



Development &
Planning Authority

Guernsey Technical Standard

Heat producing appliances and fuel storage systems

The Building (Guernsey) Regulations, 2012

J

- J1 Air supply
- J2 Discharge of products of combustion
- J3 Protection of building and occupants
- J4 Provision of information
- J5 Protection of liquid fuel storage systems
- J6 Protection against pollution
- J7 Clean air

2012 edition
With May 2016 amendments

MAIN CHANGES MADE BY THE MAY 2016 AMENDMENTS

1. Text changes made to reflect the new structure of government post May 1st 2016. All references to Departments have been removed.

MAIN CHANGES MADE BY THE FEB 2013 AMENDMENTS

2. The general guidance on materials and workmanship and the Construction Products Directive has been edited to reflect the new EU Construction Products Regulation.

MAIN CHANGES IN THE 2012 EDITION

3. This Guernsey Technical Standard which takes effect on 1st July 2012 is issued under the Building (Guernsey) Regulations, 2012. From this date all previous editions of documents approved under the Building Regulations, 1992 i.e. (the UK Approved Document J and sections J3 - J6 of the Guernsey Approved Documents 1993) will no longer be valid except in relation to building work carried out in accordance with full plans deposited with the States of Guernsey Building Control.

How this Guernsey Technical Standard J differs from the UK Approved Document J

4. In addition to the different legislative references reflecting Guernsey legislation, the main differences a non resident based applicant should note are;
5. Only Gassafe registered engineers are permitted to undertake gas installations on the Island, therefore only basic design location advice is given in this document.
6. Reference is made to the Islands catchment area when determining protection measures required for fuel oil storage.
7. J3 requirements include for carbon monoxide detection.
8. J4 impose emission requirements for boilers and furnaces over the sizes dealt with in J1 - J4.
9. The UK Building (Approved Inspectors, etc.) Regulations 2010 are not in force in Guernsey. Therefore approved inspectors are not recognised on the Island and all references have been removed.

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Introduction

What is a Guernsey Technical Standard?

This document has been approved and issued by the Development and Planning Authority to provide practical guidance on ways of complying with requirements J1 to J7 and regulation 11 of the Building (Guernsey) Regulations, 2012 (GSI, 2012 No.11). The Building (Guernsey) Regulations, 2012 are referred to throughout the remainder of this document as 'the Building Regulations'.

The intention of issuing Guernsey Technical Standards is to provide guidance about compliance with specific aspects of the Building Regulations in some of the more common building situations. They include examples of what, in ordinary circumstances, may be reasonable provision for compliance with the relevant requirement(s) of the Building Regulations to which they refer.

If guidance in a Guernsey Technical Standard is followed this may be relied upon as tending to show compliance with the requirement(s) covered by the guidance. Similarly a contravention of the standard may be relied upon as tending to establish a breach of the requirements. However, this is not conclusive, so simply following guidance does not guarantee compliance in an individual case or a failure to follow it meaning that there is necessarily a breach. It is also important to note that there may well be other ways of achieving compliance with the requirements. There is therefore no obligation to adopt any particular solution contained in this Guernsey Technical Standard if you would prefer to meet the relevant requirement in some other way. However, persons intending to carry out building work should always check with Building Control, that their proposals comply with Building Regulations.

The guidance contained in this Guernsey Technical Standard relates only to the particular requirements of the Building Regulations that the document addresses, (see 'Requirements' below). However, building work may be subject to more than one requirement of the Building Regulations and there may be an obligation to carry out work on a material change of use. In such cases the works will also have to comply with any other applicable requirements of the Building Regulations and work may need to be carried out which applies where a

material change of use occurs.

This document is one of a series that has been approved and issued for the purpose of providing practical guidance with respect to the requirements of the Building Regulations in particular of regulations 6, 8 and 11 and Schedule 1.

At the back of this document is a list of all the documents that have been approved and issued for this purpose.

How to use this Guernsey Technical Standard

In this document the following conventions have been adopted to assist understanding and interpretation:

- a. Texts shown against a yellow background are extracts from the Building Regulations, and set out the legal requirements that relate to compliance with the **heat producing appliances and fuel storage systems** requirements of the Building Regulations. It should be remembered however that, as noted above, building works must comply with all the other applicable provisions of the Building Regulations.
- b. Key terms are defined in annex G at the rear of this document.
- c. Details of technical publications referred to in the text of this document will be presented in *italics* and repeated in standards referred to as an annex at the rear of this document. A reference to a publication is likely to be made for one of two main reasons. The publication may contain additional or more comprehensive technical detail, which it would be impractical to include in full in this Document but which is needed to fully explain ways of meeting the requirements; or it is a source of more general information. The reason for the reference will be indicated in each case. The reference will be to a specified edition of the document. The Guernsey Technical Standard may be amended from time to time to include new references or to refer to revised editions where this aids compliance.

Where you can get further help

If you require clarification on any of the technical guidance or other information set out in this Guernsey Technical Standard and the additional detailed technical references to which it directs you, there are a number of routes through which you can seek further assistance:

- The States of Guernsey website:
www.gov.gg/planning
- If you are the person undertaking the building work you can seek advice from Building Control Surveyors to help ensure that, when carried out, your work will meet the requirements of the Building Regulations.
- Businesses registered with a competent person self-certification scheme may be able to get technical advice from their scheme operator. A full list of competent persons schemes are included as Schedule 3 of the Building Regulations.
- If your query is of a highly technical nature you may wish to seek the advice of a specialist, or industry technical body, in the area of concern.

Responsibility for compliance

It is important to remember that if you are the person (e.g. designer, builder, installer) carrying out building work to which any requirement of Building Regulations applies you have a responsibility to ensure that the work complies with any such requirement. The building owner or occupier will also have a responsibility for ensuring compliance with Building Regulation requirements and could be served with a compliance notice in cases of non-compliance or with a challenge notice in cases of suspected non-compliance.

General Guidance

Types of work covered by this Guernsey Technical Standard

Building work

Building work, as defined in regulation 5 of the Building (Guernsey) Regulations, 2012, includes the erection or extension of a building, the provision or extension of a controlled service or fitting, and the material alteration of a building or a controlled service or fitting. In addition, the Building Regulations may apply in cases where the purposes for which, or the manner or circumstances in which, a building or part of a building is used change in a way that constitutes a material change of use.

Under regulation 6 of the Building Regulations 2012, building work must be carried out in such a way that, on completion of work,

- i. the work complies with the applicable Parts of Schedule 1 of the Building Regulations,
- ii. in the case of an extension or material alteration of a building, or the provision, extension or material alteration of a controlled service or fitting, it complies with the applicable Parts of Schedule 1 to the Building Regulations and also does so as satisfactorily as it did before the work was carried out.

Work described in Part J concerns heat producing appliances and fuel storage systems. Work associated with heat producing appliances and fuel storage systems covered in these sections may be subject to other relevant Parts of the Building Regulations.

Material change of use

A material change of use occurs in specified circumstances in which a building or part of a building that was previously used for one purpose will be used in future for another or is converted to a building of another kind. Where there is a material change of use, the Building Regulations set requirements that must be met before the building can be used for its new purpose.

Regulation 7 of the Building (Guernsey) Regulations, 2012 specifies the following circumstances as material changes of use:

- a building is used as a dwelling where previously it was not,
- a building contains a flat where previously it did not,
- a building is used as an institution where previously it was not,
- a building is used as a public building where previously it was not,
- a building is not described in Classes I to V or VI of Schedule 2, where previously it was,
- a building contains a room for residential purposes where previously it did not,
- a building contains an office where previously it did not,
- a building is used as an hotel or guest house, where previously it was not,
- a building is an industrial building, where previously it was not,
- a building contains a shop, where previously it did not,
- a building is used for the sale of food or drink, to the public in the course of a business and for consumption in that building and where there is a maximum capacity of 15 or more persons seated or standing, where previously it was not so used,
- the building, which contains at least one room for residential purposes, contains a greater or lesser number of such rooms than it did previously,

- the building, which contains at least one dwelling, contains a greater or lesser number of dwellings than it did previously.

Part J will apply to all the material changes of use mentioned above. This means that whenever such changes occur the building must be brought up to the standards required by Part J.

Protected Buildings and Monuments

The types of building works covered by this Guernsey Technical Standard may include work on historic buildings. Historic buildings include:

- a. a building appearing on the protected buildings listing
- b. a building or other structure appearing on the protected monument listing

When exercising its functions under The Land Planning and Development Law, the States has duties under s30(1), 34, 35 and 38(1) of that Law, to secure so far as possible that monuments are protected and preserved, that the special characteristics of protected buildings are preserved and to pay special attention to the desirability of preserving and enhancing the character and appearance of a conservation area. Building Control will need to comply with these duties when considering any decisions in relation to such buildings or buildings in such areas.

Special considerations may apply if the building on which the work is to be carried out has special historic, architectural, traditional or other interest, and compliance with the **heat producing appliances and fuel storage systems** requirements would unacceptably alter the fabric, character or appearance of the building or parts of it.

When undertaking work on or in connection with buildings with special historic, architectural, traditional or other interest, the aim should be to improve the **heat producing appliances and fuel storage systems** where and to the extent that it is possible provided that the work does not prejudice the fabric, character or appearance of the host building or increase the long-term deterioration to the building's fabric or fittings.

In arriving at a balance between historic building conservation and the **heat producing appliances and fuel storage systems** requirements advice should be sought from the historic building adviser.

Note: Any building which is a protected monument listed under Section 29 of The Land Planning and Development (Guernsey) Law 2005 is exempt from most Building Regulations requirements including those in Part J, (See regulation 13 and class V of Schedule 2 to the Building Regulations) unless the proposed works constitute a material change of use.

Notification of work

In almost all cases of new building work it will be necessary to notify Building Control in advance of any work starting. The exception to this: where work is carried out under a self-certification Scheme listed in Schedule 3 or where works consist of emergency repairs.

Competent person self-certification schemes under Schedule 3

Under regulations 14(4), 17(4) and 19 of the Building Regulations it is not necessary to deposit plans or notify Building Control in advance of work which is covered by this Guernsey Technical Standard if that work is of a type set out in column 1 of Schedule 3 to the Regulations and is carried out by a person registered with a relevant self-certification (competent persons) scheme as set out in column 2 of that Schedule. In order to join such a scheme a person must demonstrate competence to carry out the type of work the scheme covers, and also the ability to comply with all relevant requirements in the Building Regulations. These schemes may change from time to time, or schemes may change name, or new schemes may be authorised under Schedule 3; the current list on the States website should always be consulted. Full details of the schemes can be found on the individual scheme websites.

Where work is carried out by a person registered with a competent person scheme, regulation 19 of the Building Regulations requires that the occupier of the building be given, within 30 days of the completion of the work, a certificate confirming that the work complies with all applicable Building Regulation requirements. There is also a requirement that Building Control be given a notice that this has been done, or the certificate, again within 30 days of the completion of the work. These certificates and notices are usually made available through the scheme operator.

Building Control is authorised to accept these certificates as evidence of compliance with the requirements of the Building Regulations. However, inspection and enforcement powers remain unaffected, although they are normally used only in response to a complaint that work may not comply.

Exemptions

Schedule 2 to the Building Regulations sets out a number of classes of buildings which are exempt from majority of Building Regulations requirements. However any building or structure described under Schedule 2, that contains a heat producing appliance and/or associated fuel storage will not be classed as exempt and will therefore be subject to the requirements of Part J

Materials and workmanship

Any building work within the meaning of the Building Regulations should, in accordance with regulation 11, be carried out with proper materials and in a workmanlike manner.

You may show that you have complied with regulation 11 in a number of ways. These include the appropriate use of a product bearing CE marking in accordance with the Construction Products Regulation (305/2011/EU-CPR) as or a product complying with an appropriate technical specification (as defined in those Regulations), a British Standard or an alternative national technical specification of any state which is a contracting party to the European Economic Area which in use is equivalent, or a product covered by a national or European certificate issued by a European Technical Approval issuing body, and the conditions of use are in accordance with the terms of the certificate.

You will find further guidance in the Guernsey Technical Standard on materials and workmanship that provides practical guidance on regulation 11 on materials and workmanship.

Supplementary guidance

Building Control occasionally issues additional material to aid interpretation of the guidance in Guernsey Technical Standards. This material may be conveyed in official letters to relevant agents and/or posted on the States website accessed through: www.gov.gg/planning

Technical specifications

When a Guernsey Technical Standard makes reference to specific standards or documents, the relevant version of the standard is the one listed at the end of the publication. However, if this version of the standard has been revised or updated by the issuing standards body, the new version may be used as a source of guidance provided that it continues to address the relevant requirements of the Building Regulations.

Where it is proposed to work to an updated version of the standard instead of the version listed at the end of the publication, this should be discussed with Building Control in advance of any work starting on site.

The appropriate use of any product, which complies with a European Technical Approval as defined in the Construction Products Regulation, (305/2011/EU-CPR) as amended, repealed or replaced will meet the relevant requirements.

Independent schemes of certification and accreditation

Much of the guidance throughout this document is given in terms of performance.

Since the performance of a system, product, component or structure is dependent upon satisfactory site installation, testing and maintenance, independent schemes of certification and accreditation of installers and maintenance firms will provide confidence in the appropriate standard of workmanship being provided.

Confidence that the required level of performance can be achieved will be demonstrated by the use of a system, material, product or structure which is provided under the arrangements of a product conformity certification scheme and an accreditation of installer scheme.

Third party accredited product conformity certification schemes not only provide a means of identifying materials and designs of systems, products and structures which have demonstrated that they reach the requisite performance, but additionally provide confidence that the systems, materials, products and structures are actually provided to the same specification or design as that tested or assessed.

Third party accreditation of installers of systems, materials, products and structures provides a means of ensuring that installations have been conducted by knowledgeable contractors to appropriate standards, thereby increasing the reliability of the anticipated performance.

Many certification bodies that approve such schemes are accredited by the **United Kingdom Accreditation Service**.

Certification of products, components, materials or structures under such schemes may be accepted as evidence of compliance with the relevant standard. Similarly the certification of installation or maintenance of products, components, materials and structures under such schemes as evidence of compliance with the relevant standard may be acceptable. Nonetheless Building Control will wish to establish in advance of the work, that any such scheme is adequate for the purpose of the Building Regulations.

Interaction with other legislation

This Guernsey Technical Standard makes reference to other legislation, including that listed below, the requirements of which may be applicable when carrying out building work. All references are to legislation as amended or repealed and replaced.

Note: All Laws, Ordinances and Statutory instruments can be accessed at

www.guernseylegalresources.gg/

The Health and Safety at Work (General)

(Guernsey) Ordinance, 1987 made under the Health and Safety at Work etc. (Guernsey) Law, 1979 and the Health, Safety and Welfare of Employees Law, 1950 applies to any workplace or part of a workplace. It applies to the common parts of flats and similar buildings if people such as cleaners, wardens and caretakers are employed to work in these common parts.

The Health and Safety (Gas) (Guernsey)

Ordinance, 2006 made under the Health, Safety and Welfare of Employees Law, 1950 and the Health and Safety at Work etc. (Guernsey Law), 1979 extend to all dangers arising from the transmission, distribution, supply or use of gas conveyed from a gas storage vessel and includes requirements relating to the installation of gas fittings.

Mixed use development

In mixed use developments part of a building may be used as a dwelling while another part has a non-domestic use. In such cases, if the requirements of this Part of the Regulations for dwellings and non-domestic use differ, the requirements for non-domestic use should apply in any shared parts of the building.

Maintenance

The guidance in this Guernsey Technical Standard provides a way of ensuring that combustion appliances can function safely. For combustion appliances to continue to work safely and effectively it is essential that they are adequately and regularly serviced and maintained.

The Requirements J1 - J4

This Guernsey Technical Standard deals with the following requirements from Part J of Schedule 1 to the Building Regulations.

Requirement	Limits on application
Part J Heat producing appliances and fuel storage systems	
Air supply	
J1. Combustion appliances must be so installed that there is an adequate supply of air to them for combustion to prevent overheating and for the efficient working of any flue pipe or chimney.	Requirements J1, J2 and J3(1) apply only to fixed combustion appliances (including incinerators).
Discharge of products of combustion	
J2. Combustion appliances must have adequate provision for the discharge of products of combustion to the outside air.	
Protection of building and occupants	
J3. (1) Combustion appliances and flue-pipes must be so constructed and installed, as to reduce to a reasonable level the risk of people suffering burns or the building catching fire in consequence of their use.	Requirement J3(2) applies only to fixed combustion appliances located in dwellings.
(2) Where a combustion appliance is provided, appropriate provision, having regard to the design and location of the appliance, must be made to detect and give early warning of the release of carbon monoxide at levels harmful to persons.	
Provision of information	
J4. Where a hearth, fireplace, flue or chimney is provided or extended, a durable notice containing information on the performance capabilities of the hearth, fireplace, flue or chimney must be affixed in a suitable place in the building for the purpose of enabling combustion appliances to be safely installed.	

Guidance

Performance

J.1 The requirements J1 to J4 will be met if the building provisions for the safe accommodation of combustion appliances:

- a. enable the admission of sufficient air for:
 - i. the proper combustion of fuel and the operation of flues; and
 - ii. the cooling of appliances where necessary;
- b. enable normal operation of appliances without the products of combustion becoming a hazard to health.
- c. incorporate an appropriate means of warning of a release of Carbon Monoxide for fixed appliances that burn solid fuels;
- d. enable normal operation of appliances without their causing danger through damage by heat or fire to the fabric of the building;
- e. have been inspected and tested to establish suitability for the purpose intended;
- f. have been labelled to indicate performance capabilities.

Note: Whilst, for the purposes of requirement J3(2), it is considered appropriate to require carbon monoxide alarms only with solid fuel appliances, such alarms can still reduce the risk of poisoning from other types of appliance.

J.2 Particular reference should be made to: **Guernsey Technical Standard B** for guidance on compartmentation of buildings for fire safety purposes and for appropriate periods of fire resistance for compartments,

and

Guernsey Technical Standard F for guidance on ventilation for health, and provision of extract ventilation using open flued combustion appliances.

Introduction to the provisions

J.3 This Guernsey Technical Standard gives guidance on how to satisfy the requirements of Part J. Although Part J applies to the accommodation of any combustion installation and liquid fuel storage system within the Limits on Application, the guidance in this Guernsey Technical Standard has been prepared mainly with domestic installations in mind, such as those comprising space and water heating systems and cookers and their flues, and their attendant oil and liquefied petroleum gas (LPG) fuel storage systems. Part J does not include specific provisions relating to the storage of solid fuel (including solid biofuel) but the relevant guidance in Guernsey Technical Standard B should be followed.

J.4 The guidance applies to combustion installations having power ratings and fuel storage capacities up to the limits shown in a) to c) below. Guidance which applies generally is given in this section and Section 1. More specific guidance is then given in:

- a. Section 2 for solid fuel installations of up to 45kW rated output;
- b. Section 3 for gas installations of up to 70Kw rated output,

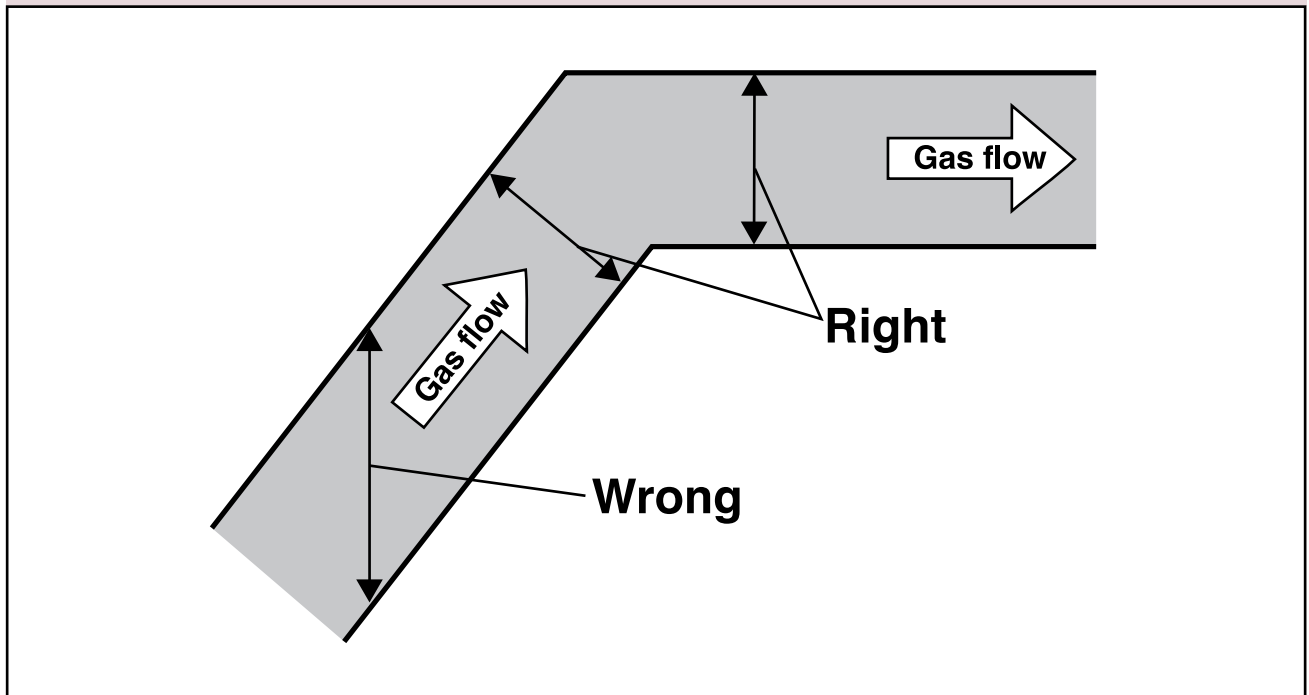
Note: this information is limited to basic design, location guidance only. All Gas installations are subject to the requirements of the The Health and Safety (Gas) (Guernsey) Ordinance, 2006 made under the Health, Safety and Welfare of Employees Law, 1950 and the Health and Safety at Work etc. (Guernsey Law), 1979 extend to all dangers arising from the transmission, distribution, supply or use of gas conveyed from a gas storage vessel and includes requirements relating to the installation of gas fittings.

- c. Section 4 for oil installations of up to 45kW rated heat output.

Measuring the size of flues and ducts

J.5 The size a flue or duct (area, diameter etc) should be measured at right angles to the direction in which gases flow. Where offset components are used, they should not reduce the flue area to less than the minimum required for the combustion appliance (see Diagram 1)

Diagram 1 Measurement of flues and ducts



Section 1 - Provisions which apply generally to combustion installations

Air supply for combustion appliances

1.1 Combustion appliances require ventilation to supply them with air for combustion. Ventilation is also required to ensure the proper operation of flues or, in the case of flueless appliances, to ensure that the products of combustion are safely dispersed to the outside air. Installation of room-sealed appliances or those with a directly connected ducted external air supply will minimise ventilation energy losses from the room and the risk of cold draughts.

1.2 In some cases, combustion appliances may also require air for cooling control systems and/or to ensure that casings remain safe to touch (see Diagram 2). General guidance on where it may be necessary to install air vents for these purposes is given below.

1.3 Air vent sizes, which are dependent upon the type of fuel burned, are given in Sections 2, 3 and 4 and are for one combustion appliance only. The air supply provisions will usually need to be increased where a room contains more than one appliance (such as a kitchen containing an open-flued boiler and an open-flued cooker).

Permanently open ventilation of rooms

1.4 A room containing an open-flued appliance may need permanently open air vents. An open-flued appliance must receive a certain amount of air from outside ('combustion air' in Diagram 2) dependent upon its type and rating. Infiltration through the building fabric may be sufficient but for certain appliance ratings and forms of construction, permanent openings are necessary (see Diagram 2).

Permanent ventilation of appliance compartments

1.5 Appliance compartments that enclose open-flued combustion appliances should be provided with vents large enough to admit all of the air required by the appliance for combustion and proper flue operation, whether the compartment draws its air from a room or directly from outside (see Diagram 2 (b) and (c)).

1.6 Where appliances require cooling air, appliance compartments should be large enough to enable air to circulate and high- and low-level vents should be provided (see Diagram 2 (d), (e), (f) and (g)).

1.7 Where appliances are to be installed within balanced compartments (see annex G), special provisions will be necessary and the appliance and ventilation system manufacturer's instructions should be followed.

Ventilation of other rooms or spaces

1.8 If an appliance is room-sealed but takes its combustion air from another space in the building (such as the roof void) or if a flue has a permanent opening to another space in the building (such as where it feeds a secondary flue in the roof void), that space should have ventilation openings directly to outside. Where the roof-space is to be used as a source of air for a combustion installation serving a dwelling, the dwelling roof ventilation provisions suggested in Guernsey Technical Standard C would normally be satisfactory.

1.9 Where flued appliances are supplied with combustion air through air vents which open into adjoining rooms or spaces, the adjoining rooms or spaces should have air vent openings of at least the same size direct to the outside. Air vents for flueless appliances, however, should open directly to the outside air.

Permanently open air vents

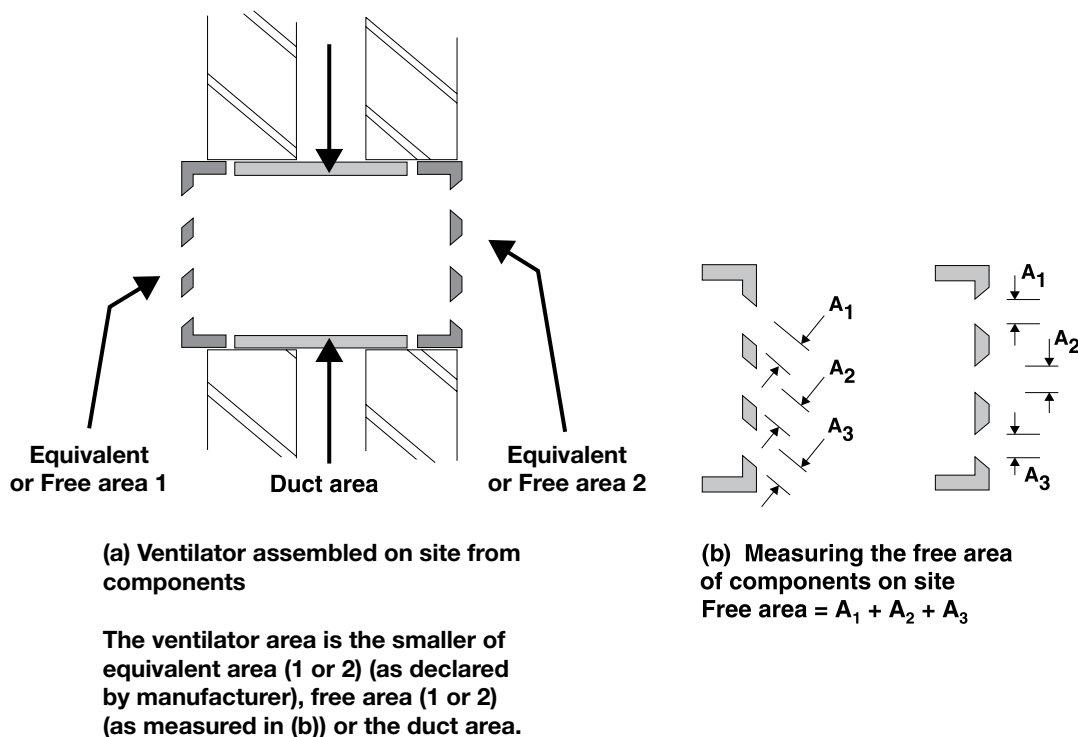
1.10 Permanently open air vents should be non-adjustable, sized to admit sufficient air for the purpose intended and positioned where they are unlikely to become blocked. Ventilators should be installed so that building occupants are not provoked into sealing them against draughts or noise. Ventilation openings should not be made in fire-resisting walls other than external walls (although they should not penetrate those parts of external walls shielding LPG tanks). Air vents should not be located within a fireplace recess except on the basis of specialist advice.

Diagram 2 General air supply to a combustion appliance
(for sizes see Sections 2 and 4)

	Open flued	Room sealed
Air for combustion and operation of the flue	<p>Infiltration air</p> <p>Permanently open air vents</p> <p>Combustion air</p> <p>(a) Appliance in room</p> <p>(b) Appliance in appliance compartment with internal vent</p> <p>Combustion air</p> <p>(c) Appliance in appliance compartment with external vent</p> <p>Combustion air</p>	No provisions necessary
Where cooling air is needed	<p>(d)</p> <p>(e)</p>	<p>(f)</p> <p>(g)</p>
FLUELESS		
Air for combustion and to carry away its products	<p>(h)</p> <p>Combustion products</p> <p>Permanently open air vents</p> <p>Combustion air</p> <p>Infiltration air</p>	

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Diagram 3 Ventilator free areas



1.11 A way of meeting the requirement would be to size permanently open air vents so that their equivalent area is sufficient for the appliance(s) to be installed (taking account where necessary of obstructions such as grilles and anti-vermin mesh), and to site them:

- outside fireplace recesses and beyond the hearths of open fires so that dust or ash will not be disturbed by draughts; and
- in a location unlikely to cause discomfort from cold draughts.

1.12 Where ventilation is to be provided via a single proprietary assembly, for example when it is proposed to use a proprietary ventilator with integral grilles to bridge a cavity wall, the equivalent area of the ventilator should be taken as that declared by the manufacturer having been measured by the method in *BS EN 13141-1:2004*.

1.13 Where two or more components are to be used to provide a non-proprietary assembly, the assembly should be kept as simple and smooth as possible. The assembly should be taken to have an equivalent area equal to that of the component with the smallest equivalent area in the assembly.

1.14 The equivalent area stated in the ventilator manufacturer's literature or marked on the air vent should be used whenever it is available, as this can differ considerably from the free area measured at one end of the air vent. When this is not available the equivalent area of a simple ventilator with no internal baffles can be taken as the total unobstructed cross-sectional area, measured in the plane where this area is at a minimum and at right angles to the direction of air flow. For an airbrick, grille or louvre with apertures no smaller than 5mm, it will be the aggregate free area of the individual apertures as shown Diagram 3.

1.15 Grilles or meshes protecting air vents from the entry of animals or birds should have aperture dimensions no smaller than 5mm.

1.16 Discomfort from cold draughts can be avoided by supplying air directly to appliances, locating vents close to appliances (for example by using floor vents), by drawing air from intermediate spaces such as hallways or by ensuring good mixing of incoming cold air by placing external air vents close to ceilings (see Diagrams 4 and 5). In noisy areas it may be necessary to install noise-attenuated ventilators to limit the entry of noise into the building. Transfer or connecting ventilation should be at low level to reduce the transfer of smoke in the event of a fire and otherwise meet the guidance given in Guernsey Technical Standard B.

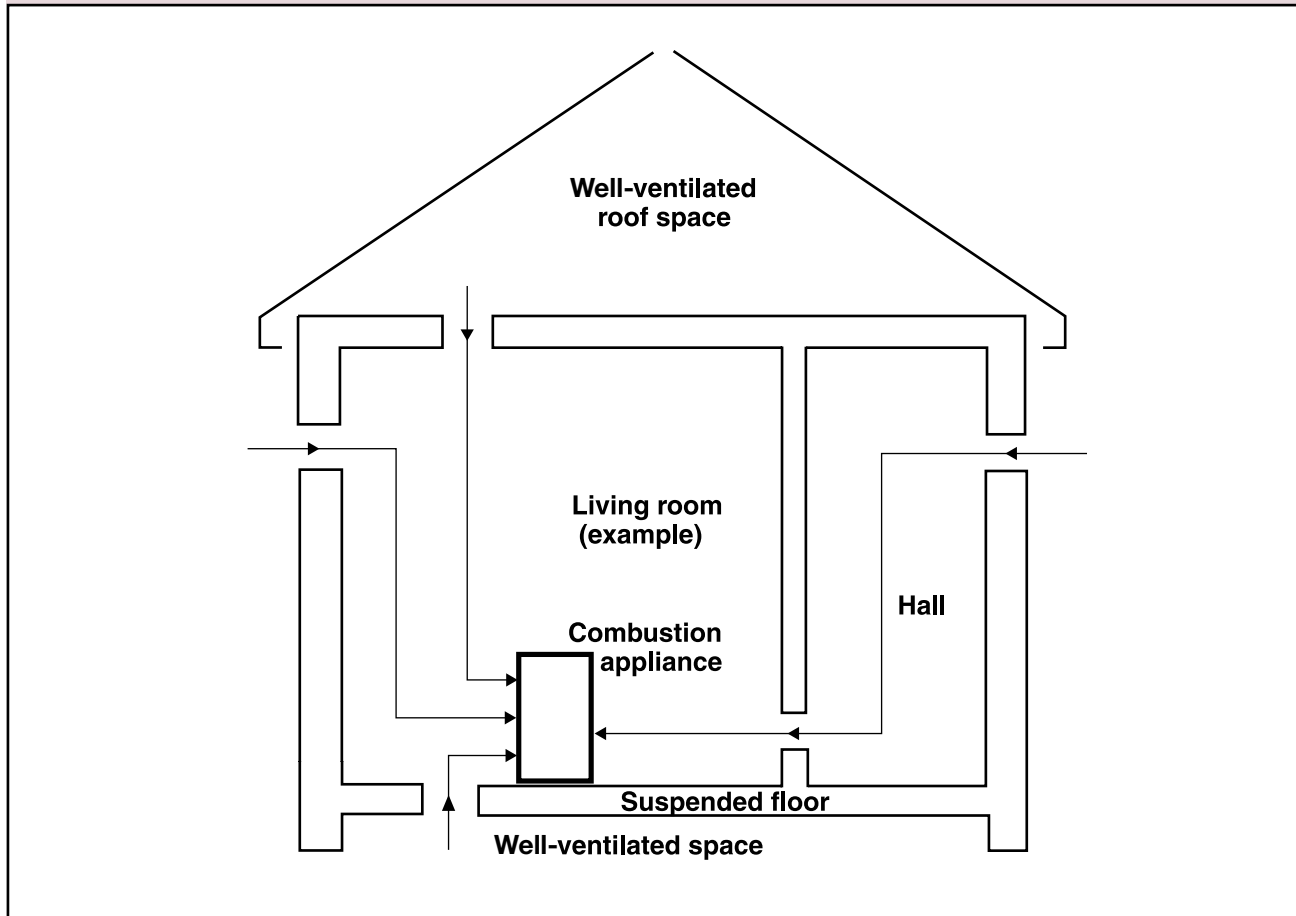
1.17 Buildings may have air-tight membranes in their floors to isolate them from the ground below. Ventilation ducts or vents installed to supply air to combustion appliances should not penetrate these

membranes in a way that will render them ineffective. Such membranes (including radon-proof membranes) are described in *BRE Report BR 414 (2001)* and *BRE Report BR 211 (2007)*, which give guidance when service penetrations are necessary.

Provisions complying with both Part F and Part J

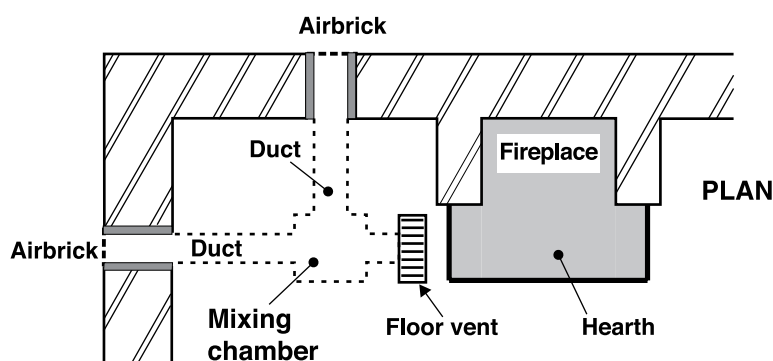
1.18 Rooms or spaces intended to contain open-flued combustion appliances may need permanent ventilation to comply with Part J and adjustable ventilation to comply with Part F. Permanently open air vents for combustion appliances can be accepted in place of some or all of the adjustable background ventilation for health, dependent upon opening area and location. However adjustable vents installed to meet the requirements of Part F cannot be used as substitutes for the ventilation openings needed to comply with Part J unless they are fixed permanently open.

Diagram 4 Location of permanent air vent openings, some examples



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Diagram 5 Provision of permanent air vent openings in a solid floor



Airbrick, duct and grille should have an equivalent free area of at least that recommended in Section 2, 3 or 4 as relevant

1.19 Rooms or spaces intended to contain flueless appliances may need: permanent ventilation and purge ventilation (such as openable windows) to comply with Part J; and adjustable ventilation and rapid ventilation to comply with Part F. Permanent ventilation provisions to comply with Part J may be acceptable in place of adjustable ventilation provisions for Part F subject to the limitations described in Paragraph 1.18. Openable elements installed for the rapid ventilation of rooms and other provisions made for the rapid ventilation of kitchens, in order to comply with Part F, may be acceptable in place of openable elements for the rapid ventilation of rooms or spaces containing flueless appliances.

Interaction of mechanical extract ventilation and open-flued combustion appliances

1.20 Extract fans lower the pressure in a building, which can cause the spillage of combustion products from open-flued appliances. This can occur even if the appliance and the fan are in different rooms. Ceiling fans produce air currents and hence local depressurisation, which can also cause the spillage of flue gases from open-flued appliances or from solid fuel open fires. In buildings where it is intended to install open-flued combustion appliances and extract fans, the combustion appliances should be able to operate safely whether or not the fans are running. A way of showing

compliance in these circumstances would be to follow the installation guidance below, and to show by tests that combustion appliances operate safely whether or not fans are running.

- For gas appliances: where a kitchen contains an open-flued appliance, the extract rate of the kitchen extract fan should not exceed 20 litres/second (72m³/hour).
- For oil appliances: where a room contains an open-flued appliance the extract rate should be limited to 40 litres/second for an appliance with a pressure jet burner and 20 litres/second for an appliance with a vaporising burner.
- For solid fuel appliances: avoid installing extract ventilation in the same room. An open-flued appliance in a kitchen may satisfy the requirements of Part F through passive stack ventilation. Refer to Guernsey Technical Standard F. If mechanical extraction is unavoidable then seek specialist advice to ensure safe operation of the appliance.
- For commercial and industrial installations, specialist advice may be necessary regarding the possible need for the interlocking of gas heaters and any mechanical ventilation systems.
- When fans are used to extract radon from below a building follow the guidance in *BRE Good Building Guide GBG 25*.

1.21 A suitable test would be to check for spillage when appliances are subjected to the greatest possible depressurisation. A prerequisite for this condition is that all external doors, windows and other adjustable ventilators to outside are closed. The depressurisation at the appliance will depend on the particular combination of fans in operation (fans in the room containing the appliance and fans elsewhere in the building) and the pattern of open internal doors, hatches etc. which is established at the time of the test (when fans should be on their maximum usable setting), and the specific combination causing the greatest depressurisation at the appliance depends upon the circumstances in each case. Several tests (which should include a test with the door leading into the room of installation closed and all fans in that room switched on) may therefore be necessary to demonstrate the safe operation of the appliance with reasonable certainty. The effect of ceiling fans should be checked during the tests.

1.22 The presence of some fans may be obvious, such as those on view in kitchens, but others may be less obvious: fans installed in domestic appliances such as tumble dryers and fans fitted to other open-flued combustion appliances can also contribute to depressurisation. In addition, fans may also be provided to draw radon gas from the ground below a building (see Paragraph 1.17).

1.23 The appliance manufacturer's installation instructions may describe a suitable spillage test for gas appliances but the procedure in *BS 5440-1:2008* can be used. For oil-fired appliances the effects of fans can be checked and, where spillage or flue draught interference is identified, it may be necessary to add additional ventilation to the room or space. A flue draught interference test for oil-fired appliances is described in *OFTEC Technical Books 2, 4 and 5*.

Provision of flues

1.24 Appliances other than flueless appliances should incorporate or be connected to suitable flues which discharge to the outside air.

1.25 This Guernsey Technical Standard provides guidance on how to meet the requirements in terms of constructing a flue or chimney, where each flue serves one appliance only. Flues designed to serve more than one appliance can meet the

requirements by following the guidance in *BS 5410-1:1997* for oil- and *BS 5440-1:2008* for gas-fired systems. However, each solid fuel appliance should have its own flue.

Condensates in flues

1.26 Chimneys and flues should provide satisfactory control of water condensation. Ways of providing satisfactory control include:

- a. for chimneys that do not serve condensing appliances, by insulating flues so that flue gases do not condense in normal operation
- b. for chimneys that do serve condensing appliances:
 - i. by using lining components that are impervious to condensates and suitably resistant to corrosion (*BS EN 1443:2003 'W' designation*) and by making appropriate provisions for draining, avoiding ledges, crevices, etc
 - ii. making provisions for the disposal of condensate from condensing appliances.

Construction of masonry chimneys

1.27 New masonry chimneys should be constructed with flue liners and masonry suitable for the intended application. Ways of meeting the requirement would be to use bricks, medium-weight concrete blocks or stone (with wall thicknesses as given in Section 2, 3 or 4 according to the intended fuel) with suitable mortar joints for the masonry and suitably supported and caulked liners. Liners suitable for solid fuel appliances (and generally suitable for other fuels) could be:

- a. liners whose performance is at least equal to that corresponding to the designation T400 N2 D 3 G, as described in *BS EN 1443:2003*, such as:
 - i. clay flue liners with rebates or sockets for jointing meeting the requirements for Class A1 N2 or Class A1 N1 as described in *BS EN 1457:2009*; or
 - ii. concrete flue liners meeting the requirements for the classification Type A1, Type A2, Type B1 or Type B2 as described in *BS EN 1857:2003*; or
 - iii. other products that meet the criteria in a).

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1.28 Liners should be installed in accordance with their manufacturer's instructions. Appropriate components should be selected to form the flue without cutting and to keep joints to a minimum. Bends and offsets should be formed only with matching factory-made components. Liners need to be placed with the sockets or rebate ends uppermost to contain moisture and other condensates in the flue. Joints should be sealed with fire cement, refractory mortar or installed in accordance with their manufacturer's instructions. Spaces between the lining and the surrounding masonry should not be filled with ordinary mortar. In the absence of liner manufacturer's instructions, the space could be filled with a weak insulating concrete such as mixtures of:

- a. one part ordinary Portland cement to 20 parts suitable lightweight expanded clay aggregate, minimally wetted; or
- b. one part ordinary Portland cement to 6 parts Vermiculite; or
- c. one part ordinary Portland cement to 10 parts Perlite.

Construction of flueblock chimneys

1.29 Flueblock chimneys should be constructed of factory-made components suitable for the intended application installed in accordance with the manufacturer's instructions. Ways of meeting the requirement for solid fuel appliances (and generally suitable for other fuels) include using:

- a. flueblocks whose performance is at least equal to that corresponding to the designation T400 N2 D 3 G, as described in *BS EN 1443:2003*, such as:
 - i. clay flueblocks at least meeting the requirements for Class FB1 N2 as described in *BS EN 1806:2006*
 - ii. other products that meet the criteria in a).
- b. blocks suitable for the purpose lined in accordance with Paragraph 1.27.

1.30 Joints should be sealed in accordance with the flueblock manufacturer's instructions. Bends and offsets should be formed only with matching factory-made components.

Material change of use

1.31 Where a building is to be altered for different use (e.g. it is being converted into flats) the fire resistance of walls of existing masonry chimneys may need to be improved as shown in Diagram 6.

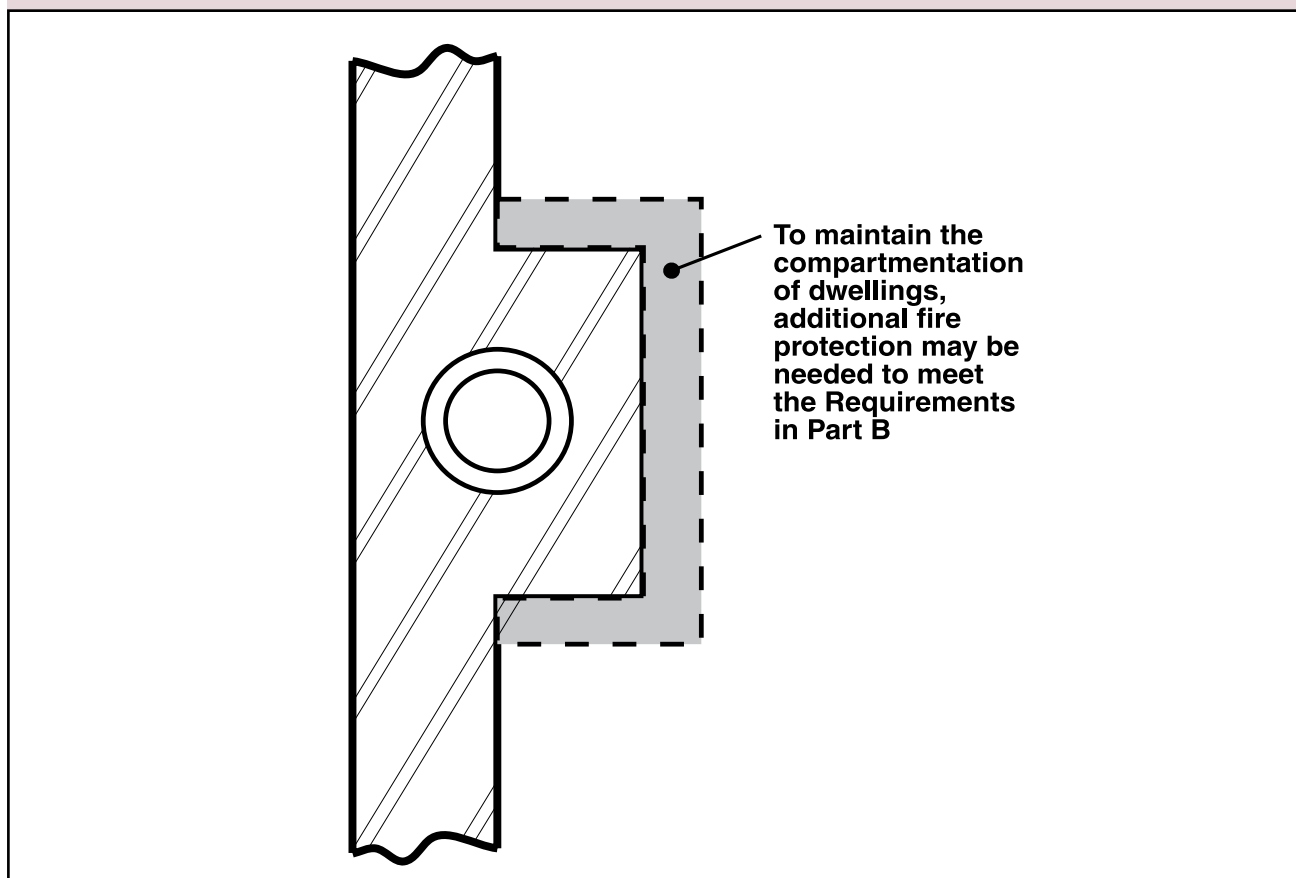
Connecting fluepipes

1.32 Satisfactory components for constructing connecting fluepipes include:

- a. cast iron fluepipes complying with *BS 41:1973 (1998)*
- b. metal flue pipes appropriately designated in accordance with *BS EN1856-2:2004* to suit the appliance and types of fuels to be burnt – refer to detailed guidance in Sections 2, 3 and 4.
- c. vitreous enamelled steel pipe complying with *BS 6999:1989 (1996)*
- d. other fluepipes having the necessary performance designation for use with the intended appliance.

1.33 Fluepipes with spigot and socket joints should be fitted with the socket facing upwards to contain moisture and other condensates in the flue. Joints should be made gas-tight. A satisfactory way of achieving this would be to use proprietary jointing accessories or, where appropriate, by packing joints with non-combustible rope and fire cement.

Diagram 6 Material change of use: fire protection of chimneys passing through other dwellings



Repair of flues

1.34 It is important to the health and safety of building occupants that renovations, refurbishments or repairs to flue liners should result in flues that comply with the requirements of J2 to J4. The test procedures referred to in paragraph 1.55 and in Annex D can be used to check this.

1.35 Flues are controlled services as defined in Regulation 2 of the Building Regulations, that is to say they are services in relation to which Part J of Schedule 1 imposes requirements. If renovation, refurbishment or repair amounts to or involves the provision of a new or replacement flue liner, it is 'building work' within the meaning of Regulation 5 of the Building Regulations. 'Building work' and must not be undertaken without prior notification to Building Control. Examples of work that would need to be notified include:

- a. relining work comprising the creation of new flue walls by the insertion of new linings such as rigid or flexible prefabricated components

- b. a cast in situ liner that significantly alters the flue's internal dimensions.

Anyone in doubt about whether or not any renovation, refurbishment or repair work involving a flue is notifiable 'building work', could consult Building Control.

Re-use of existing flues

1.36 Where it is proposed to bring a flue in an existing chimney back into use or to re-use a flue with a different type or rating of appliance, the flue and the chimney should be checked and, if necessary, altered to ensure that they satisfy the requirements for the proposed use. A way of checking before and/or after remedial work would be to test the flue using the procedures in Annex D.

1.37 A way of refurbishing defective flues would be to line them using the materials and components described in Sections 2, 3, and 4 dependent upon the type of combustion appliance proposed. Before relining flues, they should be swept to remove deposits.

1.38 A flue may also need to be lined to reduce the flue area to suit the intended appliance. Oversize flues can be unsafe.

1.39 If a chimney has been relined in the past using a metal lining system and the appliance is being replaced, the metal liner should also be replaced unless the metal liner can be proven to be recently installed and can be seen to be in good condition.

Use of flexible metal flue liners for the relining of chimneys

1.40 A way of relining a chimney would be to use a flexible metal flue liner, appropriately designated in accordance with *BS EN1856-2:2004* to suit the appliance, fuel and flue gas characteristics. Flexible flue liners should be used only to reline a chimney and should not be used as the primary liner of a new chimney. They can be used to connect gas back boilers to chimneys where the appliance is located in a fireplace recess.

Use of plastic fluepipe systems

1.41 A way of using plastic flue systems and liners would be to use a plastic flue, appropriately designated in accordance with *BS EN 14471:2005* to suite the appliance, fuel and flue characteristics. Plastic fluepipe systems can be acceptable in some cases, for example with condensing boiler installations, where the fluepipes are supplied by or specified by the appliance manufacturer as being suitable for purpose.

Factory-made metal chimneys

1.42 Ways of meeting the requirements when proposing factory-made metal chimneys include:

- a. using component systems appropriately designated in accordance with *BS EN1856-1:2003* to suit the appliance and types of fuels to be burnt and installing them in accordance with the relevant recommendations of *BS EN 15287-1:2007*;
- b. for gas and for oil appliances where flue temperatures will not normally exceed 250°C, using twin-walled component systems (and, for gas, single-walled component systems) appropriately designated in accordance with *BS EN1856-1:2003* to suit the appliance and types of fuels to be burnt and installing gas appliances in accordance with *BS 5440-1:2008*;

- c. using any other chimney system that is suitable for the intended purpose and installed in accordance with the relevant recommendations in *BS EN 15287-1:2007* or *BS 5440-1:2008*, as appropriate to the type of appliance being installed.

1.43 Where a factory-made metal chimney passes through a wall, sleeves should be provided to prevent damage to the flue or building through thermal expansion. To facilitate the checking of gas-tightness, joints between chimney sections should not be concealed within ceiling joist spaces or within the thicknesses of walls without proper access being provided (see paragraph 1.47).

1.44 When providing a factory-made metal chimney, provision should be made to withdraw the appliance without the need to dismantle the chimney.

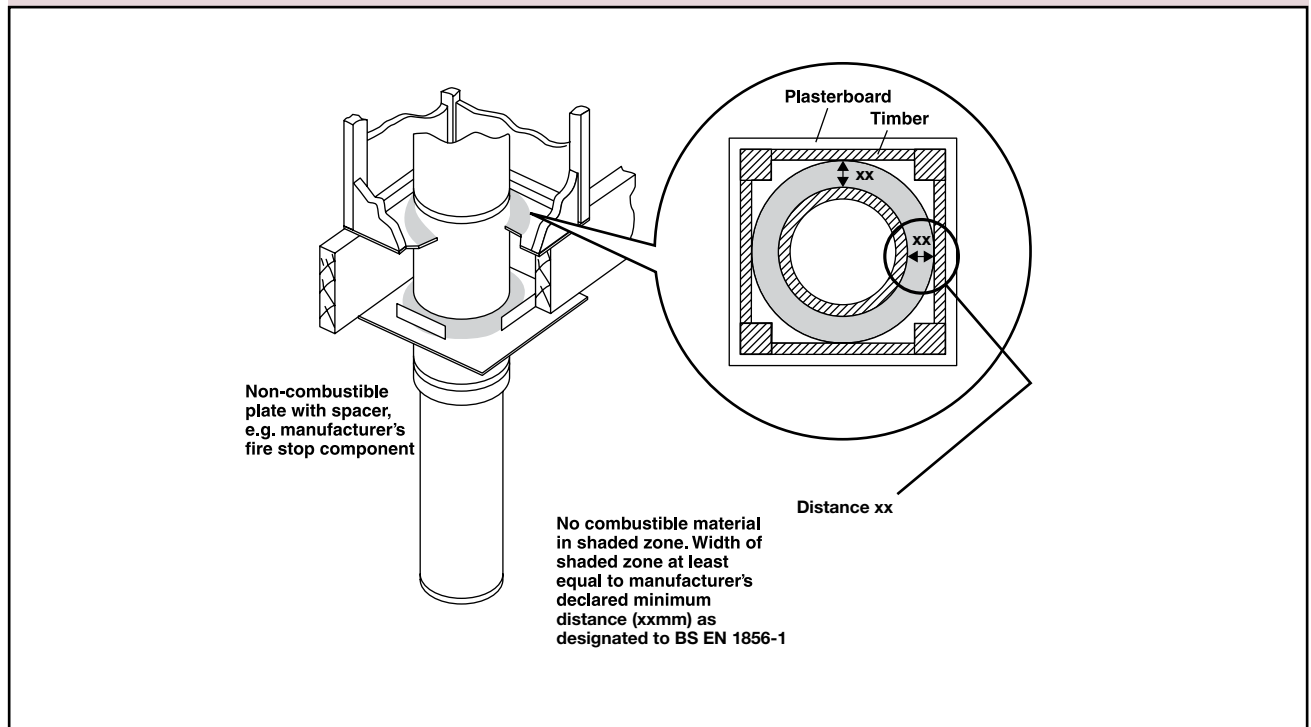
1.45 Factory-made metal chimneys should be kept a suitable distance away from combustible materials. Ways of meeting the requirement for chimneys designated to *BS EN 1856-1:2003* comprise:

- a. locating the chimney not less than distance 'xx' from combustible material, where 'xx' is defined in *BS EN 1856-1:2003* as shown in Diagram 7;
- b. where a chimney passes through a cupboard, storage space or roof space, providing a guard placed no closer to the outer wall of the chimney than the distance in a) above.

1.46 Where a factory-made metal chimney penetrates a fire compartment wall or floor, it must not breach the fire separation requirements of Part B. See Guernsey Technical Standard B for more guidance but the requirements may be met by:

- a. using a factory-made metal chimney of the appropriate level of fire resistance installed in accordance with *BS EN 1856-1:2003 Annex NA*; or
- b. casing the chimney in non-combustible material giving at least half the fire resistance recommended for the fire compartment wall or floor.

Diagram 7 The separation of combustible material from a factory-made metal chimney designated to BS EN 1856-1:2003



Concealed flues

1.47 Where a flue is routed within a void, appropriate means of access at strategic locations should be provided to allow the following aspects to be visually checked and confirmed. This is necessary both when an appliance is first installed and subsequently when the appliance is serviced:

- the flue is continuous throughout its length
- all joints appear correctly assembled and are appropriately sealed
- the flue is adequately supported throughout its length
- any required gradient of fall back to the boiler (required to recover the condensate produced as part of the combustion process) and any other required drain points have been provided..

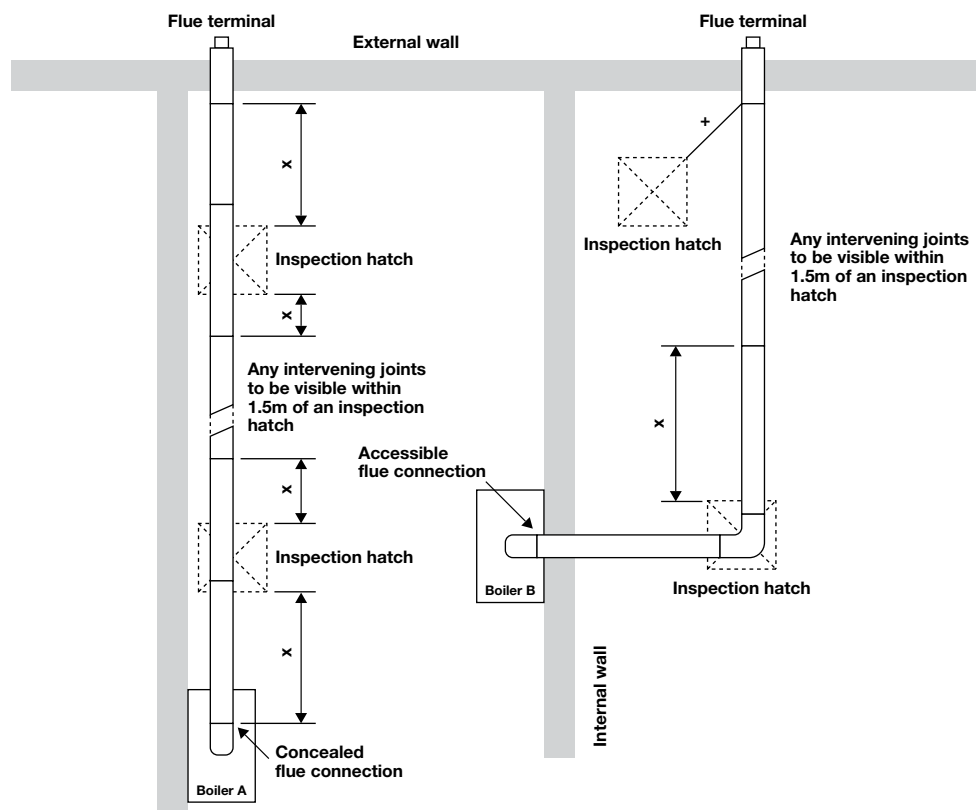
Means of access for flues needs to be sufficiently sized and positioned to allow a visual inspection to be undertaken of the flue, particularly at any joints in the flue. It is not intended that the means of access should be sized to allow full physical access to the flue system. Diagram 8 shows an acceptable approach for a flue in an ceiling void.

Flues should not pass through another dwelling since access for inspection may not always be available to that dwelling and chimney system running through it. Flues may pass through communal areas including purpose-designed ducts where inspection access is provided.

Any 'means of access' should not impair any fire, thermal or acoustic requirements of the Building Regulations. Refer to the relevant guidance in Guernsey Technical Standards B, L and E. Where necessary, inspection panels or hatches should be fitted with resilient seals and provide the similar standards of fire, thermal and acoustic isolation to the surrounding structure.

Access hatches should be at least 300mm x 300mm or larger where necessary to allow sufficient access to the void to look along the length of the flue. Diagram 8 shows an acceptable approach to providing access to a horizontal flue located within a ceiling void.

Diagram 8 Example locations of access panels for concealed horizontal flues



All voids containing concealed flues should have at least one inspection hatch measuring at least 300mm square.

No flue joint within the void should be more than 1.5m distant from the edge of the nearest inspection hatch, i.e. dimension x in the diagram should be less than 1.5m.

Where possible inspection hatches should be located at changes of direction. Where this is not possible then bends should be viewable from both directions.

Configuration of natural draught flues serving open-flued appliances

1.48 Flue systems should offer least resistance to the passage of flue gases by minimising changes in direction or horizontal length. A way of meeting the requirement would be to build flues so that they are straight and vertical except for the connections to combustion appliances with rear outlets where the horizontal section should not exceed 150mm. Where bends are essential, they should be angled at no more than 45° to the vertical.

1.49 Provisions should be made to enable flues to be swept and inspected. A way of making reasonable provision would be to limit the number of changes of direction between the combustion appliance outlet and the flue outlet to not more

than four (each up to 45°), with not more than two of these being between an intended point of access for sweeping and either another point of access for sweeping or the flue outlet. (90° factory-made bends, elbows or Tee pieces in fluepipes may be treated as being equal to two 45° bends (see Diagram 9)).

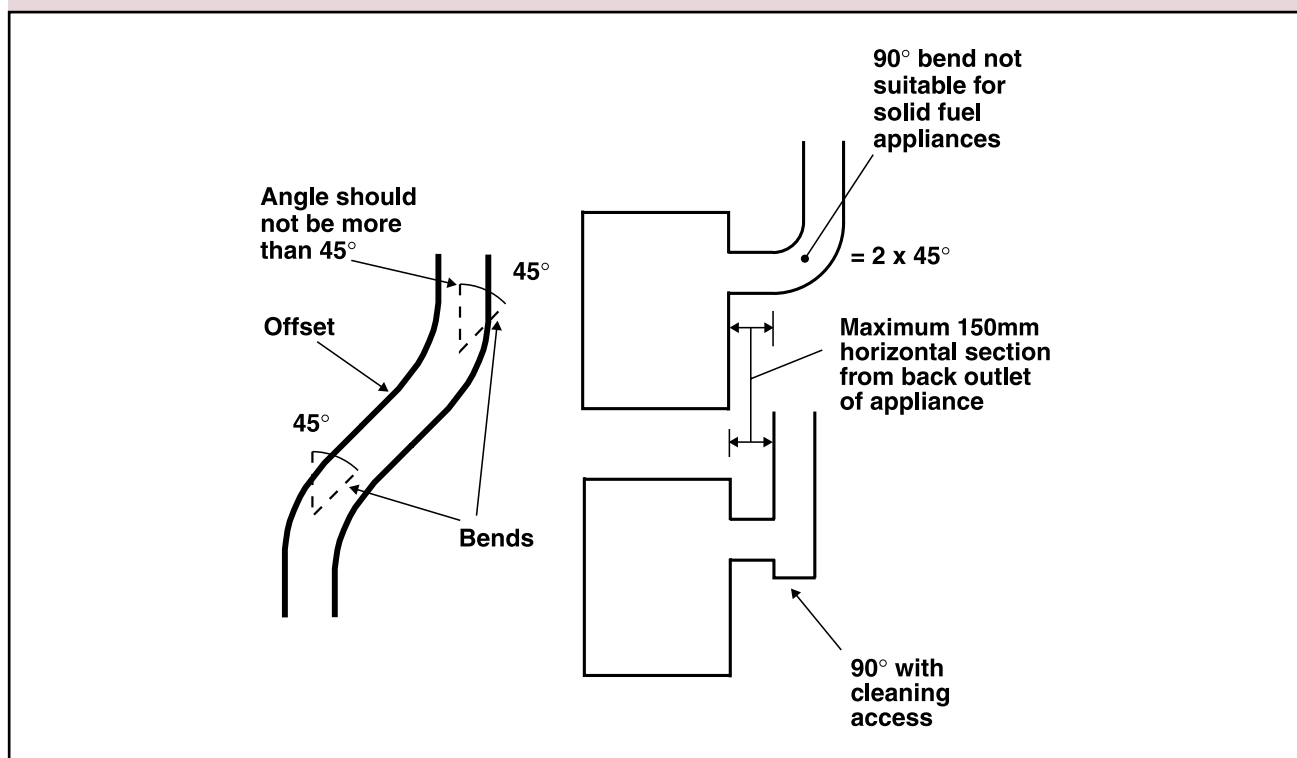
Inspection and cleaning openings in flues

1.50 A flue should not have openings into more than one room or space except for the purposes of:

- inspection or cleaning; or
- fitting an explosion door, draught break, draught stabiliser or draught diverter.

1.51 Openings for inspection and cleaning should be formed using purpose factory-made components compatible with the flue system,

Diagram 9 Bends in flues



having an access cover that has the same level of gas-tightness as the flue system and an equal level of thermal insulation. Openings for cleaning the flue should allow easy passage of the sweeping brush. Covers should also be non-combustible except where fitted to a combustible fluepipe (such as a plastic fluepipe). After the appliance has been installed, it should be possible to sweep the whole flue.

Flues discharging at low level near boundaries

1.52 Flues discharging at low level near boundaries should do so at positions where the building owner will always be able to ensure safe flue gas dispersal. A way of achieving this where owners of adjacent land could build up to the boundary would be to adopt the suggestions in Diagram 25 or 30, as relevant.

Dry lining around fireplace openings

1.53 Where a decorative treatment, such as a fireplace surround, masonry cladding or dry lining, is provided around a fireplace opening, any gaps that could allow flue gases to escape from the fireplace opening into the void behind the decorative treatment should be sealed to prevent

such leakage. The sealing material should be capable of remaining in place despite any relative movement between the decorative treatment and the fireplace recess.

Condition of combustion installations at completion

1.54 Responsibility for achieving compliance with the requirements of Part J rests with the person carrying out the work. That 'person' may be, e.g., a specialist firm directly engaged by a private client or it may be a developer or main contractor who has carried out work subject to Part J or engaged a sub-contractor to carry it out. In order to document the steps taken to achieve compliance with the requirements, a report should be drawn up showing that materials and components appropriate to the intended application have been used and that flues have passed appropriate tests. A suggested checklist for such a report is given at Annex A and guidance on testing is given at Annex D. Other forms of report may be acceptable. Specialist firms should provide the report to the client, developer or main contractor, who may be asked for documentation by Building Control.

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1.55 Flues should be checked at completion to show that they are free from obstructions, satisfactorily gas-tight and constructed with materials and components of sizes which suit the intended application. Where the building work includes the installation of a combustion appliance, tests should cover fluepipes and [the gas-tightness of] joints between fluepipes and combustion appliance outlets. A spillage test to check for compliance with J2 should be carried out with the appliance under fire, as part of the process of commissioning to check for compliance with Part L.

1.56 Hearths should be constructed with materials and components of sizes to suit the intended application and should show the area where combustible materials should not intrude.

Notice plates for hearths and flues (Requirement J5)

1.57 Where a hearth, fireplace (including a flue box), flue or chimney is provided or extended (including cases where a flue is provided as part of the refurbishment work), information essential to the correct application and use of these facilities should be permanently posted in the building. A way of meeting this requirement would be to provide a notice plate as shown in Diagram 10 conveying the following information:

- the location of the hearth, fireplace (or flue box) or the location of the beginning of the flue;
- the category of the flue and generic types of appliances that can be safely accommodated;
- the type and size of the flue (or its liner if it has been relined) and the manufacturer's name;
- the installation date.

1.58 Notice plates should be robust, indelibly marked and securely fixed in an unobtrusive but obvious position within the building such as:

- next to the electricity consumer unit; or
- next to the chimney or hearth described; or
- next to the water supply stop-cock.

1.59 For chimney products whose performance characteristics have been assessed in accordance with a European Standard (EN) and which are supplied or marked with a designation, the installer may optionally include this designation on the label as shown in Diagram 10.

Access to combustion appliances for maintenance

1.60 There should be a permanent means of safe access to appliances for maintenance. Roof space installations of gas-fired appliances should comply with the requirements of BS 6798:2009.

Diagram 10 Example notice plate for hearths and flues

Essential information	IMPORTANT SAFETY INFORMATION	
	This label must not be removed or covered	
Optional additional information	Property address	20 Main Street New Town
	The hearth and chimney installed in the	lounge
	are suitable for	decorative fuel effect gas fire
	Chimney liner	double skin stainless steel flexible, 200mm diameter
	Suitable for condensing appliance.....	no
	Installed on	date
	Other information (optional)	Designation of stainless steel liner stated by manufacturer to be T450 N2 S D 3
	e.g. installer's name, product trade names, installation and maintenance advice, European chimney product designations, warnings on performance limitations of imitation elements, e.g. false hearths.	

Section 2 - Additional provisions for appliances burning solid fuel (including solid biofuel) with a rated output up to 50kW

Air supply to appliances

2.1 A way of meeting the requirement would be to adopt the general guidance given in Section 1, beginning at Paragraph 1.2, in conjunction with the guidance below.

2.2 Any room or space containing an appliance should have a permanent air vent opening of at least the size shown in Table 1. For appliances designed to burn a range of different solid fuels the air supply should be designed to accommodate burning the fuel that produces the highest heating output.

2.3 Some manufacturers may specify even larger areas of permanently open air vents or omit to specify a rated output (for example in the case of a cooker). In these cases, manufacturers' installation instructions should be followed subject to any minimum ventilation provisions of this Guernsey Technical Standard.

Size of flues

2.4 Fluepipes should have the same diameter or equivalent cross-sectional area as that of the appliance flue outlet and should not be smaller than the size recommended by the appliance manufacturer.

2.5 Flues should be at least the size shown in Table 2 relevant to the particular appliance, and not less than the size of the appliance flue outlet or that recommended by the appliance manufacturer.

2.6 For multi-fuel appliances, the flue should be sized to accommodate burning the fuel that requires the largest flue.

Table 1 Air supply to solid fuel appliances

Type of appliance	Type and amount of ventilation (1)
Open appliance, such as an open fire with no throat, e.g. a fire under a canopy as in Diagram 17.	Permanently open air vent(s) with a total equivalent area of at least 50% of the cross sectional area of the flue.
Open appliance, such as an open fire with a throat as in Diagrams 16 and 22.	Permanently open air vent(s) with a total equivalent area of at least 50% of the throat opening area. (2)
Other appliance, such as a stove, cooker or boiler, with a flue draught stabiliser.	Permanently open vents as below: If design air permeability $>5.0\text{m}^3/(\text{h.m}^2)$ then 300mm ² /kW for first 5kW of appliance rated output 850mm ² /kW for balance of appliance rated output If design air permeability $\leq 5.0\text{m}^3/(\text{h.m}^2)$ then 850mm ² /kW of appliance rated output (4)
Other appliance, such as a stove, cooker or boiler, with no flue draught stabiliser.	Permanently open vents as below: If design air permeability $>5.0\text{m}^3/(\text{h.m}^2)$ then 550mm ² /kW of appliance rated output above 5kW If design air permeability $\leq 5.0\text{m}^3/(\text{h.m}^2)$ then 550mm ² per kW of appliance rated output (4)

Notes:

- Equivalent area is as measured according to the method in BS EN 13141-1:2004 or estimated according to paragraph 1.14. Divide the area given in mm² by 100 to find the corresponding area in cm²
- For simple open fires as depicted in Diagram 23, the requirement can be met with room ventilation areas as follows:

Nominal fire size (fireplace opening size)	500mm	450mm	400mm	350mm
Total equivalent area of permanently open air vents	20,500mm ²	18,500mm ²	16,500mm ²	14,500mm ²

- Example: an appliance with a flue draught stabiliser and a rated output of 7kW would require an equivalent area of: $[5 \times 300] + [2 \times 850] = 3200\text{mm}^2$
- It is unlikely that a dwelling constructed prior to 2008 will have an air permeability of less than $5.0\text{m}^3/(\text{h.m}^2)$ at 50 Pa unless extensive measures have been taken to improve air-tightness. See Annex E.

J1 - 4 ADDITIONAL PROVISIONS FOR APPLIANCES BURNING SOLID FUEL (INCLUDING SOLID BIOFUEL) WITH A RATED OUTPUT UP TO 50Kw

Table 2 Size of flues in chimneys

Installation (1)	Minimum flue size
Fireplace with an opening of up to 500mm x 550mm	200mm diameter or rectangular/square flues having the same cross-sectional area and a minimum dimension not less than 175mm
Fireplace with an opening in excess of 500mm x 550mm or a fireplace exposed on two or more sides	See paragraph 2.7. If rectangular/square flues are used the minimum dimension should be not less than 200mm
Closed appliance of up to 20kW rated output which: a) burns smokeless or low-volatiles fuel (2) or b) is an appliance which meets the requirements of the Clean Air Act when burning an appropriate bituminous coal (3) or c) is an appliance which meets the requirements of the Clean Air Act when burning wood (3)	125mm diameter or rectangular/square flues having the same cross-sectional area and a minimum dimension not less than 100mm for straight flues or 125mm for flues with bends or offsets
Pellet burner or pellet boiler which meets the requirements of the Clean Air Act (3)	125mm diameter This may be reduced to no less than 100mm when permitted by the appliance manufacturer and supported by calculation according to BS EN 13384-1:2002. This calculation can be applied to an individual installation or manufacturers can provide precalculated designs.
Other closed appliance of up to 30kW rated output burning any fuel	150mm diameter or rectangular/square flues having the same cross-sectional area and a minimum dimension not less than 125mm
Closed appliance of above 30kW and up to 50kW rated output burning any fuel	175mm diameter or rectangular/square flues having the same cross-sectional area and a minimum dimension not less than 150mm

Notes:

1. Closed appliances include cookers, stoves, room heaters and boilers.
2. Fuels such as bituminous coal, untreated wood or compressed paper are not smokeless or low-volatiles fuels.
3. These appliances are known as 'exempted fireplaces'.

2.7 For fireplaces with openings larger than 500mm x 550mm or fireplaces exposed on two or more sides (such as a fireplace under a canopy or open on both sides of a central chimney breast) a way of showing compliance would be to provide a flue with a cross-sectional area equal to 15 per cent of the total face area of the fireplace opening(s) (see Annex B). However, specialist advice should be sought when proposing to construct flues having an area of:

- a. more than 15 per cent of the total face area of the fireplace openings; or
- b. more than 120,000mm² (0.12m²).

Height of flues

2.8 Flues should be high enough to ensure sufficient draught to clear the products of combustion. The height necessary for this will depend upon the type of the appliance, the height of the building, the type of flue and the number of bends in it, and an assessment of local wind patterns. However, a minimum flue height of 4.5m could be satisfactory if the guidance in Paragraphs 2.10 to 2.12 is adopted. As an alternative

approach, the calculation procedure within *BS EN 13384-1:2005* can be used as the basis for deciding whether a chimney design will provide sufficient draught.

2.9 The height of a flue serving an open fire is measured vertically from the highest point at which air can enter the fireplace to the level at which the flue discharges into the outside air. The highest point of air entry into the fireplace could be the top of the fireplace opening or, for a fire under a canopy, the bottom of the canopy. The height of a flue serving a closed appliance is measured vertically from the appliance outlet.

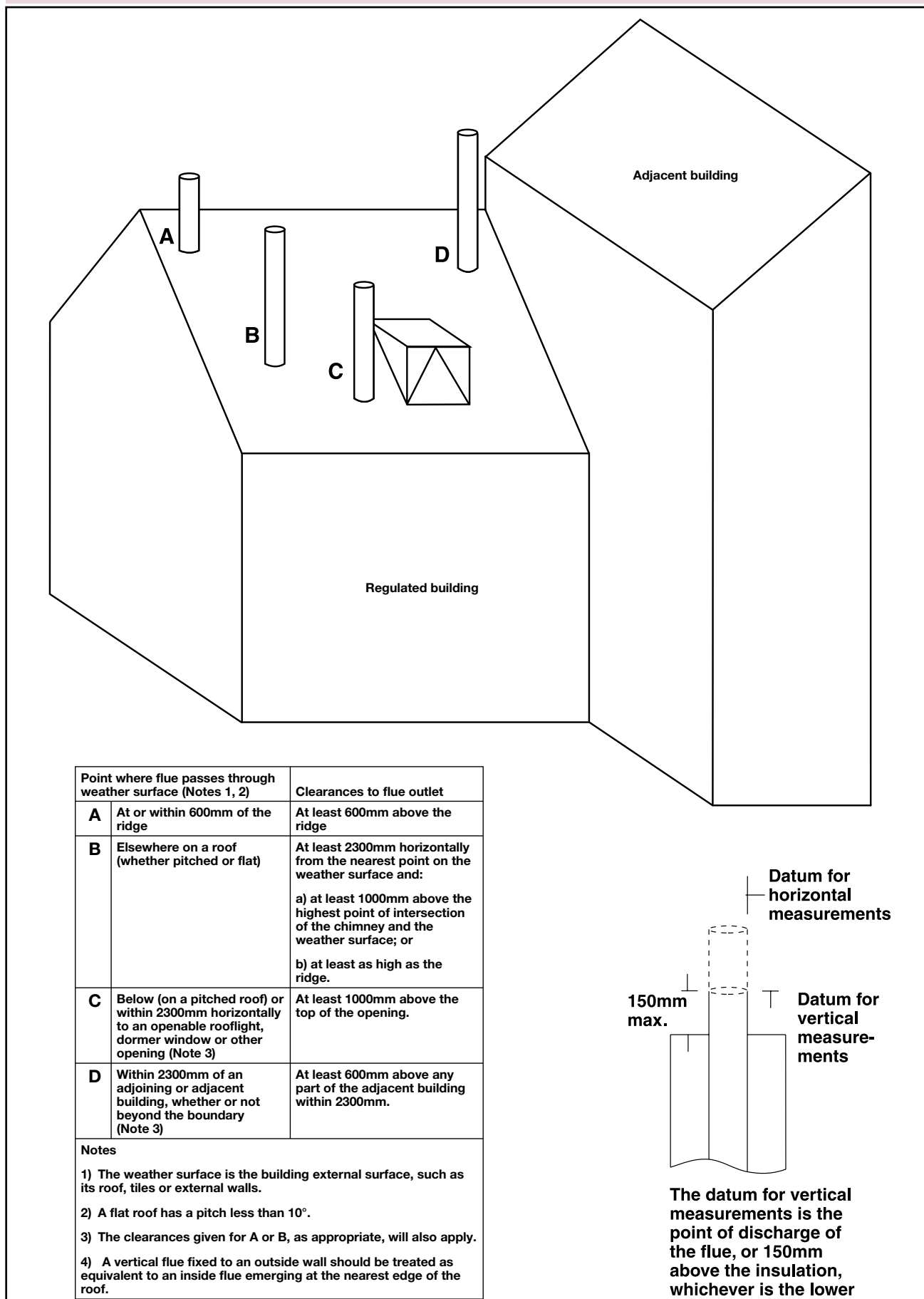
Outlets from flues

2.10 The outlet from a flue should be above the roof of the building in a position where the products of combustion can discharge freely and will not present a fire hazard, whatever the wind conditions.

2.11 Flue outlet positions which can meet the requirements in common circumstances are shown in Diagram 11. The chimney heights and/or separations shown may need to be increased in

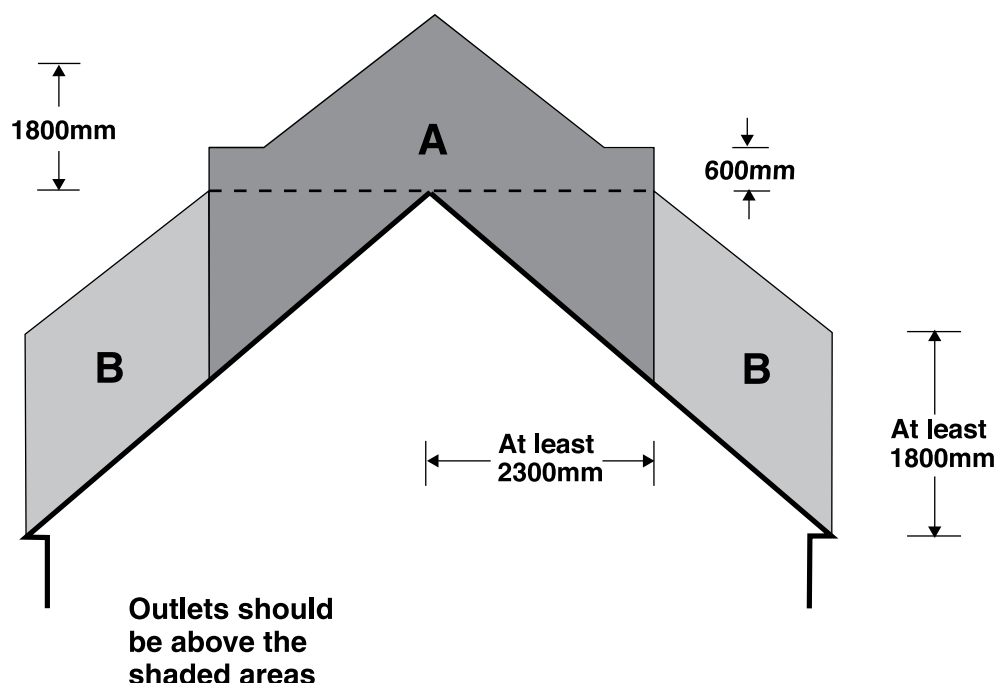
ADDITIONAL PROVISIONS FOR APPLIANCES BURNING SOLID FUEL (INCLUDING SOLID BIOFUEL) WITH A RATED OUTPUT UP TO 50Kw J1 - 4

Diagram 11 Flue outlet positions for solid fuel appliances



J1 - 4 ADDITIONAL PROVISIONS FOR APPLIANCES BURNING SOLID FUEL (INCLUDING SOLID BIOFUEL) WITH A RATED OUTPUT UP TO 50Kw

Diagram 12 Flue outlet positions for solid fuel appliances – clearances to easily ignited roof coverings
(Note: This diagram needs to be read in conjunction with Diagram 11)



Area	Location of flue outlet
A	At least 1800mm vertically above the weather surface and at least 600mm above the ridge.
B	At least 1800mm vertically above the weather surface and at least 2300mm horizontally from the weather surface.

particular cases where wind exposure, surrounding tall buildings, high trees or high ground could have adverse effects on flue draught.

2.12 A way of meeting the requirements where flues discharge on or in close proximity to roofs with surfaces which are readily ignitable, such as where roofs are covered in thatch or shingles, would be to increase the clearances to flue outlets to those shown in Diagram 12.

Note: Thatched roofs can sometimes be vulnerable to spontaneous combustion caused by heat transferred from flues building up in thick layers of thatch in contact with the chimney. To reduce the risk it is recommended that rigid twin-walled insulated metal flue liners be used within a ventilated (top and bottom) masonry chimney void provided they are

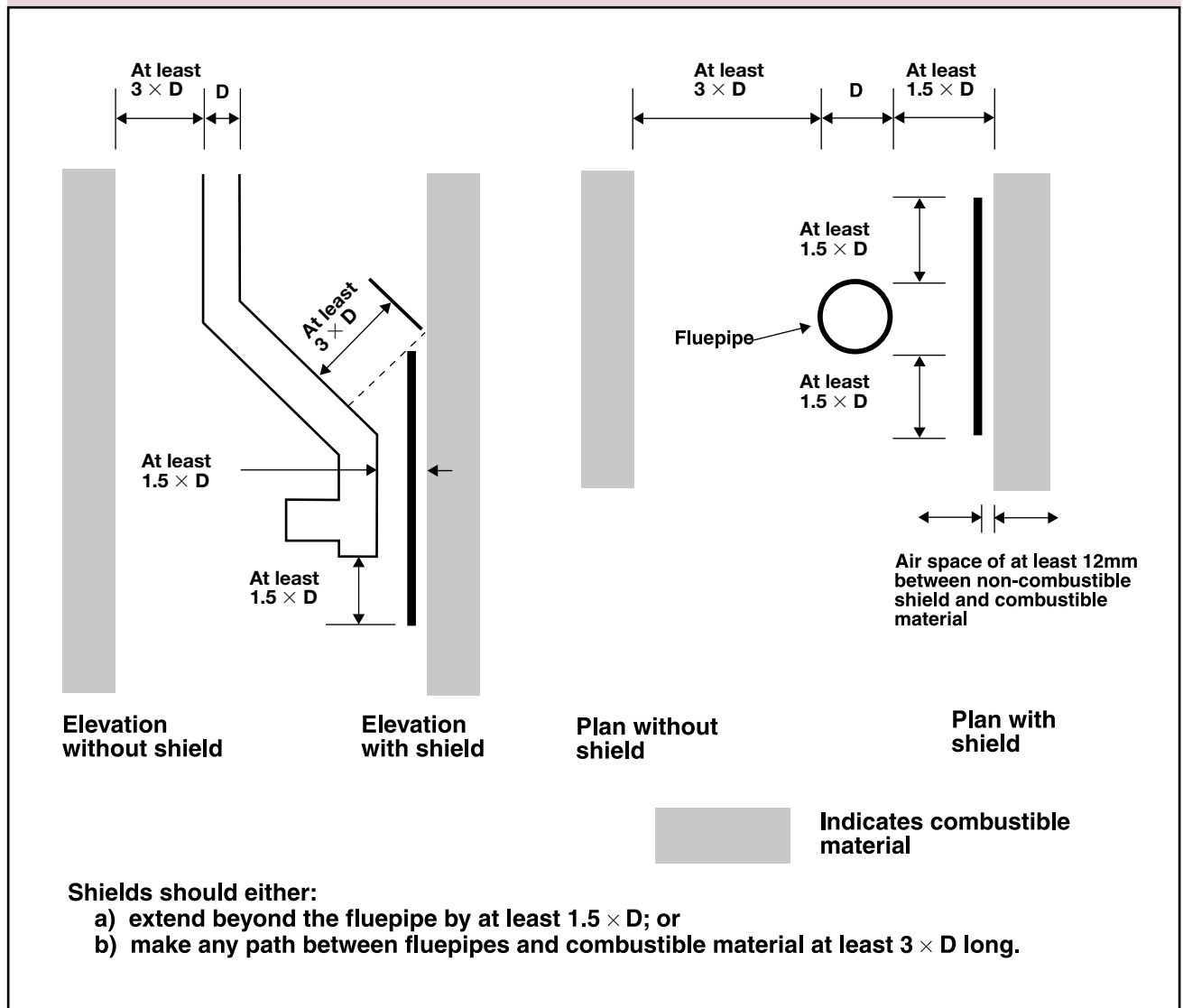
adequately supported and not in direct contact with the masonry. Non-metallic chimneys and cast in-situ flue liners can also be used provided the heat transfer to the thatch is assessed in relation to the depth of thatch and risk of spontaneous combustion.

Spark arrestors are not generally recommended as they can be difficult to maintain and may increase the risk of flue blockage and flue fires.

Further information and recommendations are contained in *Hetas Information Paper 1/007 Chimneys in Thatched Properties*.

Reference should also be made to *The Dorset Model for thatched buildings, 2009*

Diagram 13 Protecting combustible material from uninsulated fluepipes for solid fuel appliances



Connecting fluepipes

2.13 For connecting fluepipes a way of meeting the requirements would be to follow the general guidance in Paragraphs 1.32 and 1.33.

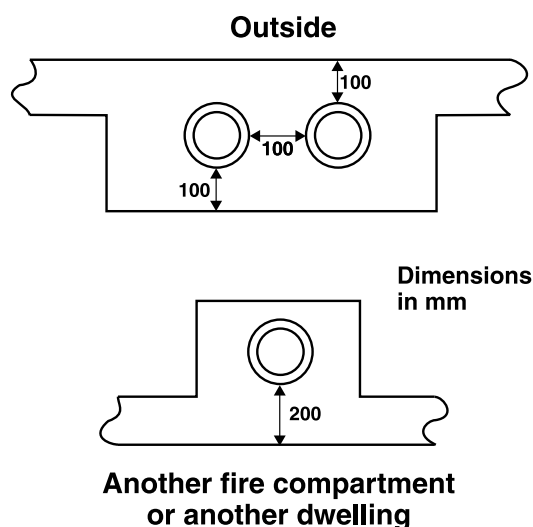
Location and shielding of connecting fluepipes

2.14 Connecting fluepipes should be used only to connect appliances to their chimneys. They should not pass through any roof space, partition, internal wall or floor, except to pass directly into a chimney through either a wall of the chimney or a floor supporting the chimney. Connecting fluepipes should also be guarded if they could be at risk of damage or if the burn hazard they present to people is not immediately apparent.

2.15 Connecting fluepipes should be located so as to avoid igniting combustible material. Ways of meeting the requirement include minimising horizontal and sloping runs and:

- following the guidance in Paragraph 1.45 where the connecting fluepipe is a factory-made metal chimney whose performance is at least equal to designation T400 N2 D3 G according to *BS EN 1856-1:2003* or *BS EN 1856-2:2004*, and installed to *BS EN 15827-1*; or
- separation by shielding in accordance with Diagram 13.

Diagram 14 Wall thicknesses for masonry and flueblock chimneys



Debris collection space

2.16 Where a chimney cannot be cleaned through the appliance, a debris collecting space which is accessible for emptying and suitably sized opening(s) for cleaning should be provided at appropriate locations in the chimney.

Masonry and flueblock chimneys

2.17 Masonry chimneys should be built in accordance with Paragraphs 1.27 and 1.28. Flueblock chimneys should be built in accordance with Paragraphs 1.29 and 1.30. The minimum chimney thickness and distance to combustibles (xxmm) should be no less than the manufacturer's product declaration (Gxx) based on testing to *BS EN 1858:2008 (concrete flue blocks)* or *BS EN 1806:2006 (clay/ceramic flueblocks)*. Other masonry chimney products should exceed the minimum thickness indicated in Diagram 14.

Separation of combustible material from fireplaces and masonry flues

2.18 Combustible material should not be located where it could be ignited by the heat dissipating through the walls of fireplaces or masonry flues. A way of meeting the requirement would be to follow the guidance in Diagram 15 so that combustible material is at least:

- a. 200mm from the inside surface of a flue or fireplace recess; or

- b. at least xxmm from a flue product with designated separation distance (Gxx); or
- c. 40mm from the outer surface of a masonry chimney or fireplace recess unless it is a floorboard, skirting board, dado or picture rail, mantel-shelf or architrave. Metal fixings in contact with combustible materials should be at least 50mm from the inside surface of a flue.

Factory-made metal chimneys

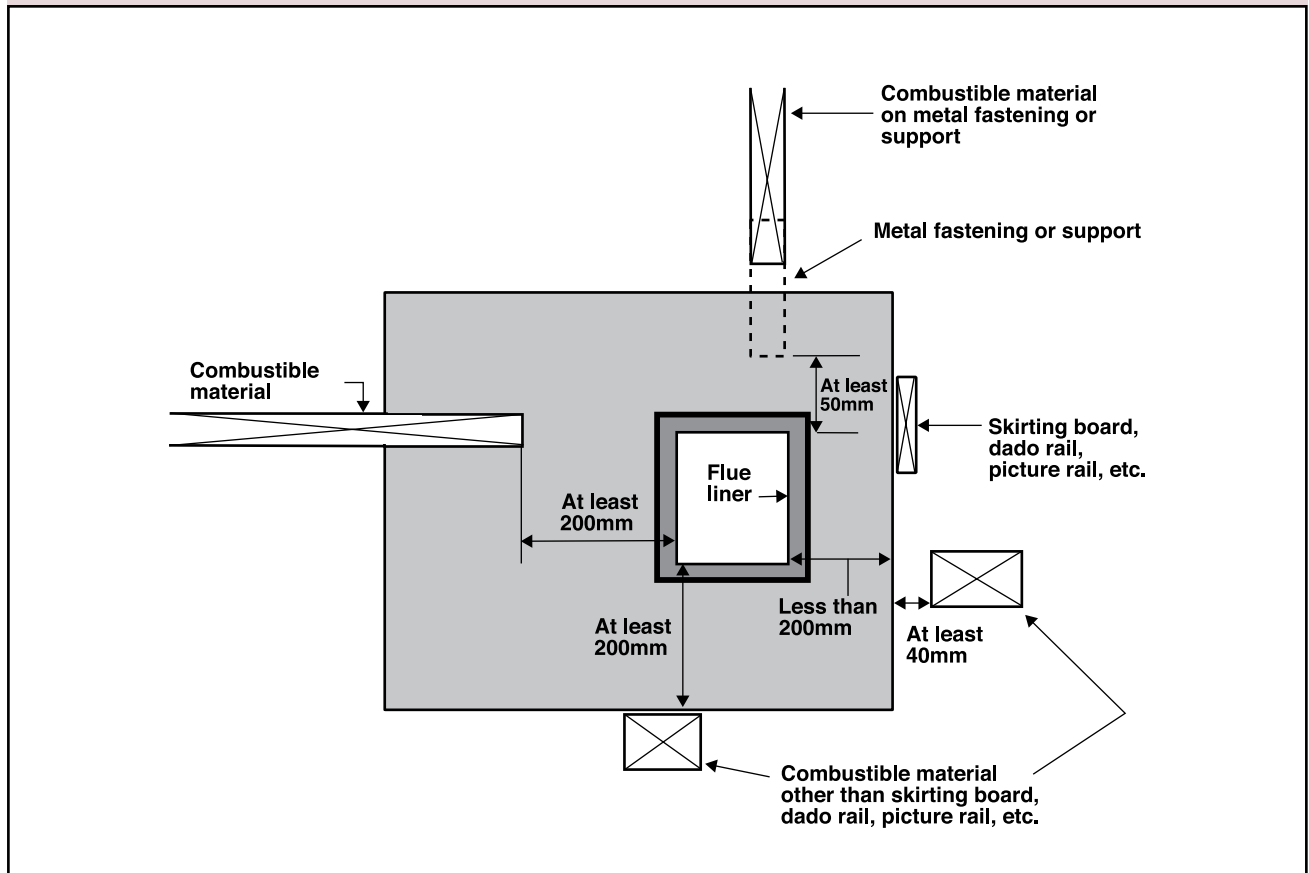
2.19 A way of meeting the requirements would be to comply with Paragraphs 1.42 to 1.46 in Section 1 (but not Paragraph 1.42(b)). The appropriate designation is given in Table 3.

Lining and relining of flues in chimneys

2.20 Lining or relining flues may be building work and, in any case, such work should be carried out so that the objectives of J2 to J4 are met (see Paragraphs 1.34 and 1.35). Existing flues being re-used should be checked as described in Paragraph 1.36. Ways of meeting the requirements include the use of:

- a. liners whose performance is at least equal to that corresponding to the designation T400 N2 D3 G, as described in *BS EN 1443:2003*, such as:
 - i. factory-made flue lining systems manufactured to *BS EN 1856-1:2003* or *BS EN 1856-2:2004*.

Diagram 15 Minimum separation distances from combustible material in or near a chimney



- ii. a cast in-situ flue relining system where the material and installation procedures are suitable for use with solid fuel burning appliances and meeting the relevant requirements of *BS EN 1857:2003 + A1:2008*.
- iii. other systems which are suitable for use with solid fuel-burning appliances and meeting the criteria in (a).
- b. liners as described in Paragraph 1.27.
- c. using a suitable canopy, as shown in Diagram 17; or
- d. using a prefabricated appliance chamber incorporating a gather.

Formation of gathers

2.21 To minimise resistance to the proper working of flues, tapered gathers should be provided in fireplaces for open fires. Ways of achieving these gathers include:

- a. using prefabricated gather components built into a fireplace recess, as shown in Diagram 16(a); or
- b. corbelling of masonry as shown in Diagram 16(b); or

Table 3 Minimum performance designations for chimney and fluepipe components for use with new solid fuel fired appliances

Appliance type	Minimum designation	Fuel type
All solid fuel appliances	Masonry or flueblock flue with liner to T400 N2 D3 Gxx Clay flue blocks FB1N2 Clay/ceramic liners B1N2 Concrete liners B2 Factory made metal chimneys to T400 N2 D3 Gxx	Coal, Smokeless Fuel, Peat, wood and other biomass
See paragraph 1.27–1.29 and 1.42		

Diagram 16 Construction of fireplace gathers

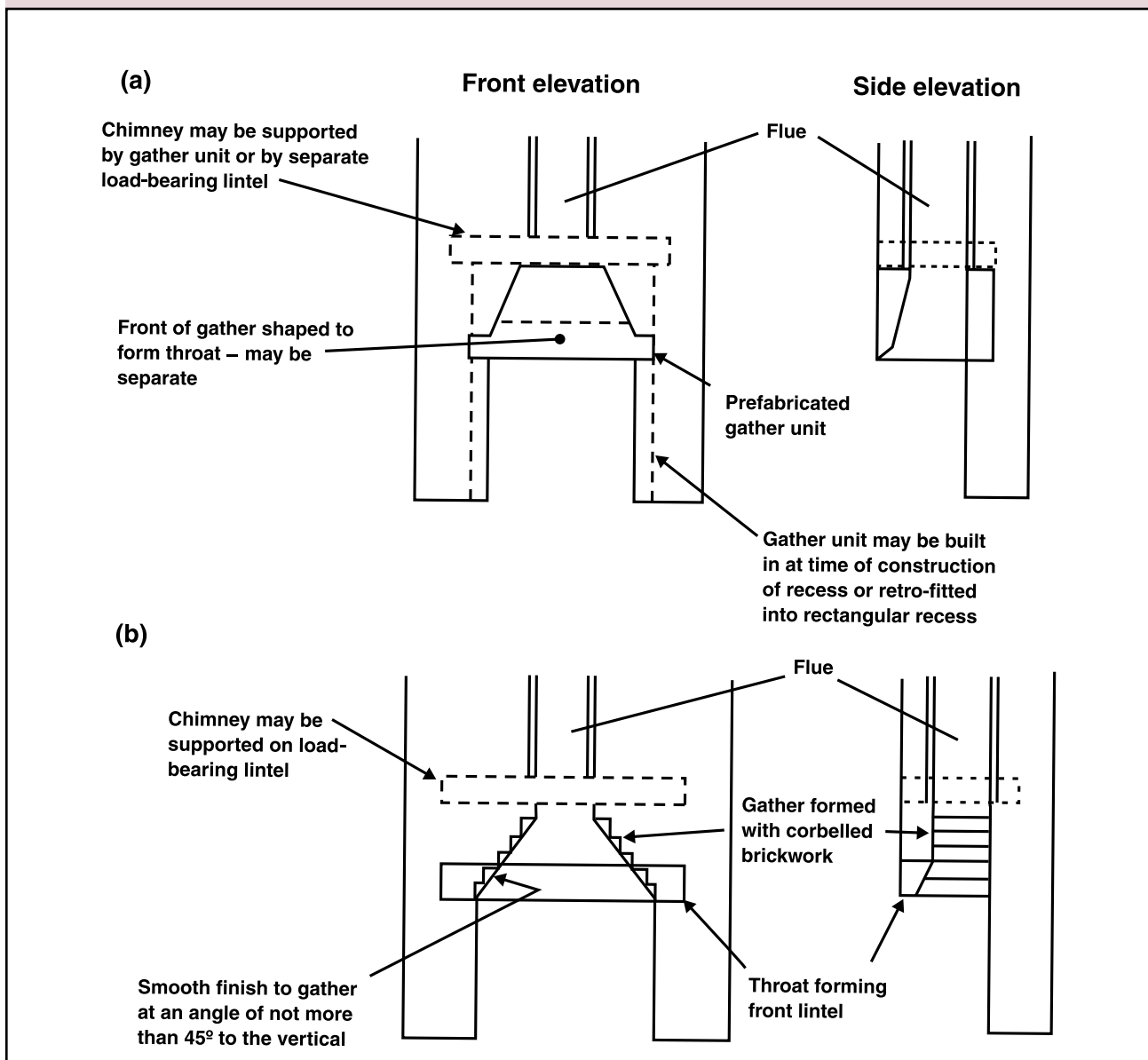
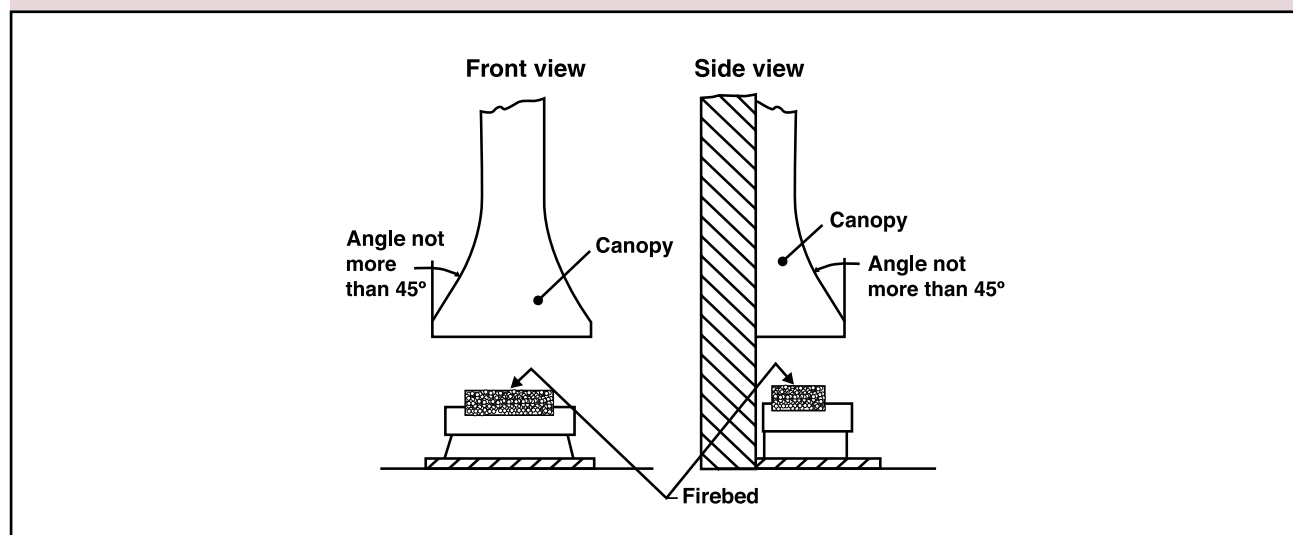


Diagram 17 Canopy for an open solid fuel fire



Hearths

2.22 Hearths should be constructed of suitably robust materials and to appropriate dimensions such that, in normal use, they prevent combustion appliances setting fire to the building fabric and furnishings, and they limit the risk of people being accidentally burnt. A way of making provision would be to adopt the guidance in Paragraphs 2.23 to 2.28 and to provide a hearth appropriate to the temperatures the appliance can create around it. The hearth should be able to accommodate the weight of the appliance and its chimney if the chimney is not independently supported.

2.23 Appliances should stand wholly above:

- a. hearths made of non-combustible board/sheet material or tiles at least 12mm thick, if the appliance is not to stand in an appliance recess and has been tested to an applicable appliance standard to verify that it cannot cause the temperature of the upper surface of the hearth to exceed 100°C; or
- b. constructional hearths in accordance with the paragraphs below.

2.24 Constructional hearths should:

- a. have plan dimensions as shown in Diagram 18; and
- b. be made of solid, non-combustible material, such as concrete or masonry, at least 125mm thick, including the thickness of any non-combustible floor and/or decorative surface.

2.25 Combustible material should not be placed beneath constructional hearths unless there is an air-space of at least 50mm between the underside of the hearth and the combustible material, or the combustible material is at least 250mm below the top of the hearth (see Diagram 19).

Diagram 18 Constructional hearth suitable for a solid fuel appliance (including open fires)

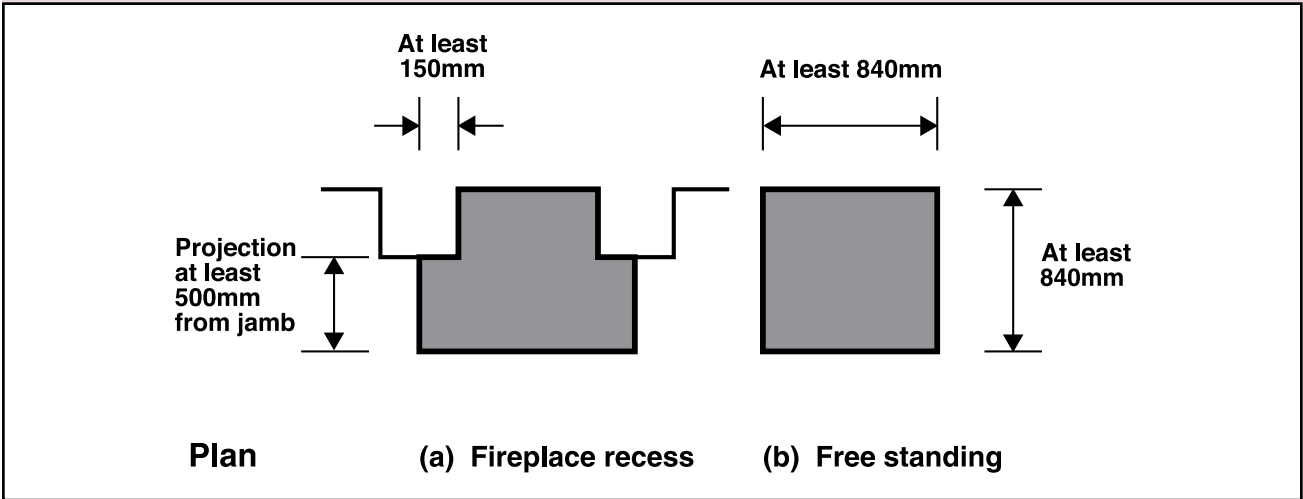


Diagram 19 Constructional hearth suitable for a solid fuel appliance (including open fires)

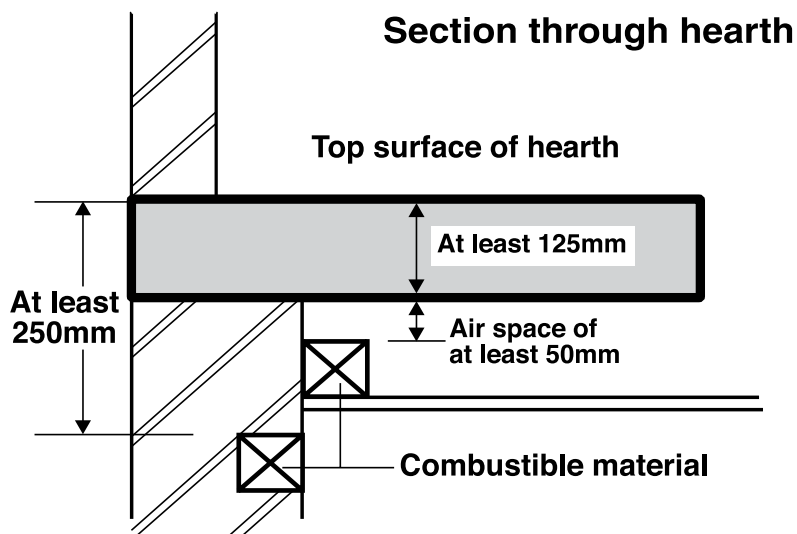
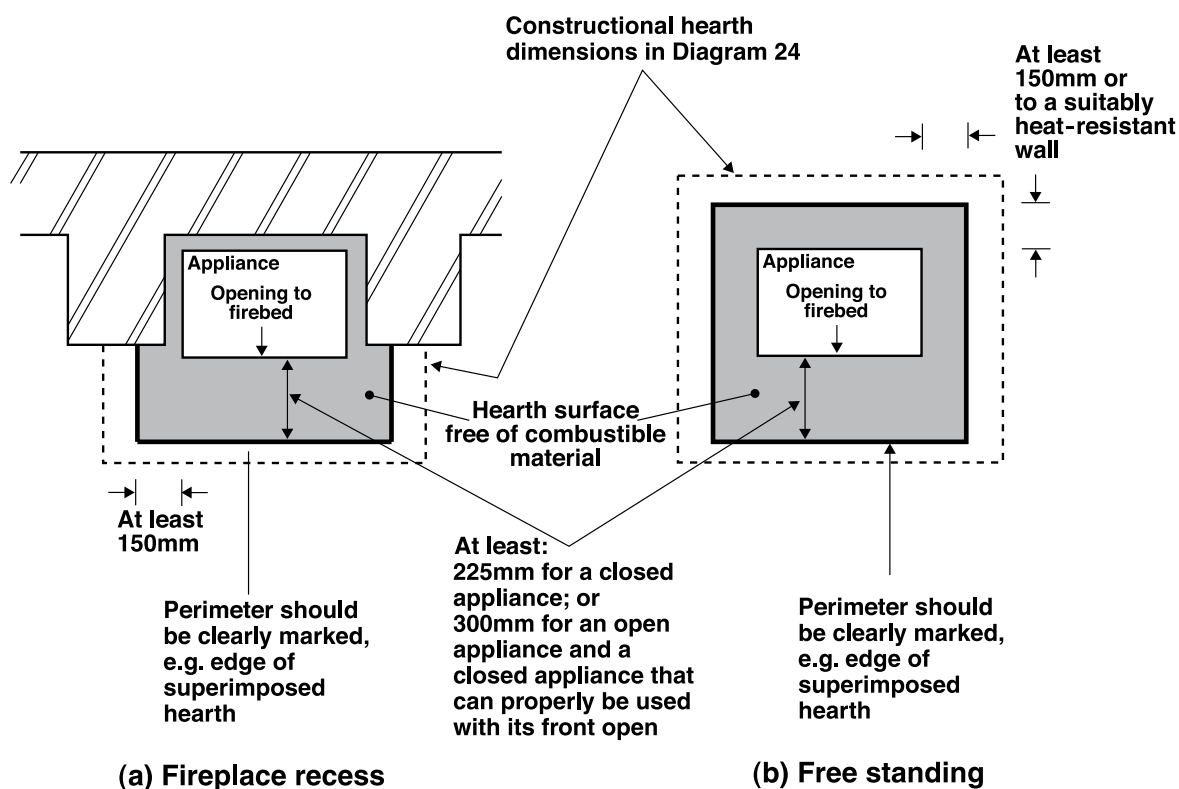


Diagram 20 Non-combustible hearth surface surrounding a solid fuel appliance



2.26 An appliance should be located on a hearth so that it is surrounded by a surface free of combustible material as shown in Diagram 20. This surface may be part of the surface of the hearth provided in accordance with Paragraph 2.23, or it may be the surface of a superimposed hearth laid wholly or partly upon a constructional hearth. The boundary of this surface should be visually apparent to provide a warning to the building occupants and to discourage combustible floor finishes such as carpet from being laid too close to the appliance. A way of achieving this would be to provide a change in level.

2.27 Dimensions shown in Diagram 20 may be reduced to manufacturer's recommendations for appliances with surface temperatures not exceeding 85°C when in normal operation and where there is no risk of spillage of fuel or ash.

2.28 Combustible material placed on or beside a constructional hearth should not extend under a superimposed hearth by more than 25mm or to closer than 150mm measured horizontally to the appliance.

2.29 Some ways of making these provisions are shown in Diagram 21.

Fireplace recesses and prefabricated appliance chambers

2.30 Fireplaces for open fires need to be constructed such that they adequately protect the building fabric from catching fire. A way of achieving the requirements would be to build:

- a. fireplace recesses from masonry or concrete as shown in Diagram 22; or
- b. prefabricated factory-made appliance chambers using components that are made of insulating concrete having a density of between 1200 and 1700 kg/m³ and with the minimum thickness as shown in Table 4. Components should be supplied as sets for assembly and jointing in accordance with the manufacturer's instructions.

Fireplace lining components

2.31 A fireplace recess may require protection from heat if it is to provide a durable setting for certain appliances such as inset open fires. Suitable protection would be fireplace lining components as shown in Diagram 23 or lining the recess with suitable firebricks.

Walls adjacent to hearths

2.32 Walls that are not part of a fireplace recess or a prefabricated appliance chamber but are adjacent to hearths or appliances also need to protect the building from catching fire. A way of achieving the requirement is shown in Diagram 24. Thinner material could be used provided it gives the same overall level of protection as the solid non-combustible material.

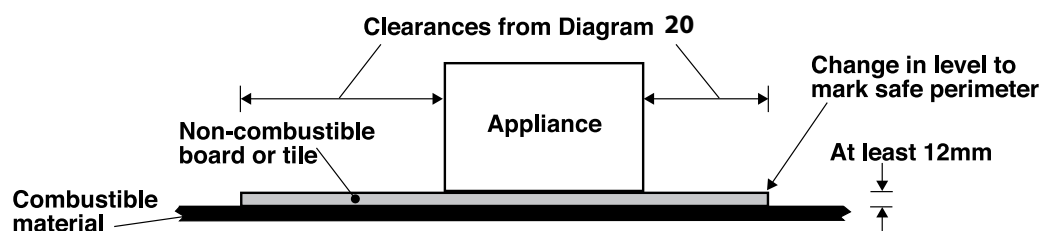
2.33 Clearances shown in Diagram 24 may be reduced to manufacturer's recommendations for appliances with surface temperatures not exceeding 85°C when in normal operation.

Alternative approach

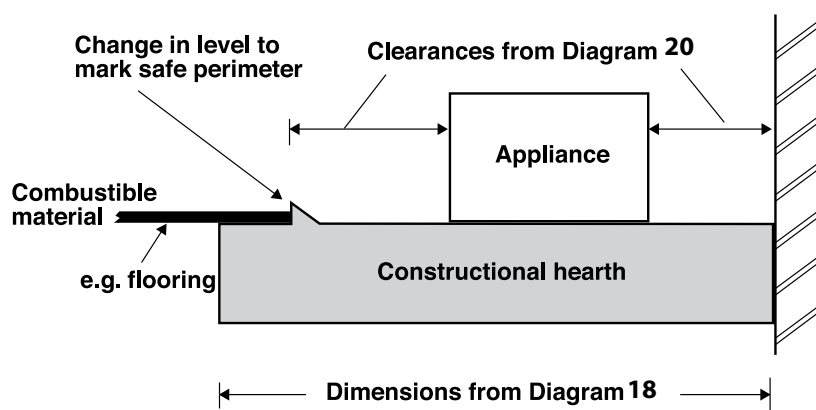
The requirements may also be met by adopting the relevant recommendations in the publications listed below to achieve a level of performance equivalent to that obtained by following the guidance in this Guernsey Technical Standard:

- a. *BS EN 15287-1:2007 Chimneys. Design, installation and commissioning of chimneys. Chimneys for non-room-sealed heating appliances;* and
- b. *BS 8303:1994 Installation of domestic heating and cooking appliances burning solid mineral fuels. Parts 1 to 3.*

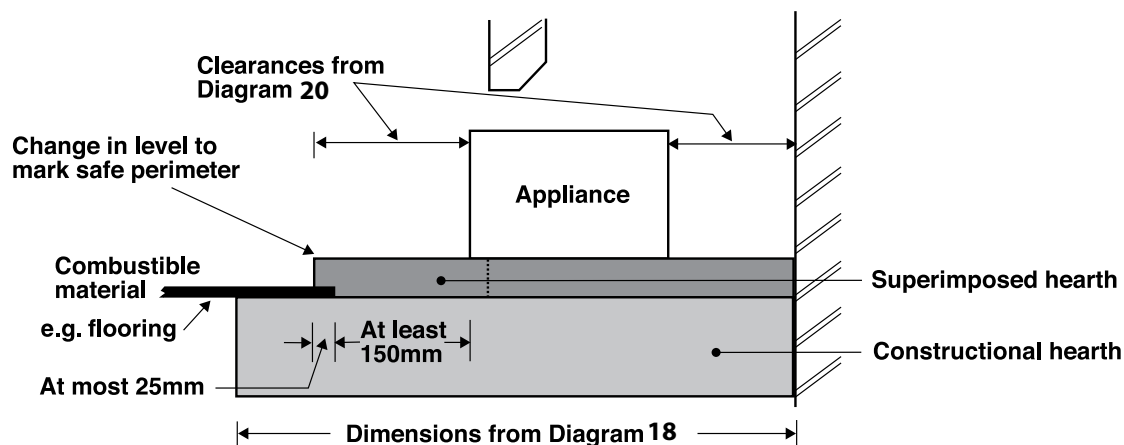
Diagram 21 Ways of providing hearths



(a) Appliance that cannot cause hearth temperature to exceed 100°C



(b) Any appliance standing directly on a constructional hearth



(c) Any appliance in a fireplace recess with a superimposed hearth

Table 4 Prefabricated appliance chambers: minimum thickness

Component	Minimum thickness (mm)
Base	50
Side section, forming wall on either side of chamber	75
Back section, forming rear of chamber	100
Top slab, lintel or gather, forming top of chamber	100

Diagram 22 Fireplace recesses

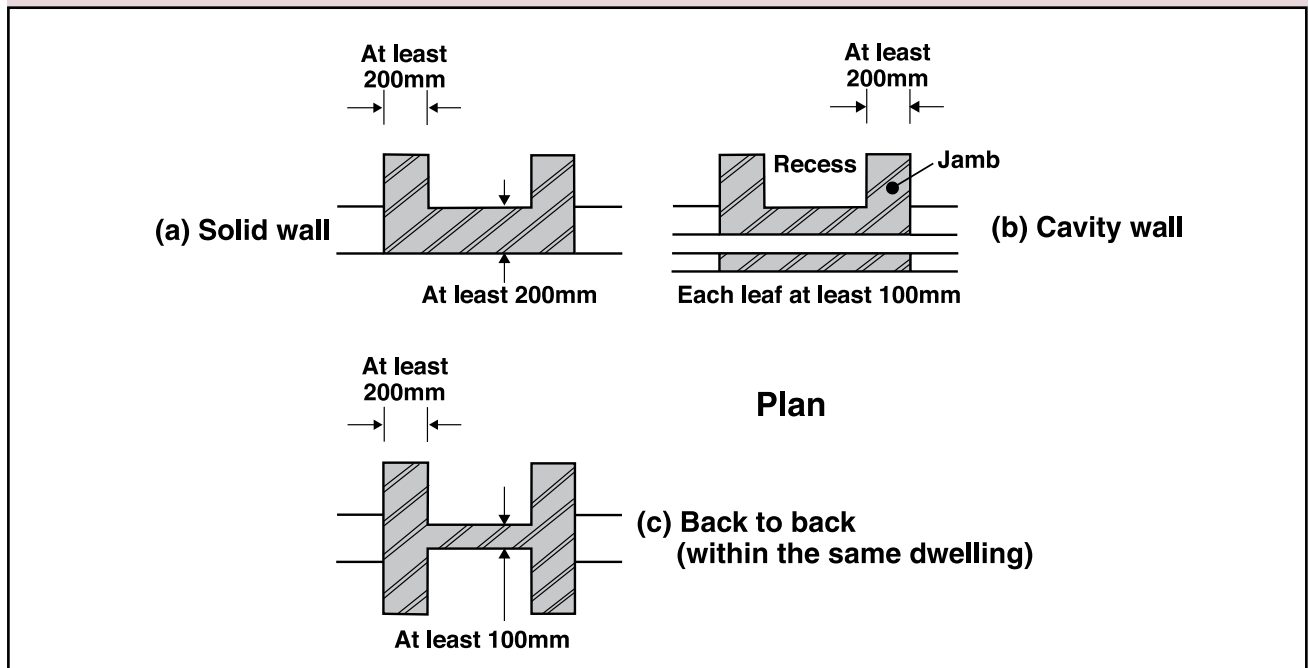
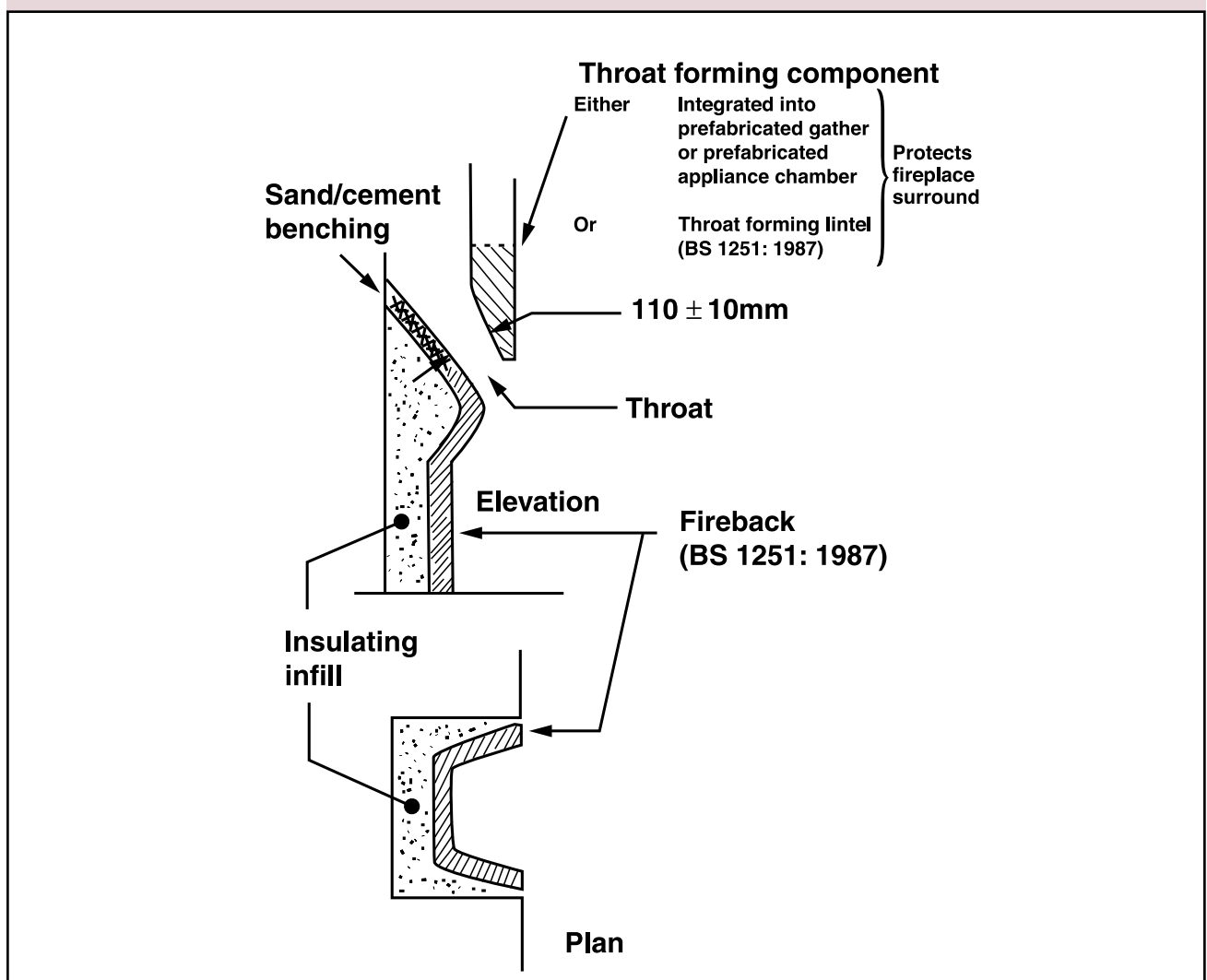


Diagram 23 Open fireplaces: throat and fireplace components



J1 - 4 ADDITIONAL PROVISIONS FOR APPLIANCES BURNING SOLID FUEL (INCLUDING SOLID BIOFUEL) WITH A RATED OUTPUT UP TO 50Kw

Carbon monoxide alarms

2.34 Where a new or replacement fixed solid fuel appliance is installed in a dwelling, a carbon monoxide alarm should be provided in the room where the appliance is located.

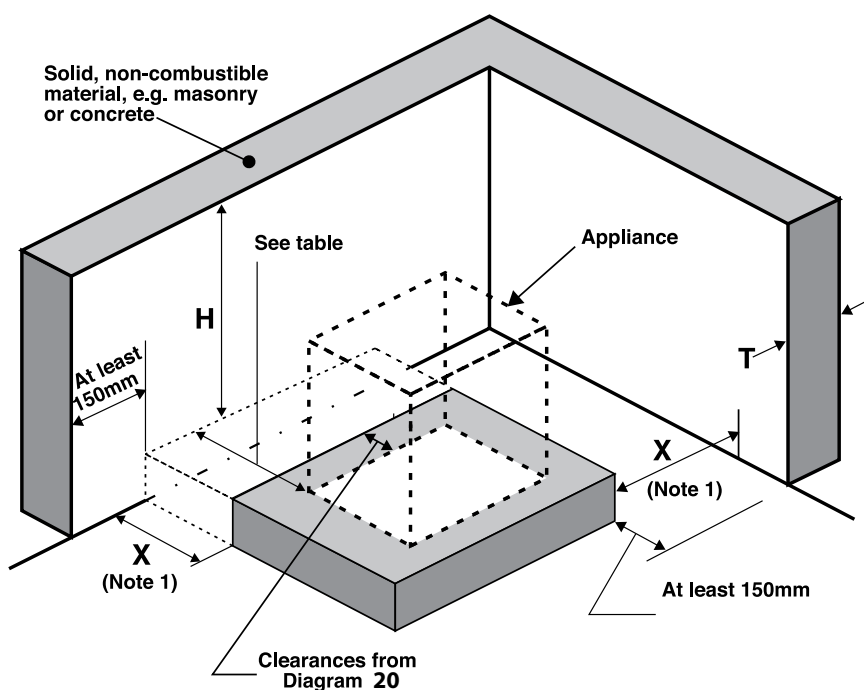
2.35 Carbon monoxide alarms should comply with *BS EN 50291:2001* and be powered by a battery designed to operate for the working life of the alarm. The alarm should incorporate a warning device to alert users when the working life of the alarm is due to pass. Mains-powered *BS EN 50291* Type A carbon monoxide alarms with fixed wiring (not plug-in types) may be used as alternative applications provided they are fitted with a sensor failure warning device.

2.36 The carbon monoxide alarm should be located in the same room as the appliance:

- on the ceiling at least 300mm from any wall or, if it is located on a wall, as high up as possible (above any doors and windows) but not within 150mm of the ceiling; and
- between 1m and 3m horizontally from the appliance.

Note: Further guidance on the installation of carbon monoxide alarms is available in *BS EN 50292:2002* and from manufacturers' instructions. Provision of an alarm should not be regarded as a substitute for correct installation and regular servicing.

Diagram 24 Wall adjacent to hearths



Location of hearth or appliance	Solid, non-combustible material	
	Thickness (T)	Height (H)
Where the hearth abuts a wall and the appliance is not more than 50mm from the wall	200mm	At least 300mm above the appliance and 1.2m above the hearth
Where the hearth abuts a wall and the appliance is more than 50mm but not more than 300mm from the wall	75mm	At least 300mm above the appliance and 1.2m above the hearth
Where the hearth does not abut a wall and is no more than 150mm from the wall (see Note 1)	75mm	At least 1.2m above the hearth
Note: 1. There is no requirement for protection of the wall where X is more than 150mm.		

Section 3 - Additional provisions for gas burning appliances with a rated input up to 70kW (net)

3.1 All gas installations are subject to the requirements of the Health and Safety (Gas) (Guernsey) Ordinance, 2006 made under the Health, Safety and Welfare of Employees Law, 1950 and the Health and Safety at Work etc. (Guernsey Law), 1979 extend to all dangers arising from the transmission, distribution, supply or use of gas conveyed from a gas storage vessel and includes requirements relating to the installation of gas fittings.

The guidance in this section is therefore limited to basic location advice only for the use of designers in development planning. For further guidance refer to the above legislation and associated Code of Practice.

Outlets from flues

3.2 Outlets from flues should be so situated externally as to allow the dispersal of products of combustion and, if a balanced flue, the intake of air. A way of meeting this requirement would be to locate flue outlets as shown in Diagram 25 and Diagram 26.

Note: The plume of wet flue products from condensing boilers, positioned in accordance with the safety distances set out in Diagram 25, can sometimes be considered a nuisance for neighbouring properties. Whilst this nuisance is not considered to be within the scope of the Building Regulations, such installations may be deemed as a nuisance by the Office of Environmental Health and Pollution Regulation.

Diagram 25 Location of outlets from flues serving gas appliances

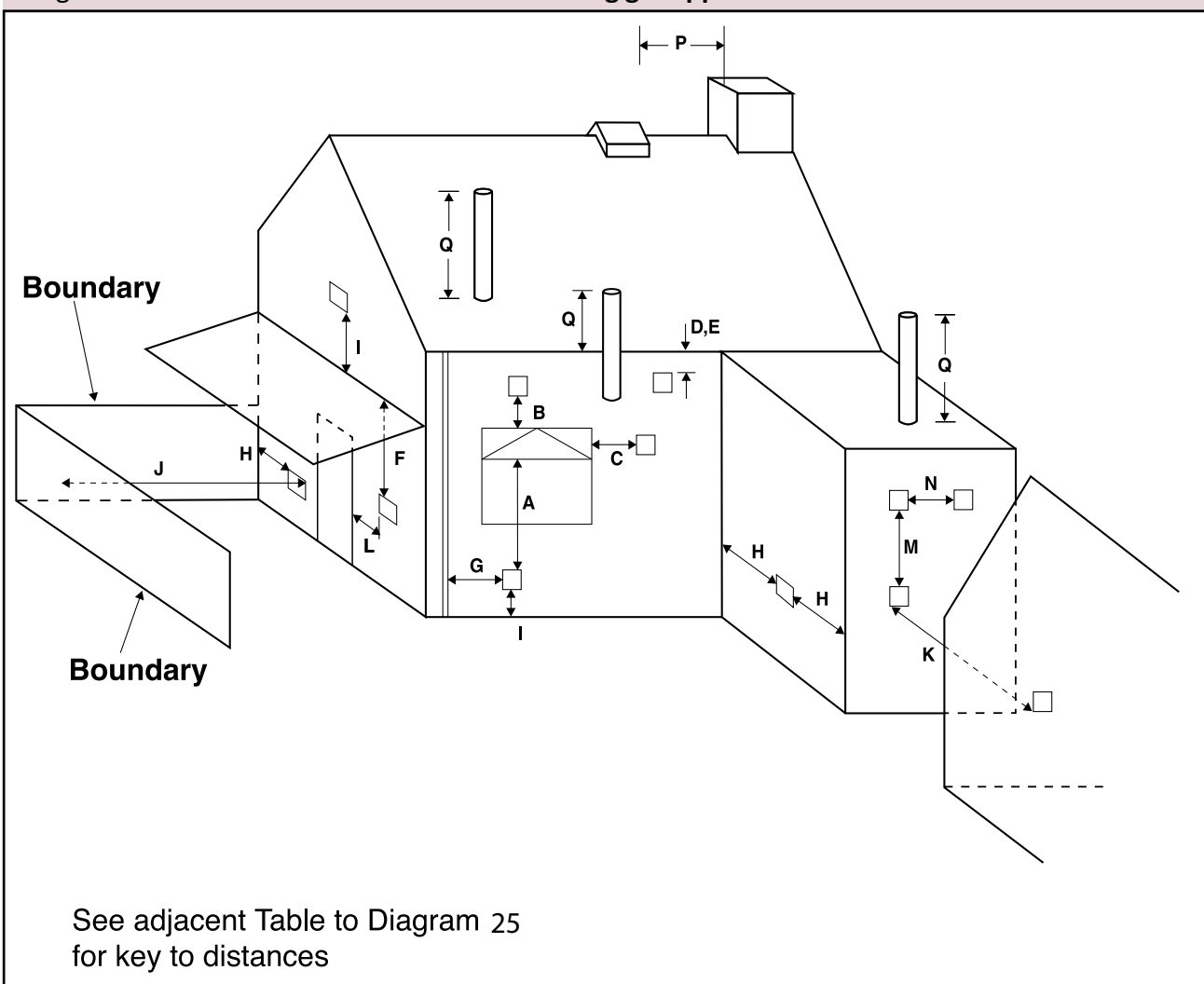


Table 5 - to Diagram 25 Location of outlets from flues serving gas appliances

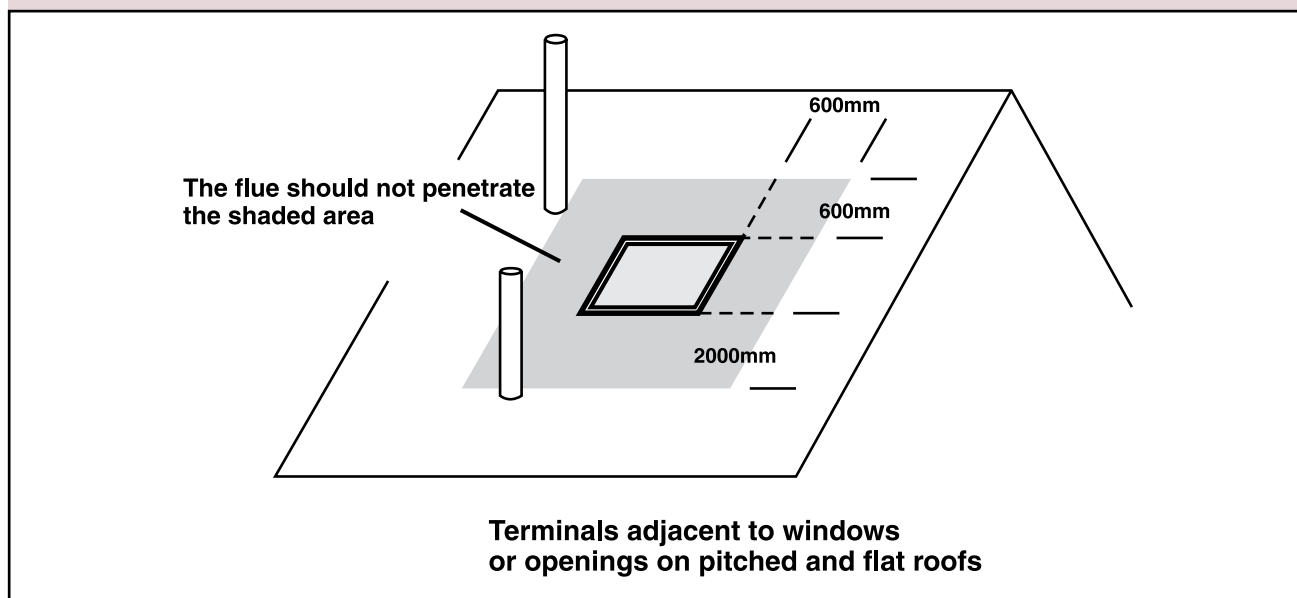
Minimum separation distances for terminals in mm

Location		Balanced flue		Open flue	
		Natural draught	Fanned draught	Natural draught	Fanned draught
A	Below an opening (1)	Appliance rated heat input (net)	300	(3)	300
		0–7kW >7–14kW >14–32kW >32kW			
B	Above an opening (1)	0–32kW >32kW	300 600	(3)	300
C	Horizontally to an opening (1)	0–7kW >7–14kW >14kW	300 400 600	(3)	300
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 BS 5440-1:2008	N/A
Q	Above the highest point of intersection with the roof	N/A	Site in accordance with manufacturer's 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 annex G.** 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.

Diagram 26 Location of outlets near roof windows from flues serving gas appliances



As such installers may wish to adopt the guidance in *Chapter 6 of the Guide to Condensing Boiler Installation Assessment Procedure for Dwellings*

Care may also need to be taken to locate flue outlets away from parts of the building that may be damaged by frequent wetting.

Hearths

3.3 Appliances should be placed on hearths unless:

- they are to be installed so that every part of any flame or incandescent material will be at least 225mm above the floor; or
- the manufacturer's instructions state that a hearth is not required.

3.4 Where hearths are required, guidance on their minimum plan dimensions is given in Diagrams 27 and 28. Hearths should comprise at least a (top) layer of non-combustible, non-friable material not less than 12mm thick. The edges of hearths should be marked to provide a warning to the building occupants and to discourage combustible floor finishes such as carpet from being laid too close to the appliance. A way of achieving this would be to provide a change in level.

Diagram 27 Hearths for decorative fuel effect (DFE) and inset live fuel effect (ILFE) fires: minimum plan dimensions of non-combustible surfaces

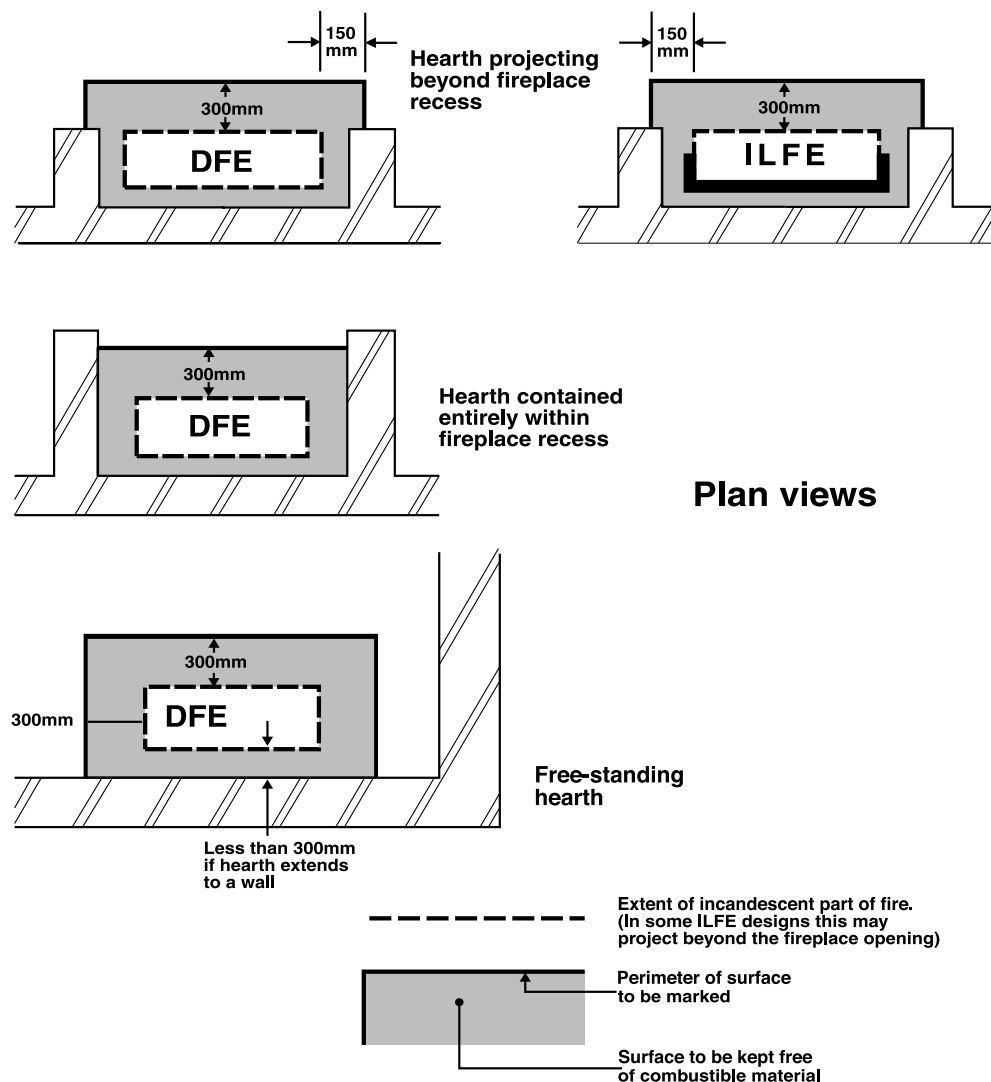
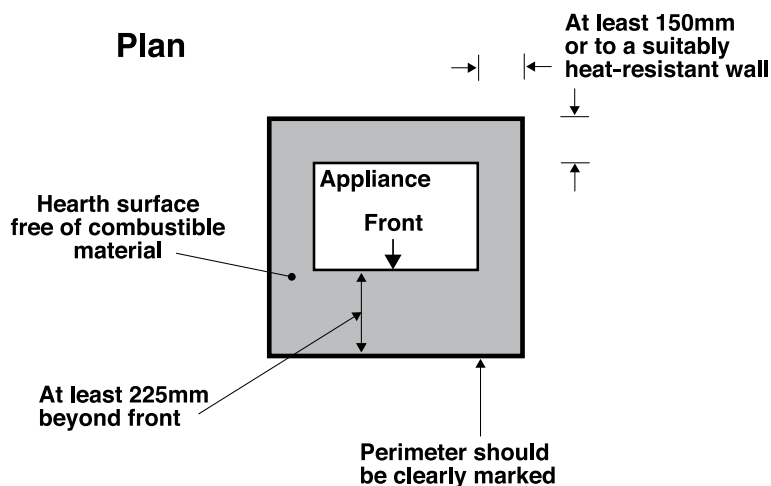


Diagram 28 Hearths for other appliances: plan dimension of non-combustible surfaces



Section 4 - Additional provisions for oil burning appliances with a rated output up to 45kW

Scope

4.1 This guidance is relevant to combustion installations designed to burn oils meeting the specifications for Class C2 (Kerosene) and Class D (Gas oil) given in *BS 2869:2006* or equivalent, liquid biofuel conforming to *EN 14213:2003* and blends of mineral oil and liquid biofuel.

Appliances fitted in bathrooms and shower rooms

4.2 Open-flued oil-fired appliances should not be installed in rooms such as bathrooms and bedrooms where there is an increased risk of carbon monoxide poisoning. Where locating combustion appliances in such rooms cannot be avoided, a way of meeting the requirements would be to provide room-sealed appliances.

Air supply to appliances

4.3 A way of meeting the requirements would be to adopt the general guidance given in Section 1, starting at Paragraph 1.2, and to provide permanently open air vents as shown in Diagram 29 in rooms or spaces containing appliances. An example calculation illustrating the use of this guidance is given in Annex C. Where manufacturers' installation instructions require greater areas of permanently open air vents than those shown in Diagram 29, the manufacturers' advice should be followed.

Size of flues (other than balanced flues and flues designed to discharge through or adjacent to walls)

4.4 Flues should be sized to suit the intended appliance such that they ensure adequate discharge velocity to prevent flow reversal problems but do not impose excessive flow resistances. A way of meeting the requirements would be to use:

- a. connecting fluepipes of the same size as the appliance flue outlet; and
- b. flues in chimneys of the same cross-sectional area as the appliance flue outlet.

When constructing masonry or flueblock chimneys, a way of doing this would be to:

- i. make the flue the same size as the appliance flue outlet; or
- ii. make the flue larger and of a size that would allow the later insertion of a suitable flexible flue liner matching the appliance to be installed.

4.5 Larger flues may need to be provided where appliance manufacturers' installation instructions demand this.

Outlets from flues and flue heights

4.6 The outlet from a flue should be so situated externally as to ensure: the correct operation of a natural draught flue; the intake of air if a balanced flue; and dispersal of the products of combustion.

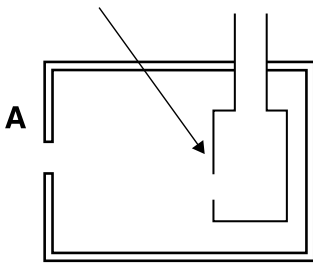
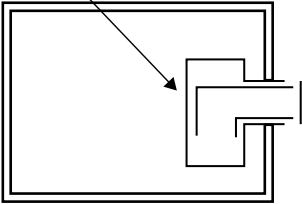
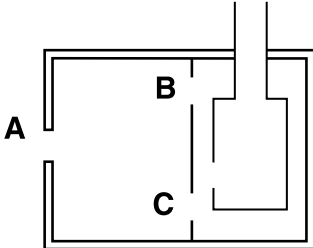
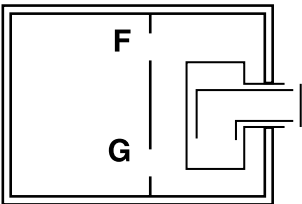
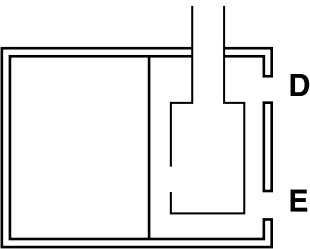
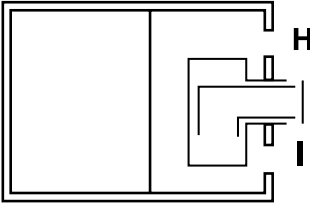
4.7 A way of meeting the requirement could be to follow the guidance in Diagram 30. The separations given in the Table 6 to Diagram 30 are minimum values that may have to be increased where there is a risk that local factors such as wind patterns could disrupt the operation of the flue or where a natural draught flue would not be tall enough to clear the products of combustion of an open-flued appliance. For flues in proximity to roof windows the minimum separation distances identified in Diagram 26 should be applied.

Note: The plume of wet flue products from condensing boilers, positioned in accordance with the safety distances set out in Diagram 30, can sometimes be considered a nuisance for neighbouring properties. Whilst this nuisance is not considered to be within the scope of building regulations, such installations may be deemed as a nuisance by the Office of Environmental Health and Pollution Regulation. As such installers may wish to adopt the guidance in *Chapter 6 of the Guide to Condensing Boiler Installation Assessment Procedure for Dwellings*

Care may also need to be taken to locate flue outlets away from parts of the building that may be damaged by frequent wetting.

4.8 Flue outlets should be protected with terminal guards if persons could come into contact with them or if they could be damaged. If a flue outlet is in a vulnerable position, such as where

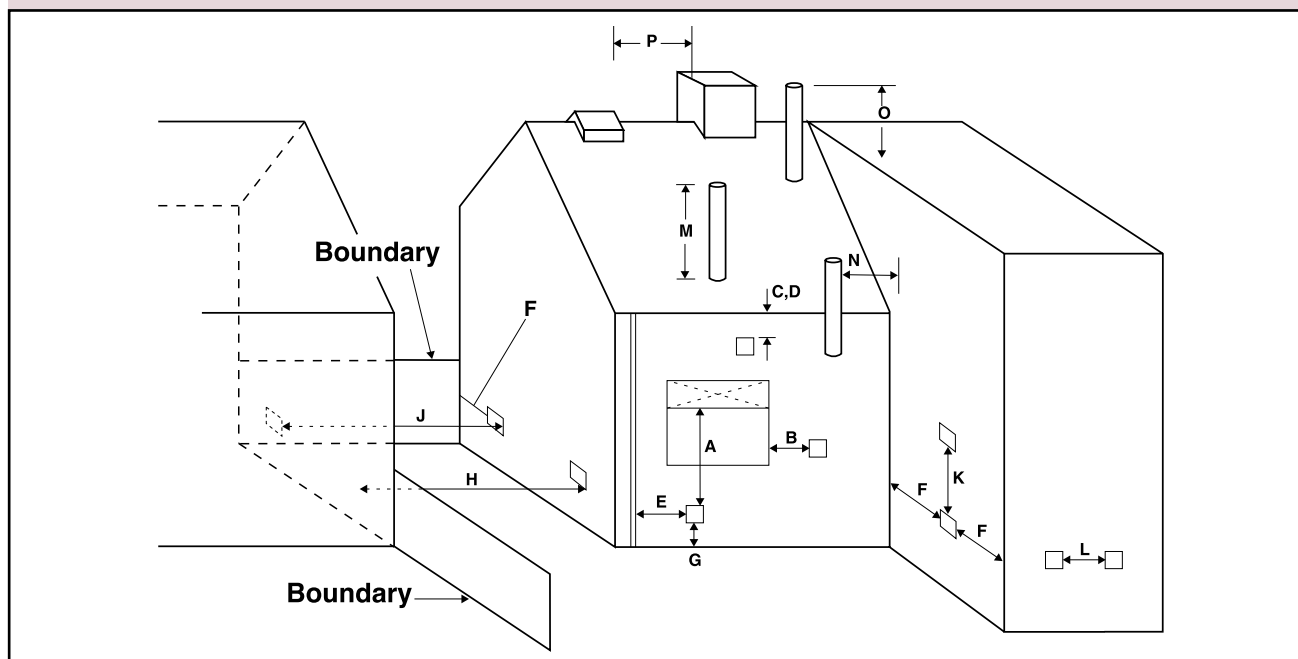
Diagram 29 Free areas of permanently open air vents for oil-fired appliance installations

	Open flued	Room sealed
Appliance in a room or space	<p>Open flued appliance</p>  <p>A = 550mm² per kW output (see Note 3 and 5)</p>	<p>Room-sealed appliance</p>  <p>No vent needed</p>
Appliance in an appliance compartment ventilated via an adjoining room or space	 <p>A = 550mm² per kW output (see Note 3 and 5) B = 1100mm² per kW output C = 1650mm² per kW output</p>	 <p>F = 1100mm² per kW output G = F</p>
Appliance in an appliance compartment ventilated direct to outside	 <p>D = 550mm² per kW output E = 1100mm² per kW output</p>	 <p>H = 550mm² per kW output I = H</p>

Notes:

1. A, D, E, H and I are permanently open vents to the outside. B, C, F and G are permanently open vents between an appliance compartment and a room or space.
2. The area given above is the free area of the vent(s) or the equivalent free area for ventilators of more complex design.
3. Vent A should be increased by a further 550mm² per kW output if the appliance is fitted with a draught break.
4. Divide the area given above in mm² by 100 to find the corresponding area in cm².
5. In older dwellings with an air permeability which is more than 5.0m³/hr/m² the first 5kW(net) can be ignored.

Diagram 30 Location of outlets from flues serving oil-fired appliances



the flue discharges at a point within reach of the ground, balcony, veranda or a window, it should be designed to prevent the entry of any matter that could obstruct the flow.

Flues for oil-fired appliances: flue gas temperature

4.9 Satisfactory provision of chimneys and fluepipes depends upon the flue gas temperature to be expected in normal service and separate guidance is given in this Guernsey Technical Standard according to whether the proposed installation will have a flue gas temperature more than or less than 250°C as measured by a suitable method such as those in OFTEC Standards A100 or A101. Suitable chimney systems may then be selected based on their performance designation having been tested in accordance with the relevant European standard.

4.10 Flue gas temperatures depend upon appliance types and the age of their design. Modern boilers bearing the CE mark, indicating compliance with the Boiler (Efficiency) Regulations (1993), normally have flue gas temperatures not exceeding 250°C. Condensing oil-fired appliances will normally produce flue gas temperatures well below 100°C. Information for individual appliances should be sought from the manufacturer's installation instructions, from the manufacturers

themselves or from OFTEC. Where this is not available, flues should be constructed for an assumed flue gas temperature greater than 250°C.

Provisions for flue gas temperatures in excess of 250°C

4.11 A way of making satisfactory provision for oil appliances in these cases would be to follow the guidance given in Sections 1 and 2 for connecting fluepipes and masonry or flueblock chimneys or to provide a factory-made metal chimney in accordance with Paragraphs 1.42 to 1.46 in Section 1 (but not Paragraph 1.42(b)). However, other products may be acceptable if they have been certified for this purpose.

Provisions for flue gas temperatures not exceeding 250°C

4.12 Satisfactory provision of chimneys and fluepipes for oil appliances in these cases may be achieved by:

- following the guidance on the selection of components and the manner of their installation as given in Paragraphs 4.13 to 4.20 and the references to Section 1 or (if the intended appliance is new and of known type);

Table 6 to Diagram 30 Location of outlets from flues serving oil-fired appliances

Minimum separation distances for terminals in mm

Location of outlet (1)		Appliance with pressure jet burner	Appliance with vaporising burner
A	Below an opening (2, 3)	600	Should not be used
B	Horizontally to an opening (2, 3)	600	Should not be used
C	Below a plastic/painted gutter, drainage pipe or eaves if combustible material protected (4)	75	Should not be used
D	Below a balcony or a plastic/painted gutter, drainage pipe or eaves without protection to combustible material	600	Should not be used
E	From vertical sanitary pipework	300	Should not be used
F	From an external or internal corner or from a surface or boundary alongside the terminal	300	Should not be used
G	Above ground or balcony level	300	Should not be used
H	From a surface or boundary facing the terminal	600	Should not be used
J	From a terminal facing the terminal	1200	Should not be used
K	Vertically from a terminal on the same wall	1500	Should not be used
L	Horizontally from a terminal on the same wall	750	Should not be used
M	Above the highest point of an intersection with the roof	600 (6)	1000 (5)
N	From a vertical structure to the side of the terminal	750 (6)	2300
O	Above a vertical structure which is less than 750mm (pressure jet burner) or 2300mm (vaporising burner) horizontally from the side of the terminal	600 (6)	1000 (5)
P	From a ridge terminal to a vertical structure on the roof	1500	Should not be used

Notes:

1. Terminals should only be positioned on walls where appliances have been approved for such configurations when tested in accordance with BS EN 303-1:1999 or OFTEC standards OFS A100 or OFS A101.
2. An opening means an openable element, such as an openable window, or a permanent opening such as a permanently open air vent.
3. Notwithstanding the dimensions above, a terminal should be at least 300mm from combustible material, e.g. a window frame.
4. A way of providing protection of combustible material would be to fit a heat shield at least 750mm wide.
5. Where a terminal is used with a vaporising burner, the terminal should be at least 2300mm horizontally from the roof.
6. Outlets for vertical balanced flues in locations M, N and O should be in accordance with manufacturer's instructions.

- i) using factory-made components that achieve a performance at least equal to that corresponding to the designation given in Table 7 (for the intended appliance type) when tested to an appropriate European chimney standard (BS EN); and
- ii) installing these components in accordance with the guidance in Paragraphs 4.13 to 4.20 and Section 1, as relevant, and in accordance with the appliance manufacturer's and component manufacturer's installation instructions.

Connecting fluepipe components

4.13 Connecting fluepipes can be constructed using the following components:

- a. any of the options listed in Paragraph 1.32; or
- b. sheet metal fluepipes as described in *BS EN 1856-2:2004*; or
- c. fibre cement pipes as described in *BS EN 1857:2003+A1:2008*; or
- d. any other component that has been certified as suitable for this purpose.

Masonry chimneys

4.14 Masonry chimneys can be built in accordance with Paragraphs 1.27 and 1.28 in Section 1.

Table 7 Minimum performance designations for chimney and fluepipe components for use with new oil-fired appliances with flue gas temperature less than 250°C

Appliance type	Minimum designation	Fuel type
Condensing boiler, including combination boiler, range cooker, range cooker/boiler – with pressure-jet burners	T120 N2 W1 O	Class C2 oil (kerosene) Liquid biofuel conforming to EN 14213:2003
Condensing boiler, including combination boiler, range cooker, range cooker/boiler – with pressure-jet burners	T160 N2 W2 O	Class D oil (heating oil)
Non-condensing boiler, including combination boiler, range cooker, range cooker/boiler – with pressure-jet burners	T250 N2 D1 O	Class C2 oil (kerosene) Liquid biofuel conforming to EN 14213:2003
Non-condensing boiler, including combination boiler, range cooker, range cooker/boiler – with pressure-jet burners	T250 N2 D2 O	Class D oil (heating oil)
Cooker and room heater – with vaporising burner	T160 N2 D1 O	Class C2 oil (kerosene)
Cooker and room heater – with vaporising burner	T250 N2 D2 O	Class D oil (heating oil)

Notes:

1. The designation of chimney products is described in Annex F. The BS EN for the product will specify its full designation and marking requirements.
2. These are default designations. Where the appliance manufacturer's installation instructions specify a higher designation, this should be complied with.
3. Refer to the appliance manufacturer regarding the suitability of the appliance and flue system for use with oil / bio-liquid blends.

Flueblock chimneys

4.15 Chimneys can be constructed from factory-made flueblock systems primarily designed for solid fuel, as described in Paragraphs 1.29 and 1.30 in Section 1. They can also be constructed from factory-made flueblock systems comprising straight blocks, recess units, lintel blocks, offset blocks, transfer blocks and jointing materials complying with:

- a. *BS EN 1858:2003* for concrete flueblocks; or
- b. *BS EN 1806:2006* for clay/ceramic flueblocks, with a performance at least equal to the designation given in Table 7 for the intended appliance type.

4.16 Flueblock chimneys should be installed with sealed joints in accordance with the flueblock manufacturer's installation instructions. Where bends or offsets are required, these should be formed using matching factory-made components. Flueblocks which are not intended to be bonded into surrounding masonry should be supported and restrained in accordance with the manufacturer's installation instructions.

Factory-made metal chimneys

4.17 Chimneys for oil-fired appliances can be constructed using the systems described in Paragraphs 1.42 to 1.46 in Section 1.

Location and shielding of flues

4.18 A way of protecting the building fabric from the heat dissipation from flues, where flue gas temperatures are not expected to exceed 250°C, would be to follow the guidance in Table 8.

4.19 Where a fluepipe or chimney penetrates a fire compartment wall or floor, it must not breach the fire separation requirements of Part B. See Guernsey Technical Standard B for more guidance.

4.20 Fluepipes and factory-made chimneys should also be guarded if they could be at risk of damage or if they present a hazard to people that is not immediately apparent such as when they traverse intermediate floors out of sight of the appliance.

Relining of flues in chimneys

4.21 Lining or relining flues may be building work and, in any case, such work should be carried out so that the objectives of requirements J2 to J4 are met (see Paragraphs 1.34 and 1.35). For flue liners serving oil appliances, ways of meeting the requirements include the use of:

- a. linings suitable for use if the flue gas temperature can be expected to exceed 250°C such as:
 - i. liners as described in Paragraph 1.27;
 - ii. liners as described in Paragraph 2.20;
 - iii. flexible stainless steel liners designated in accordance with *BS EN 1858:2008*;
 - iv. other systems which have been certified as suitable for this purpose.

Table 8 Protecting buildings from hot flues for flue gas temperatures not more than 250°C

Flue within:	Protection measures
Connecting fluepipe Factory-made chimney designated in accordance with BS EN 1856-1:2003	Flues should be at least 25mm from any combustible material (measured from the outer surface of the flue wall, or the outer surface of the inner wall in the case of multi-walled products). Where passing through a combustible wall, floor or roof (other than a compartment wall floor or roof) this separation can be achieved by a non-combustible sleeve enclosing the fluepipe or chimney with a 25mm air-space to the relevant flue wall. (The air-space could be wholly or partially filled with non-combustible insulating material.)
Factory-made chimney designated in accordance with BS EN 1856-1:2003 and BS EN 1856-2:2004	Install in accordance with Paragraph 1.45 of this Approved Document with minimum separation distances according to flue designation.
Masonry chimney	Provide at least 25mm of masonry between flues and any combustible material.
Flueblock chimney	Provide flueblock walls at least 25mm thick.
Flue assemblies for room-sealed appliances	a) flues passing through combustible walls should be surrounded by insulating material at least 50mm thick. b) provide a clearance of at least 50mm from the edge of the flue outlet to any combustible wall cladding.

b. linings suitable for use if the flue gas temperature is unlikely to exceed 250°C such as:

- i. any of the linings described in (a) above;
- ii. other systems which have been certified as suitable for this purpose;
- iii. (if the appliance is new and of known type) flue lining systems that have a performance at least equal to that corresponding to the designation given in Table 7 for the intended appliance type.

4.22 Flexible metal flue liners should be installed in one complete length without joints within the chimney. Other than for sealing at the top and the bottom, the space between the chimney and the liner should be left empty unless this is contrary to the manufacturer's instructions. Double-skin flexible flue liners should be installed in accordance with the manufacturer's installation instructions.

Liners should be installed in accordance with *BS EN 15827-1:2007*.

Flues for appliances burning Class D oil

4.23 Flues which may be expected to serve appliances burning Class D oil should be made of materials which are resistant to acids of sulphur, i.e. minimum flue designation 'D2' for non-condensing appliances or 'W2' for condensing appliances, according to the designation system in *BS EN 1443:2003* and related flue standards.

Hearths for oil-fired appliances

4.24 Hearths are needed to prevent the building catching fire and, whilst it is not a health and safety provision, it is customary to top them with a tray for collecting spilled fuel.

4.25 If the operation of an appliance is unlikely to cause the temperature of the floor below it to exceed 100°C, as shown using an appropriate test procedure such as those in OFTEC Standards A 100 and A 101, special measures may be unnecessary beyond the provision of a rigid, imperforate, and non-absorbent sheet of non-combustible material such as a steel tray. This may be provided as an integral part of the appliance.

4.26 If the appliance could cause the temperature of the floor below it to exceed 100°C, a more substantial hearth is required. A way of meeting the requirement would be to provide a hearth of solid non-combustible material at least 125mm thick (which may include the thickness of any non-combustible floor) with plan dimensions not less than those shown in Diagram 18 in Section 2. It should have no combustible material below it unless there is an air-space of at least 50mm between the material and the underside of the hearth, or there is a distance of at least 250mm between the material and the top of the hearth (see Diagram 19 in Section 2).

4.27 To provide a region around the appliance which is free of any combustible material, the appliance should not be placed closer to the edges of the hearth nor closer to any combustible material which is laid over the hearth than the distances shown in Diagram 31. The perimeter of this safe region should be marked to provide a warning to the building occupants and to discourage combustible floor finishes such as

carpet from being laid too close to the appliance. A way of achieving this would be to provide a change in level.

Shielding of oil-fired appliances

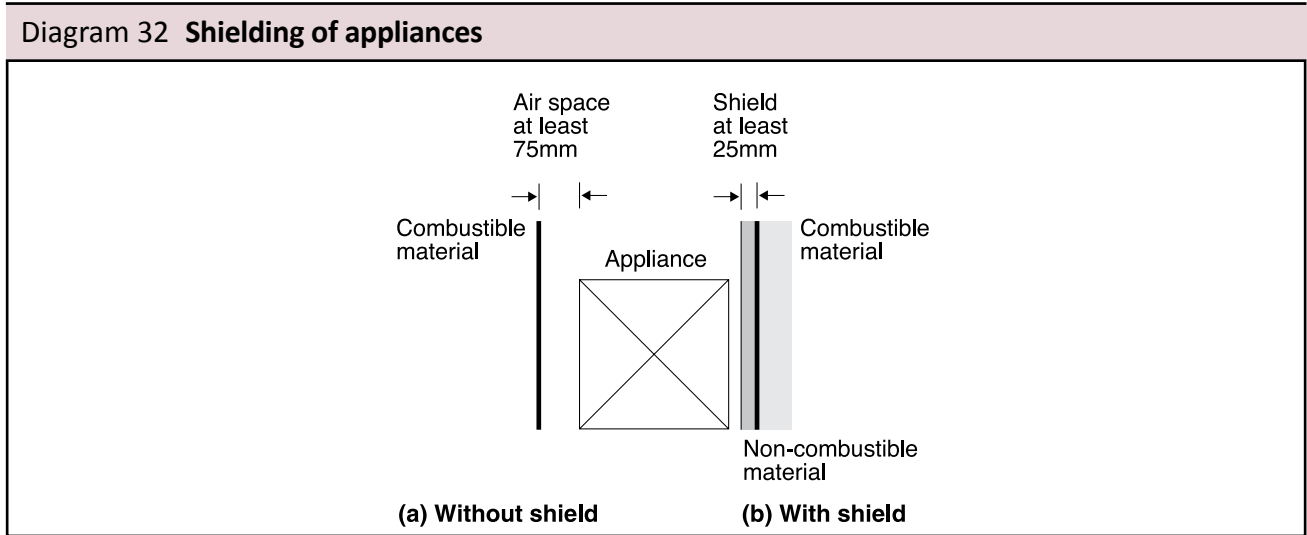
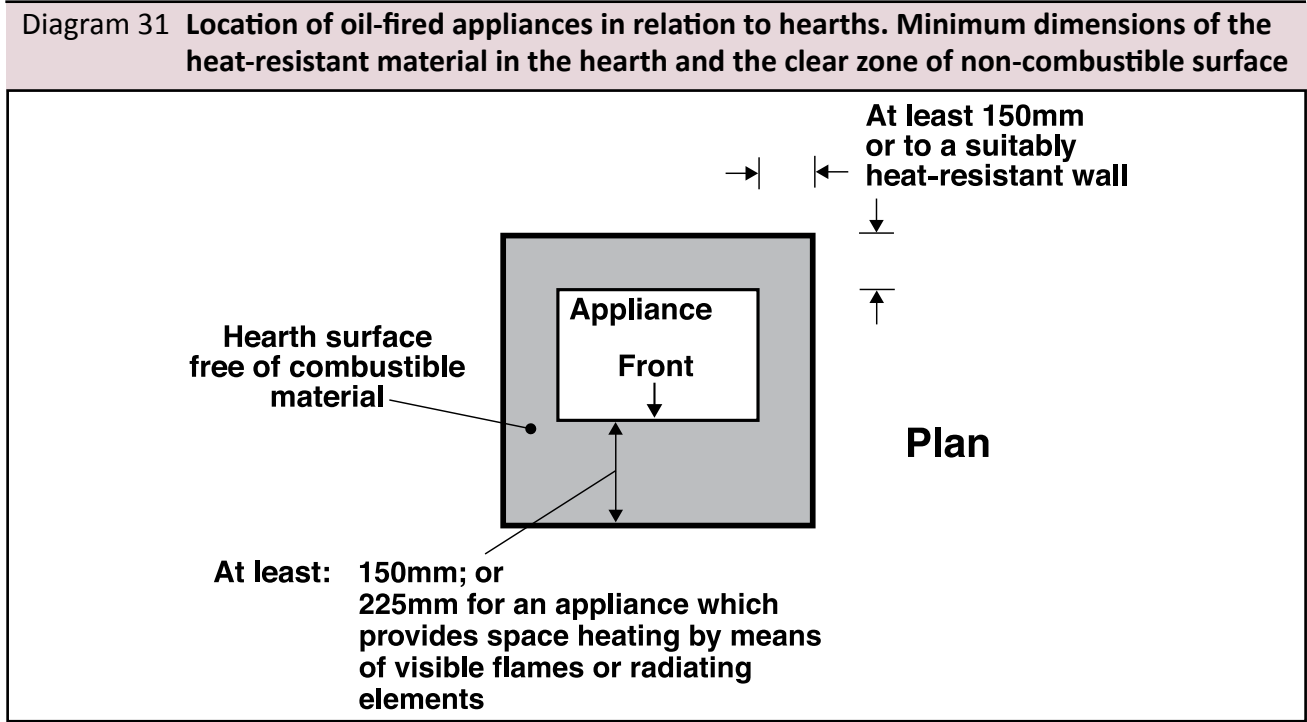
4.28 Combustible materials adjacent to oil-fired appliances may need protection from the effects of heat. Special measures may be unnecessary if the materials will not be subjected to temperatures in excess of 100°C, but otherwise a way of meeting the requirement would be to protect combustible fabric with:

- a. a shield of non-combustible material, such as insulating board with fire-resistant surface; or
- b. an air-space of at least 75mm see Diagram 32

4.29 Appliances having surface temperatures during normal operation of no more than 100°C would not normally require shielding.

Alternative approach

The requirements may also be met by adopting the relevant recommendations in the publication listed below to achieve an equivalent level of performance to that obtained by following the guidance in this Guernsey Technical Standard: *BS 5410-1:1997 Code of practice for oil firing. Installations up to 45kW output capacity for space heating and hot water supply purposes.*



The Requirements J5 and J6

This Guernsey Technical Standard deals with the following requirements from Part J of Schedule 1 to the Building Regulations

Requirement	Limits on application
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Part J Heat Producing Appliances and Fuel Storage Systems

Protection of liquid fuel storage systems

J5. Liquid fuel storage systems and the pipes connecting them to combustion appliances must be so constructed and separated from buildings and the boundary of the premises as to reduce to a reasonable level the risk of the fuel igniting in the event of fire in adjacent buildings or premises.

Protection against pollution

J6. (1) Any oil or gas fired boiler, internal combustion engine or any storage tank, pipes or other apparatus intended to be used for or in conjunction with the consumption, storage or supply of petroleum spirit, oil or gas, or heating oil or gas must be-

(a) so manufactured or constructed that it is impermeable to liquids, and

(b) so sited and constructed that –

(i) it is not prejudicial to the health or safety of any person, and

(ii) it will not contaminate any stream, surface water drain, pond or underground water or water supply.

(2) Any petroleum spirit or oil storage tank must be provided with, and situated in a adequate secondary containment vessel or catchpit, which itself must meet the requirements of subparagraphs (1)(a) and (b)

(3) Any petroleum spirit, or oil storage tank must have affixed in a prominent position a durable notice containing information on how to respond to an oil escape so as to reduce to a reasonable level the risk of pollution.

Guidance

Performance

- J.6** The requirements J6 and J7 will be met if:
- a. oil and LPG fuel storage installations including the pipework connecting them to the combustion appliances in the buildings they serve are located and constructed so that they are reasonably protected from fires which may occur in buildings or beyond boundaries;
 - b. oil storage tanks, their ancillary equipment and the pipework connecting them to combustion appliances in buildings used wholly or mainly for private dwellings:
 - i. are reasonably resistant to physical damage and corrosion and are designed and installed so as to minimise the risk of oil escaping during the filling or maintenance of the tank; and
 - ii. incorporate secondary containment when there is a significant risk of pollution; and
 - iii. are labelled with information on how to respond to a leak.

Introduction to the provisions

J.7 Section 5 gives guidance on requirement J5 for heating oil storage installations with capacities up to 3500 litres and LPG storage installations with capacities up to 1.1 tonne, although there is no size limit on the application of requirement J5. Section 5 also gives guidance on requirement J6, which is limited to installations where the capacity of the oil storage tank is 3500 litres or less, serving buildings used wholly or mainly as private dwellings.

Section 5 - Provisions for liquid fuel storage and supply

Heating oil storage installations

5.1 Guidance is given in this Guernsey Technical Standard on ways of meeting requirements J5 and J6 when proposing to construct oil storage systems with above-ground or semi-buried tanks of 3500 litres capacity or less, used exclusively for heating oil. Heating oils comprise Class C2 oil (kerosene) or Class D oil (gas oil) as specified in *BS 2869:1998, liquid biofuel conforming to EN 14213:2003 and blends of mineral oil and liquid biofuel*. A way of meeting requirements J5 and J6 for such installations would be to follow the relevant recommendations in *BS 5410-1:1997*, whilst also adopting the guidance in paragraphs 5.3 to 5.11.

5.2 Requirement J6 does not apply to oil storage systems where the capacity of the tank exceeds 3500 litres, or where the tank is fully buried or where the building served is not wholly or mainly used as one or more private dwellings. However, requirement J5 applies to oil storage systems serving buildings of all descriptions, where the capacity of the tank exceeds 90 litres, with no upper capacity limit on application, and including cases where the tank is buried. For tanks with capacities in excess of 3500 litres, advice on ways of complying with requirements J5 and any other fire precautions legislation may be sought from the The Guernsey Fire and Rescue Service.

Protective measures against fire

5.3 A way of achieving compliance with requirement J5 would be to adopt the guidance given in Table 9, which also offers advice on reducing the risk of fuel storage system fires igniting buildings and to make provision against the installation becoming overgrown. This can be achieved with a hard surface beneath the tank such as concrete, or paving slabs at least 42mm thick, extending out at least 300mm beyond the perimeter of the tank (or its external skin if it is of the integrally banded type).

Table 9 Fire protection for oil storage tanks

Location of tank	Protection usually satisfactory
Within a building	Locate tanks in a place of special fire hazard which should be directly ventilated to outside. Without prejudice to the need for compliance with all the requirements in Schedule 1, the need to comply with Part B should particularly be taken into account.
Less than 1800mm from any part of a building	a) Make building walls imperforate (1) within 1800mm of tanks with at least 30 minutes fire resistance (2) to internal fire and construct eaves. b) Provide a fire wall (3) between the tank and any part of the building within 1800mm of the tank and construct eaves as in (a) above. The fire wall should extend at least 300mm higher and wider than the affected parts of the tank.
Less than 760mm from a boundary	Provide a fire wall between the tank and the boundary or a boundary wall having at least 30 minutes fire resistance to fire on either side. The fire wall or the boundary wall should extend at least 300mm higher and wider than the top and sides of the tank.
At least 1800mm from the building and at least 760mm from a boundary	No further provisions necessary.

Notes:

1. Excluding small openings such as air bricks etc.
2. Fire resistance in terms of insulation, integrity and stability as determined by testing to the relevant parts of BS 476 or BS EN 1363 or BS EN 1364.
3. Fire walls are imperforate non-combustible walls or screens, such as masonry walls or fire-rated composite panel screens.

5.4 Fire walls should be built to be stable so as not to pose a danger to people around them. A way of achieving this when constructing masonry walls would be to follow the guidance on wall thickness in relation to height given in *The UK's DOE publication - Your garden walls: Better to be safe than sorry* (See annex J).

Oil supply pipe systems: means of automatic isolation

5.5 A way of meeting the requirement would be to install fuel pipework which is resistant to the effects of fire and to fit a proprietary fire valve system in accordance with the relevant recommendations in *BS 5410-1:1997, Sections 8.2 and 8.3*.

Provisions where there is a risk of oil pollution

5.6 Requirement J6 applies to oil storage tanks of 3500 litres or less serving combustion appliances in buildings used wholly or mainly as private dwellings. In such cases, secondary containment should be provided where there is a significant risk of oil pollution. For the purposes of requirement J6, there is a significant risk of pollution if the oil storage installation:

- a. has a total capacity of more than 2500 litres; or
- b. is located within the Islands water catchment area; or
- c. is located where spillage could run into an open drain or to a loose-fitting manhole cover; or
- d. is located within 50m of sources of potable water, such as wells, bore-holes or springs; or
- e. is located where oil spilled from the installation could reach the waters listed above by running across hard ground; or
- f. is located where tank vent pipe outlets cannot be seen from the intended filling point.

Note: The Islands catchment area is shown on a map lodged at the Greffe and is available to view by contacting Guernsey Water.

5.7 When secondary containment is considered necessary, a way of meeting the requirement would be to:

- a. provide an integrally bundled prefabricated tank; or
- b. construct a bund from masonry or concrete in accordance with the general guidance in *Above Ground Oil Storage Tanks: PPG2 (2004)* and the specific advice in *Masonry Bunds for Oil Storage Tanks* or *Concrete Bunds for Oil Storage Tanks*, as appropriate. However:
- c. where the bund walls are part of the walls of a chamber or building enclosing the tank, any door through such walls should be above bund level; and
- d. specialist advice should be sought where the bund has a structural role as part of a building.

5.8 Bunds, whether part of prefabricated tank systems or constructed on site, should have a capacity of at least 110 per cent of the largest tank they contain. Integrally bundled oil tanks that comply with the following standards will meet this provision:

- i. *OFS T100 Oil Firing Equipment Standard – Polyethylene Oil Storage Tanks for Distillate Fuels (2008)*;
- ii. *OFS T100 Oil Firing Equipment Standard – Steel Oil Storage Tanks and Tank Bunds for use with Distillate Fuels, Lubrication Oils and Waste Oils (2008)*.

5.9 An oil storage installation should carry a label in a prominent position giving advice on what to do if an oil spill occurs and the telephone number of Guernsey Water's Emergency Hotline (01481 264073).

LPG storage installations

5.10 LPG installations are controlled by legislation enforced by the Health and Safety Executive. Factors which determine the amount of building work necessary for a LPG storage installation to comply include its capacity, whether tanks are installed above or below ground and the nature of the premises they serve. A storage installation may be shown to comply with the legislation by constructing it in accordance with an appropriate industry Code of Practice, prepared in consultation with the UK's HSE. However, for an installation of up to 1.1 tonne capacity, whose tank stands in the open air, following the guidance in this Guernsey Technical Standard and the relevant guidance in Guernsey Technical Standard B, will normally ensure that no further building work is needed to comply with other legislation.

Tank location and protective measures

5.11 For LPG storage systems of up to 1.1 tonne capacity, comprising one tank standing in the open air, a way of meeting the requirement J6 would be to comply with the relevant recommendations in the *UKLPG Code Of Practice 1: Bulk LPG Storage at Fixed Installations Part 1 (2009)* and *BS 5482-1:2005* (see Annex E and Annex J) whilst also adopting the following guidance:

5.12 The LPG tank should be installed outdoors and not within an open pit. The tank should be adequately separated from buildings, the boundary and any fixed sources of ignition to enable safe dispersal in the event of venting or leaks and in the event of fire to reduce the risk of fire spreading. A way of meeting the requirements in normal situations would be to adopt the separation distances in Table 10 and Diagram 33, which also offers advice on reducing the risk of LPG storage fires igniting the building. Drains, gullies and cellar hatches within the separation distances should be protected from gas entry.

5.13 Fire walls may be free-standing walls built between the tank and the building, boundary and fixed source of ignition (see Diagram 33 (b)) or a part of the building or a boundary wall belonging to the property. Where a fire wall is part of the building or a boundary wall, it should be located in accordance with Diagram 33(c) and, if part of the building, constructed in accordance with Diagram 33(d).

5.14 Suitable fire walls would be imperforate and of solid masonry, concrete or similar construction. They should have a fire resistance (insulation, integrity and stability (REI)) of at least 30 minutes but, if part of the building as shown in Diagram 33 (d), they should have a fire resistance (REI) of at least 60 minutes. To ensure good ventilation, fire walls should not normally be built on more than one side of a tank.

5.15 A fire wall should be at least as high as the pressure relief valve. It should extend horizontally such that the separation specified in Table 10 (Column B) is maintained:

- a. when measured around the ends of the fire wall as shown in Diagram 33(b); or
- b. when measured to the ends of the fire wall as shown in Diagram 33(c), if the fire wall is the boundary or part of the building.

Location and support of cylinders

5.16 Where an LPG storage installation consists of a set of cylinders, a way of meeting the requirements would be to follow the provisions below and as shown in Diagram 34.

5.17 Provisions should enable cylinders to stand upright, secured by straps or chains against a wall outside the building in a well-ventilated position at ground level, where they are readily accessible, reasonably protected from physical damage and where they do not obstruct exit routes from the building. Satisfactory building work provisions would be to provide a firm level base such as concrete at least 50mm thick or paving slabs bedded on mortar at a location so that cylinder valves will be:

- a. at least 1m horizontally and 300mm vertically from openings in the building or heat sources such as flue terminals and tumble-dryer vents; and
- b. at least 2m horizontally from drains without traps, unsealed gullies or cellar hatches unless an intervening wall not less than 250mm high is provided.

Table 10 Fire protection for LPG storage tanks (see Diagram 33)

(A) Capacity of tank not exceeding (tonnes):	Minimum separation distances from buildings, boundaries or fixed sources of ignition (metres)	
	(B) To a tank with no fire wall or to a tank around a fire wall	(C) To a tank shielded by a fire wall
0.25	2.5	0.3
1.1	3	1.5

Diagram 33 Separation or shielding of liquefied petroleum gas tanks of up to 1.1 tonne capacity from buildings, boundaries and fixed sources of ignition

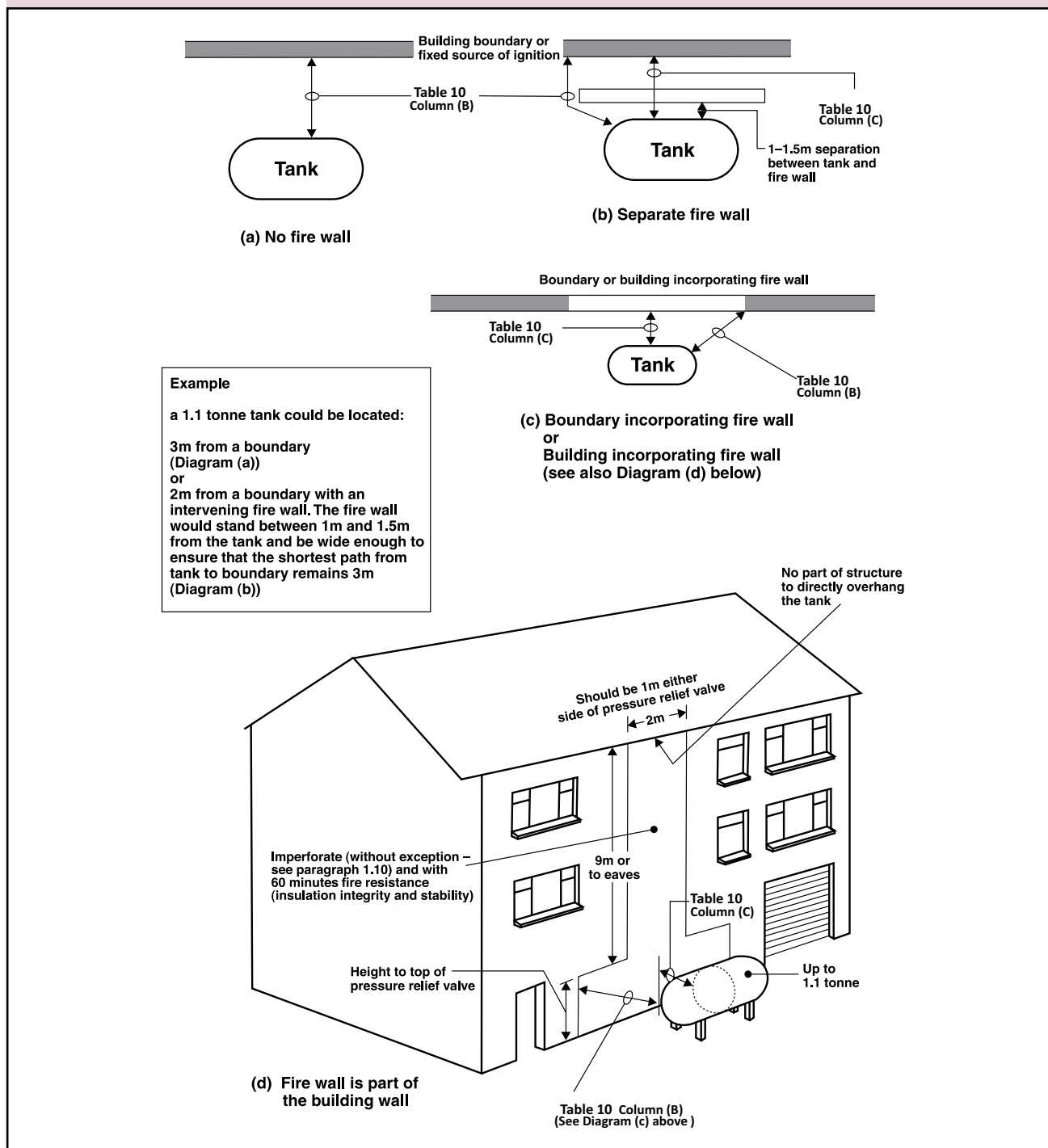
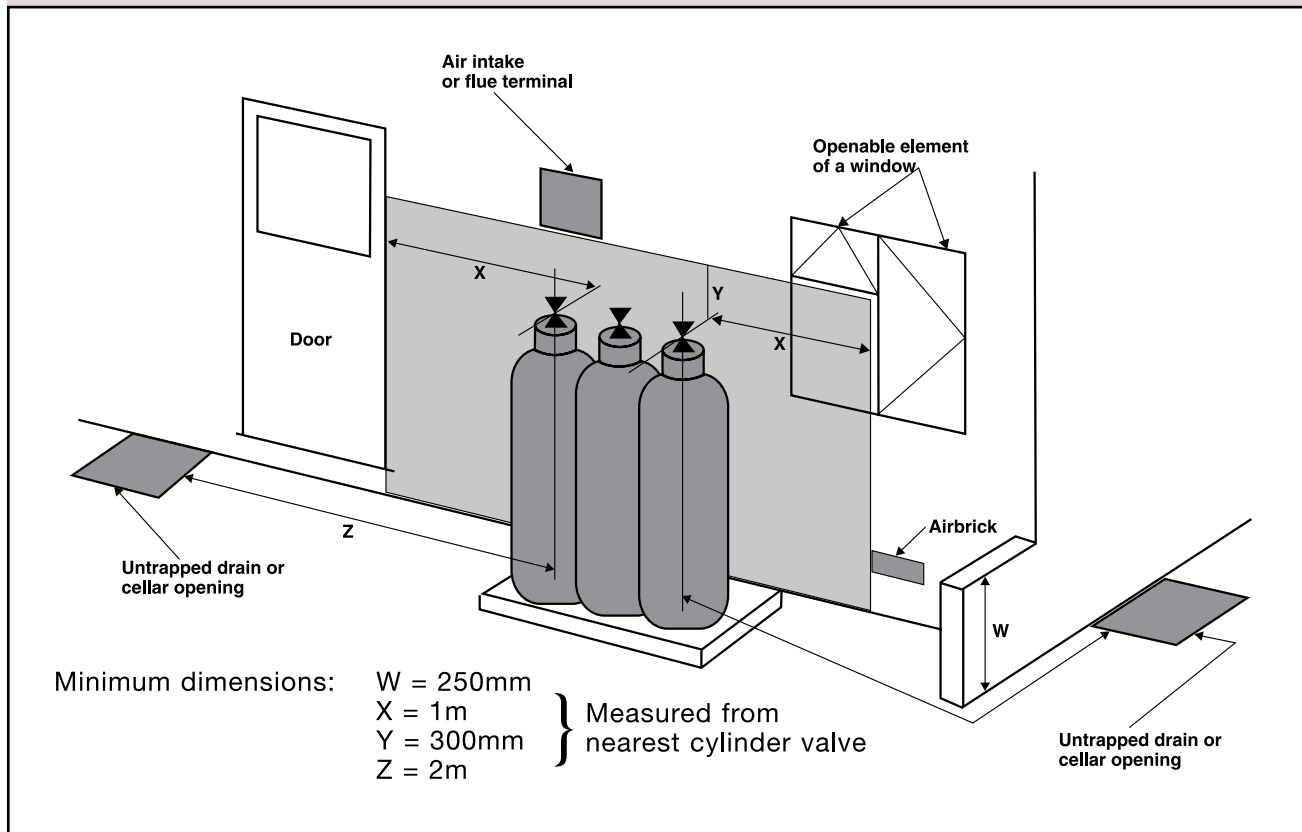


Diagram 34 Location of LPG cylinders



The Requirement J7

This Guernsey Technical Standard deals with the following requirements from Part J of Schedule 1 to the Building Regulations.

<i>Requirement</i>	<i>Limits on application</i>
Part J Heat Producing Appliances and Fuel Storage Systems	
Clean air	
J7. (1) Furnaces and boilers must be installed so as to operate, as far as practicable, without emitting -	
(a) smoke, or	
(b) grit and dust	
(2) “Furnace” in this paragraph means any furnace except -	
(a) one designed solely or mainly for a single family dwelling, or	
(b) one used for heating a boiler with the maximum heating capacity of less than 45 kilowatts per hour.	

Guidance

Performance

J8 An installation will meet the requirements of J7 if an installation is constructed so as to prevent as far as is reasonably practicable, the escape of smoke, grit, dust or gases into the atmosphere.

Section 6 - Provisions meeting the requirements of J7

The requirements will be met by -

- 6.1** A solid fuel burning appliance which;
- a) complies with *BS 8303-1:1994, BS 8303-2:1994 and BS 8303-3:1994*, or
 - b) has been installed under the Competent person self certification scheme under Schedule 3 of the Building Regulations
- 6.2** An oil-fired appliance which;
- a) complies with the recommendations of *BS 5410-2:1978 Code of practice for oil firing. Installations of 45kW and above output capacity for space heating, hot water and steam supply purposes.*
 - b) has been installed under the Competent person self certification scheme under Schedule 3 of the Building Regulations
- 6.3** A gas fired appliance which has been installed under the Competent person self certification scheme under Schedule 3 of the Building Regulations

And-

6.4 Where applicable, the chimney or flue-pipe height and position complies with the recommendations of the guidance given in UK document *Chimney heights: Third edition of the 1956 Clean Air Act memorandum. ISBN 9780117515567*

Annex A - Checklist for checking and testing of hearths, fireplaces, flues and chimneys

Hearth, fireplace, flues and chimneys

The checklist can help you to ensure hearths, fireplaces, flues and chimneys are satisfactory. If you have been directly engaged, copies should also be offered to the client and to the Building Control Body to show what you have done to comply with the requirements of Part J. If you are a sub-contractor, a copy should be offered to the main contractor.

1.	Building address, where work has been carried out			
.....				
.....				
2.	Identification of hearth, fireplace, chimney or flue.	Example: Fireplace in lounge	Example: Gas fire in rear addition bedroom	Example: Small boiler room
3.	Firing capability: solid fuel/gas/oil/all.	All	Gas only	Oil only
4.	Intended type of appliance. State type or make. If open fire give finished fireplace opening dimensions.	Open fire 480 W x 560 H (mm)	Radiant/convactor fire 6kW input	Oil fire boiler 18kW output (pressure jet)
5.	Ventilation provisions for the appliance: State type and area of permanently open air vents.	2 through wall ventilators each 10,000mm ² (100cm ²)	Not fitted	Vents to outside: Top 9,900mm ² Bottom 19,800mm ²
6.	Chimney or flue construction			
a)	State the type and make and whether new or existing.	New. Brick with clay liners 200mm Ø	Existing masonry	S.S. prefab to BS 4543-2 127mm Ø
b)	Internal flue size (and equivalent height, where calculated – natural draught gas appliances only).		125mm Ø (H ₀ =3.3m)	
c)	If clay or concrete flue liners used confirm they are correctly jointed with socket end uppermost and state joining materials used.	Sockets uppermost Jointed by fire cement	Not applicable	Not applicable
d)	If an existing chimney has been refurbished with a new liner, type or make of liner fitted.	Not applicable to BS 715	Flexible metal liner	Not applicable
e)	Details of flue outlet terminal and diagram reference.			
	Outlet detail:	Smith Ltd Louvred pot 200mm Ø	125mm Ø GC1 terminal	Maker's recommended terminal
	Compiles with:	As Diagram 11, GTS J	As BS 5440-1:2008	As Diagram 30, GTS J
f)	Number and angle of bends.	2 x 45°	2 x 45°	1 x 90° Tee
g)	Provision for cleaning and recommended frequency.	Sweep annually via fireplace opening	Annual service by Gas Safe Register engineer	Sweep annually via base of Tee and via appliance
7.	Hearth, form of construction. New or existing?	<u>New.</u> Tiles on concrete floor. 125mm thick. As Diagram 19 GTS J	<u>Existing</u> hearth for solid fuel fire, with fender.	<u>New.</u> Solid floor Min 125mm concrete above DPM. As Diagram 31, GTS J
8.	Inspection and testing after completion Test carried out by: Test (Annex E in GTS J) and results	Inspected and tested by J Smith, Smith Building Co.	Tested by J Smith, GasSafe Reg no. 1234	Tested by J Smith, The Oil Heating Co.
	Flue inspection	visual	Not possible, bends	Checked to Section 10, BS7566:Part 3: 1992 – OK
		sweeping	OK	Not applicable
		coring ball	OK	Not applicable
		smoke	OK	Not applicable
	Appliance (where included) spillage	Not included	OK	OK

I/We the undersigned confirm that the above details are correct. In my opinion, these works comply with the relevant requirements in Part J of Schedule 1 to the Building Regulations.

Print name and title Profession

Capacity ... (e.g. "Proprietor of Smith's Flues", Authorising Engineer for Brown plc)..... Tel no.

Address Postcode

Signed Date

Registered membership of ... (e.g. GasSafe, OFTEC, HETAS)

CHECKLIST FOR CHECKING AND TESTING OF HEARTHES, FIREPLACES, FLUES AND CHIMNEYS

Blank form – This page may be copied to provide certificates for use

Hearth, fireplace, flues and chimneys	
<p>The checklist can help you to ensure that hearths, fireplaces, flues and chimneys are satisfactory. If you have been directly engaged, copies should also be offered to the client and to the Building Control Body to show what you have done to comply with the requirements of Part J. If you are a sub-contractor, a copy should be offered to the main contractor.</p>	
<p>1. Building address, where work has been carried out.....</p> <p>.....</p> <p>.....</p>	
2. Identification of hearth, fireplace, chimney or flue.	
3. Firing capability: solid fuel/gas/oil/all.	
4. Intended type of appliance. State type or make. If open fire give finished fireplace opening dimensions.	
5. Ventilation provisions for the appliance: State type and area of permanently open air vents.	
<p>6. Chimney or flue construction</p> <p>a) State the type and make and whether new or existing.</p> <p>b) Internal flue size (and equivalent height, where calculated – natural draught gas appliances only).</p> <p>c) If clay or concrete flue liners used confirm they are correctly jointed with socket end uppermost and state joining materials used.</p> <p>d) If an existing chimney has been refurbished with a new liner, type or make of liner fitted.</p> <p>e) Details of flue outlet terminal and diagram reference.</p> <p style="text-align: right;">Outlet detail:</p> <p style="text-align: right;">Complies with:</p> <p>f) Number and angle of bends.</p> <p>g) Provision for cleaning and recommended frequency.</p>	
7. Hearth, form of construction. New or existing?	
<p>8. Inspection and testing after completion</p> <p>Test carried out by:</p> <p>Test (Annex E in GTS J) and results</p> <p>Flue inspection</p> <p style="text-align: right;">visual sweeping coring ball smoke</p> <p style="text-align: right;">Appliance (where included) spillage</p>	
<p>I/We the undersigned confirm that the above details are correct. In my opinion, these works comply with the relevant requirements in Part J of Schedule 1 to the Building Regulations.</p> <p>Print name and title Profession</p> <p>Capacity ...(e.g. "Proprietor of Smith's Flues", Authorising Engineer for Brown plc)..... Tel no.</p> <p>Address Postcode</p> <p>Signed Date</p> <p>Registered membership of ... (e.g. GasSafe, OFTEC, HETAS)</p>	

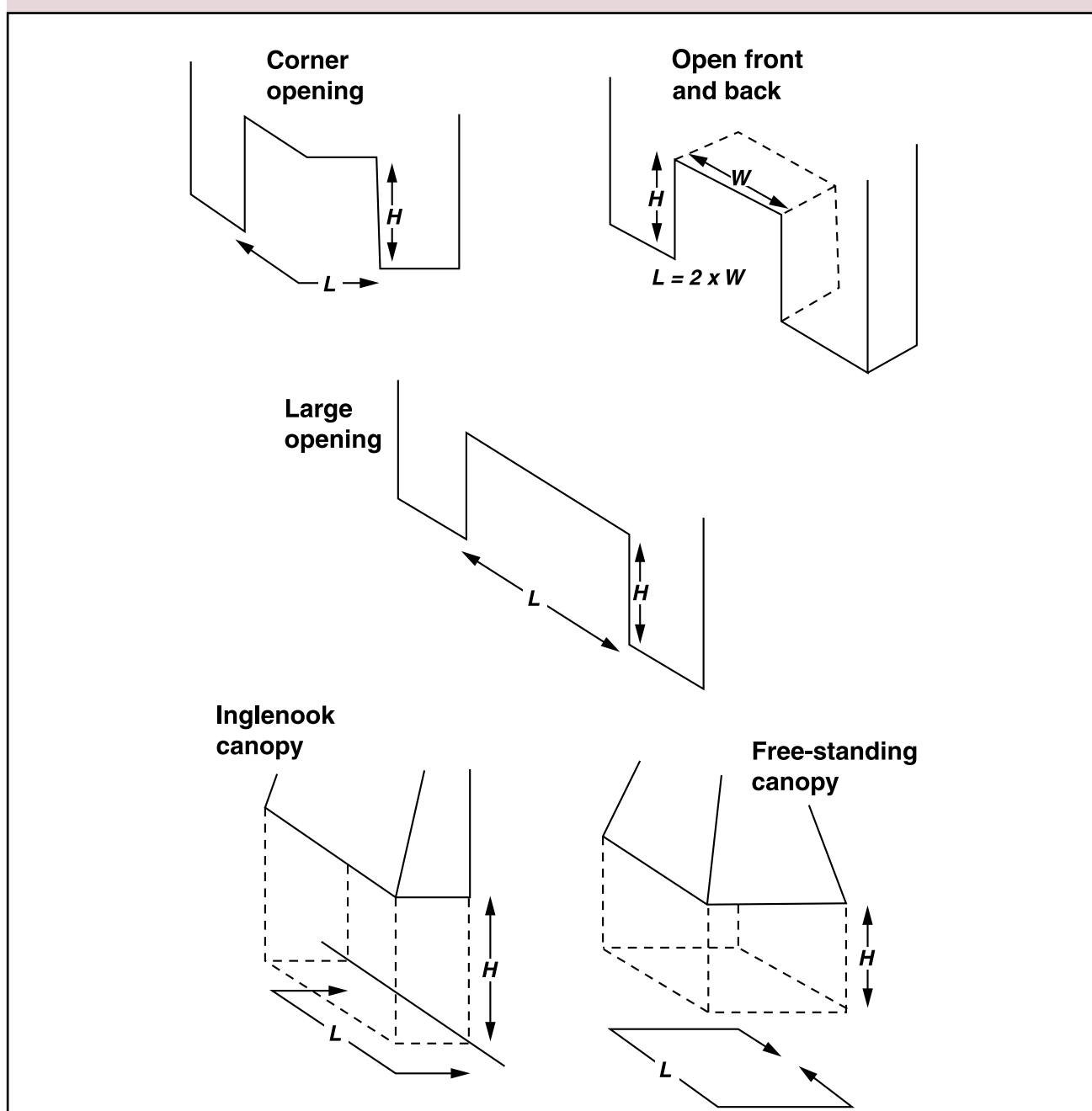
Annex B - Opening areas of large or unusual fireplaces

B1 The opening area of a fireplace should be calculated from the following formula:

$$\text{Fireplace opening area (mm}^2\text{)} = \left(\frac{\text{Total horizontal length of fireplace opening}}{L \text{ (mm)}} \right) \times \left(\frac{\text{Height of fireplace opening}}{H \text{ (mm)}} \right)$$

B2 Examples of L and H for large and unusual fireplace openings are shown in Diagram 35.

Diagram 35 Large or unusual fireplace openings. (Note: for use with this Annex, measure L, H and W in mm)



Annex C - Example calculation of the ventilation requirements of an oil-fired appliance

C1 An open-flued appliance is installed in an appliance compartment such as a cupboard, which is ventilated via an adjoining room. The air permeability of the dwelling is $6.0 \text{ m}^3/(\text{h} \cdot \text{m}^2)$ at 50Pa. The appliance has a rated output of 11kW, i.e. 6kW more than the rating at which permanent ventilation openings become necessary for the adjoining room.

C2 Air for combustion and the safe operation of the flue enters the adjoining room partially through infiltration, with the balance entering via vent A, whose area is calculated as follows:

$$(11\text{kW} - 5\text{kW}) \times 550 \frac{\text{mm}^2}{\text{kW}} = 3300\text{mm}^2$$

C3 The cooling air for the appliance compartment is exhausted through vent B, which has an area:

$$11\text{kW} \times 1100 \frac{\text{mm}^2}{\text{kW}} = 12,100\text{mm}^2$$

C4 All of the air for combustion and the safe operation of the flue as well as cooling air enters the appliance compartment through vent C, which has an area:

$$11\text{kW} \times 1650 \frac{\text{mm}^2}{\text{kW}} = 18,150\text{mm}^2$$

C5 The ventilation areas in cm^2 can be found by dividing the results given above in mm^2 by 100.

Annex D -Methods of checking compliance with requirement J2

D1 This Annex describes ways of checking the compliance with J2 of existing, relined or new flues, and (where included in the work) the combustion appliance. It applies only to natural draught flues intended for open-flued appliances. The procedures described are used only to assess whether the flue in the chimney, the connecting fluepipe (and flue gas passages in the appliance) are free of obstruction and acceptably gas-tight. In addition, appliance performance tests, including flue spillage tests to check for compliance with J2, should be carried out when an appliance is commissioned to check for compliance with Part L.

D2 Tests on flues should be carried out at the most appropriate time during the building work. Where possible, for example, smoke tests should be performed when the structure of a chimney is visible and before the application of finishes such as plaster or dry lining that could obscure sight of smoke leakage during testing.

Testing applications

Tests for existing flues

D3 Flues in existing chimneys can be obstructed by nests, debris resulting from deterioration of the structure (e.g. brickwork, flue lining material or pieces of chimney pot) and by soot and tar. Flues in existing chimneys may also leak as a result of holes or cracks appearing in the structure and linings, particularly at joints. The top, exposed part of a chimney is particularly prone to decay. A way of checking the state of a flue prior to bringing it back into use would be to do the following:

- a. Sweep the flue. This is intended to clean the flue to demonstrate that it is essentially free from obstructions and to enable better visual inspection and testing of the flue. Tar deposits caused by burning wood may be especially hard to dislodge and should be removed. The debris that comes down the chimney when sweeping should be examined for excessive quantities of lining or brick that are signs that further repairs are necessary.
- b. Carry out a visual inspection of the accessible parts to identify:

- i. Deterioration in the structure, connections or linings which could affect the flue's gas-tightness and safe performance with the proposed combustion appliance. Examine the interior of the flue and the exterior of the chimney including in the roof-space. The presence of smoke or tar stains on the exterior of a chimney/breast is a sign of leaks that possibly indicate damage;
 - ii. Modifications made whilst the flue was out of service, such as the fitting of a ventilator terminal, which would be incompatible with using the flue with the intended appliance;
 - iii. Correct lining and lining sizes for the proposed new application.
- c. Perform checks where necessary to demonstrate that the flue is free from restriction: a visual check may be sufficient where the full length of the flue can be seen. In cases of doubt, a way of checking this would be to carry out a coring ball test.
 - d. Check the gas-tightness of the flue by carrying out a smoke test.

New masonry and flueblock chimneys

D4 Check during construction that liners are installed the right way up, with sockets facing upwards and joints are sealed so that moisture and condensate will be contained in the chimney.

D5 Flues in new masonry chimneys can be obstructed, particularly at bends, by debris left during construction or by excess mortar falling into the flue or by jointing material extruded from between liners and flueblocks. The flues should be checked to demonstrate that they have been correctly constructed and are free of restrictions and acceptably gas-tight.

A way of checking the condition of a new flue prior to bringing it into use would be to do the following:

- a. Carry out a visual inspection of the accessible parts to check that the lining, liners or flueblocks are of the correct materials and of suitable size for the proposed application.

- b. Perform checks where necessary to demonstrate that the flue is free from restriction: a visual check may be sufficient where the full length of the flue can be seen. In cases of doubt, a way of checking this would be to carry out a coring ball test or to sweep the flue, which may be more effective at removing flexible debris that might not be dislodged by a coring ball.
- c. Check the operation and gas-tightness of the flue by carrying out a smoke test.

New factory-made metal chimneys

D6 A checklist for the visual inspection of a newly completed factory-made metal chimney is given in *BS EN 15287-1:2007* and additional checks or particular variants may be included in manufacturers' installation instructions. Following inspection, the chimney should be subjected to a smoke test.

Relined flues

D7 A flue which has been relined may be checked to show that it is free from restrictions, such as from surplus material (where that can occur) and that it is acceptably gas-tight by using the same tests as would be applied in the case of a newly built flue. However, a flue which has been relined with a flexible metal liner in accordance with Paragraph 3.36 of this Guernsey Technical Standard may be assumed to be unobstructed and acceptably gas-tight. (The use of a coring ball or inappropriate sweeps brushes can seriously damage a flexible metal flue liner.)

Appliances

D8 Where a combustion appliance is provided and connected up to the flue system as part of the work, the complete system of appliance and flue should be tested for gas-tightness in addition to testing the flue separately as above. For gas appliances, an appropriate spillage test procedure is given in *BS 5440-1:2008*. For oil- and solid-fuel fired appliances, suitable test procedures are given in *BS 5410-1:1997* and *BS EN 15287-1:2007 Annex O* respectively.

Flue test procedures

Coring ball test

D9 This test may be appropriate for proving the minimum diameter of circular flues. It may also be used to check for obstructions in square flues but will not detect obstructions in the corners. (A purpose-made coring ball or plate may need to be used if the flue is rectangular.) It is not applicable to fluepipes and should not be used with flexible metal flue liners. It should be carried out before smoke testing.

D10 A heavy ball, with a diameter about 25mm less than that of the flue, is lowered on a rope from the flue outlet to the bottom of the flue. If an obstruction is encountered, the blockage should be removed and the test repeated.

Smoke testing

D11 Where an existing flue is to be checked with a smoke test, it should first be swept.

D12 Two smoke testing procedures are described below. Test I confirms the gas-tightness of the whole flue and may be used for one serving a solid fuel appliance or if there is any doubt over the condition of a gas or oil flue. Test II may be used where the flue is to serve a gas-fired appliance. Neither test is a substitute for any spillage or flue draught interference test required when commissioning the appliance. Other smoke testing procedures could be used where these form part of the procedure for the installation of an approved flue or relining system.

Smoke test I

D13 All doors and windows in the room served by the flue should be closed. The flue should first be warmed to establish a draught, e.g. with a blow lamp or electric heater. A suitable number of flue testing smoke pellets are placed at the base of the flue, such as in the fireplace recess or in the appliance if it is fitted, and ignited. When smoke starts to form, the base of the flue or fireplace opening should be sealed or the appliance should be closed, so that the smoke can only enter the flue. (For example, the recess opening should be closed off with a board or plate, sealed at the edges or, if the pellets are in the appliance, its doors, ashpit covers and vents should be closed.)

D14 Smoke should be seen to issue freely from the flue outlet or terminal. When this is established, the top of the flue is sealed. The full length of the flue should then be checked, bearing in mind Paragraph D19; there should be no significant leakage. The test should be allowed to continue for at least 5 minutes. The closures at the top and bottom of the flue should then be removed.

Smoke test II

D15 All doors and windows in the room served by the flue should be closed. The flue should first be warmed to establish a draught. A suitable flue-testing smoke pellet is ignited at the base of the flue or in the intended position of the appliance, so that the smoke is drawn into the flue with the rising draught. (If the pellets are placed in a recess at the base of the flue, the opening between the room and the recess should be partially closed, such as with a board, but so as to leave an air entry gap of about 25mm at the bottom.)

D16 Smoke should be seen to issue freely from the flue outlet or terminal and not to spill back into the room. There should be no significant leakage of smoke from the length of the chimney inside or outside of the building.

D17 Smoke tests I and II are in line with the recommendations in *BS 5440-1:2008*.

Notes in relation to testing

D18 Where warming of the flue is specified, this is intended to establish a draught, but this may take more than 10 minutes in the case of large or cold flues.

D19 Appliances, where fitted, should not be under fire at the time of carrying out the test. During a smoke test, smoke should not emerge from the outlet of any other flue, as this indicates leakage between flues. When checking for smoke leakage from a flue, it should be borne in mind that smoke from a faulty flue can emerge some distance away from the original fault. In such cases, the smoke could emerge from such places as barge overhangs in the end of terrace dwellings or from window reveals in cavity walls.

D20 The purpose of carrying out smoke testing is to check that flue gases will rise freely through the flue and to identify whether there are any faults, such as incorrectly sealed joints or damage that would cause the flue gases to escape into the dwelling.

D21 It should be noted that smoke pellets create a pressure significantly higher than the pressure required in the product standards for natural draught chimneys and for flues having a gas-tightness designation of N1. Flues to this designation are permitted to have a leakage rate of up to 2 litre/s/m² flue wall area. Some smoke leakage may therefore be seen during smoke tests and it can be a matter of expert judgement of whether leakage indicates failure.

D22 However, wisps of smoke visible on the outside of the chimney or near joints between chimney sections do not necessarily indicate a fault. If forceful plumes, or large volumes of smoke are seen, this could indicate a major fault such as an incorrectly made connection or joint, or a damaged section of chimney that requires investigation and remedial action followed by a repeat of the test.

Annex E - Assessing air permeability of older dwellings in relation to permanent ventilation requirements

E1 The minimum requirements for permanent ventilation for certain appliances depend on a knowledge of the air-tightness of the dwelling where they are to be installed. Dwellings built prior to 2012 are unlikely to have evidence of the air-tightness either through an individual air permeability test certificate or through representative testing of the same design of dwelling on the same housing development.

E2 Older houses are unlikely to have been tested but are unlikely to achieve an air permeability of less than $5.0\text{m}^3/(\text{h.m}^2)$ at 50Pa unless the building fabric has been substantially upgraded. That would include the following measures:

- Full double (or triple) glazing
- Effective closures on trickle vents and other controllable ventilation devices
- All external doors with integral draught seals and letter box seals
- Internal and external sealing around external doors and window frames
- Filled cavity or solid walls
- Impermeable overlay and edge sealing of suspended ground floors
- Careful sealing at junctions between building elements such as between walls and floors or ceilings
- Careful sealing around loft hatch
- Careful sealing around chimney or flue penetrations
- Careful sealing around internal soil pipe
- Careful sealing around domestic water and heating pipes passing into externally ventilated spaces
- Careful sealing of all service penetrations in the building fabric (electricity, gas, water, drainage, phone, TV aerial, etc.)
- Internal warning pipe for WC
- All cable channels for light switches and power sockets sealed

- All cable entry for lighting and ceiling roses sealed. Recessed lighting should not penetrate ceilings separating loft spaces.

E3 Failure to implement even a few of these measures will typically mean that the overall air permeability will probably exceed $5.0\text{m}^3/(\text{h.m}^2)$ at 50Pa. However, individual rooms in some older houses with solid walls and solid floors can be inherently air-tight when fitted with modern glazing. The situation may therefore need to be assessed with respect both to the overall dwelling and to the individual room where the appliance is to be fitted. If in doubt then assume that the air permeability is lower than $5.0\text{m}^3/(\text{h.m}^2)$ at 50 Pa and fit the appropriate permanent ventilation or seek specialist advice.

Further information on sources of air leakage can be found in *GPG224 Improving airtightness in dwellings*

Annex F - European chimney designations

F1 This informative annex provides a summary of the European chimney designation scheme. The essence of the scheme is a series of code letters based on the general chimney designation scheme of *BS EN 1443:2003*, an example of which and their explanation is given below.

Designation

F2 The designation of a chimney consists of :

Chimney	EN 1234 – T 450 N2 D 1 G50
Number of corresponding chimney standard	
Temperature class	
Pressure class N or P or H	
Resistance to condensate class, W (wet) or D (dry)	
Corrosion resistance class	
Sootfire resistance class G or O followed by distance to combustible materials	

F3 European chimney standards have been developed based on the material of the flue liner e.g. clay/ceramic, concrete, metal, and plastic. Some material based standards have adopted a different shortened designation e.g. for clay flue liners a designation Liner – EN 1457-300-A1-N2 means it is suitable for a chimney with the designation T600 N2 D 3 G, with a nominal size of 300mm.

F4 The designation of the corrosion resistance class of a metal chimney product is dealt with in *BS EN 1856-1* and *BS EN 1856-2* by a two-fold approach. A minimum material specification and thickness is allowed which is dependent on that which is permitted in member states regulations, where these exist. Products upon which a declaration has been made in this manner are designated Vm. The alternative approach involves the choice of one of three corrosion resistance tests. Products meeting the tests carry the designation V1, V2 or V3, as appropriate allow the product to be designated with the Corrosion resistance class 1, 2, or 3 respectively. The material specification still forms part of the overall designation, and appears alongside the 'V'

letter, e.g. Vx-L40045. The material specification for the liner (or connecting pipe) is formed by the letter 'L' followed by five digits. The first two digits represent the material type and the last three digits represent the material thickness in multiples of 0.01mm.

F5 For the UK, guidance on the minimum material specification appropriate for the various applications in terms of corrosion resistance (solid fuel, gas and oil) is given in the UK National Annex to *BS EN 1856-1* and *-2*.

For further examples of shortened designation refer to the specific product standards

F6 In selecting an appliance for a given chimney designation, the appliance, irrespective of the fuel used, is required to generate combustion products with characteristics equal or less than those designated for the chimney. When selecting a chimney suitable for a given appliance, any chimney with performance characteristics equal to or higher than those appropriate for the appliance may be used.

Temperature classes

F7 Temperature classes are set out in Table 11 and expressed as 'T' followed by a number which is less than or equal to the nominal working temperature, i.e., the average flue gas temperature obtained during the nominal/rated output test (usually the maximum operating level);

Pressure classes

F8 Pressure classes are set out in Table 12 and expressed as either 'N', 'P' or 'H' followed by either '1' or '2'. N relates in general to natural draught chimneys i.e. operating under negative pressure where the value 1 or 2 allows for a different class of product; metal chimneys to *BS EN 1856-1* have the class N1. In the UK the value N2 will be assigned as a minimum to masonry chimneys. P and H relate to chimneys which operate under positive pressure e.g. for fan assisted applications and diesel generators respectively. The pressure designation depends on the gas tightness it achieves, the lower number being the more onerous, the higher allowed leakage for positive pressure application being intended to external installations.

Table 11 Temperature classes

Temperature class	Nominal working temperature °C
T 080	# 80
T 100	# 100
T 120	# 120
T 140	# 140
T 160	# 160
T 200	# 200
T 250	# 250
T 300	# 300
T 400	# 400
T 450	# 450
T 600	# 600

Table 12 Pressure classes

Pressure class	Test pressure Pa	Gas tightness – Maximum leakage rate L/s/m ²
N1	40	2.0
N2	20	3.0
P1	200	0.006
P2	200	0.120
H1	5000	0.006
H2	5000	0.120

Table 13 Corrosion resistance classes (from BS EN 1443-2003)

Corrosion resistance class	1 Possible fuel types	2 Possible fuel types	3 Possible fuel types
gas	Gas: sulphur-content # 50 mg/m ³ Natural gas L + H	Gas Natural gas L + H	Gas Natural gas L + H
liquid	Kerosene: sulphur-content # 50 mg/m ³	Oil: sulphur-content # 0.2 mass % kerosene: sulphur-content \$ 50 mg/m ³	Oil: sulphur-content > 0.2 mass % kerosene: sulphur-content \$ 50 mg/m ³
wood		Wood in open fire places	Wood in open fire places Wood in closed stoves
coal			Coal
peat			Peat

Condensate resistance classes

F9 Condensate resistance class – expressed as either ‘W’ for wet or ‘D’ for dry operations. A product designated ‘W’, able to contain condensates within the flue, is aimed at condensing appliances. A product designated ‘D’ would usually have flue gas temperatures high enough to avoid condensate formation.

Corrosion resistance classes

F10 Corrosion resistance classes are set out in Table 13 – this is fuel dependant and expressed as 1, 2 or 3.

Sootfire resistance classes

F11 Sootfire resistance class – expressed as either ‘G’ with sootfire resistance, or ‘O’ without. A product assigned the designation ‘G’ has been tested at 1000°C for 30 minutes.

Distance to combustible material

F12 The designation of the minimum distance from the outer surface of the chimney to combustible material is given as xx expressed in millimetres (e.g. the distance ‘x-x’ identified in paragraph 1.45 and diagram 13).

Annex G - Key Terms

The following definitions have been adopted solely for the purposes of providing clarity in this Guernsey Technical Standard.

An appliance compartment is an enclosure specifically constructed or adapted to accommodate one or more combustion appliances.

A balanced compartment is a method of installing an open-flued appliance into a compartment which is sealed from the remainder of the building and whose ventilation is so arranged in conjunction with the appliance flue as to achieve a balanced flue effect.

A balanced flue appliance is a type of room-sealed appliance which draws its combustion air from a point outside the building adjacent to the point at which the combustion products are discharged, the inlet and outlet being so disposed that wind effects are substantially balanced. Balanced flues may run vertically, but in the most common configuration they discharge horizontally through the external wall against which the appliance is situated.

The boundary is the boundary of the land or buildings belonging to and under the control of the building owner. Depending upon the paragraphs of this Guernsey Technical Standard to which it applies, it may be drawn only around the perimeter of the land in question or extended to

the centreline of adjacent routes or waterways as shown in Diagram 36.

The capacity of an oil tank is its nominal capacity as stated by the manufacturer. It is usually 95 per cent of the volume of liquid required to fill it to the brim.

A chimney is a structure consisting of a wall or walls enclosing one or more flues (see Diagram 37). In the gas industry, the chimney for a gas appliance is commonly called the flue.

A combustion appliance (or appliance) is an apparatus where fuel is burned to generate heat for space heating, water heating, cooking or other similar purpose. The appliance does not include systems to deliver fuel to it or for the distribution of heat. Typical combustion appliances are boilers, warm air heaters, water heaters, fires, stoves and cookers.

A draught break is an opening formed by a factory-made component into any part of the flue serving an open-flued appliance. Such openings may be provided to allow dilution air to be drawn into a flue or to lessen the effects of down-draught on combustion in the appliance.

A draught diverter is a form of draught break intended to prevent conditions in the main length of flue from interfering with the combustion performance of an open-flued appliance (see Diagram 38(a)). It allows the appliance to operate without interference from down-draughts that may occur in adverse wind conditions and excessive draught.

A draught stabiliser is a factory-made counter-balanced flap device admitting air to the flue, from the same space as the combustion air, to prevent excessive variations in the draught (see Diagram 38(b)). It is usual for these to be in the fluepipe or chimney, but they may be located on the appliance.

Equivalent area is defined in BS EN 13141 -1:2004 as the area of a sharp-edged circular orifice which would pass the same air flow rate at the same applied pressure difference as the product or device being tested. The equivalent area of a

Diagram 36 **Boundaries in this Guernsey Technical Standard**

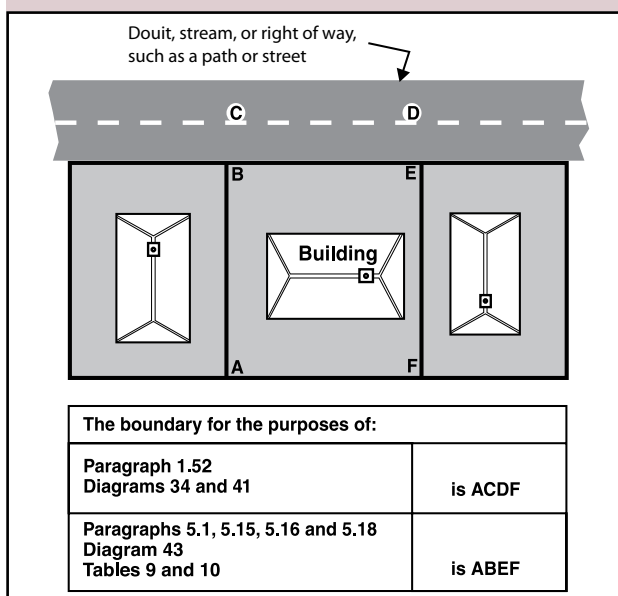


Diagram 37 Chimneys and flues

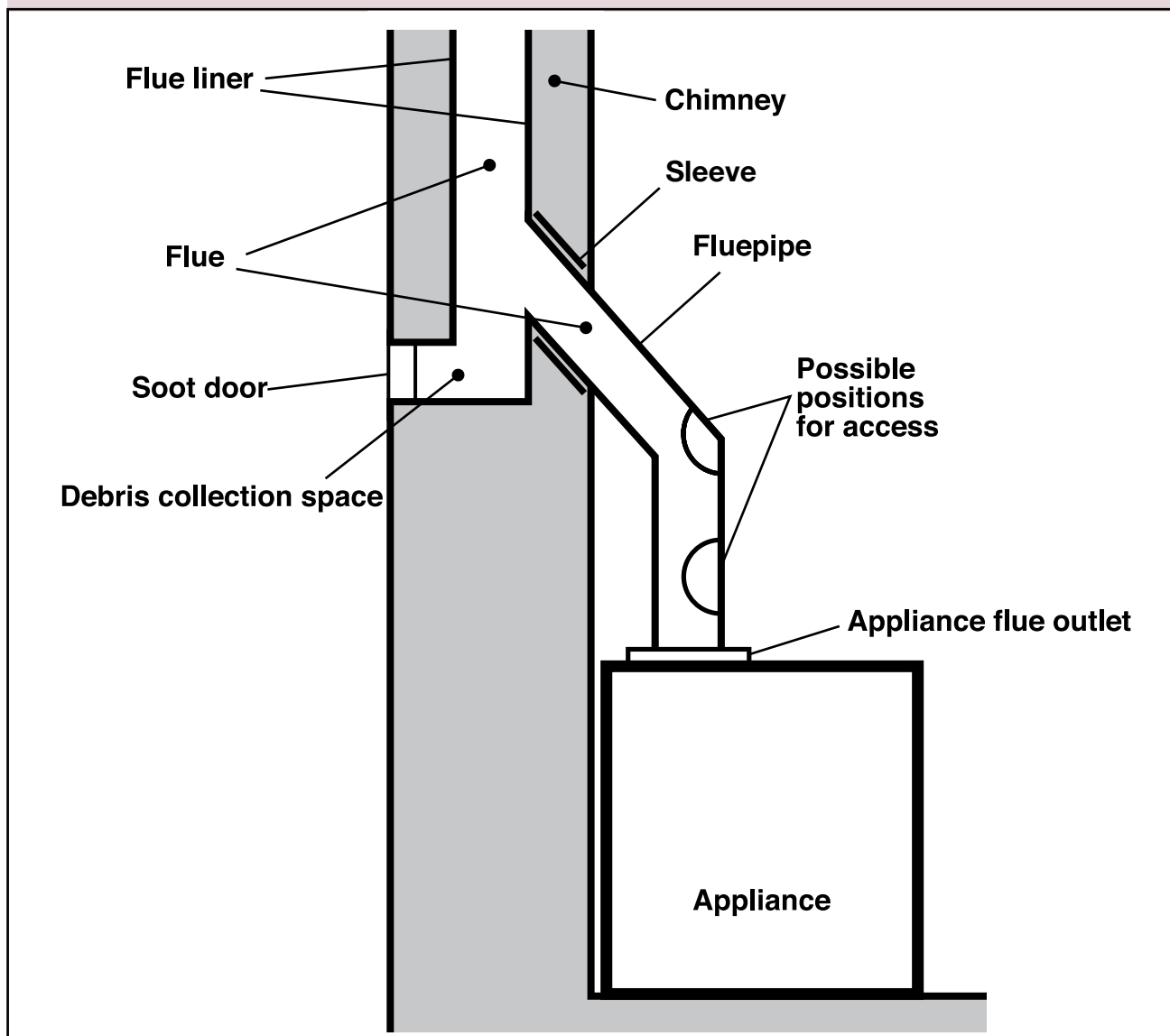
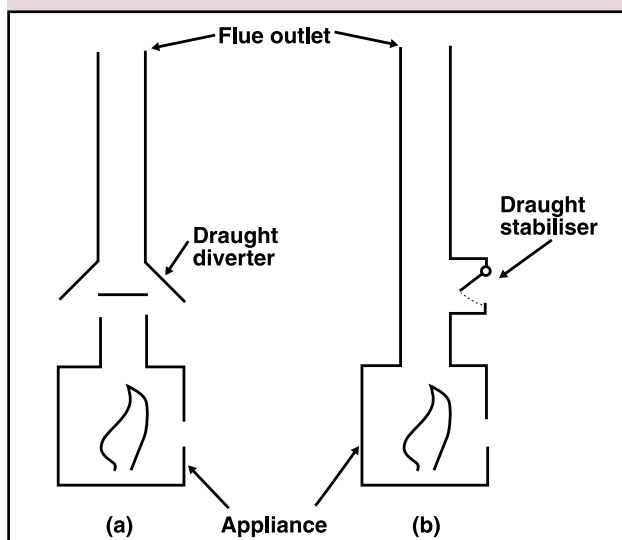


Diagram 38 Draught diverter and draught stabiliser



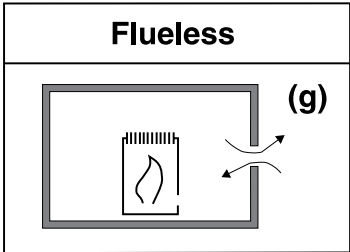
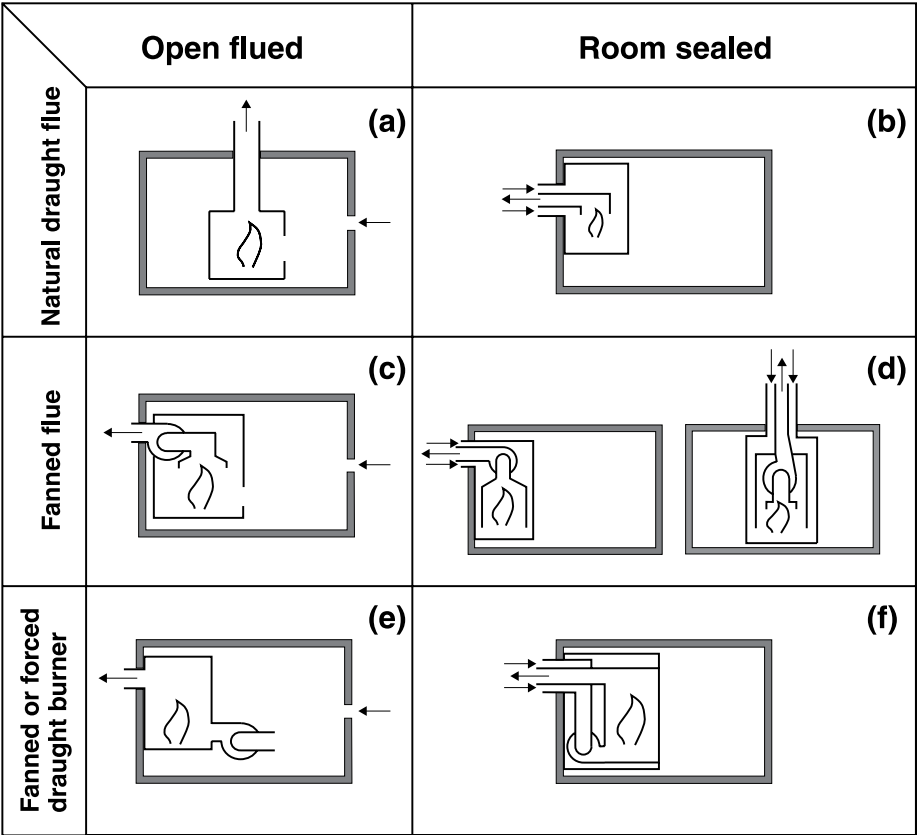
simple ventilator will be less than the geometrical free area and for complex products may be significantly less.

Factory-made metal chimneys (also known as system chimneys) are prefabricated chimneys that are commonly manufactured as sets of components for assembly on site (although they can be supplied as one unit), having the performance appropriate for the intended appliance. They are available in various materials and types ranging from single-walled metal chimneys suitable for some gas appliances to twin-walled chimneys with insulation sandwiched between an inner liner and an outer metal wall which are designed for oil or solid fuel use.

In a **fanned draught** installation, the proper discharge of the flue gases depends upon the operation of a fan, which may be separately installed in the flue or may be an integral part of the combustion appliance. Fans in combustion appliances either may extract flue gases from the combustion chamber or may cause the flue gases to be displaced from the combustion chamber if the fan is supplying it with air for combustion. Appliances with fans providing the

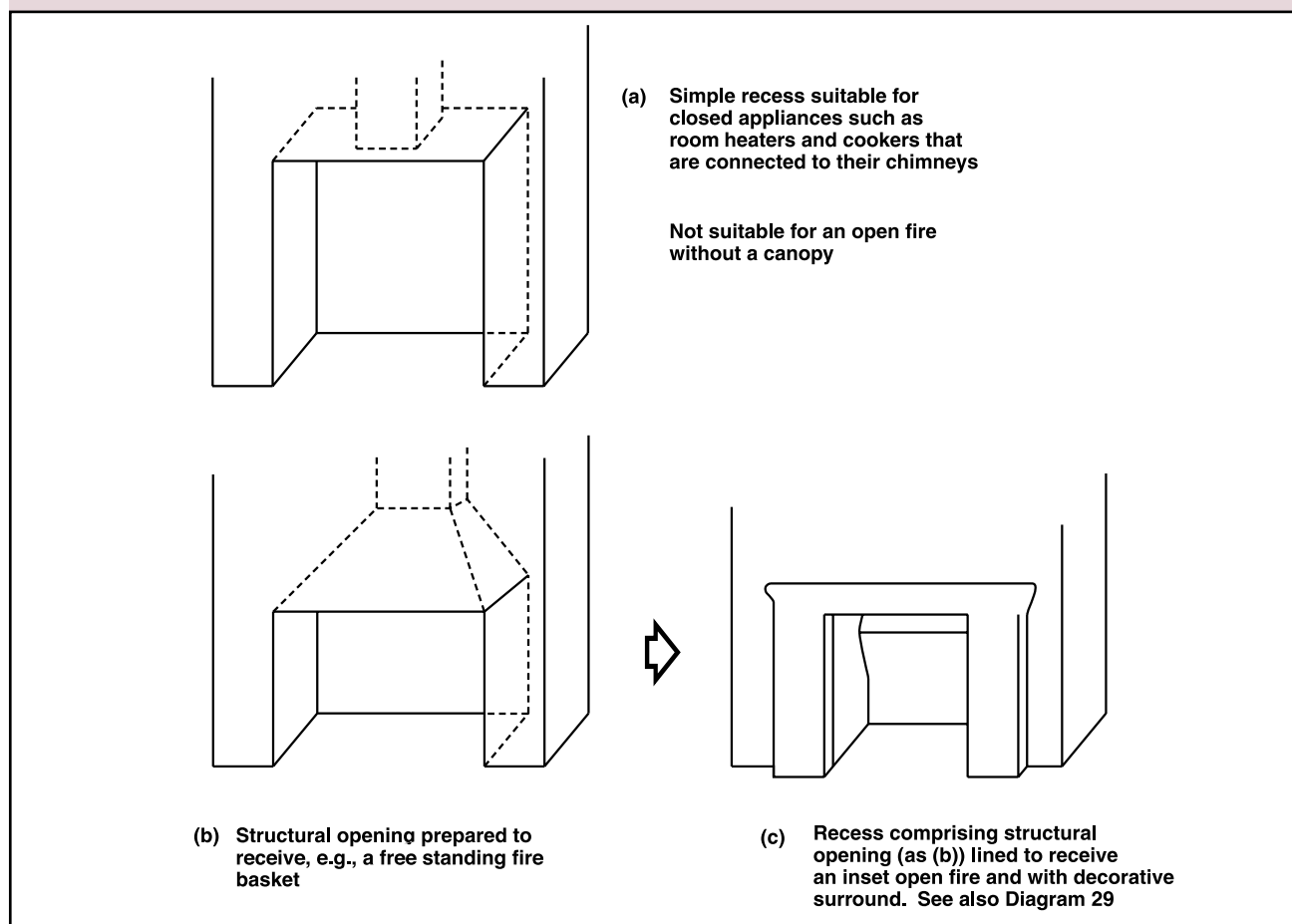
combustion air (including most oil-fired and many gas-fired boilers) are also commonly referred to as forced draught appliances (see Diagram 39). Flues in fanned draught installations run horizontally or vertically and can be at higher or lower pressures than their surroundings, dependent upon the location of the fan.

Diagram 39 Types of installation



Note – For gas appliances only: CEN TR1749 classifies gas appliances according to their method of evacuating the products of combustion:
Type A – Flueless appliances
Type B – Open flued
Type C – Room sealed
The letters A, B and C are further qualified by numbers to identify the existence and mode of use of fans and draught diverters, as applicable (e.g. B₁, for an open-flued natural draught appliance with draught diverter).

Diagram 40 Fireplace recesses



A **fire compartment** is a building or part of a building comprising one or more rooms, spaces or storeys constructed to prevent the spread of fire to or from another part of the same building or an adjoining building. (A roof-space above the top storey of a fire compartment is included in that fire compartment.) A separated part of a building is a form of compartmentation in which part of a building is separated from another part of the same building by a compartment wall. Such walls run the full height of the part and are in one vertical plane. Further information on this is given in Guernsey Technical Standard B Vol 2 (see Section 8 Compartmentation and Annex C Methods of Measurement).

A **fireplace recess** is a structural opening (sometimes called a builder's opening) formed in a wall or in a chimney breast, from which a chimney leads and which has a hearth at its base. Simple structural openings (Diagram 40(a)) are suitable for closed appliances such as stoves, cookers or boilers, but gathers (Diagram 40(b)) are necessary for

accommodating open fires. Fireplace recesses are often lined with firebacks to accommodate inset open fires (Diagram 40(c)). Lining components and decorative treatments fitted around openings reduce the opening area. It is the finished fireplace opening area which determines the size of flue required for an open fire in such a recess.

The **fire resistance** of a component or construction is a measure of its ability to withstand the effects of fire in one or more ways for a stated period of time. Guidance on determination of performance in terms of fire resistance is given in Guernsey Technical Standard B (Fire Safety).

A **fire wall** is a means of shielding a fuel tank from the thermal radiation from a fire. For LPG tanks, it also ensures that gas accidentally leaking from the tank or fittings must travel by a longer path and therefore disperse safely, before reaching a hazard such as an opening in a building, a boundary or other potential ignition source.

A **flue** is a passage that conveys the products of combustion from an appliance to the outside air (see Diagram 37).

Flueblock chimney systems consist of a set of factory-made components, made from precast concrete, clay or other masonry units, that are designed for assembly on site to provide a complete chimney having the performance appropriate for the intended appliance. There are two types of common systems, one being solely for use with gas-burning appliances and the other, often called chimney block systems, being primarily designed for solid fuel-burning appliances.

A **flue box** is a factory made unit, usually made of metal, which is similar to a prefabricated appliance chamber except that it is designed to accommodate a gas burning appliance in conjunction with a factory-made chimney.

A **flueless appliance** is one which is designed to be used without connection to a flue. Its products of combustion mix with the surrounding room air and are eventually transported to the outside as stale air leaves the room (see Diagram 39(g)).

A **flue liner** is the wall of the chimney that is in contact with the products of combustion (see Diagram 37), such as a concrete flue liner, the inner liner of a factory-made chimney system or a flexible liner fitted into an existing chimney.

A **flue outlet** is the point at which the products of combustion are discharged from the flue to the outside atmosphere, such as the top of a chimney pot or flue terminal.

A **fluepipe** is a pipe, either single walled (bare or insulated) or double walled, which connects a combustion appliance to a flue in a chimney. For clarity, when used in this way, it may be called a connecting fluepipe. (Fluepipe is also used to describe the tubular components from which some factory made chimneys for gas and oil appliances are made or from which plastic flue systems are made).

A **hearth** is a base intended to safely isolate a combustion appliance from people, combustible parts of the building fabric and soft furnishings. The exposed surface of the hearth provides a region around the appliance which can be kept clear of

anything at risk of fire. The body of the hearth may be thin insulating board, a substantial thickness of material such as concrete or some intermediate provision dependent upon the weight and downward heat emission characteristics of the appliance(s) upon it (see Diagram 41).

The **heat input rate** is the maximum rate of energy flow into an appliance. It is calculated as the rate of fuel flow to the appliance multiplied by either the fuel's gross or net calorific value.

Note: Traditionally, the UK has used Gross values, most European standards use Net values. Thus for gas appliances it is now the norm to express this rating as a net value (kW (net)).

Incinerator a furnace or apparatus such as a furnace used for incinerating something i.e. waste.

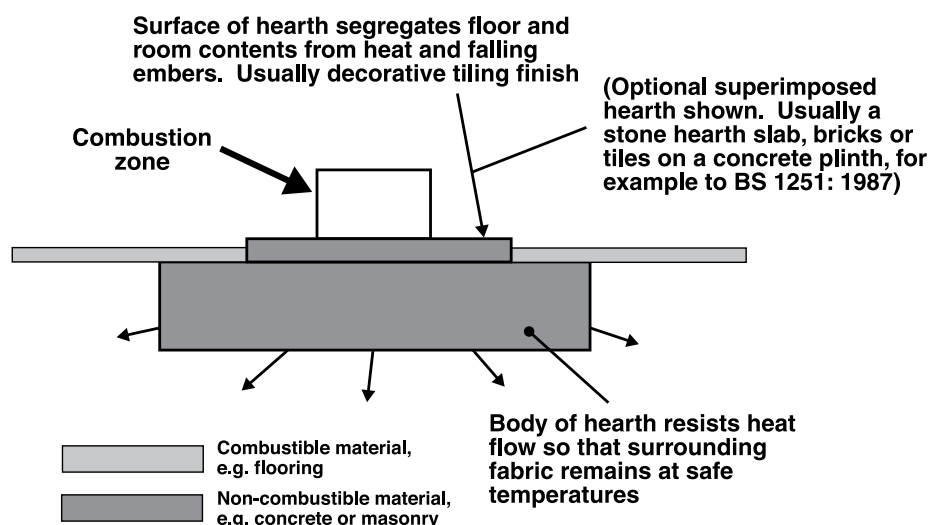
Installation instructions are those instructions produced by manufacturers to enable installers to correctly install and test appliances and flues and to commission them into service.

In a **natural draught flue**, the combustion products flow into the flue as a result of the draught produced due to the difference between the temperature of the gases within the flue and the temperature of the ambient air. Taller flues produce a greater draught at their base. Except for those balanced flue appliances which are designed to discharge directly through the wall adjacent to the appliance, a satisfactory natural draught requires an essentially vertical run of flue (see Diagram 39 (a) and (b)).

Non-combustible material. This is the highest level of reaction to fire performance. Non-combustible materials include:

- any material which when tested to *BS 476-11:1982 (2007)* does not flame nor cause any rise in temperature on either the centre (specimen) or furnace thermocouples; and
- products classified as non-combustible in tests following the procedures in *BS 476-4:1970 (2007)*;
- any material classified as class A1 in accordance with *BS EN 13501-1:2002 Fire classification of construction products and building elements*. Classification using data from reaction to fire tests.

Diagram 41 The functions of hearths



Typical examples of such materials to be found in buildings include totally inorganic materials such as concrete, fired clay, ceramics, metals, plaster and masonry containing not more than 1 per cent by weight or volume of organic material. (Use in buildings of combustible metals such as magnesium–aluminium alloys should be assessed in each individual case.)

More detailed information is given in Guernsey Technical Standard B (Fire Safety).

An **open-flued appliance** is one which draws its combustion air from the room or space within which it is installed and which requires a flue to discharge its products of combustion to the outside air (see Diagram 39 (a), (c) and (e)).

A **prefabricated appliance chamber** is a set of factory-made precast concrete components designed to provide a fireplace recess to accommodate an appliance such as a stove, and incorporates a gather when used with an open fire. The chamber is normally positioned against a wall and may be designed to support a chimney. The chamber and chimney are often enclosed to create a false chimney breast (see also ‘flue box’).

The **rated heat input** (sometimes shortened to rated input) for a gas appliance is the maximum heat input rate at which it can be operated, as declared on the appliance data plate. (See also heat input rate.)

The **rated heat output** for an oil appliance is the maximum declared energy output rate (kW) as declared on the appliance data plate.

The **rated heat output** for a solid fuel appliance is the manufacturer’s declared nominal energy output rate (kW) for the appliance. This may be different for different fuels.

A **room-sealed appliance** means an appliance whose combustion system is sealed from the room in which the appliance is located and which obtains air for combustion from a ventilated uninhabited space within the building or directly from the open air outside the building and which vents the products of combustion directly to open air outside the building (see Diagram 39 (b), (d) and (f)).

Solid biofuel means, for the purpose of this Approved Document, a solid fuel derived from plants and trees. It can include logs, wood chips, wood pellets and other processed plant material.

A **throat** is a contracted part of the flue between a fireplace recess and its chimney (see Diagram 16). Throats are usually formed from prefabricated components as shown in Diagram 23.

Annex H - Standards referred to

BS 41:1973 (1998)

Specification for cast iron spigot and socket flue or smoke pipes and fittings.

BS EN 303-1:1999

Heating Boilers. Heating boilers with forced draught burners. Terminology general requirements, testing and marking.

BS EN 449:2002 + a1:2007

Specification for Dedicated Liquid Petroleum Gas Appliances. Domestic Flueless Space Heaters (including Diffusive Catalytic Combustion Heaters).

BS 476-4:1970 (2007)

Fire tests on building materials and structures. Non-combustibility test for materials. AMD 2483 and AMD 4390.

BS 476-11:1982 (2007)

Fire tests on building materials and structures. Method for assessing the heat emission from building materials.

BS 476-20:1987

Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles).

BS 476-21:1987

Fire tests on building materials and structures. Methods for determination of the fire resistance of loadbearing elements of construction.

BS 476-22:1987

Fire tests on building materials and structures. Methods for determination of the fire resistance of non-loadbearing elements of construction.

BS EN 449:2002 + a1:2007

Specification for Dedicated Liquid Petroleum Gas Appliances. Domestic Flueless Space Heaters (including Diffusive Catalytic Combustion Heaters).

BS 715:2005

Specification for metal flue pipes, fittings, terminals and accessories for gas-fired appliances with a rated input not exceeding 60kW. AMD 8413.

BS 799-5:1987

Oil Burning Equipment. Specification for Oil Storage Tanks.

BS 1181:1999

Specification for clay flue linings and flue terminals.

BS 1251:1987

Specification for open fireplace components.

BS EN 1443:2003

Chimneys. General Requirements.

BS 1449-2:1983

Specification for stainless and heat-resisting steel plate, sheet and strip. AMD 4807, AMD 6646 and AMD 8832.

BS EN 1457:2009

Chimneys. Clay/ceramic flue liners. Requirements and test methods.

BS EN 1806:2006

Chimneys. Clay/ceramic flue blocks for single wall chimneys. Requirements and test methods.

BS 1846-1:1994

Glossary of Terms Relating to Solid Fuel Burning Equipment. 1994 Domestic appliances.

BS EN 1856-1:2003

Chimneys. Requirements for metal chimneys. System chimney products.

BS EN 1856-2:2004

Chimneys. Requirements for metal chimneys. Metal liners and connecting flue pipes.

BS EN 1857:2003 + A1:2008

Chimneys. Components. Concrete flue liners.

BS EN 1858:2003

Chimneys. Components. Concrete flue blocks.

BS EN 1859:2009

Chimneys. Metal chimneys. Test methods.

BS 2869:2006

Fuel oils for agricultural, domestic and industrial engines and boilers. Specification.

BS 2869-2:1998

Fuel oils for non-Marine use. Specification for fuel oil for agricultural and industrial engines and burners (Classes A2, C1, C2, D, E, F, G and H). AMD 6505.

BS 4543 for Domestic Appliances. Method of Specifying Installation Design Information.

BS 4543-1:1990

Factory-made insulated chimneys. Methods of test. AMD 8379.

BS 4543-2:1990

Factory-made insulated chimneys. Specification for chimneys with stainless steel flue linings for use with solid fuel fired appliances. AMD 8380.

BS 4543-3:1990

Factory-made insulated chimneys. Specification for chimneys with stainless steel fluelining for use with oil fired appliances. AMD 8381.

BS 4876:1984

Specification for performance requirements for domestic flued oil burning appliances (including test procedures).

BS 5410-1:1997

Code of practice for oil firing. Installations up to 44kW output capacity for space heating and hot water supply purposes. AMD 3637.

BS 5410-2:1978

Code of practice for oil firing. Installations of 45 kW and above output capacity for space heating, hot water and steam supply services.

BS 5854:1980 (1996)

Code of practice for flues and flue structures in buildings.

BS 6798:2009

Specification for Installation of Gas-Fired Boilers of Rated Input Not Exceeding 70kW.

BS 6999:1989 (1996)

Specification for Vitreous-Enamelled Low-Carbon-Steel Fluepipes, Other Components and Accessories for Solid-Fuel-Burning Appliances with a Maximum Rated Output of 45kW.

BS 7435-1:1991 (1998)

Fibre Cement Flue Pipes, Fittings and Terminals. Specification for Light Quality Fibre Cement Flue pipes, Fittings and Terminals.

BS 7435-2:1991

Fibre Cement Flue Pipes, Fittings and Terminals. Specifications for heavy quality cement flue pipes, fittings and terminals.

BS 7566:

Installation of Factory-Made Chimneys to BS 4543 for Domestic Appliances

BS 7566-1:1992 (1998)

Installation of Factory-Made Chimneys to

BS 7566-2:1992 (1998)

Installation of Factory-Made Chimneys to BS 4543 for Domestic Appliances. Specification for Installation Design.

BS 7566-4:1992 (1998)

Installation of Factory-Made Chimneys to BS 4543 for Domestic Appliances. Recommendations for Installation Design and Installation.

BS 8303-1:1994 inc parts 2 and 3

Installation of domestic heating and cooking appliances burning solid mineral fuels. Recommendations for design and on site installation

BS EN 10088-1:2005

Stainless Steels. List of Stainless Steels.

BS EN 10268:2006

Cold rolled steel flat products with high yield strength for cold forming. Technical delivery conditions.

BS EN 13384-1:2002 + A2:2008

Chimneys. Thermal and fluid dynamic calculation methods. Chimneys serving one appliance.

BS EN 14213:2003

Heating fuels. Fatty acid methyl esters (FAME). Requirements and test methods.

BS EN 14471:2005

Chimneys. System chimneys with plastic flue liners. Requirements and test methods.

BS EN 15287-1:2007

Chimneys. Design, installation and commissioning of chimneys. Chimneys for non-roomsealed heating appliances.

BS EN 15287-1:2007

Chimneys. Design, installation and commissioning of chimneys.

BS EN 50291:2001 Electrical apparatus for the detection of carbon monoxide in domestic premises. Test methods and performance requirements

BS EN 50292:2002 Electrical apparatus for the detection of carbon monoxide in domestic premises. Guide on the selection, installation, use and maintenance

Annex J - Other documents referred to

Guide to Condensing Boiler Installation Assessment Procedure for Dwellings. Office of the Deputy Prime Minister (2005).
ISBN 978 1 85112 784 9

Building Research Establishment

BR 414 (2001) Protective measures for housing on gas contaminated land.
ISBN 978 1 86081 460 0

BR 211 (2007) Radon: guidance on protective measures for new buildings (including supplementary advice for extensions, conversions and refurbishment) (2007 edition).

Chartered Institution of Building Services Engineers

CIBSE Guide B: Heating, Ventilating, Air Conditioning and Refrigeration, (2005).
ISBN 978 1 90328 758 3

Energy Saving Trust

GPG224 Improving airtightness in dwellings (2005).

Environment Agency

Pollution Prevention Guidelines PPG2 – Above Ground Oil Storage Tanks (2004).

Pollution Prevention Guidelines PPG27- Installation, Decommissioning and Removal of Underground Storage Tanks (2002).

Masonry Bunds for Oils Storage Tanks, CIRIA/ Environment Agency Joint Guidelines

Concrete Bunds for Oils Storage Tanks, CIRIA/ Environment Agency Joint Guidelines

Available to download from <http://publications.environment-agency.gov.uk>.

HETAS

HETAS Information Paper 1/007 Chimneys in Thatched Properties (2009).

Oil Firing Technical Association (OFTEC)

OFTEC Oil Fired Appliance Standard. OFS A100. Heating Boilers with Atomising Burners. Outputs up to 70kW. Maximum Operating Pressures of 3 Bar (2004).

OFTEC Oil Fired Appliance Standard. OFS A101. Oil Fired Cookers with Atomising or Vaporising Burners with or without Boilers. Heat Outputs up to 45kW (2004).

OFTEC Technical Book 3: Installation requirements for oil fired equipment 1st Edition (2006).

OFS T100 Oil Firing Equipment Standard – Polyethylene Oil Storage Tanks for Distillate Fuels (2008).

OFS T200 Oil Firing Equipment Standard – Steel Oil Storage Tanks and Tank Bunds for use with Distillate Fuels, Lubrication Oils and Waste Oils (2007).

UKLPG

Code of Practice 1 Bulk LPG Storage at Fixed Installations Part1: Design, Installation and Operation of Vessels Located Above Ground (January 2009).

The Land Planning and Development (Guernsey) Law 2005

The Health and Safety (Gas) (Guernsey) Ordinance, 2006 made under the Health, Safety and Welfare of Employees Law, 1950 and the Health and Safety at Work etc. (Guernsey Law), 1979 extend to all dangers arising from the transmission, distribution, supply or use of gas conveyed from a gas storage vessel and includes requirements relating to the installation of gas fittings.



GUERNSEY TECHNICAL STANDARDS

The following documents have been approved and issued Development and Planning Authority for the purpose of providing practical guidance with respect to the requirements of the Building Regulations

Guernsey Technical Standard A: Structure, 2012 edition with May 2016 amendments.

Guernsey Technical Standard B: Fire Safety - Volume 1 - Dwellinghouses, 2012 edition with May 2016 amendments.

Guernsey Technical Standard B: Fire Safety - Volume 2 - Buildings other than dwellinghouses, 2012 edition with May 2016 amendments.

Guernsey Technical Standard C: Site preparation and resistance to contaminants and moisture 2012 edition with May 2016 amendments.

Guernsey Technical Standard D: Toxic substances 2012 edition with May 2016 amendments.

Guernsey Technical Standard E: Resistance to the passage of sound, 2012 edition with May 2016 amendments.

Guernsey Technical Standard F: Ventilation, 2012 edition with May 2016 amendments.

Guernsey Technical Standard G: Health, hygiene and water efficiency, 2012 edition with May 2016 amendments.

Guernsey Technical Standard H: Drainage and waste disposal, 2012 edition with May 2016 amendments.

Guernsey Technical Standard J: Heat producing appliances and fuel storage systems, 2012 edition with May 2016 amendments.

Guernsey Technical Standard K: Safe means of access and egress, 2012 edition with May 2016 amendments.

Guernsey Technical Standard L1: Conservation of fuel and power – Dwellings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard L2: Conservation of fuel and power – Buildings other than dwellings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard M: Access to and use of buildings, 2012 edition with May 2016 amendments.

Guernsey Technical Standard N: Glazing - Materials and protection, 2012 edition with May 2016 amendments.

Guernsey Technical Standard P: Roads - Layout design and construction, 2012 edition with May 2016 amendments.

Guernsey Technical Standard Regulation 11: Materials and Workmanship, 2012 edition with May 2016 amendments.



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States of Guernsey - Building Control

Sir Charles Frossard House

La Charroterie

St Peter Port

Guernsey

GY1 1FH

Telephone +44 (0) 1481 717200

Facsimile +44 (0) 1481 717099

Email planning@gov.gg



States of Guernsey
Building Control