



Public Review

Vancouver Building By-law (VBBL)

Proposed to retain existing standard ASHRAE 62.1

Topic: ASHRAE 62.1

Code change number: 24-0012

Code reference: ASHRAE 62.1

Description of the proposed change

To continue to reference this same standard while both the NBC and BCBC reference a new version of the same standard (ASHRAE 62.1-2016).

The “62-2001 (except addendum n)” version of the ventilation standard has been referenced by the NBC, BCBC and VBBL for almost 2 decades but with sporadic speculation about its upgrade to a newer version. A potential upgrade has always been problematic because the ventilation rates have generally decreased with each subsequent version produced by ASHRAE (62.1-2004, 2007, 2010, 2013, 2016, 2019 etc) and would therefore increase the levels of CO₂ in interior spaces, meanwhile the 2010’s were also a period of increased awareness of carcinogenic VOCs (off-gassing from new materials, glues and paints etc), and now a global awareness of the dangers of pathogens rooted in the experiences from the COVID-19 pandemic.

In 2013 a national committee was formed to review the latest ventilation standards available for possible replacement of the 62-2001 version in the NBC, however the task was difficult without baseline parameters to provide definitive reasons for a switch. In 2016, the national committee chose 62.1-2016 as the likely best candidate for incorporation into the NBC, but it was acknowledged this was done without any baseline parameter. (Throughout the process it was recognized there are numerous elements that determine IAQ however it was decided that CO₂ is the best proxy for IAQ from a practical testing and measuring point of view.)

On March 19, 2021 Health Canada released their indoor air quality (IAQ) findings for CO₂ levels, thus introducing a health risk and baseline parameters for consideration by the building industry, per the following;

Health Canada (March 19, 2021)

1. NEW: Federal Government recognizes a CO₂ limit connected to Health. It lists specific physiological symptoms as “health effects of CO₂”;

Health effects of CO₂

As CO₂ increases, you may be at increased risk of:

- tiredness
- headache
- eye irritation
- sore or dry throat
- dizziness or difficulty concentrating
- stuffy, congested or runny nose, sneezing, coughing and rhinitis

These effects may not be from CO₂ exposure, but from poor indoor air quality in general.

2. NEW: Health Canada states a specific exposure limit of 1,000 ppm for CO₂, based on “health effects”

Exposure limit for CO₂ in indoor air in Canada

We developed an exposure limit for CO₂ in Canadian homes based on:

- CO₂ sources
- exposure levels
- the health effects

The long-term exposure limit is 1800 µg/m³ or 1000 parts per million (ppm) based on a 24-hour average.

3. NEW: Health Canada lists segments of the public who would be detrimentally affected if the CO₂ limit is not adhered to;

This limit protects the health of Canadians including vulnerable populations such as:

- Indigenous peoples
- infants and children
- individuals living in low income housing
- those most susceptible to the effects of CO₂ including individuals with pre-existing health conditions such as:
 - asthma
 - allergies
 - cardiovascular conditions

4. NEW: Health Canada expects “public health officials and other professionals” to take this seriously;

The recommended exposure limit allows public health officials and other professionals to assess the risk from indoor air pollutants.

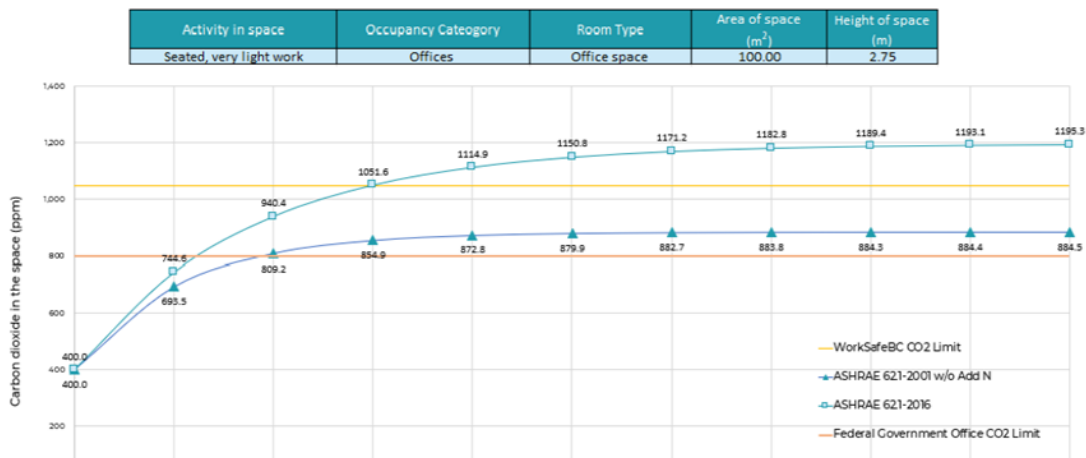
Justification

Justifications for NOT using ASHRAE 62.1-2016 include;

- i) A federal (Health Canada) determination that CO2 levels are an official health risk,
- ii) A federal (Health Canada) determination of a baseline limit parameter of 1,000ppm over 24 hours,
- iii) Performance models showing the Health Canada limits of 1,000ppm are exceeded in some scenarios, and
- iv) The primary responsibility of all registered professionals, per the following;
 - 1. NEW: Ventilation can now be tied to the Code of Ethics for design professionals, AND building officials.

EGBC Code of Ethics Tenant #1: ***hold paramount the safety, health, and welfare of the public, including the protection of the environment and the promotion of health and safety in the workplace;***

- 2. NEW: Models of 62.1-2016 show CO2 levels will exceed 1,000ppm.



- v) If buildings are allowed to exceed the 1,000ppm levels there is a complete lack of any safeguard for the public to monitor their accumulated exposure as they transition from one building to another throughout the day. There is a professional and ethical responsibility for any building to not contribute to a health risk being exceeded, thus, if every building stays below the 1,000ppm limit then cumulative exposure over a 24 hour period cannot be reached.
- vi) Meanwhile, the ambient CO2 levels are increasing at approximately 2ppm annually making it harder to flush buildings using outdoor air. Reducing ventilation rates and associated ductwork will make the flushing process increasingly more difficult over time.

- vii) Note the orange line within the graph denoting the existing CO2 level limit within Federal Buildings is 800ppm.

Proposed VBBL content

Vancouver Building By-law content to remain unchanged.

ASHRAE	ANSI/ASHRAE 62-2001 (except Addendum n)	Ventilation for Acceptable Indoor Air Quality (except Addendum n)	6.3.1.1.(2) 10.2.2.3.(1)(b) 10.2.2.3.(1) A-9.25.5.2
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Example: g) ventilation in conformance with ASHRAE 62-2001 (except addendum n), or if applicable, 6.3.1.1.(3)(b) of the Building By-law,