

IGEM/UP/17
Communication 1754

Shared chimney and flue systems for domestic gas appliances



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Shared chimney and flue systems for domestic gas appliances



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SECTION 1 : INTRODUCTION

1.1 This Standard has been drafted by a Panel appointed by the Institution of Gas Engineers and Managers' (IGEM's) Gas Utilization Committee and is published by the authority of IGEM's Council.

1.2 This Standard summarises best practice in the use and maintenance of new and existing "shared flues" systems i.e. shunt duct, Se-duct, U-duct systems, and fabricated shared chimney/flue systems (communal flue systems (CFSs)).

The intention is to make designers, installers, maintenance persons and landlords aware of the safety issues surrounding the use of shared flue systems.

1.3 This Standard makes use of the terms "must", "shall" "should" and when prescribing particular requirements. Notwithstanding Sub-Section 1.6:

- the term "must" identifies a requirement by law in Great Britain (GB) at the time of publication
- the term "shall" prescribes a requirement which, it is intended, will be complied with in full and without deviation
- the term "should" prescribes a requirement which, it is intended, will be complied with unless, after prior consideration, deviation is considered to be acceptable.

1.4 It is now widely accepted that the majority of accidents in industry generally are in some measure attributable to human as well as technical factors in the sense that actions by people initiated or contributed to the accidents, or people might have acted in a more appropriate manner to avert them.

It is therefore necessary to give proper consideration to the management of these human factors and the control of risk. To assist in this, it is recommended that due regard be paid to HSG48.

1.5 The primary responsibility for compliance with legal duties rests with the employer. The fact that certain employees, for example "responsible engineers", are allowed to exercise their professional judgement does not allow employers to abrogate their primary responsibilities. Employers must:

- have done everything to ensure, as far as is reasonably practicable, that there are no better protective measures that can be taken other than relying on the exercise of professional judgement
- have systems and procedures in place to ensure that the exercise of professional judgement by "responsible engineers" is subject to appropriate monitoring and review
- not require "responsible engineers" to undertake tasks which would necessitate the exercise of professional judgement that is beyond their competence. There should be written procedures defining the extent to which "responsible engineers" can exercise their judgement. When "responsible engineers" are asked to undertake tasks which deviate from this, they should refer the matter for higher review.

1.6 Notwithstanding Sub-Section 1.3, this Standard does not attempt to make the use of any method or specification obligatory against the judgement of the responsible engineer. Where new and better techniques are developed and proved, they should be adopted without waiting for modification of this Standard. Amendments to this Standard will be issued when necessary and their publication will be announced in the Journal of IGEM and other publications as appropriate.

- 1.7 Requests for interpretation of this Standard in relation to matters within its scope, but not precisely covered by the current text, should be addressed to Technical Services, IGEM, IGEM House, High Street, Kegworth, Derbyshire, DE74 2DA and will be submitted to the relevant Committee for consideration and advice, but in the context that the final responsibility is that of the engineer concerned. If any advice is given by, or on behalf of, IGEM, this does not relieve the responsible engineer of any of his or her obligations.
- 1.8 This Standard was published in July 2011.

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SECTION 2 : SCOPE

2.1 This Standard covers the use, maintenance and de-commissioning of shared flue systems comprising:

- shunt ducts
- Se-ducts
- U-ducts
- fabricated shared chimney/flue systems (communal flue systems) (CFSs).

installed in buildings containing multiple individual dwellings. This includes the installation of replacement appliances onto existing systems.

Note 1: The principles of the Standard may equally be applied where such a flue design is used in a building containing a single dwelling or in single or multiple commercial or industrial units.

Note 2: It is important to differentiate between traditional shared flue systems i.e. shunt ducts, Se-ducts and U-ducts, and the more modern CFSs.

Note 3: It is assumed that any CFS is of a proprietary design and of materials that are fit for purpose.

This Standard does not address the installation of new shared flue systems. Once such systems are in place, this Standard applies to their subsequent use, maintenance and de-commissioning, and to the replacement of appliances.

Note: Advice on the installation of new shared flue systems is given in BS 5440-1.

2.2 This Standard applies to shared flue systems that serve domestic appliances burning any gaseous fuel.

2.3 This Standard assumes replacement domestic appliances installed onto a shared flue system are CE marked and are suitable for the system to which they are intended to be installed.

2.4 Italicized text is informative and does not represent formal requirements.

2.5 Appendices are informative and do not represent formal requirements unless specifically referenced in the main sections via the prescriptive terms "must", "shall" or "should".

SECTION 3 : LEGAL AND ALLIED CONSIDERATIONS

This Standard is set out against a background of legislation in force in GB at the time of publication. The devolution of power to the Scottish, Welsh and Northern Ireland Assemblies means that there may be variations to the legislation described below for each of them and consideration of their particular requirements must be made. Similar considerations are likely to apply in other countries and reference to the appropriate national legislation will be necessary.

Appendix 2 lists legislation, guidance notes, standards, etc. which are identified within this Standard as well as further items of legislation that may be applicable. Where standards are quoted, equivalent national or international standards, etc. equally may be appropriate. Unless otherwise stated, the latest version of the referenced document should be used.

The responsibility for a shared flue system lies with the landlord (building owner) or the person responsible for the building, as appropriate. The landlord or person responsible for "relevant" premises must carry out annual checks on the flue system, including parts of the flue that are shared, as required by Gas Safety (Installation and Use) Regulations (GS(I&U)R) (see Sub-Section 3.3).

3.1 HEALTH AND SAFETY AT WORK ETC. ACT (HSA)

HSWA applies to all persons involved with work activities, including employers, the self-employed, employees, designers, manufacturers, suppliers, etc. as well as the owners of premises. It places general duties on such people to ensure, so far as is reasonably practicable, the health, safety and welfare of employees and the health and safety of members of the public who may be affected by the work activity.

3.2 BUILDING REGULATIONS AND STANDARDS

Although many of the requirements of the Building Regulations (England and Wales), the Buildings (Scotland) Regulations and Building (Amendment) Regulations (Northern Ireland) are similar, they sometimes differ in specific detail. The designer must refer to the appropriate Regulations for the country concerned.

3.2.1 England and Wales (as amended)

3.2.1.1 Building Regulations are Statutory Instruments that must be followed when engaged in any building work. They are written in a format of broad Regulations, setting out simple requirements in a Separate Schedule. Suggested ways of complying with these Regulations are contained in Approved Documents.

3.2.1.2 The Approved Documents that apply to gas work are:

- A (Structure)
- B (Safety in Fire)
- F (Ventilation)
- G (Hygiene)
- J (Heat producing Appliances)
- L (Conservation of Fuel and Power)
- M (Access to and use of buildings)
- P (Electrical Safety).

Note: Further information is available from www.planningportal.gov.uk.

3.2.2 **Building Standards (Scotland) Regulations and Amendments**

The Building Standards (Scotland) are written directly as Regulations within the Statutory Instrument. The Regulations can be satisfied:

- by compliance with Technical Standards published by the Scottish Office

Note: The technical handbooks are available at www.sbsa.gov.uk.

- conforming with the provisions of "deemed to satisfy" documents, for example British Standards
- other equivalent means.

3.2.3 **Northern Ireland (as amended)**

The Regulations can be satisfied:

- by compliance with Technical Standards
- conforming with the provisions of "deemed to satisfy" documents, for example British Standards
- other equivalent means.

Note: Further information is available from www.planningportal.gov.uk.

3.3 **GAS SAFETY (INSTALLATION AND USE) REGULATIONS (GS(I&U)R)**

Note: HSL56 provides an Approved Code of Practice (ACoP) and Guidance on GS(I&U)R.

3.3.1 GS(I&U)R are relevant statutory provisions of HSWA, setting out general and detailed requirements dealing with the safe installation, maintenance and use of gas systems (including gas fittings, appliances and flues).

3.3.2 GS(I&U)R place responsibilities on those installing, servicing, maintaining or repairing gas appliances, pipework, meters, flues etc. as well as on suppliers and users of gas.

3.3.3 GS(I&U)R define the type of work that requires persons carrying out such work, or their employers, to be a "member of a class of person".

3.3.4 The installer must check the safety of any appliance or pipework they install or work on and take appropriate action where they find faults. Where the premises are let or hired out, the landlord/hirer has special responsibilities to ensure that any installer they use for the gas fitting, service, maintenance or safety check is an approved class of person and is competent to carry out such work. If any serious fault is found, the installer must inform both the landlord/hirer, as well as the user, so that such faults can be rectified before further use. Reference should also be made to the current edition of the "Gas Industry Unsafe Situations Procedure" (GIUSP).

3.3.5 With respect to the duties on landlords, of particular relevance is Regulation 36:

- **Section 2b.** This states "every landlord shall ensure that there is maintained in a safe condition any flue which serves any relevant gas fitting, so as to prevent the risk of injury to any person in lawful occupation of relevant premises"
- **Section 3a.** This requires a landlord to "ensure that each appliance and flue to which that duty extends is checked for safety within 12 months of being installed and at intervals of not more than 12 months since it was last checked for safety (whether or not such check was made pursuant to these regulations)."

Note: BS 5440-1 states that a Se-duct or U-duct has to be checked to ensure that it conforms to all relevant sections of BS 5440-1 and that appliances connected can be used safely. The same principles would need to be applied for CFSS.

3.4 **MANAGEMENT OF HEALTH AND SAFETY AT WORK REGULATIONS (MHSWR)**

MHSWR impose a duty on employers and the self-employed to make assessments of risks to the health and safety of employees, and non-employees affected by their work. They also require effective planning and review of protective measures.

3.5 **CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH REGULATIONS (COSHH)**

3.5.1 COSHH, which reinforce existing statutory obligations under HSWA, impose a duty on employers to protect employees against risks to health, whether immediate or delayed, arising from exposure to substances hazardous to health, either used or encountered, as a result of a work activity. They also impose certain duties on employees.

3.5.2 Under COSHH, work must not be carried out which is liable to expose employees to hazardous substances unless the employer has made a suitable and sufficient assessment of the risk created by the work and the steps that need to be taken to comply with COSHH. After assessing the risk, it is necessary to inform employees of the risks and to carry out the appropriate training and instruction to ensure the risks are minimised. In certain cases, control measures such as ventilation or personal protective equipment may be necessary and, where required, they must be used.

3.6 **CONTROL OF ASBESTOS AT WORK REGULATIONS**

3.6.1 These Regulations set out standards for the identification, monitoring and assessment of work that may expose workers to asbestos and the measures needed to control the risk.

3.6.2 Employers cannot carry out any work that exposes, or is likely to expose, employees to asbestos unless an assessment of that exposure has been made. Employers have to set out steps to be taken to prevent, or reduce to the lowest level reasonably practicable, that exposure. Employers have to carry out medical surveillance of employees if they work over a certain time limit.

3.6.3 The Regulations impose a duty on those with responsibilities for the repair and maintenance of non-domestic premises to find out if there are, or may be, asbestos containing materials within them; to record the location and condition of such materials and assess and manage any risk from them, including passing of any information about their location and condition to anyone likely to disturb them. There is an 18 month lead in period for this duty.

3.6.4 Further information is available in HSG227, HSL27, HSL28 and HSL127.

3.7 **GAS APPLIANCES (SAFETY) REGULATIONS**

Until 1992, the safety of consumers using gas appliances offered for sale in the United Kingdom (UK) was covered, generally, by the Consumer Protection Act and, specifically, by the Gas Cooking Appliances (Safety) Regulations and the Heating Appliances (Fireguard) Regulations. The Gas Appliances (Safety) Regulations introduced specific requirements, for all gas appliances, which must be met before the product can be sold. All new appliances must carry CE marking and be endorsed for use in the UK.

3.8 **CONFINED SPACES REGULATIONS**

These Regulations apply to a large range of confined spaces. The supplier or designer of an enclosure and equipment within it is required to perform a risk

assessment of the enclosure with respect to safe access and egress and to give clear instructions to operators on access/egress as well as to what actions to take in the event of a gas alarm occurring.

Employers and the self employed should prevent entry into confined spaces unless avoidance is not reasonably practicable and unless there is a system of work which renders the work safe. They are also required to have specific emergency arrangements in place.

3.9

CONSTRUCTION (DESIGN AND MANAGEMENT) REGULATIONS (CDM)

CDM impose duties on designers, clients (and their agents), developers, planning supervisors and principal contractors. Not all the regulations apply to all construction projects. Further information is given in HSL144. For a notifiable project (as defined in CDM) the planning supervisor must notify HSE before construction work commences. Construction includes the alterations, repair redecoration, maintenance, decommissioning or demolition of a structure. It also covers installation, commissioning maintenance or removal of gas services.

SECTION 4 : RESPONSIBILITIES AND MANAGEMENT

- 4.1 The responsibility for the maintenance of specific parts of a shared flue system should be as shown in Table 1.

DESCRIPTION OF EQUIPMENT	RESPONSIBILITY
Duct air inlet grilles, shared chimney ducts and roof terminals.	Property owner, for example, the landlord, housing association, management company etc.
Individual appliances and their flue ducts up to and including the connection to the shared flue.	Appliance owner, for example, owner-occupier, landlord, housing association etc.

TABLE 1 - RESPONSIBILITY FOR MAINTENANCE

- 4.2 The property owner shall ensure that the shared flue system, including any flue ducts, air inlets and roof terminals are inspected and/or tested at intervals not exceeding 12 months, to ensure the continued safety of the shared flue.

Note 1: By their nature, shared flue systems are considered susceptible to vandalism and unauthorised modification by tenants and owner-occupiers.

Note 2: Attention is drawn to the landlord's responsibilities under GS(I&U)R which require that a landlord "must ensure that each appliance and flue...is checked for safety within 12 months of being installed and at intervals of not more than 12 months since it was last checked for safety..."

- 4.3 Where a fault on a shared flue that could affect safety is identified, the property owner shall promptly arrange for repair to be undertaken.

Note: It may be necessary to prevent use of the shared flue until such repairs are undertaken.

- 4.4 The property owner shall provide the name and contact telephone number of an appropriate party that is able to supply the following information about the shared flue system:

- the type of system used at the property, for example, Se-Duct, U-Duct, CFS etc.
- height and dimensions of the shared flue system
- flue type of appliances that may be connected to the shared flue system
- maximum rating of appliances that may be connected to the shared flue system
- any other limitation on appliances that may be connected, for example CFS/FA (see clause 5.5.3)
- records of the routine inspections carried out (see Sub-Section 4.2)
- information about the location and condition of any asbestos within the chimney system.

Note: The intention of this requirement is to ensure that operatives replacing appliances (who may not be directly employed by the property owner) have access to accurate information about the shared chimney.

SECTION 5 : RECOGNISING TYPES OF SHARED OR COMMUNAL FLUE SYSTEMS

5.1 GENERAL

5.1.1 When planning to install a gas appliance on a new or existing shared flue system, it shall be established whether it is:

- a shunt duct system or
- a Se-duct system or
- a U-duct system or
- a fabricated communal flue system (CFS) and, if so, whether it is;
 - a concentric naturally ventilated (negative pressure) CFS supplying combustion air and extracting flue combustion products (designated CFS/NV) or
 - a concentric fan assisted (positive pressure) CFS supplying combustion air and extracting flue combustion products (designated CFS/FA) or
 - a naturally ventilated or fan assisted single duct CFS extracting flue combustion products only (designated CFS/EO/NV or CFS/EO/FA).

Note 1: If it is found that the system is not of the shunt duct, Se-duct or U-duct type, or of the described CFS type, this Standard may not be appropriate.

Note 2: Shunt, Se-duct and U-duct systems are not suitable for condensing appliances (see clause 6.1.4).

5.1.2 Figure 10 should be used to assist in identifying which of the four types of shared flue system has been constructed. However, no single feature should be taken as correct identification of the type. As many features as possible should be confirmed.

Note: For example, if open flued appliances are fitted, this would indicate a shunt duct type system as such appliances are not suitable for other systems, but the appliances may have been installed in error on another type of system.

5.2 SHUNT DUCT SYSTEMS

Shunt ducts are used to remove combustion products from open flued appliances that are situated in different rooms within an individual dwelling (commonly gas fires, multi-point water heaters, storage heaters, boilers and warm air heaters). Such appliances take their combustion air from the room in which the appliance is installed, and the shunt duct conveys the combustion products to outside air.

Typical arrangements for shunt ducts are shown in Figure 1.

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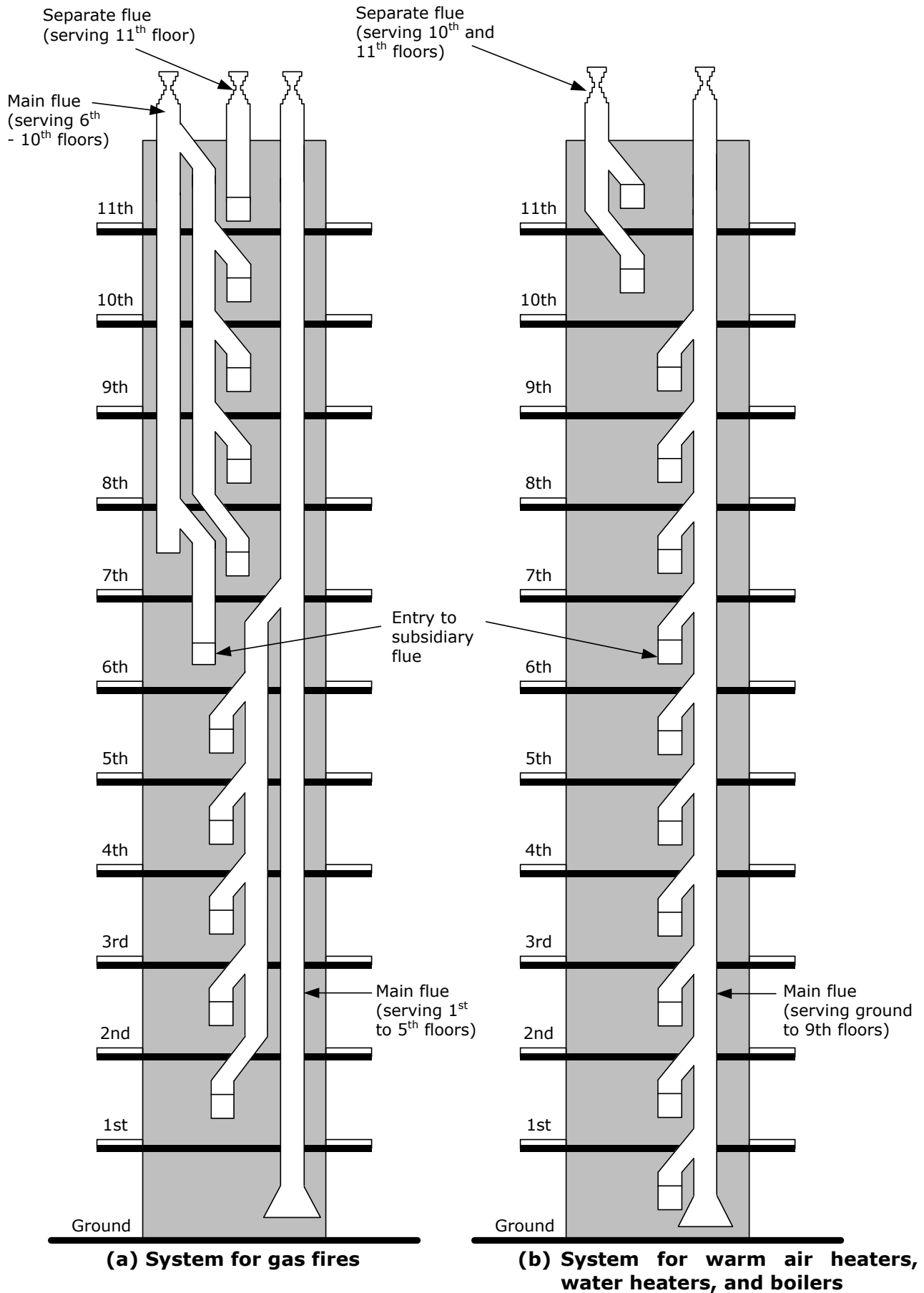


FIGURE 1 - TYPICAL ARRANGEMENTS OF A SHUNT DUCT SHARED FLUE SYSTEM

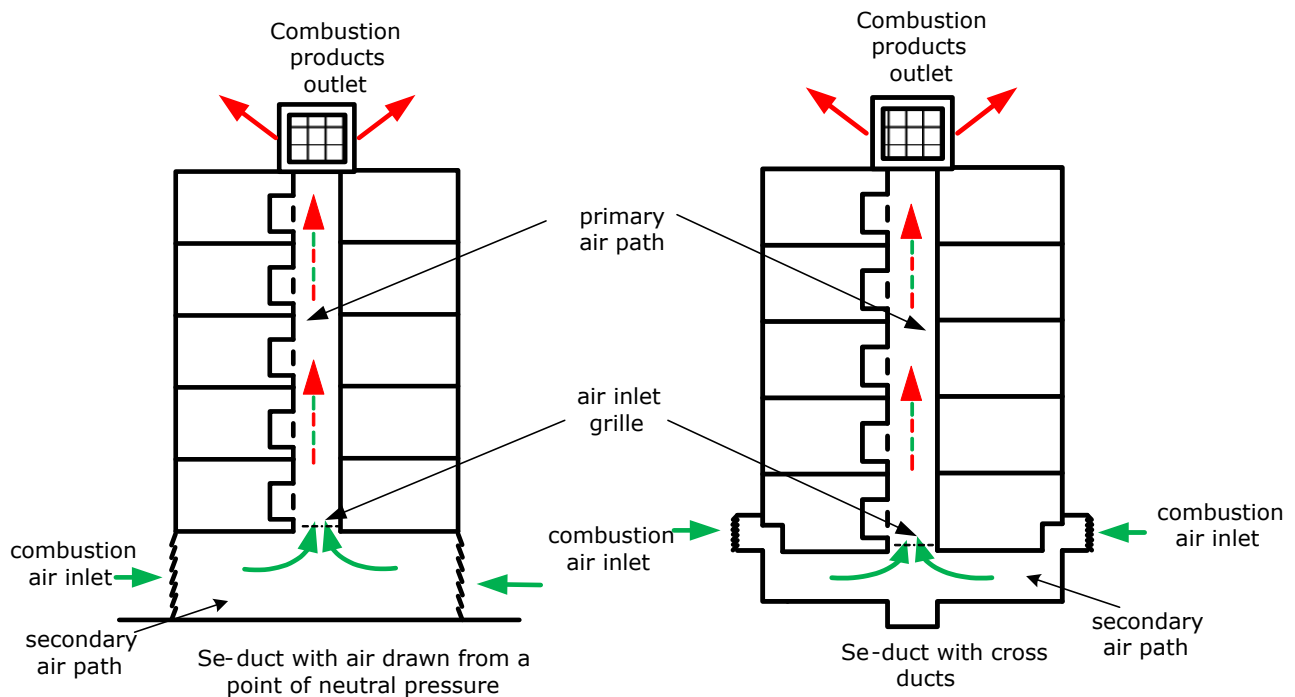
5.3

SE-DUCT SYSTEMS

Se-duct systems allow room sealed appliances to receive combustion air from a common duct which also conveys the combustion products to outside air. This is possible through the "flue flow" effect whereby combustion products are drawn towards the centre of the duct, leaving an envelope of fresh air of up to 50 mm from the edge of the duct wall which provides the combustion air. This combustion air is drawn in from the base of the duct and combustion products are expelled through a terminal on the building roof.

Typical arrangements for Se-ducts are shown in Figure 2.

Photographs showing actual air inlets and combustion product outlets are given in Appendix 3.



Note: The cross ducts may be remote from the vertical section and difficult to find and identify. The air inlet ducts may be in such areas as communal areas, a utilities area or even in refuse bin sheds/enclosures.

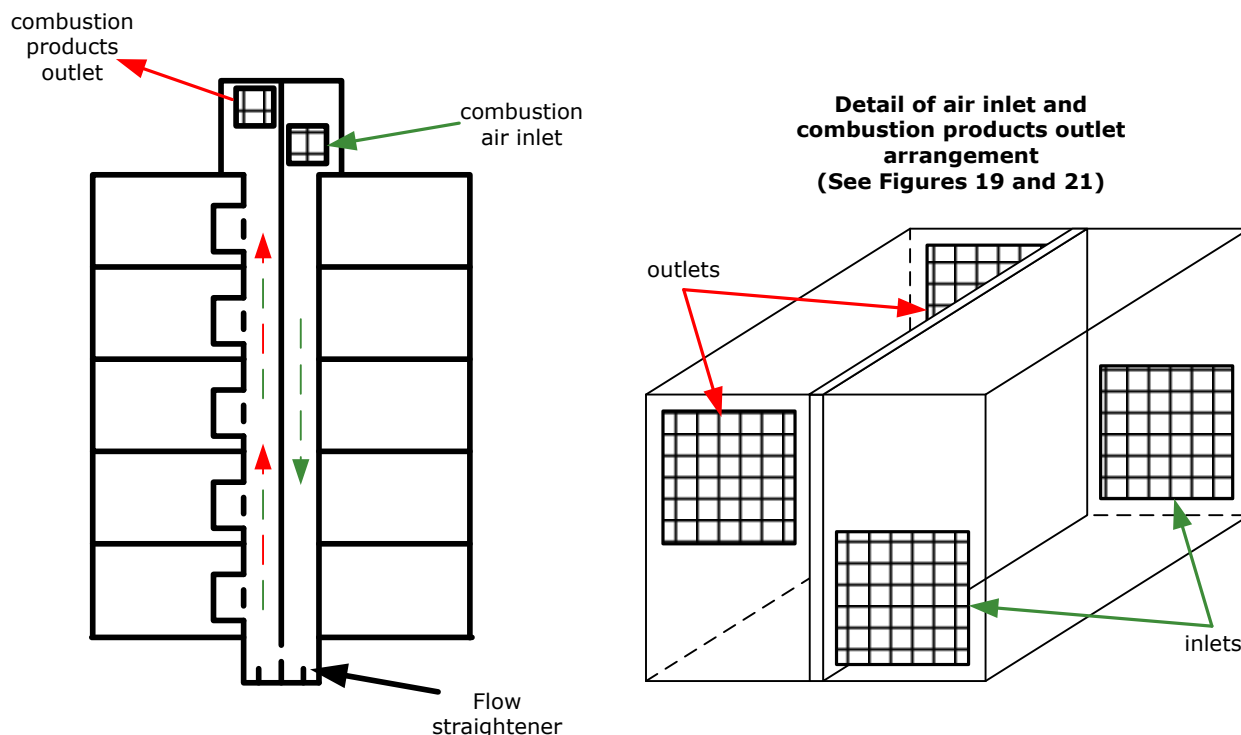
FIGURE 2 - TYPICAL ARRANGEMENTS OF A SE-DUCT SHARED FLUE SYSTEM

5.4

U-DUCT SYSTEMS

U-ducts draw combustion air from the top of a building in a vertical duct that is adjacent to the duct that takes combustion products from appliances. This vertical duct is joined to the other duct via a "U" shape arrangement, at the base. Otherwise, the U-duct operates on the same principles as a Se-duct.

Typical arrangements for U-ducts are shown in Figure 3.



Note: The terminal arrangement may be different if the total heat output gross exceeds 150 kW.

FIGURE 3 - TYPICAL ARRANGEMENT OF A U-DUCT SHARED FLUE SYSTEM

5.5 COMMUNAL FLUE SYSTEMS (CFSs)

5.5.1 General

The following shall be considered:

- CFSs may be used to accommodate condensing and non-condensing appliances (see Figure 9)

Note: For appliances suitable for CFS, see Figure 10.

- a condensate collection unit is installed at the base of the system (see Figure 4).

Although designed and constructed to accommodate any condensate which may accumulate in the flue system the CFS must not be used as the discharge route for condensate removal from individual appliances connected to the CFS. Under normal operation residual condensate will accumulate in the CFS and a suitable means of removal from the condensate collector at the base of the CFS will be required

Note 1: Further information on Condensate Drain design can be found in Appendix 6.

Note 2: Each condensing appliance still requires its own condensate drain connection which is not connected to the CFS.