

Section 11

PROTECTION OF OPENINGS AND FIRE STOPPING

Introduction

11.1 Sections 9 and 10 make provisions for fire separating elements, and set out the circumstances in which there may be openings in them. This section deals with the protection of openings in such elements.

11.2 If a fire separating element is to be effective, then every joint, or imperfection of fit, or opening to allow services to pass through the element, should be adequately protected by sealing or fire-stopping so that the fire resistance of the element is not impaired.

11.3 The measures in this section are intended to delay the passage of fire. They generally have the additional benefit of retarding smoke spread, but the test specified in Appendix A for integrity does not stipulate criteria for the passage of smoke as such.

11.4 Detailed guidance on door openings and fire doors is given in Appendix B.

Openings for pipes

11.5 Pipes which pass through a compartment wall or compartment floor (unless the pipe is in a protected shaft), or through a cavity barrier, should meet the appropriate provisions in alternatives A, B or C below.

Alternative A: Proprietary seals (any pipe diameter)

11.6 Provide a proprietary sealing system which has been shown by test to maintain the fire resistance of the wall, floor or cavity barrier.

Alternative B: Pipes with a restricted diameter

11.7 Where a proprietary sealing system is not used, fire-stopping may be used around the pipe, keeping the opening as small as possible. The nominal internal diameter of the pipe should not be more than the relevant dimension given in Table 15.

Table 15 Maximum nominal internal diameter of pipes passing through a compartment wall/floor (see para 11.5 et seq)

Situation	Pipe material and maximum nominal internal diameter (mm)		
	(a) Non-combustible material (1)	(b) Lead, aluminium, aluminium alloy, uPVC (2), fibre cement	(c) Any other material
1. Structure (but not a wall separating buildings) enclosing a protected shaft which is not a stairway or a lift shaft	160	110	40
2. Wall separating dwelling houses, or compartment wall or compartment floor between flats	160	160 (stack pipe) (3) 110 (branch pipe) (3)	40
3. Any other situation	160	40	40

Notes:

- Any non-combustible material (such as cast iron, copper or steel) which if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.
- uPVC pipes complying with BS 4514 and uPVC pipes complying with BS 5255.
- These diameters are only in relation to pipes forming part of an above-ground drainage system and enclosed as shown in Diagram 38. In other cases the maximum diameters against situation 3 apply.

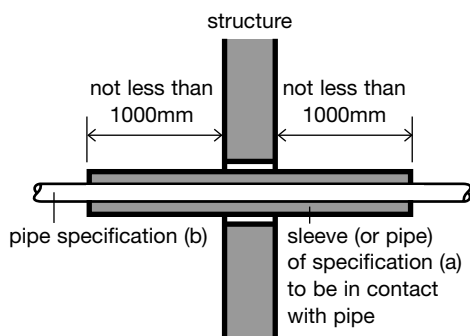
11.8 The diameters given in Table 15 for pipes of specification (b) used in situation (2) assume that the pipes are part of an above-ground drainage system and are enclosed as shown in Diagram 38. If they are not, the smaller diameter given in situation (3) should be used.

Alternative C: Sleeving

11.9 A pipe of lead, aluminium, aluminium alloy, fibre-cement or uPVC, with a maximum nominal internal diameter of 160mm, may be used with a sleeving of non-combustible pipe as shown in Diagram 37. The specification for non-combustible and uPVC pipes is given in the notes to Table 15.

Diagram 37 Pipes penetrating structure

See para 11.9, alternative method C



Notes:

- 1 Make the opening in the structure as small as possible and provide fire-stopping between pipe and structure.
- 2 See Table 15 for materials specification.

Fire-stopping

11.12 In addition to any other provisions in this document for fire-stopping:

- a. joints between fire separating elements should be fire-stopped; and
- b. all openings for pipes, ducts, conduits or cables to pass through any part of a fire separating element should be:
 - i. kept as few in number as possible, and
 - ii. kept as small as practicable, and
 - iii. fire-stopped (which in the case of a pipe or duct, should allow thermal movement).

11.13 To prevent displacement, materials used for fire-stopping should be reinforced with (or supported by) materials of limited combustibility in the following circumstances:

- a. in all cases where the unsupported span is greater than 100mm; and
- b. in any other case where non-rigid materials are used (unless they have been shown to be satisfactory by test).

11.14 Proprietary fire-stopping and sealing systems, (including those designed for service penetrations) which have been shown by test to maintain the fire resistance of the wall or other element, are available and may be used.

Other fire-stopping materials include:

- cement mortar,
- gypsum based plaster,
- cement or gypsum based vermiculite/perlite mixes,
- glass fibre, crushed rock, blast furnace slag or ceramic based products (with or without resin binders), and
- intumescent mastics.

These may be used in situations appropriate to the particular material. Not all of them will be suitable in every situation.

Ventilating ducts

11.10 BS 5588: Part 9 *Fire precautions in the design, construction and use of buildings, Code of practice for ventilation and air conditioning ductwork* sets out alternative ways in which the integrity of compartments may be maintained where ventilation and air conditioning ducts penetrate fire separating elements. The alternatives are equally acceptable, and the recommendations of that code should be followed where air handling ducts pass from one compartment to another.

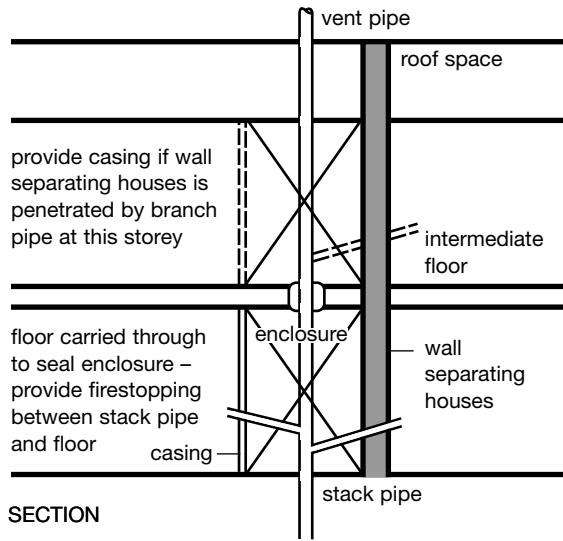
Flues, etc.

11.11 If a flue, or duct containing flues or appliance ventilation duct(s), passes through a compartment wall or compartment floor, or is built into a compartment wall, each wall of the flue or duct should have a fire resistance of at least half that of the wall or floor in order to prevent the by-passing of the compartmentation (see Diagram 39).

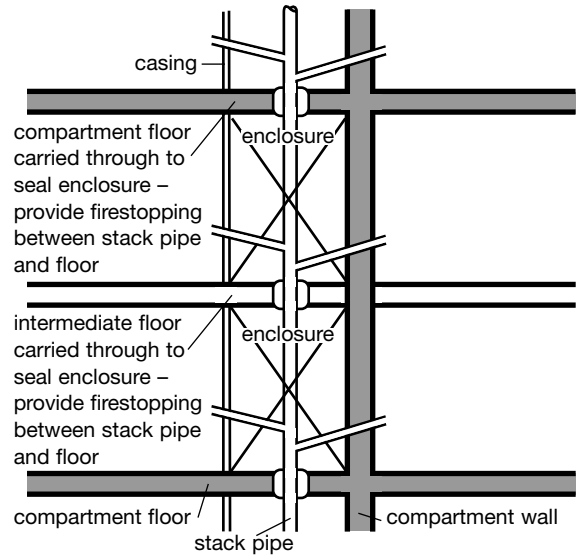
Diagram 38 Enclosure for drainage or water supply pipes

See para 11.8 and Table 15

a. HOUSE WITH ANY NUMBER OF STOREYS



b. OTHER BUILDINGS



Notes:

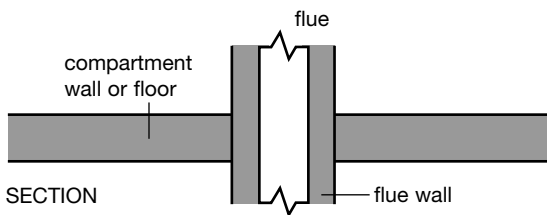
- 1 The enclosure should:
 - a be bounded by a compartment wall or floor, an outside wall, an intermediate floor, or a casing (see specification at 2 below), and
 - b have internal surfaces (except framing members) of Class 0, and
 - c not have an access panel which opens into a circulation space or bedroom, and
 - d be used only for drainage, or water supply, or vent pipes for a drainage system
- 2 The casing should:
 - a be imperforate except for an opening for a pipe or an access panel, and
 - b not be of sheet metal, and
 - c have (including any access panel) not less than 30 minutes fire resistance
- 3 The opening for a pipe, either in the structure or the casing, should be as small as possible and fire-stopped around the pipe.

Diagram 39 Flues penetrating compartment walls or floors

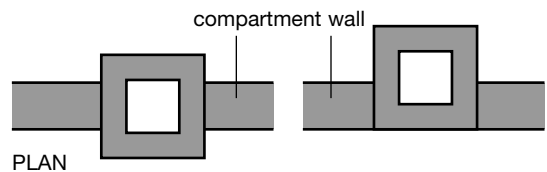
(note that there is guidance in Approved Document J concerning hearths adjacent to compartment walls)

See para 11.11

a. FLUE PASSING THROUGH COMPARTMENT WALL OR FLOOR



b. FLUE BUILT INTO COMPARTMENT WALL



Flue walls should have a fire resistance of at least one half of that required for the compartment wall or floor, and be of non-combustible construction.

In each case flue walls should have a fire resistance at least one half of that required for the compartment wall and be of non-combustible construction.