

Condensation Management Handbook

National Construction Code (NCC) 2022 Housing Provisions Standard

The NCC 2022 Condensation Management Provisions build on NCC 2019 Provisions to further enhance the Standard and further decrease health risks and building damage associated with high moisture levels in new homes.

Section 10.8.1 relates to vapour permeable building membranes and has only been changed marginally. There are 2 sections relating to ventilation in NCC 2022 – 10.8.2 (Exhaust Systems) and 10.8.3 (Ventilation of Roof Spaces) that are covered by this handbook.

Condensation Management provisions have become an additional challenge for builders to address – and a rethink of ventilation was required. Alpine Ventilation has developed comprehensive and innovative solutions to these new provisions that are: attractively designed, visually appealing, cost effective, BAL rated and easy to install.

This is a guide to builders, architects and home owners to assist in ensuring compliance for residential detached homes (Class 1) – and provides a variety of alternative product suggestions to assist.

10.8.2 Exhaust Systems Overview

What are the Key Implications?

- Exhaust fans, rangehoods and vented clothes dryers are required to be vented externally to outside air
- Exhaust fans must have a minimum flow rate requirement of up to 40L/s
- Some exhaust fans must be connected to the light switch with a 10 minute run-on timer

Do I need a timer on my exhaust fan?

When a room is not naturally ventilated, run-on timers are required on exhaust fans which are connected to the main light switch in the room.

Does this provision apply to all climate zones in Australia?

Yes. Only 10.8.3 applies to selected climate zones.

Can I still vent exhaust fans or kitchen rangehoods into the roof space instead of venting externally?

No. This is no longer an option under the updated NCC 2022 provisions.

Should I vent out via the roof, eave, wall or fascia?

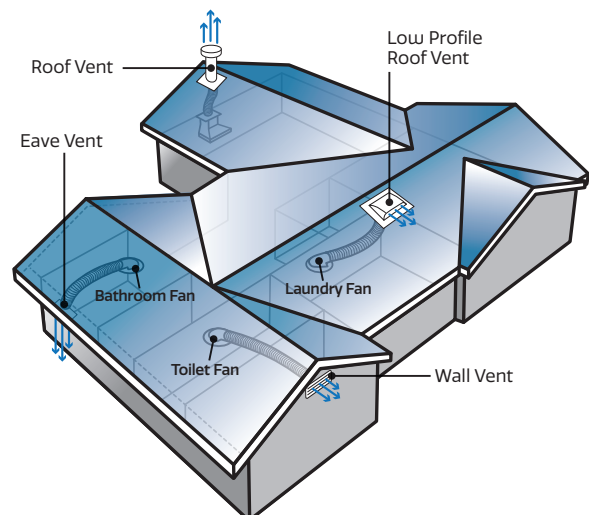
All locations have advantages and disadvantages. Most homes have multiple appliances requiring external ventilation and a combination will likely be required in most homes.

What type of ducting should be used?

Ducting is generally non-insulated (ie "nude"). Flexible or semi rigid ducting can be used. Semi rigid ducting is generally more efficient but is less durable than flexible ducting.

What diameter is ducting?

Most rangehoods are 125 or 150mm diameter. Clothes dryers are generally 100mm. Exhaust fans are most commonly 150mm. Most builders use 150mm ducting with reducers if necessary. Some builders are choosing to use a larger (generally 200mm) vent and ducting 2 or more fans through a larger vent using a y-piece duct adapter.





Header Box Fan

10.8.2 Exhaust Fans

A compliant exhaust fan must have a minimum flow rate of 40L/s (144m³/h) in kitchen or laundry or 25L/s (90m³/h) in bathroom or sanitary compartments. The fan must also be ductable. In many situations, the fan requires a run-on timer. Ideally these are inbuilt (to save time and reduce cost) – but can also be wired in separately.

Alpine has a range of powerful header box exhaust fans that are ideal for venting out via 150mm ducting.

- 104L/s (375m³/h) flow rate (significantly above minimum flow rate requirement)

- DIY installation – plugs
- Low clearance – 210mm
- Low noise
- Japanese ball bearing motor – tested to 50,000 hours
- Round cut-out with fast swing clips for easy installation
- 3 year warrantee

The RF250 is ideal for naturally ventilated rooms and the RFT250 (with timer) is ideal for non naturally ventilated rooms.

The timer version has 2 simple plugs for DIY installation and requires no hard wiring.

10.8.2 Ducting and Accessories

Fans need to be ducted externally to roof, wall, eave or fascia vents. Alpine Ventilation has a range of flexible and semi rigid ducting (AS1530 and AS4-254 compliant) and accessories required for installation such as connectors, adapters, duct tape and clamps. They come in a variety of diameters, with 150mm being the most commonly used size.



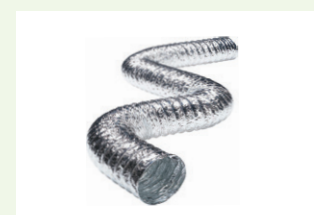
Semi Rigid Ducting



Duct Joiners



Worm Clamps



Flexible Ducting

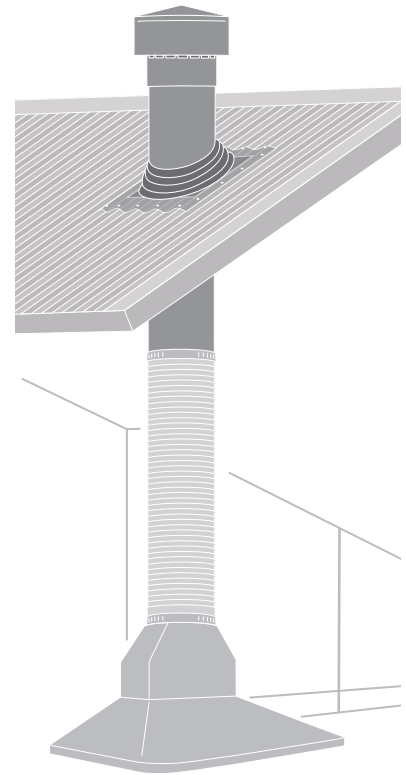
10.8.2 Roof Venting

Most homes will utilise roof venting for some air extraction as it is relatively simple and accessible as a method.

For fans and rangehoods requiring roof venting, Alpine Ventilation provides 3 options – traditional kits for metal or tiled roofs, components (mushroom cowls, pipe and flashing) or the new low profile roof vents. We generally recommend the low profile roof vents for the following reasons:

- Visually appealing and discrete
- Static – no moving parts means no damage, no noise and better durability
- Multiple Colorbond® colours plus a paintable model
- BAL-40 compliant
- Easy and fast to install on both metal and tiled roofs
- Effectively replaces cowl, pipe and flashing (3-in-1)

The low profile roof vent is available in 2 neck sizes – 125/150mm and 150/200mm. Some builders are using a 150-150-200mm y-piece and are venting two fans through the 150/200mm sized model.



Roof Vent Kit



Low Profile Roof Vent



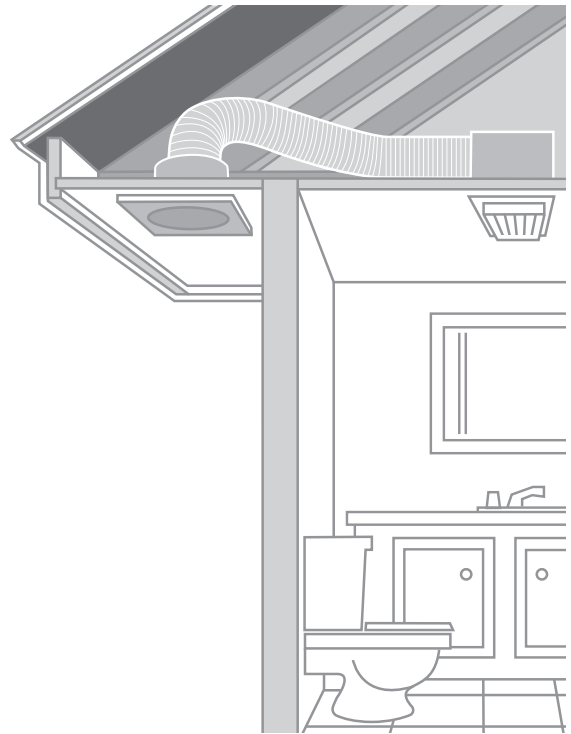
Roof Vent

10.8.2 Eave Venting

Venting out of the eaves is low cost, visually discrete and has a very low likelihood of leaking. For homes that have eaves, this can be a great alternative. An eave vent with a neck for attaching ducting is required.

For venting at the eaves, Alpine Ventilation has two options – a snap in version and a screw in eave vent. The snap in version is preferable for faster installation, longer neck for attaching ducting and a higher BAL rating (BAL-29 vs BAL-19) The snap in version comes in two different face designs. The 4 spring loaded clips clasp the eave when the vent is pushed up from the underside.

Snap in eave vents are available in 3 neck sizes – 150mm, 200mm and 250mm. Whilst multiple appliances may be exhausted via a larger vent, the 150mm size is the most popular option.

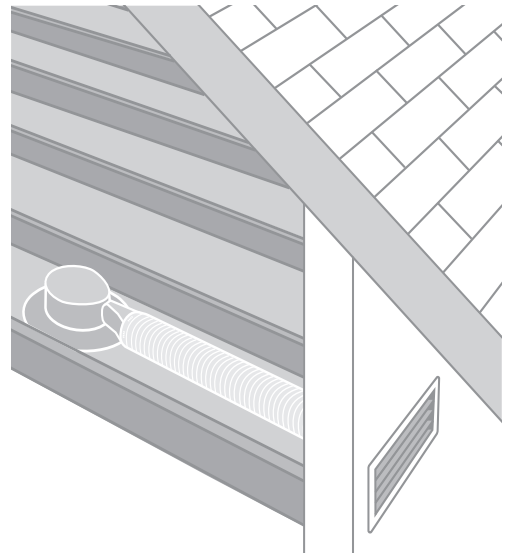


10.8.2 Wall Venting

Venting via the wall is usually an option, using either metal or plastic vents with a neck to attach ducting. Wall venting can be a good alternative for houses that do not have eaves.

Metal is ideal for durability, superior aesthetics and BAL-40 compliance – and Alpine Ventilation has a full range of aluminium weatherproof louvres. The brick sized BV150 model is extremely popular for its looks and ease of installation.

Plastic options include grille vents and gravity vents (which include flaps to prevent backdrafts). Our plastic vents include steel mesh and are BAL-19 compliant.





10.8.3 Ventilation of the Roof Space Overview

What are the key implications?

- Some homes in certain climate areas require additional venting at the eave
- Homes requiring venting at the eave with a pitch of <10 degrees also require additional roof venting

What are climate zones 6, 7 and 8?

This refers respectively to Mild Temperature, Cool Temperature and Alpine respectively. The Southern parts of Australia (areas in NSW, SA, Vic, ACT, Tas and WA) fall into these zones.



What type of roofs must comply with this provision?

All metal roofs and sarked tiled roofs.

How do I calculate the amount of roof venting I need?

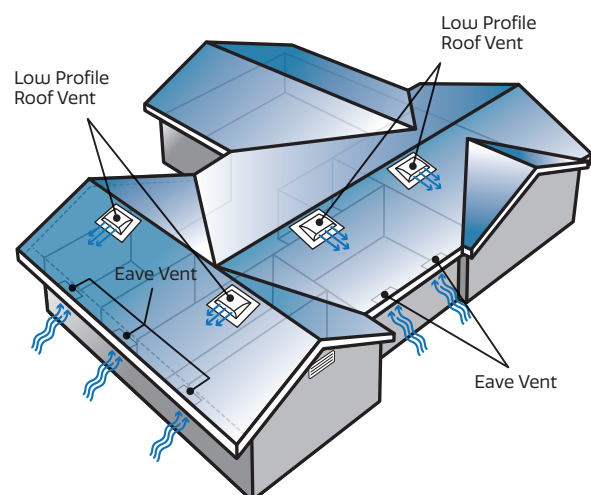
Refer to the tables below. You just need to know the roof pitch and the longest horizontal dimension of the roof and what the open area is on the vent you are using?

How close to the top of the roof must high level venting be?

Within 0.9m of the top of the roof.

Why are both eave venting and high level venting often required?

Cooler air is drawn up through eave venting as warmer air is expelled at the higher level on the roof.



Venting at the Eaves

All houses that fall under 10.8.3 require a level of venting at the eaves.

In some situations, this is possible at the fascia. In many situations, eave vents are used.*

For the venting at the eave component, Alpine Ventilation has two 400x200 metal eave vent options. The new SEV2040W has some advantages – greater open area (21,000 to 19,000), enhanced aesthetics and increased durability (constructed from 0.9mm galvanised steel). Both are BAL-40 compliant.

High Level Venting

Most houses that fall under 10.8.3 require high level venting (all with a pitch over 10 degrees).

Different options of high level venting are available. Traditional mushroom cowls or "chinamans" hats with pipe and flashing can be used. However these are visually unappealing and have limited open area hence a large number would be required.

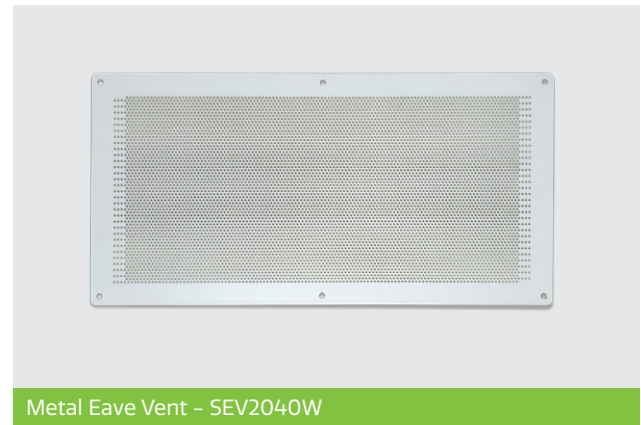
Rotary vents may be used – however they are visually prominent, have moving parts that can become damaged or make noise and can leak in low wind conditions.

Some metal roof manufacturers offer venting under the ridge capping. This can be a great, unobtrusive method of venting if available – however can be expensive and must be planned for and installed early in the build process.

Alpine Ventilation has a range of mushroom cowls with pipe and flashing. However we recommend the use of low profile roof vents for the following reasons:

- Static – no moving parts means no damage, no noise and better durability
- Easy and fast to install on metal and tiled roofs
- Multiple Colorbond® colours plus a paintable model
- Visually appealing and discrete – can even install under a solar panel
- BAL-40 compliant

*If a house has no eaves we have a range of stainless steel and galvanised steel brick and wall vents that may be an alternative to eave vents when installed high on a wall.



Determining Roof and Eave Venting Requirements

To calculate venting requirements, refer to 10.8.3 table. You need to determine which type of roof, the horizontal roof length and open area of the vents being used.

85%+ of new homes have a 15–75° pitch.

	Example 1	Example 2	Example 3	Example 4
Roof Pitch	9°	14°	22.5° Non Cathedral	40° Cathedral
Horiz Roof Length	22m	22m	22m	22m
Eave Vent Used	SEV2040W	SEV2040W	SEV2040W	SEV2040W
Requirement Calculations	$25,000 \times 22 / 21,000 = 26.19$	$25,000 \times 22 / 21,000 = 26.19$	$7,000 \times 22 / 21,000 = 7.33$	$(7,000 + 18,000) \times 22 / 21,000 = 26.19$
# Eave Vents Required	27 at each end	27 evenly spaced	8 evenly spaced	27 evenly spaced
Roof Vents Used	n/a	200mm Low Profile	200mm Low Profile	200mm Low Profile
Requirement Calculations	n/a	$5,000 \times 22 / 29,040 = 3.79$	$5,000 \times 22 / 29,040 = 3.79$	$5,000 \times 22 / 29,040 = 3.79$
# Roof Vents Required	0	4 evenly spaced	4 evenly spaced	4 evenly spaced

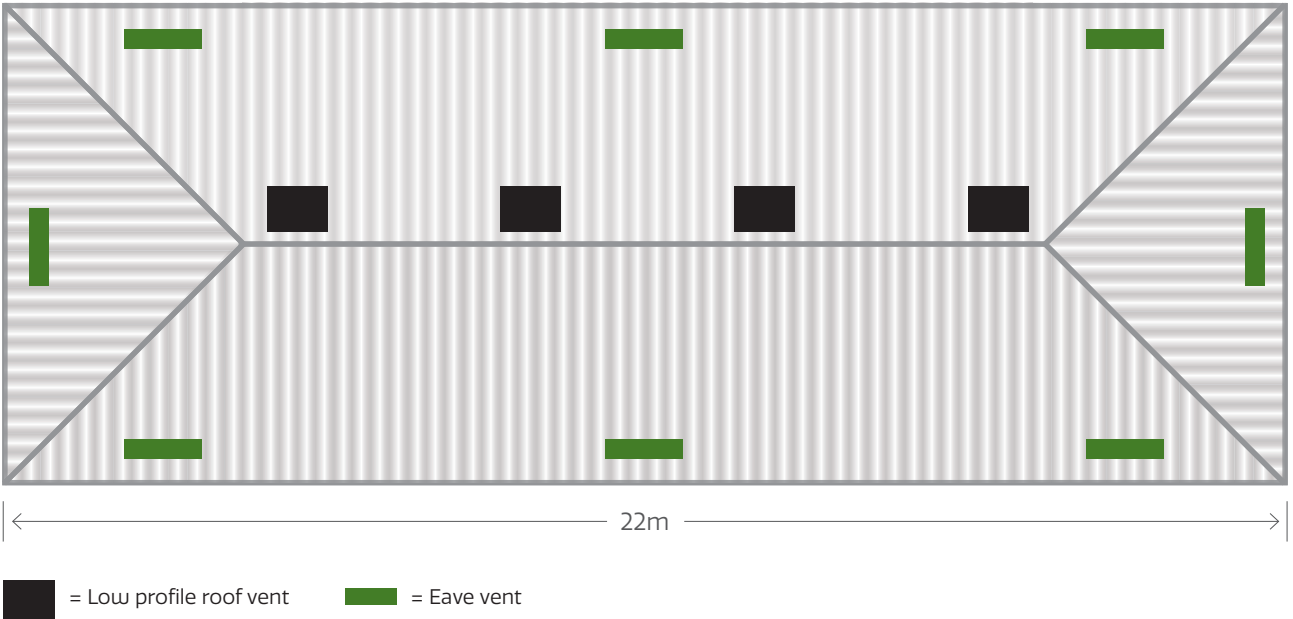
Example diagrams for the above table on page 10.

Quick Calculation Guide

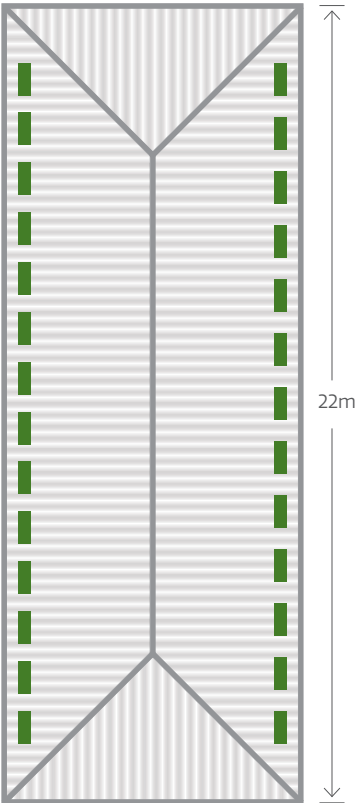
Roof pitch	Low Profile Roof Vents Required	SEV2040W Eave Vents Required	MEV2040W Eave Vents Required
< 10°	n/a	1 for every 0.42m of horizontal roof length	1 for every 0.38m of horizontal roof length
≥ 10° and < 15°	1 per 5.8m of horizontal roof length	1 for every 0.84m of horizontal roof length	1 for every 0.76m of horizontal roof length
≥ 15° and < 75° Non Cathedral	1 per 5.8m of horizontal roof length	1 for every 3m of horizontal roof length	1 for every 2.7m of horizontal roof length
≥ 15° and < 75° Cathedral	1 per 5.8m of horizontal roof length	1 for every 0.84m of horizontal roof length	1 for every 0.76m of horizontal roof length

Example 3
22.5° Roof Pitch (Non-cathedral)

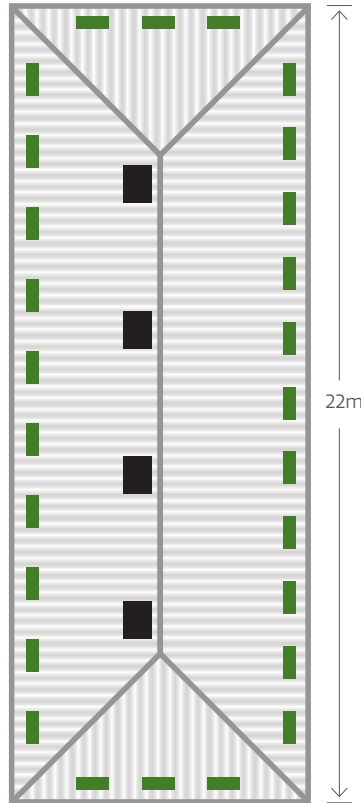
85%+ of new homes have a 15-75° pitch.



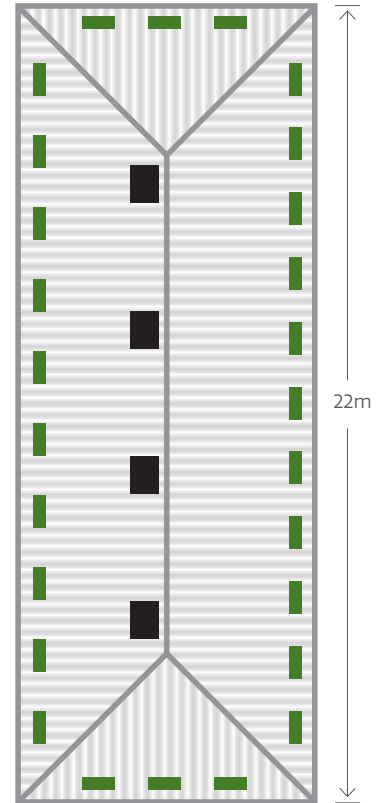
Example 1
9° Roof Pitch



Example 2
14° Roof Pitch



Example 4
40° Roof Pitch (Cathedral)



Excerpt from National Construction Code 2022

10.8.2 Exhaust Systems

(1) An exhaust system installed in a kitchen, bathroom, sanitary compartment or laundry must have a **minimum flow rate** of—

1. 25 L/s for a bathroom or sanitary compartment; and
2. 40 L/s for a kitchen or laundry.

(2) Exhaust from a kitchen, kitchen range hood, bathroom, sanitary compartment or laundry must **discharge directly** or via a shaft or duct to outdoor air.

(3) Where a **venting clothes dryer** is installed, it must discharge directly or via a shaft or duct to outdoor air.

(4) An exhaust system that is not run continuously and is serving a bathroom or sanitary compartment that is not ventilated in accordance with 10.6.2(a) must—

1. be **interlocked** with the room's light switch; and
2. include a **run-on timer** so that the exhaust system continues to operate for 10 minutes after the light switch is turned off.

(5) Except for rooms that are ventilated in accordance with 10.6.2(a), a room with an exhaust system in accordance with (1) must be provided with make-up air—

1. via openings to an adjacent room with a free area of 14,000 mm²; or
2. in accordance with AS 1668.2.

(6) Except for rooms that are ventilated in accordance with 10.6.2(s), a room with an exhaust system in accordance with (3) must be provided with make-up air in accordance with AS 1668.2.

10.8.3 Ventilation of Roof Spaces

(1) In climate zones 6, 7 and 8, a roof must have a roof space that—

1. is located—
 1. immediately above the primary insulation layer; or
 2. immediately above sarking with a vapour permeance of not less than 1.14 µg/N.s, which is immediately above the primary insulation layer; or
 3. immediately above ceiling insulation that meets the requirements of 13.2.3(3) and 13.2.3(4); and
2. has a height of not less than 20 mm; and
3. is either—
 1. ventilated to outdoor air through evenly distributed openings in accordance with Table 10.8.3; or
 2. located immediately underneath the roof tiles of an unsarked tiled roof.

(2) The requirements of (1) do not apply to a—

1. concrete roof; or
2. roof that is made of structural insulated panels; or
3. roof that is subject to Bushfire Attack Level FZ reqs in accordance with AS 3959.

Table 10.8.3 Roof space ventilation requirements

Roof pitch	Ventilation openings
< 10°	25,000 mm ² /m provided at each of two opposing ends
≥ 10° and < 15°	25,000 mm ² /m provided at the eaves and 5,000 mm ² /m at high level
≥ 15° and < 75°	7,000 mm ² /m provided at the eaves and 5,000 mm ² /m at high level, plus an additional 18,000 mm ² /m at the eaves if the roof has a cathedral ceiling

Table Notes

1. Ventilation openings are specified as a minimum free open area per metre length of the longest horizontal dimension of the roof.
2. For the purposes of this Table, high level openings are openings provided at the ridge or not more than 900 mm below the ridge or highest point of the roof space, measured vertically.



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