BUILDING PERFORMANCE

G4

G4 Ventilation

Acceptable Solution G4/AS1

Ventilation of buildings

FIFTH EDITION | EFFECTIVE 28 JULY 2025

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Te Kāwanatanga o Aotearoa
New Zealand Government

Preface

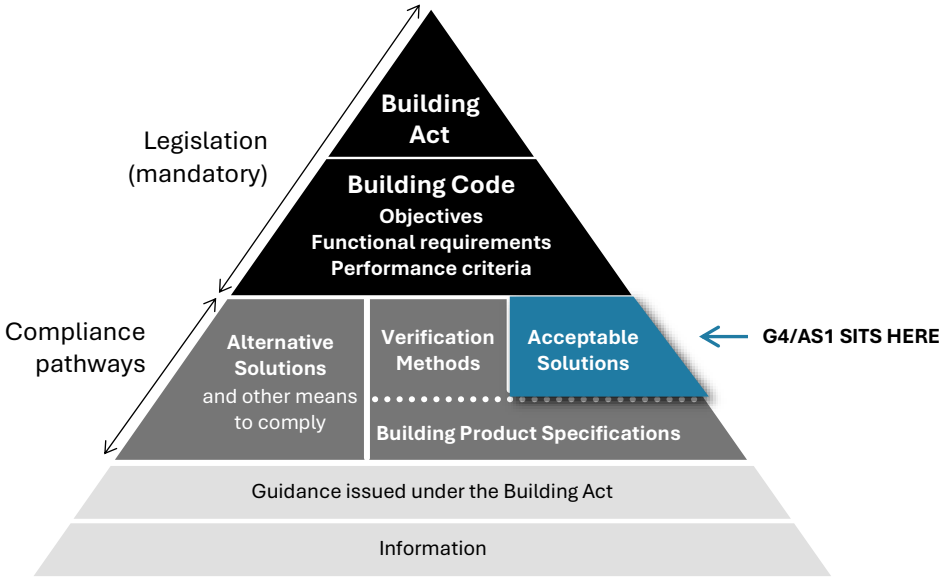
Document status

This document (G4/AS1) is an acceptable solution issued under section 22 (1) of the Building Act 2004 and is effective on 28 July 2025. It does not apply to building consent applications submitted before 28 July 2025. The previous Acceptable Solution G4/AS1 Fourth Edition can be used to show compliance until 31 July 2026 and can be used for building consent applications submitted before 1 August 2026.

Building Code regulatory system

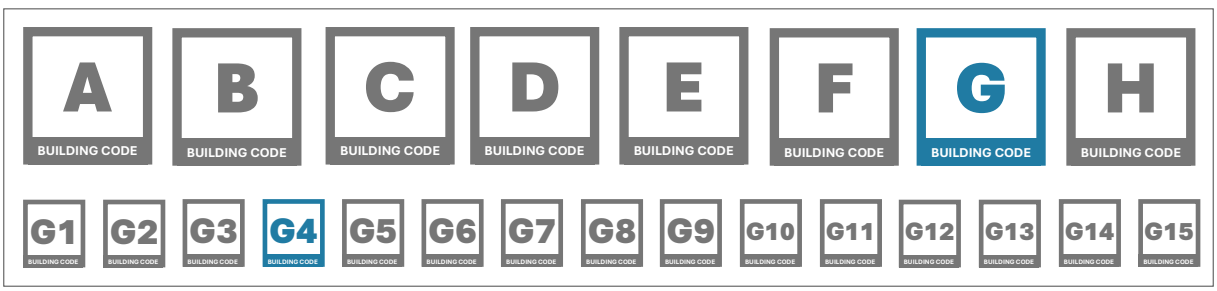
Each acceptable solution outlines the provisions of the Building Code that it relates to. Complying with an acceptable solution or verification method are ways of complying with that part of the Building Code. Other options for establishing compliance are listed in section 19 of the Building Act.

Schematic of the Building Code system



A building design must take into account all parts of the Building Code. The Building Code is located in Schedule 1 of the Building Regulations 1992 and available online at www.legislation.govt.nz.

The part of the Building Code that this acceptable solution relates to is clause G4 Ventilation. Information on the scope of this document is provided in Part 1. General.



Further information about the Building Code, including objectives, functional requirements, performance criteria, acceptable solutions, and verification methods, is available at www.building.govt.nz.

Main changes in this version

This acceptable solution is the fifth edition of G4/AS1. The main changes from the previous version are:

- The document has been published in a standalone format and the layout has been revised to improve clarity. This includes using a common structure for headings and text throughout the acceptable solution.
- Portions of text have been re-written to enhance clarity in the document and provide consistent language with other acceptable solutions and verification methods.
- A title of the document has been added to the document to reflect the scope of the acceptable solution. Additional information on the document and its scope is provided in Part 1. General.
- References have been revised to reflect the documents cited in this acceptable solution in Appendix A.
- Definitions have been revised to reflect the terms used in this acceptable solution in Appendix B.
- The acceptable solution now refers to the Building Product Specifications for air handling systems in Paragraph 2.3.1.1. As a consequence, reference AS/NZS 3666 has been removed from the acceptable solution.

People using this document should check for amendments on a regular basis. The Ministry of Business, Innovation and Employment may amend any part of any acceptable solution or verification method at any time. Up-to-date versions of acceptable solutions or verification methods are available from www.building.govt.nz.

Features of this document

- For the purposes of Building Code compliance, the standards and documents referenced in this verification method and acceptable solution must be the editions, along with their specific amendments listed in Appendix A.
- Words in *italic* are defined at the end of this document in Appendix B.
- Hyperlinks are provided to cross-references within this document and to external websites and appear with a blue underline.
- Appendices to this acceptable solution are part of, and have equal status to, the acceptable solution. Figures are informative only and the wording of the paragraphs takes precedence. Text boxes headed 'COMMENT' occur throughout this document and are for guidance purposes only.
- A consistent number system has been used throughout this document. The first number indicates the Part of the document, the second indicates the Section in the Part, the third is the Subsection, and the fourth is the Paragraph. This structure is illustrated as follows:

2	Part
2.5	Section
2.5.3	Subsection
2.5.3.1	Paragraph
2.5.3.1(a)	Paragraph (as a portion of the relevant paragraph)
2.5.3.1(a)(i)	Paragraph (as a portion of the relevant paragraph)

- Classified uses for *buildings*, as described in clause A1 of the Building Code, are printed in bold in this document. These requirements are also denoted with classified use icons.

H **Housing**

Com **Commercial**

Out **Outbuildings**

CR **Communal residential**

Ind **Industrial**

Anc **Ancillary**

CN **Communal non-residential**

Contents

Part 1. General

1.1 Introduction

1.1.1 Scope of this document

1.1.1.1 This acceptable solution can be used for the ventilation of *buildings*.

1.1.2 Items outside the scope of this document

1.1.2.1 There are no specific items outside the scope of this document.

1.1.3 Compliance pathway

1.1.3.1 This acceptable solution is one option that provides a means of establishing compliance with the functional requirements and performance criteria in Building Code clause G4 Ventilation. It can be used to demonstrate compliance with performance clauses:

a) G4.3.1 for the ventilation of *buildings* with *outdoor air* to maintain air purity; and

b) G4.3.2 for the *construction* and maintenance of mechanical air-handling systems to prevent growth of harmful bacteria, pathogens, and allergens; and

c) G4.3.3 for the collection and removal of the following products from spaces where they are generated:

i) cooking fumes and odours, or

ii) moisture from laundering, utensil washing, bathing, and showering, or

iii) odours from sanitary and waste storage spaces, or

iv) gaseous by-products and excessive moisture from commercial or industrial processes, or

v) poisonous fumes and gases, or

vi) flammable fumes and gases, or

vii) airborne particles, or

viii) bacteria, viruses or other pathogens, or

ix) products of combustion; and

d) G4.3.4 for the disposal of contaminated air; and

e) G4.3.5 for the ventilation of spaces with fixed combustion appliances.

1.1.3.2 If this acceptable solution cannot be followed in full, use an alternative means to demonstrate compliance.

1.2 Using this acceptable solution

1.2.1 Determining the classified use

1.2.1.1 Classified uses for *buildings* are described in clause A1 of the Building Code. Where a specific classified use is mentioned within a subheading and/or within the text of a paragraph, this requirement applies only to the specified classified use(s) and does not apply to other classified uses.

1.2.2 Building Product Specifications

1.2.2.1 This acceptable solution refers to the Building Product Specifications for *building* product standards and specifications in relation to their manufacture, fabrication, testing, quality control, physical properties, performance, installation, and/or maintenance.

1.2.2.2 The Building Product Specifications cannot be used in isolation to demonstrate compliance with any requirement of the Building Code. To comply with G4/AS1, *building* products

conforming to the Building Product Specifications must be used with the scope, limitations, and other applicable requirements set out in this acceptable solution.

Part 2. Spaces within buildings

2.1 Ventilation of spaces within buildings

2.1.1 Overview

2.1.1.1 Ventilation of spaces within *buildings* is required to maintain air purity by a flow of *outdoor air* through the *building envelope*, with or without mechanical assistance.

> COMMENT: If activities or environmental conditions adjacent to external natural ventilation openings produce air pollution in any of the forms listed in Building Code clause G4.3.3 (refer to Paragraph 1.1.3.1(c)), it may be necessary to relocate the openings or use mechanical ventilation.

2.1.1.2 Ventilation of spaces within *buildings* must be provided by

a) natural ventilation in accordance with Section 2.2; or

b) mechanical ventilation in accordance with Section 2.3; or

c) a combination of mechanical and natural ventilation in accordance with Section 2.4.

2.1.1.3 Kitchens, bathrooms, toilets and laundries that do not have an external wall must be mechanically ventilated in accordance with Section 2.3 or Section 2.4.

2.1.1.4 *Buildings* containing Type 5 *fire* alarm systems must have mechanical extract ventilation installed in kitchens.

> COMMENT: Refer to Acceptable Solution C/AS1 and Acceptable Solution C/AS2 for information on Type 5 *fire* alarms.

2.2 Natural ventilation

2.2.1 Openings

2.2.1.1 Where natural ventilation is available via adjacent spaces, specific ventilation is not required to small spaces such as hallways and lobbies in *household units*.

2.2.1.2 Natural ventilation of *occupied spaces* must be achieved by providing a *net openable area* of windows or other openings to the outside of no less than 5% of the floor area. The 5% floor area requirement does not apply to:

Com Ind

a) *occupied spaces* in **commercial** and **industrial** *buildings* where products listed in Building Code clause G4.3.3 are generated (refer to Paragraph 1.1.3.1(c)), as mechanical ventilation of these spaces is required; and

b) *household units* and accommodation units where there is only one external wall with opening windows (refer to Subsection 2.2.2 for additional requirements if natural ventilation is used).

> COMMENT:
>
> 1. The *net openable area* of windows or doors is measured on the face dimensions of the *building element* concerned.
> 2. Fixing in an open position of doors and windows used for ventilation is necessary to avoid injury or damage from sudden closure in the event of strong winds or other forces.
> 3. Keeping water from entering the *building* must be considered for compliance with Building Code clause E2 External Moisture.

2.2.1.3 Openable *building elements* shall be constructed in a way that allows them to remain fixed in the open position as a means of ventilation during normal occupancy of the *building*.

2.2.1.4 Natural ventilation of car parks shall comply with the natural ventilation part of AS 1668.2 Section 7.

2.2.1.5 Spaces in *household units* and accommodation units that contain cooktops, showers and baths must have mechanical extract fans installed to remove moisture generated by these *fixtures*. Mechanical extract fans (including associated ducting) must have a flowrate not less than:

a) 25 L/s for showers and baths; and

b) 50 L/s for cooktops.

> COMMENT: Mechanical extract fans are intended to remove moisture from localised sources, and will not necessarily provide *adequate* ventilation for the whole *occupied space*.
>
> Within this acceptable solution, natural ventilation on its own is not *adequate* to remove moisture generated from cooktops, showers and baths.

2.2.2 Natural ventilation of household units and accommodation units with one external wall

2.2.2.1 Natural ventilation to both *household units* and accommodation units with only one external wall (such as those often found in apartments, hotels, and motels) must comply with Paragraphs 2.2.2.2, 2.2.2.3, 2.2.2.4, and 2.2.2.5.

2.2.2.2 Kitchens, bathrooms, toilets, laundries and *habitable spaces* with an external wall must be ventilated to the outside by:

a) windows and/or other openings to the outside with a *net openable area* of no less than 5% of the floor area of the space; or

b) high level *trickle ventilators* located through the external wall or in *building elements* within the external wall (see Paragraph 2.2.2.5 for *trickle ventilators*); and

c) having a distance between the external wall and opposing wall of the space of less than 6 metres.

2.2.2.3 Spaces in *household units* and accommodation units that contain cooktops, showers and baths must have mechanical extract fans installed to remove moisture generated by these *fixtures*. Mechanical extract fans (including associated ducting) must have a flow rate not less than:

a) 25 L/s for showers and baths; and

b) 50 L/s for cooktops.

> COMMENT: Mechanical extract fans are intended to remove moisture from localised sources, and will not necessarily provide *adequate* ventilation for the whole *occupied space*.
>
> Within this acceptable solution, natural ventilation on its own is not *adequate* to remove moisture generated from cooktops, showers and baths.

2.2.2.4 *Habitable spaces* without openings to the exterior must be ventilated via another *habitable space* by:

a) providing from the other *habitable space* to outside, openable windows and/or other openings of *net openable area* of no less than 5% of the combined floor area of the combined *habitable spaces*; and

b) providing high and low level *trickle ventilators* located on the external wall (see Paragraph 2.2.2.5 for *trickle ventilators*), sized according to the combined floor area; and

c) providing an area of *permanent opening* between the two spaces of no less than 5% of the combined floor area of the *habitable spaces*; and

d) having a combined distance of the *habitable spaces*, measured between the external wall and furthest opposing wall, of less than 6 metres.

> COMMENT: *Habitable spaces* must not be naturally ventilated via an adjacent space that is a bathroom, kitchen, toilet or laundry.

2.2.2.5 *Trickle ventilators* are devices that have an opening to the outside. *Trickle ventilators* shall:

a) have an opening of no less than 2000 mm^2 *equivalent aerodynamic area*; and

b) be located to minimise draughts; and

c) be secured to keep pests and insects out; and

d) have acoustic attenuation, if required by Building Code clause G6 Airborne and Impact Sound; and

e) be controllable and closable in all conditioned spaces; and

f) be installed in *household units*, providing they do not contain mechanical supply ventilation; and

g) have the *equivalent aerodynamic area*, based on the number of occupants, for the space as given in Table 2.2.2.5A and Table 2.2.2.5B; and

h) have, where high and low level *trickle ventilators* are required, the high and low level *trickle ventilators* of approximately the same *equivalent aerodynamic area* and separated by a minimum of 1 metre. High level *trickle ventilators* are located in the top half of the wall. Low level *trickle ventilators* are located in the bottom half of the wall.

> COMMENT: There are a range of *trickle ventilators*, sometime called background ventilators, on the market.

Table 2.2.2.5A: Number of occupants for the space

Paragraph 2.2.2.5 g)

Household unit type	Number of people
Studio	2 people
1 bedroom	2 people
2 bedroom	3 people
Greater than 2 bedrooms	3 people plus 1 person for every bedroom after 2

Table 2.2.2.5B: Total required equivalent aerodynamic area for the space (mm^2)

Paragraph 2.2.2.5 g)

Ventilator locations	1 occupant	2 occupants	3 occupants	4 occupants	5 occupants
High and low level	4000 mm^2	8000 mm^2	12000 mm^2	6000 mm^2	20000 mm^2
High level only	3000 mm^2	6000 mm^2	9000 mm^2	12000 mm^2	15000 mm^2

2.3 Mechanical ventilation

2.3.1 Mechanical ventilation systems

2.3.1.1 Mechanical ventilation systems must satisfy the following conditions:

a) *outdoor air* supply shall be designed and equipment installed to comply with NZS 4303, or AS 1668.2 (excluding Table A1 and Sections 3 and 7), and to provide *outdoor air* to *occupied spaces* at the flow rates given in NZS 4303 Table 2; and

b) air-handling systems shall comply with Section 7.2.2 of the Building Product Specifications; and

c) extract ventilation shall:

i) be constructed so that any products listed in Clause G4.3.3 are removed, collected or diluted by ventilation rates and methods set out in AS 1668.2 Section 5, and

> COMMENT: Commercial kitchen extract ventilation is included in AS 1668.2 Section 5.

ii) where provided to remove moisture and other contaminants from kitchens, bathrooms, toilet spaces and laundries in *household units*, exhaust the air to the outside at flow rates given in AS 1668.2, Table B1, and

> COMMENT: Extract ventilation systems that pass through *fire* rated *building elements* must be designed to maintain the *fire* performance of the *building*. Refer to Building Code Clauses C1-C6 Protection from Fire.

iii) exhaust air to the outside at a flowrate not less than 50 L/s, when intermittent mechanical extract ventilation is used to remove moisture and other contaminants from spaces in *household units* and accommodation units that contain cooktops; and

d) *outdoor air* intakes shall be located to avoid contamination from any local source in accordance with AS 1668.2 Clause 4.3.1 and NZS 4303 Clause 5.5; and

e) recirculated air systems shall comply with AS 1668.2 Clause 4.5; and

f) contaminated air discharge systems shall discharge contaminated air in a way that complies with AS 1668.2 Clause 5.10; and

g) filtration shall comply with AS 1668.2 Clause 4.4; and

h) commissioning shall comply with CIBSE Code Series A.

2.3.2 Car park ventilation

2.3.2.1 Mechanical ventilation of car parks shall comply with the mechanical ventilation part of AS 1668.2 Section 7.

2.3.3 Positive and negative pressure

2.3.3.1 *Building* interiors ventilated by mechanical systems incorporating filtration shall be maintained at a positive pressure except where Paragraph 2.3.3.2 applies.

> COMMENT: Positive pressure allows good control of intake air filtration, whereas under negative pressure, unfiltered air may be drawn through gaps and openings in *building elements*.

2.3.3.2 Spaces in which mechanical ventilation is used to remove or collect contaminants shall be maintained at negative pressure relative to other spaces in the *building*.

> COMMENT: Negative pressure reduces the likelihood of contaminants being spread to other spaces.

2.4 Combined natural ventilation and mechanical ventilation

2.4.1 Household units and accommodation units with one external wall

2.4.1.1 This section specifies the combined natural and mechanical ventilation requirements for both *household units* and accommodation units, with one external wall, such as those often found in apartments, hotels and motels.

2.4.1.2 *Habitable spaces* will be naturally ventilated; and kitchens, bathrooms, toilets and laundries will be ventilated by continuous or intermittent mechanical extract ventilation (refer to Section 2.3).

2.4.2 Combined natural ventilation with continuous or intermittent mechanical ventilation

2.4.2.1 *Habitable spaces* with one external wall and a *permanent opening* to a kitchen, bathroom, toilet or laundry, within which a continuous or intermittent mechanical extract system is installed, must be ventilated by:

a) integrating high level *trickle ventilators*, located within the external wall or *building elements* that are integrated within the external wall (see Paragraph 2.2.2.5 for *trickle ventilators*); and

b) having a *net openable area* of windows and/ or other openings to the outside of no less than 5% of the floor area; and

c) having the kitchen, bathroom, toilet, or laundry door undercut by 20 mm; and

d) having a maximum dimension between the external wall and the furthest internal opposing wall, when measured across the combined *habitable space* and the kitchen, bathroom, toilet, or laundry, of

   i) less than 10 metres for continuous mechanical extract systems, or

   ii) less than 6 metres for intermittent mechanical extract systems.

> COMMENT: If Paragraphs 2.4.2.1(d)(i) and (ii) both apply, then ventilation shall be achieved by complying with Paragraph 2.4.2.1(d)(ii).

Part 3. Gas-fuel appliances

3.1 Natural ventilation

3.1.1 Natural draught and permanent venting

3.1.1.1 Natural ventilation systems for appliances burning gas fuel designed to operate under *natural draught* conditions shall:

a) supply air under equal pressure conditions to the burners and to the *draught diverter* (i.e. in the same room and as close as possible to the appliance); and

b) for non *room-sealed appliances* having a combined gas input exceeding 1 kW for each m^3 of the space in which they are installed, be provided with vents, in addition to the ventilation required by Section 2.1 and Section 2.2. The vents shall be sized and located according to Subsection 3.1.2.

3.1.1.2 Domestic gas cookers in non room-sealed spaces that are also used for sleeping require permanent venting to the outside. The size of the vent shall be appropriate to the gas input to the cooker and shall be subject to specific design.

3.1.2 Vent sizes

3.1.2.1 Two permanent vent openings, one high level and one low level, shall be provided and each must have a free ventilation area per kW of gas input (of all appliances in the space) of no less than:

a) 1200 mm^2 for spaces vented directly to the outside; and

b) 2300 mm^2 for spaces vented via adjacent spaces.

3.1.2.2 The free ventilation opening areas may be halved for plant rooms and boiler rooms infrequently occupied by people.

3.1.2.3 Vent openings shall have vertical dimensions of no less than 50 mm, and no dimension of less than 6.0 mm in any other direction.

3.1.2.4 Low-level vents shall have their lower edge no more than 100 mm above floor level, and upper-level vents shall have their lower edge no less than 75 mm above the top of the *draught diverter* relief opening.

3.1.2.5 A louvred door is also an acceptable method of ventilation provided the bottom of the free area extends to not less than 100 mm above the floor, and the requisite high-level free area is available from the level of 75 mm above the *draught diverter* relief opening.

3.1.2.6 In plant room or boiler room installations, low- and high-level vents may be combined into a single opening, provided it reaches from floor to ceiling and has a total free area equivalent to that required for the two separate vents.

3.2 Mechanical ventilation

3.2.1 Mechanical ventilation systems

3.2.1.1 When mechanical ventilation is used, the system shall have either:

a) mechanical supply with mechanical extraction; or

b) mechanical supply with natural exhaust.

3.2.1.2 A mechanical ventilation system shall:

a) for each kW of gas consumption (of all appliances in the plant room), provide *outdoor air* at the rate of:

i) 3.6 m^3/h for *forced* or *induced draught appliances*, and

ii) 7.2 m^3/h for appliances with *atmospheric burners*; and

b) remove exhaust air from the room either:
   i) mechanically at one third the inlet rate, or
   ii) naturally via high-level openings having a free ventilation area of no less than 600 mm^2 per kW of total gas consumption for all appliances in the room.

3.2.2 Flue construction

3.2.2.1 A *flue* system shall have:

a) the cross-sectional area of a *natural draught flue* system external to the appliances, no less than the cross-sectional area of the appliance outlet; or

b) the *flue* designed to comply with AS/NZS 5601.1, section 6.7 and Appendix H; and

c) if a *draught diverter* is not fitted:
   i) *flue* products discharged to the atmosphere only at the *flue* terminal, unless the discharge at other locations can be achieved without hazard to persons, property or appliance operation, and
   ii) a method of automatically shutting down the main burners of *forced* or *induced draught appliances*, should the normal free discharge of the *flue* be interrupted.

3.2.3 Draught diverters

3.2.3.1 *Draught diverter* installations shall discharge the total *flue* products including excess air and *draught diverter* dilution air, at the *flue* terminal without spillage from the skirt of the *draught diverter*.

3.3 Flue locations on dwellings

3.3.1 Flue terminals

3.3.1.1 The location of a *flue* terminal on a dwelling shall have:

a) outlets from *natural draught flues* or *chimneys*, positioned relative to surrounding *construction* to avoid wind causing down draughts in the *flue*; and

b) *flue* pipes which extend through the roof, terminated no closer than:
   i) 500 mm to the nearest part of any roof, and
   ii) 2.0 m to the roof level of a flat roof intended for personal or public use, and
   iii) 500 mm above any parapet; and

c) *flues* which terminate on the wall of a *building* located clear of inlets for outside air in accordance with the minimum clearances specified in AS/NZS 5601.1, section 6.9 and Figure 6.2.

3.4 Another solution for gas-fuel appliances

3.4.1 Gas installations

3.4.1.1 As an alternative to Sections 3.1, 3.2, 3.3, gas installations may be designed and installed to comply with AS/NZS 5601.1 Sections 1, 3, 4, 5 and 6 and Appendices A – M and O – R.

> COMMENT: Compliance with this standard may exceed the performance criteria of Building Code clause G4 Ventilation.

Appendix A. References

For the purposes of Building Code compliance, the standards referenced in this acceptable solution must be the editions, along with their specific amendments, listed below.

Standards New Zealand		**Where quoted**
NZS 4303:1990	Ventilation for acceptable indoor air quality	2.3.1.1
AS/NZS 5601.1:2013	Gas installations – Part 1: Generall installations Amendments 1, 2	3.1.1.1, 3.3.1.1, 3.4.1.1

These standards can be accessed from www.standards.govt.nz.

Standards Australia		**Where quoted**
AS 1668.2:2002	The use of mechanical ventilation and air-conditioning in buildings – Part 2: Ventilation design for indoor-air contaminant control Amendments 1, 2	2.2.1.4, 2.3.1.1, 2.3.2.1

These standards can be accessed from www.standards.org.au.

Chartered Institution of Building Services Engineers		**Where quoted**
CIBSE Code Series A:1996	Air distribution systems	2.3.1.1

This document can be accessed from www.cibse.org.

Appendix B. Definitions

These definitions are specific to this acceptable solution. Other defined terms italicised within the definitions are provided in clause A2 of the Building Code.

Term	Definition
Adequate	Adequate to achieve the objectives of the Building Code.
Atmospheric burner	A burner system where all the air for combustion is induced by the inspirating effect of a gas injector and/or by *natural draught* in the combustion chamber without mechanical assistance.
Building	Has the meaning given to it by sections 8 and 9 of the Building Act 2004.
Building element	Any structural and non-structural component or assembly incorporated into or associated with a *building*. Included are *fixtures*, services, *drains*, permanent mechanical installations for access, glazing, partitions, ceilings and temporary supports.
Chimney	A *non-combustible* structure which encloses one or more *flues*, *fireplaces* or other heating appliances.
Chimney back	The *non-combustible* wall forming the back of a *fireplace*.
Chimney breast	The front *fireplace* wall *construction* above the *fireplace* opening.
Chimney jambs	The side walls of a *fireplace*.
Construct	In relation to a *building*, includes to design, build, erect, prefabricate, and relocate the *building*; and construction has a corresponding meaning.
Draught diverter	A device, without moving parts, fitted in the *flue* of an appliance for isolating the combustion system from the effects of pressure changes in the secondary *flue*.
Equivalent aerodynamic area	The area of an equivalent aerodynamically perfect orifice, and equals the penetration area required by the natural ventilation device multiplied by the discharge coefficient determined under test.
Fire	The state of combustion during which flammable materials burn producing heat, toxic gases, or smoke or flame or any combination of these.
Fireplace	A space formed by the *chimney back*, the *chimney jambs*, and the *chimney breast* in which fuel is burned for the purpose of heating the room into which it opens.
Fixture	An article intended to remain permanently attached to and form part of a *building*.
Flue	The passage through which the products of combustion are conveyed to the outside.
Forced or induced draught appliance	An appliance where all or part of the air for combustion is provided by a fan or other mechanical device which is an integral part of the combustion system.
Habitable space	A space used for activities normally associated with domestic living, but excludes any bathroom, laundry, water closet, pantry, walk-in wardrobe, corridor, hallway, lobby, clothes-drying room, or other space of a specialised nature occupied neither frequently nor for extended periods.

Definitions

Term	Definition
Household unit	a) means a *building* or group of *buildings*, or part of a *building* or group of *buildings*, that is— i) used, or intended to be used, only or mainly for residential purposes; and ii) occupied, or intended to be occupied, exclusively as the home or residence of not more than 1 household; but b) does not include a hostel, boarding house, or other specialised accommodation.
Intended use	In relation to a *building* – a) includes any or all of the following: i) any reasonably foreseeable occasional use that is not incompatible with the intended use; ii) normal maintenance; ii) activities undertaken in response to *fire* or any other reasonably foreseeable emergency; but b) does not include any other maintenance and repairs or rebuilding.
Natural draught	The flow produced by the tendency of warmed gases to rise.
Net openable area	The area of windows or doors or other opening measured on the face dimensions of the openable *building element* concerned.
Occupied space	Any space within a building in which a person will be present from time to time during the *intended use* of the *building*.
Other property	Any land or *buildings* or part of any land or *buildings*, that are: a) not held under the same *allotment*; or b) not held under the same *ownership*; and c) includes a road.
Outdoor air	Air as typically comprising by volume: i) oxygen 20.94% ii) carbon dioxide 0.03% iii) nitrogen and other inert gases 79.03%.
Permanent opening	An opening which cannot be closed, this implies that doors, windows etc are NOT permanent openings, although door undercuts are.
Room-sealed appliance	An appliance designed so that air for combustion neither enters from, nor combustion products enter into, the room in which the appliance is located.
Trickle ventilator	A controllable ventilation opening through the external envelope to the outside to provide background ventilation.

Appendix C. Examples of ventilation options

C.1 Typical apartments

C.1.1 Layouts

C.1.1.1 This appendix contains a summary of the relevant requirements in this acceptable solution for examples of typical apartment layouts including:

a) Layout 1 as shown in Figure C.1.1.1A and Table C.1.1.1A; and

b) Layout 2 as shown in Figure C.1.1.1B and Table C.1.1.1B; and

c) Layout 3 as shown in Figure C.1.1.1C and Table C.1.1.1C.

Ventilation options for typical apartment layouts

Figure C.1.1.1A: Layout 1

Paragraph C.1.1.1

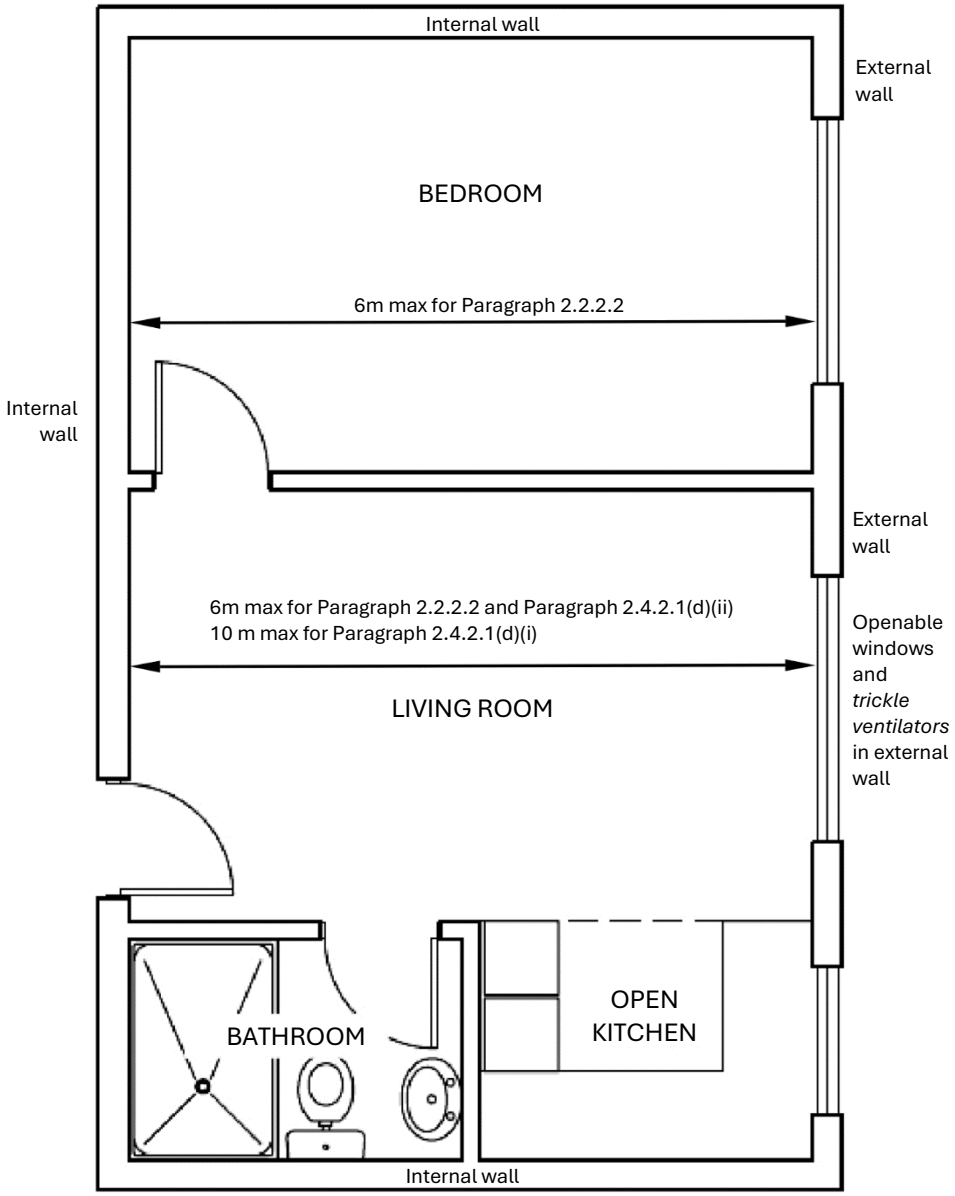


Table C.1.1.1A: Ventilation options – Layout 1

Paragraph C.1.1.1

Room	Natural ventilation	Mechanical ventilation	Combined ventilation
Bedroom	Paragraph 2.2.2.2	Section 2.3	–
Living room	Paragraph 2.2.2.2	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)
Kitchen	Paragraphs 2.2.2.2 and 2.2.2.3	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)
Bathroom	Paragraph 2.2.2.2	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)

Ventilation options for typical apartment layouts

Figure C.1.1.1B: Layout 2

Paragraph C.1.1.1

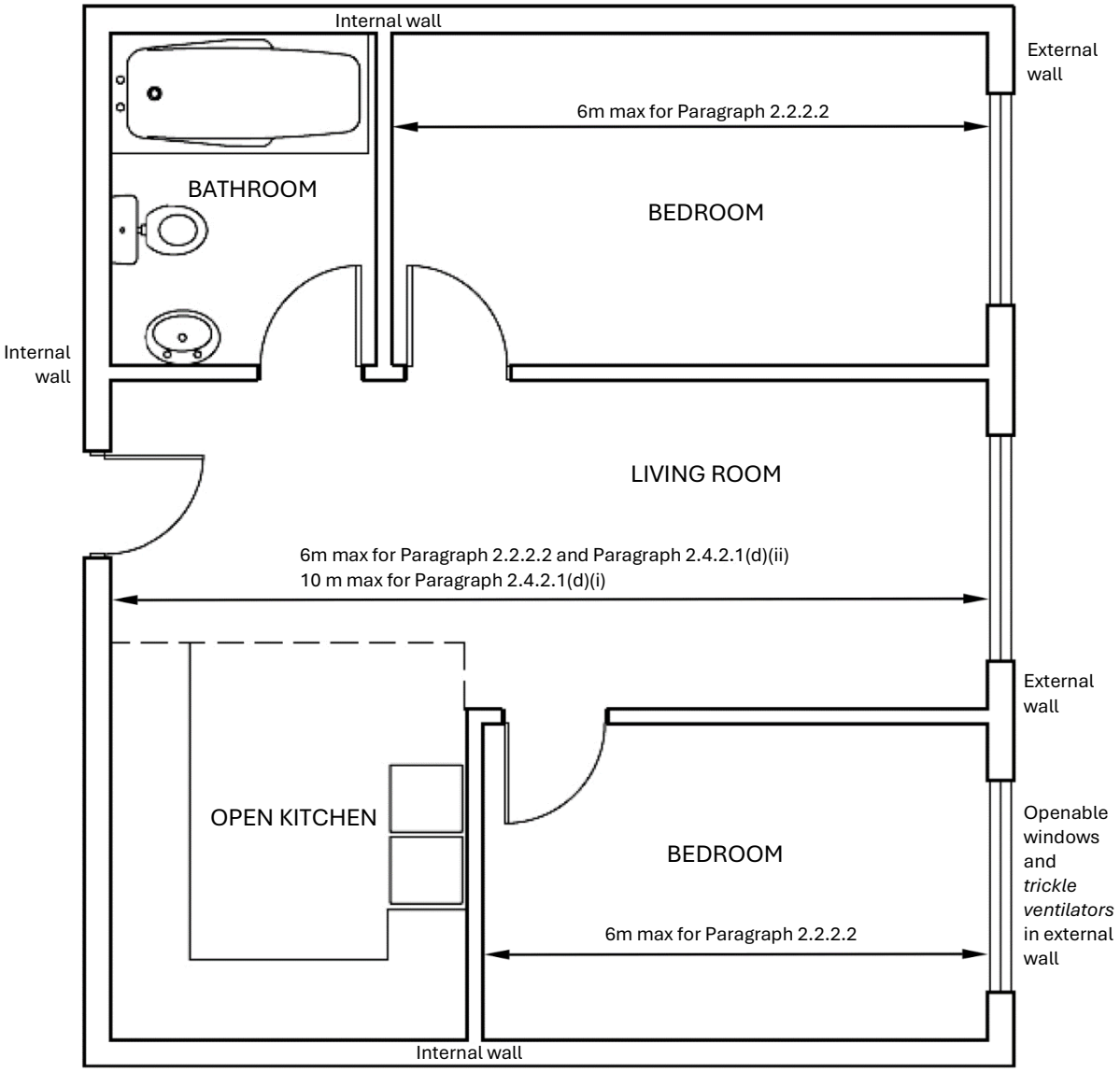


Table C.1.1.1B: Ventilation options – Layout 2

Paragraph C.1.1.1

Room	Natural ventilation	Mechanical ventilation	Combined ventilation
Bedroom	Paragraph 2.2.2.2	Section 2.3	–
Living room	Paragraph 2.2.2.2	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)
Kitchen	–	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)
Bathroom	–	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)

Ventilation options for typical apartment layouts

Figure C.1.1.1C: Layout 3

Paragraph C.1.1.1

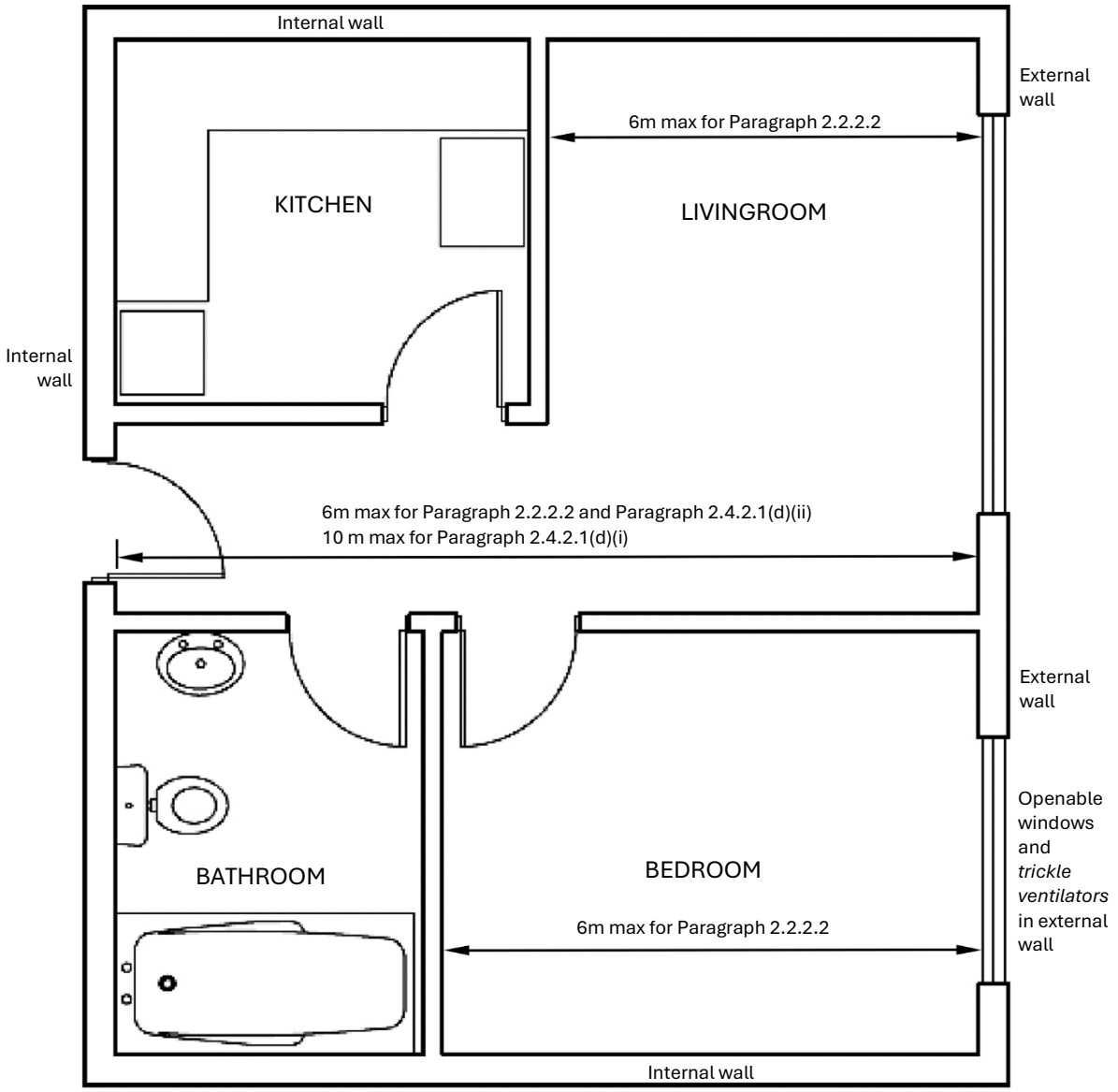


Table C.1.1.1C: Ventilation options – Layout 3

Paragraph C.1.1.1

Room	Natural ventilation	Mechanical ventilation	Combined ventilation
Bedroom	Paragraph 2.2.2.2	Section 2.3	–
Living room	Paragraph 2.2.2.2	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)
Kitchen	–	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)
Bathroom	–	Section 2.3	2.4.2.1(d)(ii) (6 m max distance) or 2.4.2.1(d)(i) (10 m max distance)

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