 3.5.3 The Investigation report³³ for the one owner who appealed the Tarion decision concluded as follows:

“The measured heating output of the subject system is 16,187 btuh which is 59% less than the calculated heating requirement of 39,308 btuh under the conditions stipulated in the OBC sentence 6.2.1.2.(1).”
- 3.5.4 It is notable that Tarion refused the warranty for the systems even when they were essentially the same as those systems which were warranted in Development “A” first noted above.

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3.6 Development “E”

A development of 16 Condominium Town homes was built in 2009 in a municipality which has a policy of enforcing all residential OBC HVAC design and installation requirements.

- 3.6.1 The design documents were certified by a person who is not an engineer but has qualifications under the “HVAC House” requirements of the OBC (BCIN Qualification).
- 3.6.2 The SDHV-HVAC systems and the problems encountered were essentially the same as those systems which were warranted in Development “A” first noted above.
- 3.6.3 One of the owners complained to the builder and Tarion and was refused a warranty. The owner subsequently appealed the decision to the LAT. The owner sold the unit prior to the hearing and was therefore forced to abandon the appeal.
- 3.6.4 The investigation report³⁴ prepared for this owner concluded as follows:
“The design of the system is fundamentally flawed, was designed using a method that is not accepted in the Ontario Building Code and was certified by a designer who does not have the qualifications for this type of building.”
- 3.6.5 The owner absorbed a significant discount on the sale of the unit owing to the defective HVAC system.

³⁴

Bowser Technical Report EP-7, September 23rd 2013