



NBCMP

National Building Control Management Project

TGD F – Part F - Ventilation 2019

Condensation in Roofs

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TGD F - The Requirementⁱ

Condensation in Roofs F2

Adequate provision shall be made to prevent excessive condensation in a roof or in a roof void above an insulated ceiling.

Section 2 – Condensation in roofs

2.1 General

2.1.1 Condensation in a roof and in the spaces above insulated ceilings should be limited so that, under normal conditions

- (a) the thermal performance of the insulating materials, and
- (b) the structural performance of the roof construction will not be substantially and permanently reduced.

2.1.2 The traditional method of limiting condensation in roof spaces is through the provision of adequate ventilation for cavities or attic spaces on the cold side of the roof insulation. Alternatively, where such cavities or spaces are absent, an effective vapour barrier is provided on the warm side of the insulation so that vapour from the building cannot permeate the insulation. **Paragraphs 2.1.3 to 2.1.19** give some guidance on good practice in relation to noncomplex buildings of normal design and construction, where the primary mechanism for achieving the limitation of condensation is the ventilation of roof voids or cavities. Effective limitation of condensation can also be achieved by other means including the use of vapour permeable or breathable roofing membranes. Where such methods are used, regard should be had to the requirements of Part D of the Building Regulations with regard to the use of proper materials and the guidance given in the Technical Guidance Document to Part D in that regard.

2.1.3 Roofs where the moisture from the building can permeate the insulation, e.g. cold deck roofs, should be ventilated in accordance with **Paragraphs 2.1.10 to 2.1.13** or in accordance with **Paragraphs 2.1.14 to 2.1.18** depending on the roof type and slope.

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2.1.4 In addition to ensuring adequate ventilation, transfer of water vapour to cold roof voids should be limited as far as practicable. Care should be taken to seal around all penetrations of pipes, ducts, wiring, etc., through the ceilings, including provision of an effective seal to the attic access hatch.

Use of a vapour control layer at ceiling level, on the warm side of the insulation, will assist in limiting vapour transfer, but cannot be relied on as an alternative to ventilation. In particular, a vapour control layer should be used where the roof pitch is less than 15°, or the insulation follows the pitch, or where the shape of the roof is such that there is difficulty in ensuring adequate ventilation, e.g. room-in-the-roof. For the purposes of health and safety, it may not always be necessary to provide ventilation to small roofs such as those over porches and bay windows.

2.1.5 Roofs where the moisture from the building cannot permeate the insulation, e.g. warm deck roofs or inverted roofs, need not be ventilated.

2.1.6 Guidance is given for pitched roofs with a **pitch greater than 15°** in **Paragraphs 2.1.10 to 2.1.13**. Guidance is given for flat roofs and pitched roofs with a **pitch less than 15°** in **Paragraphs 2.1.14 to 2.1.19**. However, if the ceiling of a room follows the pitch of the roof, ventilation should be provided as if it were a flat roof, irrespective of the slope of the roof.

2.1.7 Although a part of a roof which has a pitch of 70° or more may be insulated as though it were a wall (see Technical Guidance Document L), Requirement F2 applies to roofs of any pitch.

2.1.8 Ventilation openings may be continuous or distributed along the full length of the eaves and may be fitted with a screen, fascia, baffle, etc.

Roofs with a pitch of 15° or more (Pitched Roofs) 2.1.10 If the ceiling follows the pitch of the roof, see Paragraphs 2.1.14 to 2.1.19.

2.1.11 Pitched roof spaces should have ventilation openings at eaves level to promote cross-ventilation.

These openings should have an area on opposite sides at least equal to continuous ventilation running the full length of the eaves and **10 mm wide (see Diagram 11(a)). (Appendix 1)**

2.1.12 Purpose-made components are available to ensure that quilt or loose fill insulation will not obstruct the flow of air where the insulation and the roof meet.

2.1.13 A pitched roof which has a single slope and abuts a wall should have ventilation openings at eaves level and at high level. The ventilation at high level may be arranged at the junction of the roof and the wall or through the roof covering. If it is through the roof covering, it should be placed as high as practicable. The area at high level should be at least equal to continuous ventilation running the full length of the junction and **5 mm wide (see Diagram 11 (b)). (Appendix 1)**

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Roofs with a pitch of less than 15° and roofs of any pitch where the ceiling follows the pitch of the roof

2.1.14 Roof spaces should have ventilation openings in two opposite sides to promote cross ventilation.

These openings should have an area at least equal to continuous ventilation running the full length of the eaves and 25 mm wide (see **Diagram 11(c)**). (Appendix 1)

2.1.15 Roofs with a **span exceeding 10 m**, or with a plain shape other than a simple rectangle, may require additional ventilation – See **BS 5250**.

2.1.16 The void should have a free air space of **at least 50 mm** between the roof deck and the insulation. Where joists run at right angles to the flow of air, a suitable air space may be formed by using counter battens.

2.1.17 Where the insulation follows the pitch of the roof, ventilation at the ridge, at least equal to continuous ventilation running the length of the ridge and **5 mm wide** is also needed (see **Diagram 11(d)**). (Appendix 1)

2.1.18 Where the edges of the roof abut a wall or other obstruction in such a way that free air paths cannot be formed to promote cross ventilation, or the movement of air outside any ventilation openings would be restricted, an alternative form of roof construction should be adopted (see **Paragraph 2.1.5**).

2.1.19 A vapour control layer on the warm side of the insulation should generally be installed in the case of flat roof and roofs with a **pitch of 15° or less**.

Additional Guidance can be found in:

BS 5250:2011+A1:2016 Code of Practice for Control of Condensation in Buildings.

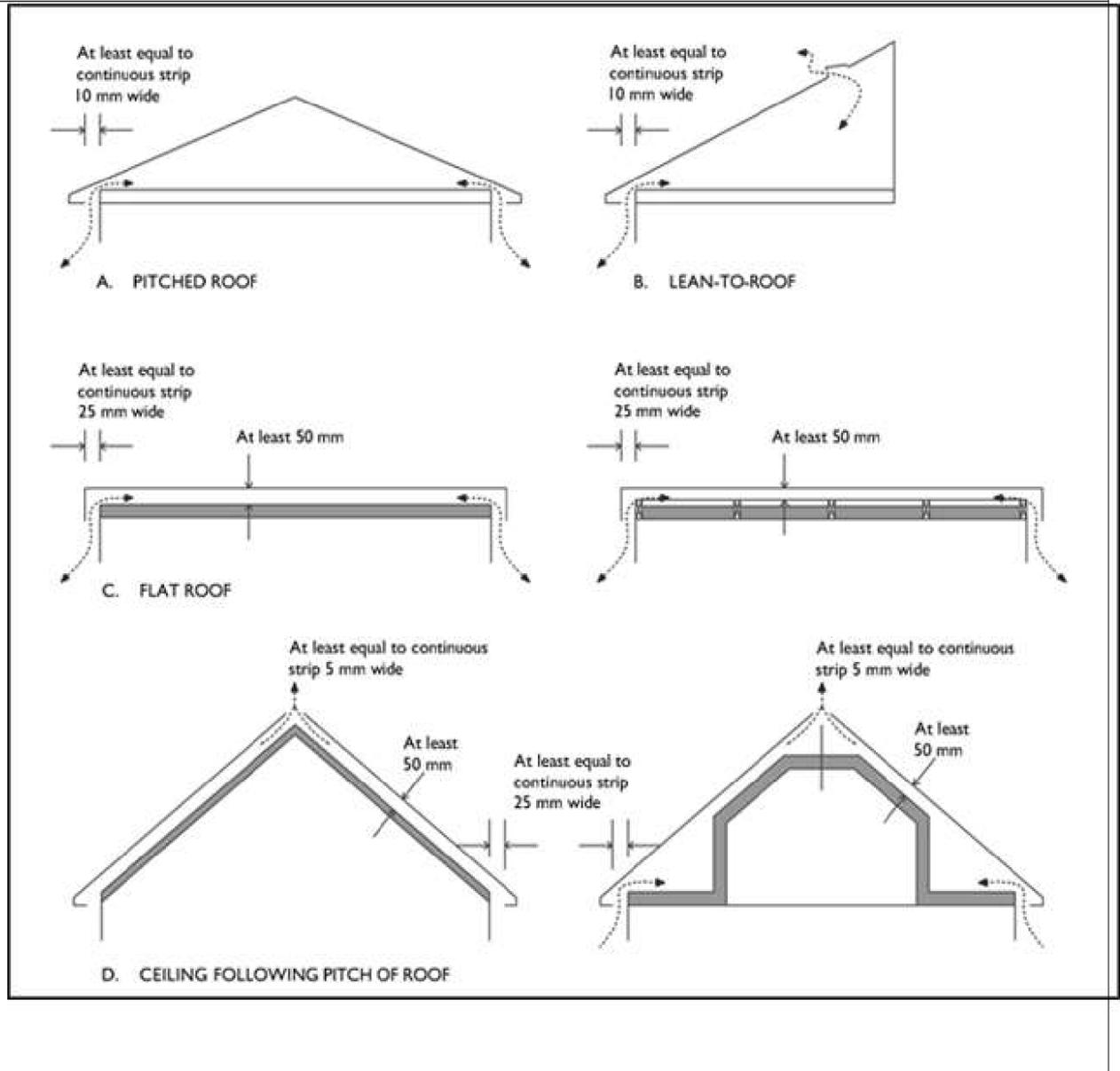
DEHLG publication Acceptable Construction Details and the

BRE publication "Thermal Insulation - avoiding risks".

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Appendix 1

Diagram 11: Ventilating roof voids



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Appendix 2

Examples:

Calculate the Eaves ventilation required for a roof, building length 6 metres.

For the following

Pitched roof with greater than 15° (6,000 mm x 10mm = 60,000mm²)

Lean to roof greater than 15° (6,000 mm x 10mm = 60,000mm²)

At the top of pitched roof or a single slope roof abuts a wall (6,000 mm x 5mm = 30,000mm²)

ⁱ **Means of ventilation F1** Adequate and effective means of ventilation shall be provided for people in buildings. This shall be achieved by: (a) limiting the moisture content of the air within the building so that it does not contribute to condensation and mould growth, and

(b) limiting the concentration of harmful pollutants in the air within the building

Condensation in roofs F2 Adequate provision shall be made to prevent excessive condensation in a roof or in a roof void above an insulated ceiling.

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