



TECHNICAL MANUAL

VERSION 10

13.

Chimneys and Flues

Contents

Functional Requirements

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ADDITIONAL FUNCTIONAL REQUIREMENTS

Workmanship

1. A commissioning certification is required for any work completed by an approved installer.

Materials

No additional requirements.

Design

2. Chimneys, flues, flue-pipes, fireplace recesses and hearths shall be designed and constructed so that they:
 - a. Demonstrate compliance with the Building Regulations and
 - b. Ensure efficient operation of the fuel-burning appliance for which they have been designed;
 - c. Are provided with sufficient air for proper combustion of the fuel;
 - d. Are structurally sound and do not adversely affect the structural stability of the building where they pass through floors, walls or roofs;
 - e. Protect the structure and fabric of the building from the effects of fire;
 - f. Do not adversely affect the ability of the building to resist the effects of weather and ground moisture;
 - g. Discharge the products of combustion safely to the outside air.

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Chimneys and Flues

13.1

Masonry

Weathering requirements

If the chimney is in a severe exposure zone the cavity should extend around the outside of the stack and be continuous up to roof level, as per BS 5628, Part 3. Where the chimney breast is gathered in, the lower projecting masonry should be protected with a suitable capping and cavity trays. A 50mm cavity at the back of the chimney breast is maintained to prevent rainwater penetration. Further information can be found in the 'External Wall's section.

Corrosion of lead work

Where free lime from mortar comes into contact with lead trays or flashings (due mainly to the continual saturation of the brickwork) in areas such as chimneys, the lead should be protected from corrosion by the use of a thick coat of bitumen paint covering the faces likely to be in contact with the mortar. The protection against corrosion of lead work buried in mortar is suggested in guidance issued by the Lead Sheet Association. This treatment can also reduce the staining of lead and brickwork. It is unnecessary to treat flashings buried only 40mm-50mm into mortar joints (cover flashings), as this close to the drying surface the carbonation of free lime is rapid and there is no risk of corrosion in such circumstances.

Chimney tray - low level

A chimney tray is required at low level where a cavity-walled chimney with brick shoulders is built onto an external wall. The tray prevents water that may enter the shoulders from penetrating to the inner leaf of the wall.

The material used is 1mm aluminium alloy sheet to BS EN 485-2; Aluminium and aluminium alloys. Sheet strip and plate, mechanical properties. This has a higher melting point than lead, so is suitable for installation close to a heat source.

Chimney tray - high level

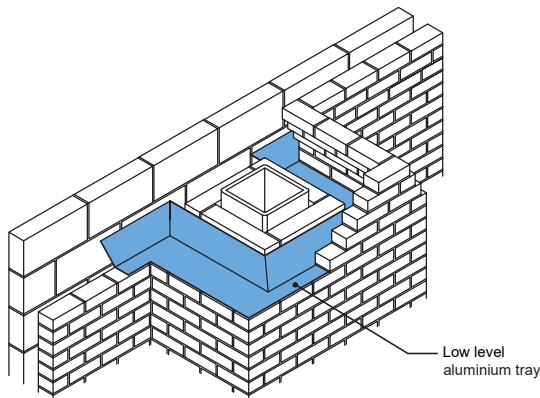
A high level tray may be required to prevent the entry of water at high level where a chimney rises through a pitched roof; suitable for new build or remedial work, this minimises disturbance to surrounding construction in remedial work.

The material used is lead sheet to BS EN 12588:2006 Lead and lead alloys. Rolled lead sheet for building purposes. Code 4 as standard. Standard sizes are 800mm x 800mm, 900mm x 900mm, 950mm x 950mm, to suit either a 195mm square or 195mm diameter circular flue.

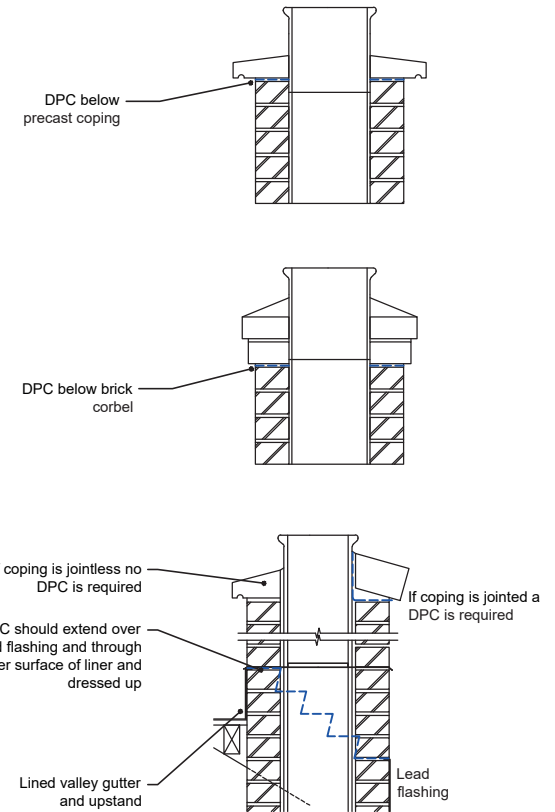
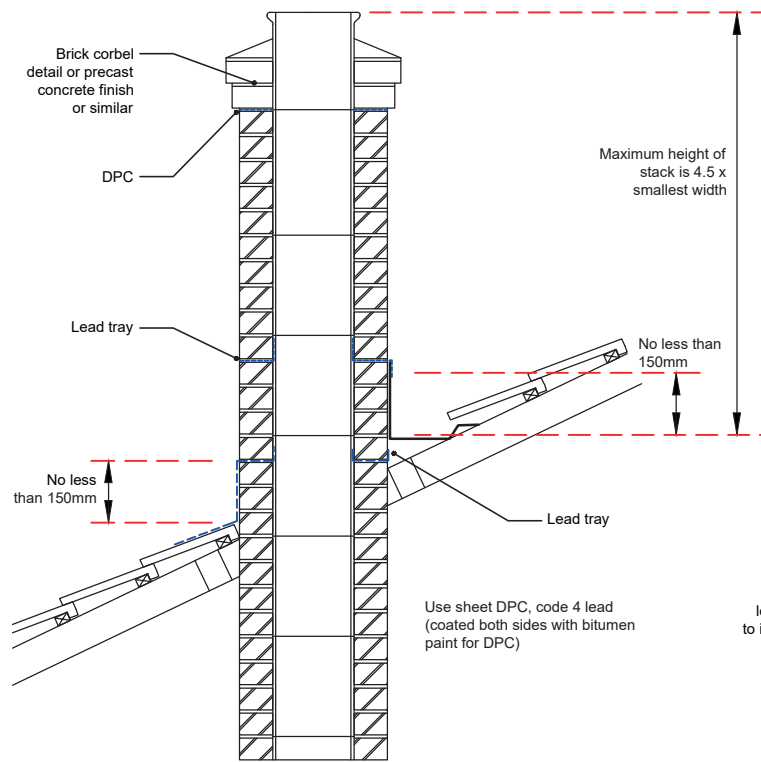
Lead work

Lead sheet used for roofs, flashings and weatherings should, in terms of suitability, be in accordance with BS EN 12588 or a UKAS (or European equivalent) valid third-party accreditation (e.g. British Board of Agrément, BRE, etc.) which demonstrates adequacy and durability for use (see 'Appendix C - Materials, Products, and Building Systems).

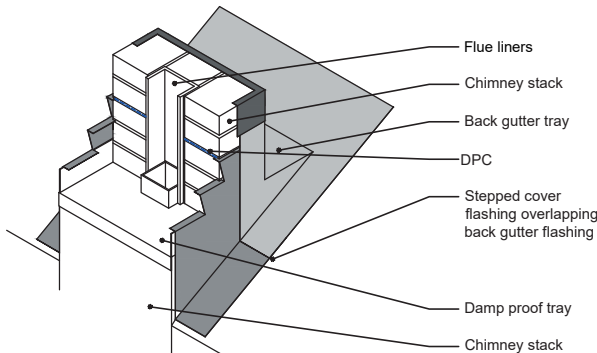
Chimney tray - low level



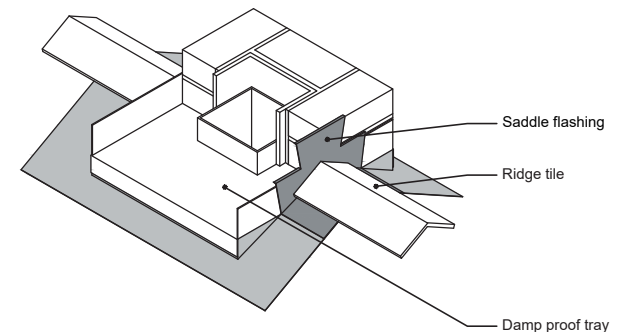
Typical chimney details - Masonry



Typical flashings to chimneys



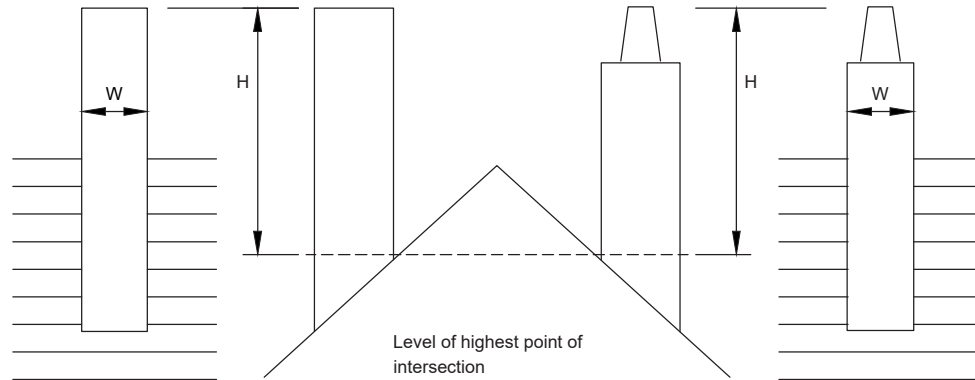
Flashings to chimneys at ridge



Support

If a chimney is not provided with adequate support using ties or not securely restrained, its height (measured to the top of the chimney) should not exceed 4.5 times its least horizontal dimension when measured from the highest point of intersection with the roof surface (density of masonry must be a minimum of 1500kg/m³).

Proportions for masonry chimneys



Key:

W - is the least horizontal dimension of the chimney measured at the same point of intersection.
H - is measured to the top of any chimney pot or other flue terminal.

Chimneys and flues

Flue liners should be used as specified with sockets uppermost and jointed with fire-resisting mortar. Flue liners should be:

- Non-combustible.
- Reasonably smooth internally.
- Correctly jointed with mortar with the space between the liners and the brickwork filled with weak insulating concrete, unless the manufacturer recommends an alternative specification.
- Properly jointed at the junctions with the starter block or lintel and outlet terminal.

A notice plate containing safety information about any hearths and flues should be securely fixed in an unobtrusive but obvious position within the building.

Where a chimney forms part of a wall, the foundation should project at least 100mm wider than the chimney base and should be the same depth as the adjacent wall foundation. Factory made insulated chimneys should have a life of at least 30 years and be designed in accordance with BS 4543 and BS EN 1859, and installed in accordance with BS 7566. Where a chimney is not directly over an appliance or opening, a soot box accessible for emptying should be formed.

Render directly applied to masonry chimney

Rendering to chimneys should only be carried out where the masonry contains little or no sulphates. An appropriate specialist sealer/bonding key coat should be applied prior to applying the main coat of render.

A proprietary alkaline resistant mesh should be embedded throughout the render, the key coat should provide a sound substrate and be compatible with the subsequent render system.

A specialist render system and mortar should be employed for chimneys with a masonry background.

Traditional hand mix render using standard sand and cement is not accepted. Only a pre-blended bagged render system will be accepted as a suitable render system that has a third party accreditation such as BBA or ETA certification and backed up with a manufacturer's specification.

The chimney which is to be rendered should be examined for excessive moisture content prior to rendering. This is particularly important where the masonry background has no upper limit on its soluble salt content, e.g. 'N' designation clay bricks.

Ensure that all joints are finished flush with the surface to avoid shade variations.

To minimise the potential for differential thermal movement and effects that the different suction that each type of background material may create; the section of walling to receive the render should be constructed using the same type and density of material throughout.

To control suction always apply a specialist sealer key coat or suitable render preparatory coat. Allow a minimum of 48 hours for the key coat to fully dry before applying the next coat.

It is recommended that throats or drips to chimneys should project beyond the finished faces to throw water clear, a minimum of 40mm to the drip.

Angles, stop beads and jointing sections should be secured with drilled or shot-fired fixings, and not with gypsum plaster.

For further guidance, please see the 'External Walls - Traditional Masonry Cavity Wall - Rendered Masonry Clad' section.

Coastal Locations

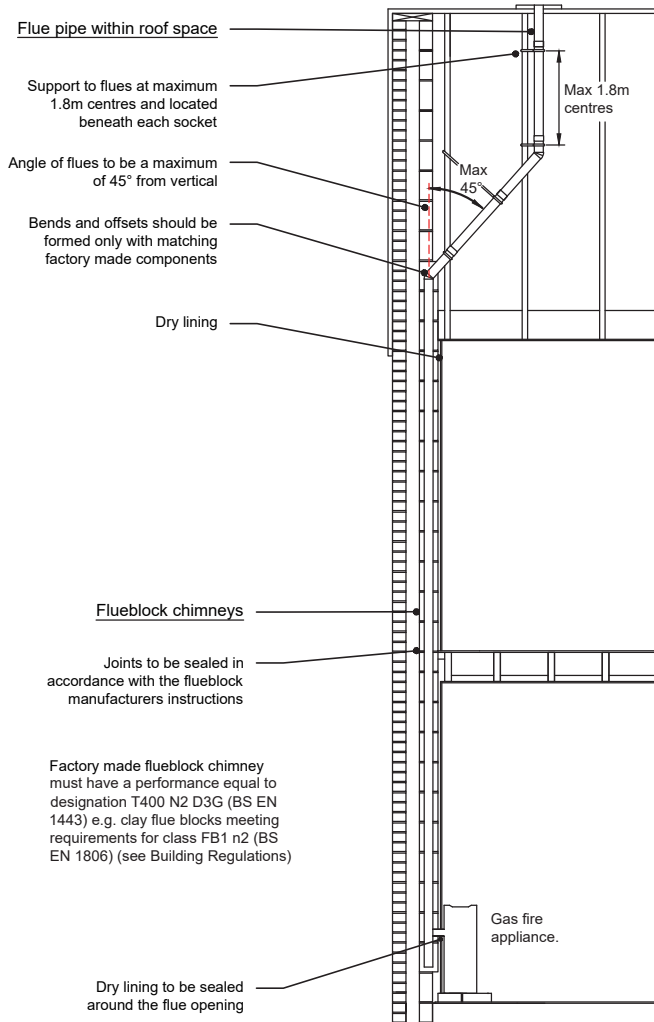
For the selection of construction materials and additional design requirements that may apply in coastal locations please refer to 'Appendix B - Coastal Locations' and 'Appendix C - Materials, Products, and Building Systems'.

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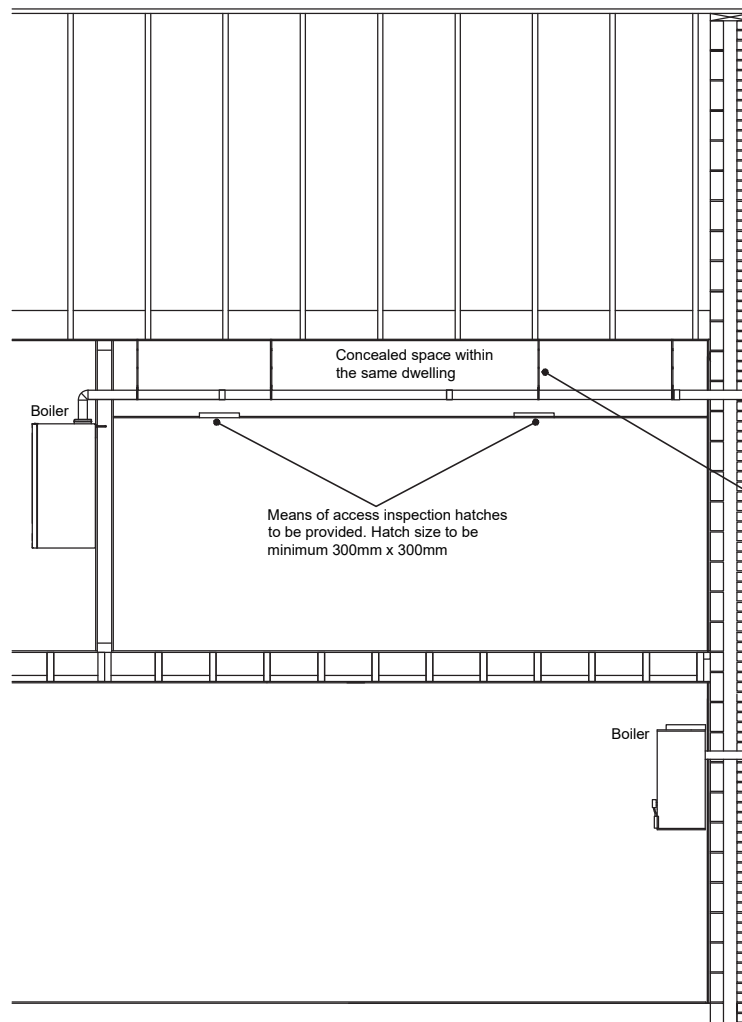
Chimneys and Flues

13.2

Flues - Gas



Flue block chimneys in masonry cavity walls



Flues for gas appliances

Flues

Ensure that all gas flues terminate to the open air, i.e. flueblocks must terminate at an appropriate ridge vent or similar even where no appliance is fitted prior to the sale/occupancy of the property.

To demonstrate that flues comply with Building Regulations, reports showing that flues have passed appropriate tests are to be made available to the Warranty Surveyor upon request.

A suggested checklist for these reports is provided in Approved Document J (England and Wales).

Special blocks are made to accommodate gas fire flues, which tend to be slightly thicker than normal units. When used in external cavity walls care should be taken not to reduce the clear cavity width below 50mm.

A notice plate containing safety information about any hearths and flues should be securely fixed in an unobtrusive but obvious position within the home.

Guidance in the relevant regional Building Regulations must be followed for the siting of flues in close proximity to combustible materials; including floors, roof and also external walls of timber frame construction.

Balanced Flue

Where the flue passes through the external envelope, the flue should be suitably sealed to prevent water ingress

For flues through timber frame, please see 'Chimneys and Flues - Flues - Gas - Flue Outlet - Weather Protection and Differential Movement'

Concealed flues

Where a flue is routed within a void, appropriate means of access should be provided to allow visual inspection of the flue.

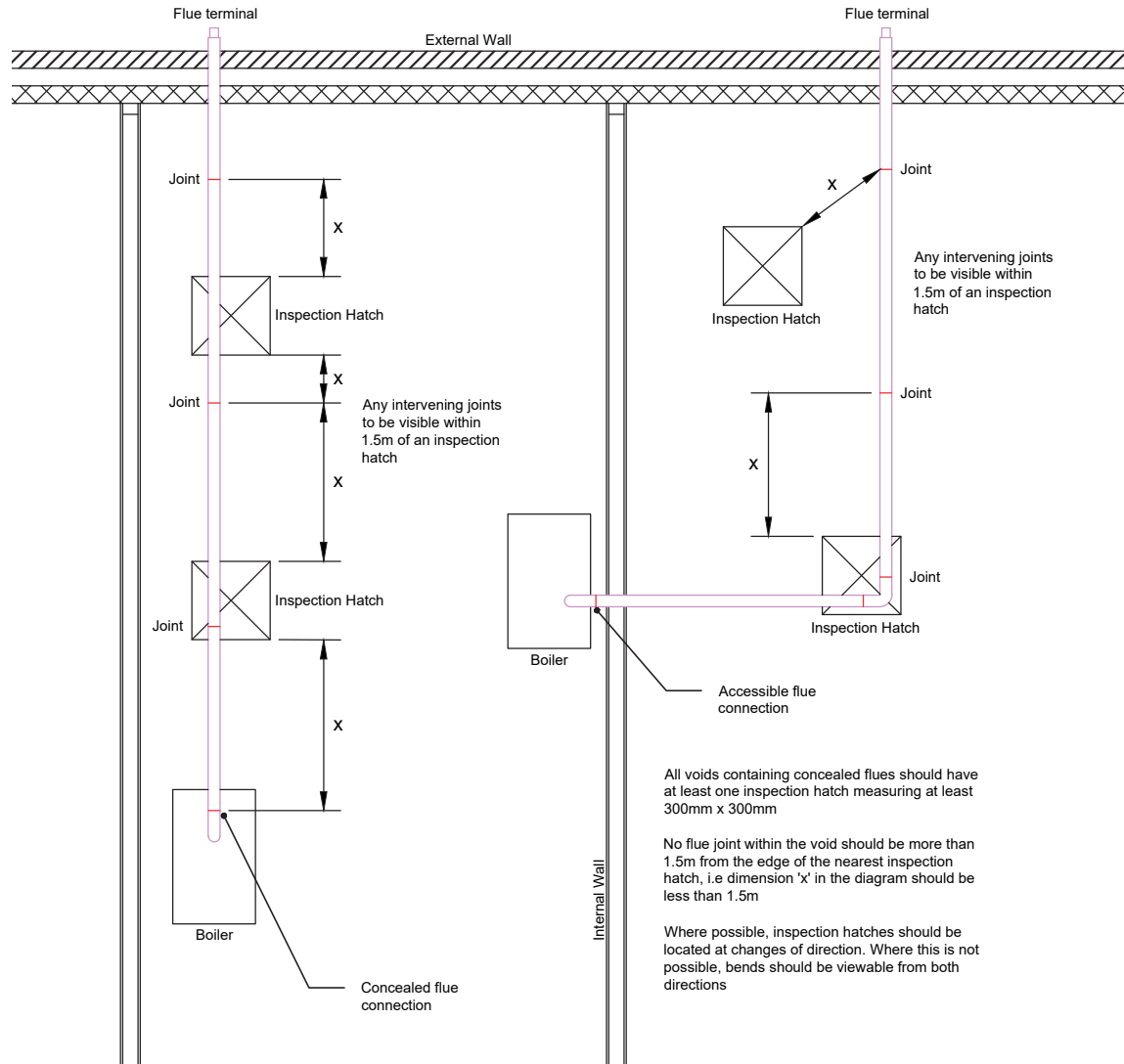
Means of access should be:

- Sufficiently sized and positioned to allow visual inspection to be under taken of the flue.
- The access hatch should be at least 300mm x 300mm or larger where necessary, to allow sufficient access to the void to look along the length of flue.

Means of access should not:

- Pass through another dwelling since access for inspection may not always be available to that dwelling and flue system running through it (flues may pass through communal areas including purpose- designed ducts where inspection access is provided).
- Impair any fire, thermal or acoustic requirements of the relevant building regulations.

Example locations of access panels for concealed flues



13.2.3 FLUES - GAS: Flue outlet locations

Minimum separation distances for terminals in mm (England and Wales)

Location		Balance flue		Open Flue		
		Natural draught	Fanned draught	Natural draught	Fanned draught	
A	Below an opening (1)	Appliance rated head input (net)		300	(3)	300
		0-7kW	300			
		>7-14kW	600			
		>14-32kW	1500			
		>32kW	2000			
B	Above an opening (1)	0-32kW	300	300	(3)	300
		>32kW	600			
C	Horizontally to an opening (1)	0-7kW	300	300	(3)	300
		>7-14kW	400			
		>14kW	600			
D	Below gutters, soil pipes or drainpipes	300	75	(3)		75
E	Below eaves	300	200	(3)		200
F	Below balcony or car port roof	600	200	(3)		200
G	From a vertical drainpipe or soil pipe	300	150(4)	(3)		150
H	From an internal or external corner or to a boundary alongside the terminal (2)	600	300	(3)		200
I	Above ground, roof or balcony level	300	300	(3)		300
J	From a surface or a boundary facing the terminal (2)	600	600	(3)		600
K	From a terminal facing the terminal	600	1200	(3)		1200
L	From an opening in the car port into the building	1200	1200	(3)		1200
M	Vertically from a terminal on the same wall	1200	1500	(3)		1500
N	Horizontally from a terminal on the same wall	300	300	(3)		300
P	From a structure on the roof	N/A	N/A	1500mm if a ridge terminal. For any other terminal, as given in BS5440-1:2008		N/A
Q	Above the highest point of intersection with the roof	N/A	Site in accordance with manufacturers instructions	Site in accordance with BS 5440-1:2008		150

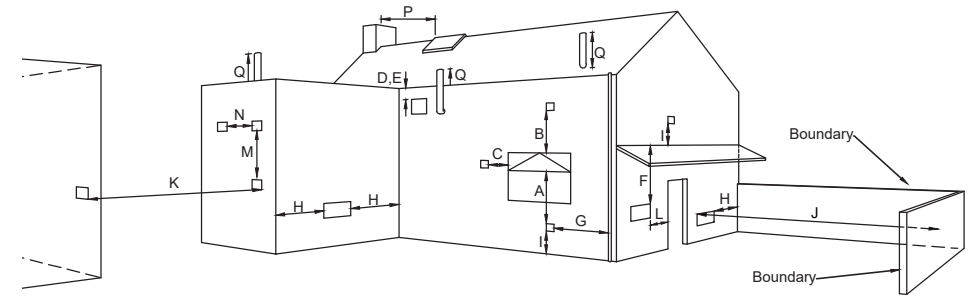
Notes:

1. An opening here means an openable element, such as an openable window, or a fixed opening such as an air vent. However, in addition, the outlet should not be nearer than 150mm (fanned draught) or 300mm (natural draught) to an opening into the building fabric formed for the purpose of accommodating a built-in element, such as a window frame.
2. Boundary as defined in paragraph 0.4 (4) of Approved document J. Smaller separations to the boundary may be acceptable for appliances that have been shown to operate safely with such separations from surfaces adjacent to or opposite the flue outlet.
3. Should not be used.
4. This dimension may be reduced to 75mm for appliances of up to 5kW input (net).

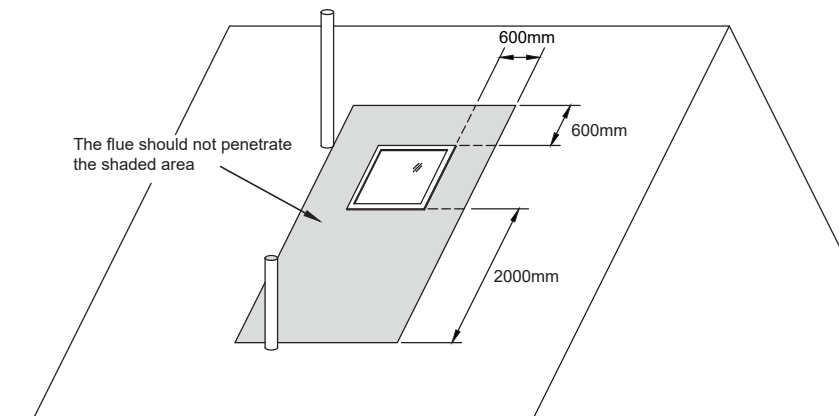
N/A means not applicable.

Location of flue outlets

Flues serving gas appliances should be located as shown in the images below, and the table to the left.



Location of outlets near roof windows or openings, on pitched or flat roofs, from flues serving gas appliances



Reproduced from Approved Document J Building Regulations England and Wales.

Location of outlets from flues serving gas appliances (reproduced from Approved Document J Building Regulations England and Wales).

Requirements may differ in Scotland please refer to the Scottish Building Regulations for further information.

Guarding to flues

A flue outlet should be protected if persons could come into contact with it or if it could be damaged. If a flue outlet is in a vulnerable position, such as where the flue discharges within reach from the ground or a balcony, veranda or window, it should be designed to prevent the entry of any matter that could obstruct the flow of flue gases.

External weather tightness

- Where flues pass through the external wall construction (external weather proof envelope), they must be suitably sealed to protect against water ingress.
- A proprietary cavity tray may be required to be inserted over the flue if the flue opening in the external wall is formed after the external wall is completed.

Lead work

Lead sheet used for roofs, flashings and weatherings should, in terms of suitability, be in accordance with this Technical Manual, or be in accordance with BS EN 12588 or a UKAS (or European equivalent) valid third-party accreditation (e.g. British Board of Agrément, BRE, etc.) which demonstrates adequacy and durability for use (see 'Appendix C - Materials, Products, and Building Systems').

External masonry

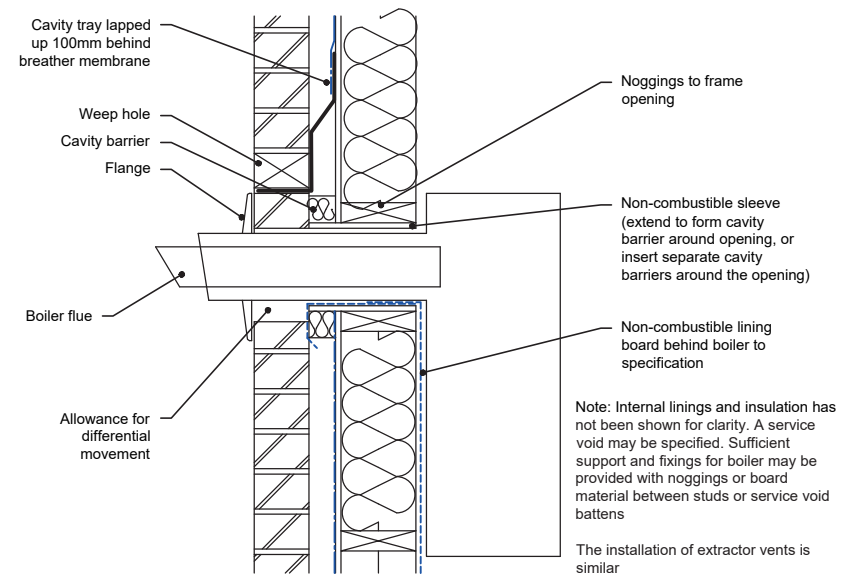
For further guidance on masonry construction see the 'External Walls' section.

Differential settlement

Allowance should be made within the structure for differential settlement around flues, as well as ensuring the water tightness of the external envelope is maintained.

- Where core drilling is used to create an opening in the external masonry cladding to timber frame or metal frame buildings; it should be ensured that suitable allowance is made for differential settlement within the external masonry.
- The core drill hole created in masonry cladding, will have to be elongated downwards to allow for the timber frame shrinking and the flue pipe moving with it.
- Care should be taken to ensure that the depth of the external flange is suitable to maintain weather tightness at the time of construction and once differential settlement has occurred.
- Cavity trays should be provided where appropriate.

Differential movement at services - Timber frame



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