FIRE

and the Design of Schools

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Introduction

Regulation 51 of the Standards for School Premises Regulations, 1972, deals with fire precautions in schools and boarding accommodation and reads:

"In all parts of the buildings the design, the construction, the limitation of the surface flame spread, the fire resistance of the elements of the structure and the properties of the materials shall be such that the health and safety of the occupants, and in particular their safe escape in the event of fire, shall be reasonably assured."

This BULLETIN seeks to give guidance on ways of designing schools so that they will satisfy the requirements of this regulation. The guidance is limited in scope in several ways:

(1) It is concerned almost entirely with primary and secondary day schools but also applies in part to certain other educational buildings such as establishments of further education and colleges of education. Although the recommendations apply in the main to new buildings the recommendations should be treated as those appropriate for school premises generally and therefore used as a guide in carrying out such work as remodelling, adaptations, or reviewing the standards of existing buildings.

(2) With the exception of paragraph 3.5, which deals with structural fire precautions, the recommendations do not apply to residential accommodation which is considered by the Department on an individual basis. Neither do the recommendations deal in detail with buildings for handicapped children which require special consideration depending on the handicap concerned. The Department is however willing to help with advice about special schools, ordinary schools and other educational establishments designed to provide for the handicapped.

It should be noted that some parts of large school buildings which are used as offices or shops may also, because of amending legislation in the Health and Safety at Work etc. Act 1974, become subject on 1 January 1977, as regards the means of escape, to the Fire Precautions Act 1971. These premises were those previously subject to the Offices, Shops & Railway Premises Act. In these cases Her Majesty's Factory Inspectorate should be brought into any discussions concerning means of escape and fire alarms, though their requirements are unlikely to differ the general guidance in this BULLETIN, until the designation order comes into effect and the local Fire Authority, who should then be consulted, takes over the responsibility.

Although the main emphasis of the BULLETIN is on those precautions judged to be sufficient to ensure the safe escape of the occupants of the building in the event of fire, rather than on any which may be necessary to preserve its structure or fabric, the BULLETIN does include within Chapter 3 precautions that are now to be taken to restrict damage to the structure. The attention of School Authorities is particularly drawn to the information about the number of fires in educational buildings of all kinds during the years 1958 to 1974 contained in Appendix 1.

The formulation of systematic principles to serve as a guide in individual cases presents special difficulties. Any such principles, to be of general use, must hold good for a wide range of designs, materials and methods of construction. In particular, taking into account the present trends of school design and construction, they must remain valid, not only for traditional building methods and designs, but also for new, including industrialised, systems of construction and for designs which are becoming less formal by the breaking down of rigid divisions between one space and another and the planning of dual and multiple use of single spaces. The precautions recommended attempt to embrace all these varying conditions. The recommendations as a whole have been specifically framed to permit the maximum freedom in planning and construction, compatible with ensuring personal safety and restricting structural damage in the event of fire.

This 5th edition of the BULLETIN has been revised in the light of experience gained since 1971, of suggestions made by local education and fire authorities and of evidence obtained from a special survey of fires in schools carried out by the Fire Research Station in 1974-5. Also it brings the standards for structural fire precautions in school buildings into closer alignment with the requirements of Part E of the Building Regulations 1972 as previously announced in the Department of Education and Science Administrative Memorandum 11/73 and Welsh Office Administrative Memorandum 7/73. These requirements particularly concern the relationship of one building to another (or to a boundary), the spread of flame classifications for internal surfaces, the protection of structural elements, the volumes and areas for compartments of a building.
and the requirements for fire stopping of voids. Authorities through their officers, will be responsible for complying with these requirements.

This edition takes further account of the problems for escape in large and interconnected spaces in schools. The recommendations for such spaces generally follow those in previous editions for large dual-purpose areas. Among others there is a small but important change in the requirement for fire doors at the top of a single stairway where it may be provided in a 2-storey school. Brief reference is made to special problems that arise when conventional opening windows are not provided or there are extensive mechanical ventilation systems. The BULLETIN deals with various types of fire precautions that can be designed into a school but in the main emphasis is placed on the proper design and construction to ensure the safe escape of the occupants in the event of fire. Other requirements that are covered include the construction of the building as a whole and its resistance to the rapid spread of fire, and the provision of fire-warning systems and fire-fighting equipment. All these requirements interact with each other and it may be thought that one can be balanced within narrow limits against the provision of another, however the characteristics of fire make it necessary to adopt a minimum standard for each. The various requirements are dealt with in the BULLETIN, as follows:

(1) Chapter 1, which serves as a general introduction to the subject of means of escape from a building, describes the behaviour of fire in so far as it may affect those parts of the building which people must necessarily use to reach safety.

(2) Chapter 2 makes detailed recommendations about the planning and construction of these escape routes and is based very largely on the considerations discussed in Chapter 1. These recommendations deal chiefly with the number, width, location and construction of escape routes.

(3) Chapter 3 sets out the structural fire precautions now recommended for schools. The standards, which are those in the Building (First Amendment) Regulations 1973, amended as described, deal with limiting the use of combustible materials, compartmentation, the use of fire resisting construction, restriction of the spread of smoke and flames both on and within the construction and precautions limiting the spread of fire from building to building.

(4) Chapter 4 describes various types of fire-warning systems and fire-fighting equipment and suggests the scale on which they might be installed.

(5) Chapter 5 briefly calls attention to some everyday precautions by the occupants which, if not observed, may well nullify all the precautions recommended elsewhere.

Acknowledgements

The preparation of the original BULLETIN and this revision would not have been possible without the active co-operation of persons outside the Department of Education and Science. The Secretary of State wishes to acknowledge all the assistance given, particularly that by the Fire Department and Fire Service Inspectorate of the Home Office, the Building Regulations Division of the Department of the Environment, the Factory Inspectorate of the Department of Employment (now part of the Health and Safety Executive), the Greater London Council and the Fire Research Station who carried out the special survey of school fires. Thanks are also due to those, particularly in local education and fire authorities, who at various times have helped to improve this BULLETIN during the 24 years since it was first published.
Terminology
(See also paragraph 3.4)

Escape route

The term "escape route" means a route from a point in a building to a final exit. Escape routes must not terminate in enclosed courtyards from which it would be necessary to re-enter the buildings before reaching complete safety.

Escape routes may comprise one or more of the following constituent parts:

- The route from any point in a room to the room exit door:
  - Horizontal circulation areas (defined below) and the exits from them:
  - Stairways and the final exits from them.

(For example, a single external door may be an adequate escape route from a room on the ground floor, but more generally, an escape route will also include a portion of horizontal circulation area and, from upper floors, a stairway).

Final exit

The term "final exit" means the last point of an escape route beyond which persons are no longer in danger. This would normally be an unenclosed space in the open air at ground level.

Dual-purpose area

The term "dual-purpose area" means any area which may serve at least two different purposes, one of which is that of an escape route. For instance, dual-purpose areas will frequently feature in schools with large interconnected areas.

Horizontal circulation area

The term "horizontal circulation area" means both corridors and dual-purpose areas (defined above).

Area of high fire risk

The term "area of high fire risk" means any room or space in which, on account of its function or use, an outbreak of fire is more likely than in a non-specialist teaching room. Boiler rooms, kitchens, laboratories, workshops, store-rooms and any practical space with a fixed or breakout portable heating (or heat producing) appliance should be considered as being among such areas.

Stairway enclosure

The term "stairway enclosure" is used in two ways to mean either the area occupied by stairs and landings and any part of a horizontal circulation area not separated from them by doors, or the walls, partitions and should doors enclosing that area.

Compartment

The term "compartment" means any part of a building separated from all other parts by one or more compartment walls or compartment floors. The requirements of Part 1 and Part 2 of the Table to Regulation E5 of the Building Regulations 1972 have been amended as set out in Chapter 3 of this BULLETIN, and cover the areas, volumes and minimum fire resistance of compartments.

Compartment walls and compartment floors

The terms "compartment wall" and "compartment floor" mean respectively a wall and a floor forming the vertical and horizontal limits to a compartment. These elements are to comply with the requirements of Regulation E9 of the Building Regulations 1972 except that, in reference to Regulation E5, the requirements of the amended table and its notes in Chapter 3 of this BULLETIN shall apply.

Combustibility and fire resistance

The terms "combustibility" and "fire resistance" and their derivatives, are used as defined in BS 476, which indicates that "non-combustibility" applies to materials only, and that "fire resistance" applies to elements of structure only.

Lining material

The term "lining material" means a material incorporated in a building structure to form the surface of a

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Terminology

(See also paragraph 3.4)

Wall or ceiling. The surfaces of combustible lining materials are classified by a surface spread of flame test specified in BS476, Part 7, in which Class 1 is the safest and Class 4 the most hazardous. Lining materials may also be required to be non-combustible (BS476, Part 4) or Class 0 (BS476, Part 6) as defined in Regulation E15 of the Building Regulations 1972 and the first amendment 1973. Class 0 materials should be checked to ensure that they also achieve a Class 1 rating by the surface spread of flame test.

Roof covering

The term “roof covering” means either the roof covering by itself or in combination with other materials (or other parts of the roof structure) necessary to improve the properties of the covering itself in retarding penetration of fire from outside. Roof coverings are designated in accordance with standard tests specified in BS476 Part 3 (1958) “external fire exposure roof tests”, and are referred to in Regulation E14 and Schedule 10 of The Building (First Amendment) Regulations 1973.

Fire doors

Fire resistant and “smoke stop” doors are referred to in this Bulletin under the general title of “fire doors” and are one of the most important elements of fire safety precautions. The failure of doors under fire usually occurs either at the point between the door and the frame or at the points where items of ironmongery (particularly hinges and locks) are fixed. Hinges should not be combustible or melt below 800°C.

Fire doors should be self-closing with an automatic device other than a rising butt, and kept closed whenever possible. They should also be marked with a warning notice such as “Fire Door: Keep Shut”. (Further reference to these points is made in paragraphs 2.39–2.43.)

For the purpose of this Bulletin, the fire doors recommended are referred to as types 1 and 2 and are as described in British Standard Code of Practice CP3: Chapter IV: Parts 2 and 3 (1968). In all cases the tests referred to are those laid down in BS476 for doors. These tests do not require fire doors to provide heat insulation.

“Type 1 door”. This door has generally been referred to as “fire resistant” (the Building Regulations 1972 refer to “Fire Resisting Door. FR”) and is intended for use in, for example, compartment walls, stairway enclosures, and internal access lobbies to boiler rooms. The door (or each leaf of double doors) when fitted in its own rebated frame should satisfy the requirements of tests for both freedom from collapse and resistance to the passage of flame for the required period. This period should be one hour for doors and frames fitted for internal boiler room access (see para. 2.8(3)), but will otherwise be half an hour, or as required by the compartment size in the table to Regulation E5 as amended in Chapter 3 (para. 3.6).

“Type 2 door”. This door has generally been referred to as “smoke-stop” and is intended to prevent smoke and dangerous gases from spreading into escape routes, although it will also assist in restricting the spread of fire generally. For the purposes of testing the door (or each leaf of double doors) when fitted in a 25 mm rebated frame should satisfy the requirements for both freedom from collapse and resistance to the passage of flame for not less than half an hour.

Type 2 doors may be either single or double leaf, and may open in either one direction (single swing) or both directions (double swing). Frames to single swing doors may have an unspecified depth of rebate, and with unrebated frames to double swing doors, the clearance between door and frame (or door leaf and door leaf) should be as small as is reasonably practical. Fire doors of both types 1 and 2 may incorporate fixed glazing as long as the fire resistance for integrity and stability is maintained. (Details of the fire resistance of glazing in doors will be found in BS Code of Practice CP 153, Part 4).
Chapter one
Means of escape: General principles

The approach to the problem

1.1 The design of means of escape from a building must be based on an appreciation of the probable behaviour of fire, which may break out in any part of the building and then spread to other parts. Although recommendations based on such considerations can be devised, they can be used intelligently only if the nature of the risks which they are intended to meet is continually borne in mind. The design of a building should therefore be analysed, part by part, in order to determine the danger which might arise from a fire, either in the part where the fire may originate or in any other part to which it may spread. The importance of analysing a plan with these facts in mind cannot be overestimated. To illustrate this approach to the problem, the following paragraphs contain a study of the behaviour of fire in the course of which the fundamental precautions which form the basis of the recommendations in this BULLETIN are deduced. Cross-references are given to the later parts of the BULLETIN where the general principles here deduced are expressed as specific recommendations.

1.2 A fire will normally start at a particular point; that is to say, it will not, at the moment of initiation, involve any large area nor will it be usual for two fires to start at the same time at different points. It will at first only create a hazard in the part in which it starts. Subsequently it may spread to other parts, either along the communication routes within the building or through the building's structure. Only spread along the communication routes will be considered in this part of the BULLETIN, as this is the primary consideration so far as means of escape are concerned. (Measures to prevent spread through the structure are considered in Chapter 3). Fire spreading along the communication route will affect, first, other parts of the same floor and then, by way of stairways or other vertical shafts, the upper floors. The risk which may be caused by a fire in each of these three phases will be examined separately.

1.3 The primary danger associated with fire in its early stages is not flame or heat but the smoke and noxious gases produced by the fire. These may make an escape route impassable long before a temperature which is dangerous to life is reached. Fatalities may also be caused by toxic qualities in the smoke from certain materials. It is against smoke and fumes, therefore, that precautions must be mainly directed (see, in particular, paragraph 3.8 on fire stopping).

First principle: Alternative means of escape

1.4 The first and fundamental principle is the provision of alternative means of escape. The principle is widely accepted but its implications are perhaps not so fully appreciated. Moreover, there are many occasions on which the principle needs to be applied only to a limited degree or even, in some cases, not at all. The general consideration of the problem which follows will therefore largely revolve around the one principle of alternative means of escape.
The first phase: The early stages of fire

Small rooms

1.5 If a fire starts in a small room the number of occupants will be so small and the distance to the doorway so short that there is little risk that the occupants will not be able to escape through a single doorway. So far as this particular risk is concerned, therefore, a second way out of a small room is not necessary (para 2.2).

Large rooms

1.6 In a large room there is always the risk of panic, should a fire break out, because of the greater number of persons who may be involved. There is, moreover, a greater risk that a fire breaking out within the room may trap some of the occupants unless there is more than one way out of the room. For these reasons large rooms should have more than one exit doorway. These should be well distributed and the size and number should be adequate for the discharge of the occupants in a reasonably short time (paras 2.2(1), 2.3 and 2.4).

Corridors

1.7 A serious situation may arise should a fire start in a corridor (diagram 1), since it may not be detected before smoke cuts off the escape route from nearby rooms. For this reason corridors which serve any room with only one exit should have wall and ceiling lining materials of such a type that there will be virtually no risk of fire starting in them (para 2.12).

Dual-purpose areas and open planning

1.8 As with a corridor, a dual-purpose area which serves any room with only one exit should be provided with such wall and ceiling lining materials as will keep to a minimum the risk of a fire spreading in the dual-purpose area and thus trapping the occupants in their rooms (para 2.12). If a dual-purpose area, which serves any room with only one exit, has itself only one way out (diagram 2), the problem will be much the same as in the dead-end corridor discussed in para 1.11, and the same precautions to reduce the risk should be adopted (paras 2.13(1) and (2)). In the situation illustrated in diagram 2, consideration would have to be given to the risk to the occupants of the inner rooms, who would not immediately be aware of an outbreak. Vision panels, appropriately placed, would help to reduce this risk. A dual-purpose area, by its nature, may differ from a corridor in its content (furniture, etc) and use, and the risk of fire is potentially greater. For this reason, if a dual-purpose area is also an area of high fire risk, all rooms opening into it should have a second way out (para 2.2(3)).

Diagram 2

Stairways

1.9 Where a fire starts in a stairway it will quickly make the stairway unusable by the occupants of all the floors above the point of origin of the fire. They may find it possible to escape by some other route, but smoke and fire rise rapidly through any openings in the floors and may quickly spread to the upper floors. All stairways, therefore, should be constructed in such a way that an outbreak of fire on the stairway is virtually impossible (paras 2.30 and 2.38). Fire spreading from outside the stairway may create further hazards, and the necessary precautions in design will be considered in paragraphs 1.13-1.21, dealing with the vertical spread of fire.
The second phase: 
Horizontal spread of fire

1.10 Consider first a fire starting in a small room and spreading from the room to a main corridor (diagram 3). The occupants of the room in which the fire originates should find no difficulty in escaping. However there is a risk that smoke may enter the corridor through the open door in such quantities as to cut off the escape of occupants of the other rooms. As a fire may break out in any one of the rooms it is desirable that escape should be possible along the corridor in either direction. As a general rule, therefore, on all floors above the ground floor, corridors should lead to at least two stairways placed well apart (paras 2.11, 2.20 and 2.21, which also show the exceptions). However, stairways should not be so far apart that the risk is again increased owing to the distance that has to be travelled in order to reach safety (paras 2.13(1) and 2.14(1)); thus with a long corridor, there should be more than two stairways, and the corridor itself should be divided into shorter lengths by doors placed across it at intervals in order to prevent extensive smoke spread (paras 2.13(3) and 2.14(3)). A ground-floor corridor should be treated similarly unless all rooms have their own separate exits to the open air (para 2.16).

Dead-end corridors

1.11 If the principle that escape along corridors should be possible in either direction were to be rigidly applied, it would be necessary for stairways to be placed at the extremities of all corridors. The condition known as a "dead-end" corridor (diagram 4)—which is a great convenience in planning—would not then be possible. It is generally accepted, however, that if the dead-end corridor is short, and the number of persons using it is limited, the risk is not sufficiently great to preclude its use (paras 2.13 (1) and 2(2), and 2.14(1) and 2). Dead ends should also be separated from any other part of the corridor beyond the nearest stairs by a type 1 or type 2 fire door.

Interconnected and open plan areas

1.12 The risk of smoke spreading horizontally is greatly increased with open plans, where areas are not separated by floor-to-ceiling walls. With open plans it may, of course, be possible to raise the alarm quickly and to escape in several directions away from the source of the outbreak. However, it will be important to check on the length of the escape routes across the open area and to ensure that, in the case of large areas, alternative routes are available. In this connection, the furnishing of open-plan areas poses special problems (see para 5.8) as does the positioning of movable partitioning. Special attention must be paid to any small enclosed rooms which open only on to a large open-plan area (diagram 2).
The third phase: Vertical spread of fire

1.13 The principles and procedures outlined in paragraphs 1.10-1.12 enable horizontal escape routes to be so designed and constructed as to ensure that nobody will be trapped on a floor by a fire spreading horizontally. It now remains to consider what is needed to ensure that the occupants of all the floors above the ground will be able to reach the final exit in safety. This entails studying the risk of a fire on any lower floor spreading to a stairway and cutting off that escape route from the upper floors. The two conditions (stairway arrangement on ground and upper floors) will be considered separately.

Stairway arrangement above ground floor level

1.14 In the plan shown in diagram 5 a fire starting in one room has spread along the corridor and entered both stairways. Although the occupants of the rooms on this floor should have been able to escape before the fire reached these dimensions (the plan conforms with the principles deduced when studying the first and second phases of fire), it cannot be assumed that the occupants of the floor or floors above will have escaped in the same time. Should their movements be delayed it is clear that both their escape routes to the ground will be cut off by the fire. The risk from smoke and subsequently fire spreading up stairways and other vertical shafts is a serious one and there have been many deaths from this cause. In order to reduce the risk to the minimum it is essential that all stairways should be "enclosed". "Enclosure" consists of surrounding stairways by fire-resisting walls or partitions (paras 2.29-2.31) and providing self-closing fire doors of the appropriate type in all internal openings into the enclosure (paras 2.33-2.35).

1.15 The effect of enclosing the stairway in the plan shown in diagram 5 is shown in diagram 6. Provided that the doors in the stairway enclosure on the floor on which the fire starts are closed, smoke will be prevented from entering either stairway and both will be available for escape from upper floors. As the enclosure is continuous there are at least two sets of doors in each enclosure between the corridor on any one floor and the corridors on any other floor. Even if the doors to one stairway on the floor where the fire began fail to close, so that the stairway is filled with smoke, the doors in the enclosure on the upper floors will prevent smoke from spreading along the upper corridors and the occupants can therefore make their way without difficulty to the other stairway. Of course, if the doors

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**Diagram 5**

*Escape from floors above blocked by smoke*

**Diagram 6**

*Smoke checked at stairway enclosure*

**Diagram 7**

*Smoke rising from fire on a lower floor*
to both stairways fail to close on the floor in which the
fire starts, the escape routes from the upper floors will
again be cut off (paras 2.43 and 5.7). It is impossible to
guard against every contingency, however, and the
most that can reasonably be required is that there should
be at least two stairways properly enclosed on all floors.
The occupants should be aware of the need to keep
type I fire doors closed as far as is practicable (see
para 2.43).

1.16 It may be thought that if one stairway is enclosed
in order to provide a safe route to the ground any other
stairways need not be enclosed. The danger of this is
shown in diagram 7, where a fire starting on a lower floor
has passed up an unenclosed stairway and spread along
an upper floor. The enclosed stairway still provides a
safe escape route to the ground but the occupants of the
rooms along the corridor are unable to reach it.

1.17 As mentioned in paragraph 1.15, fire may enter
more than one stairway at the same time even with
properly enclosed stairways. The risk of this is very
small, and it is usual to assume that only one stairway
is likely to become unusable during the period of escape.
The arrangement of stairway enclosures must, however,
be such that, if one stairway cannot be used, the occu-
pants of the upper floors are able to reach an alternative
stairway. Instances in which faulty planning might
make this impossible are discussed below.

1.18 Diagram 8 shows how fire passing up the stair-
way next to the dead-end corridor may trap the occu-
pants of the rooms in the dead end. As a general
principle, the stairway enclosure on upper floors should
be arranged so that any part of a horizontal escape
route which forms the sole means of escape from any
portion of a building does not pass through the en-
closure. The remedy for the faults illustrated in dia-
agrams 7 and 8 is shown in diagram 9 (which is, of course,
identical with diagram 4).

1.19 Another instance of faulty planning is illustrated
in diagram 10. Fire passing up the stairway may make
escape by that route impossible and any room opening
into the stairway enclosure should, if used for teaching
purposes, have a second way out leading by a separate
escape route to the final exit (para 2.2(2)). Room A
which has only one way out, is unsafe, but Room B,
which has a second way out through Room C to another
stairway, is safe. (The need to provide a second way
out of a room which opens into a stairway enclosure
does not apply to lavatories and washrooms). One
remedy for the fault shown in diagram 10 is shown in
diagram 11.
Open plans on two floor levels

1.20 Two general principles have emerged so far: the provision of alternative escape routes, and the separation of the two routes by two sets of fire doors at each level. However, it is possible to treat small sections of accommodation where an open stairway or an open well connects two floor levels on the same principle as open-plan areas (diagrams 19 and 20). For example (as in diagrams 12 and 13), rooms with only one exit on an upper level may have an escape route across an open gallery, provided it is not longer than 12 m to the exit from the floor and there are vision panels. Also the open area at the lower level must not exceed 200 m² or be associated with any area of high fire risk (e.g. kitchen servery). If these conditions cannot be met, the open gallery must be sealed off from the lower area by fire-resisting glazing or other method.

Diagram 14

bottom of a stairway to the open air. All persons descending from upper floors, and often those leaving the ground floor, converge upon and pass through this area. A fire spreading to it will make a whole escape route from every floor useless. The simplest and safest precaution against such a risk is to provide a stairway enclosure which, on the ground floor, has a doorway leading directly to the open air and which, except for the minimum number of doors opening from the horizontal circulation area, is otherwise completely shut off. Such an arrangement is shown in diagram 14, where the enclosure is connected to the rest of the ground floor by only one doorway into a corridor.

Two-storey schools

1.22 Although the principles discussed earlier apply as much to two-storey schools as to higher buildings, the risk of children being trapped on the upper floor of a two-storey school is less than it is in higher buildings because the vertical distance to the ground is shorter. In limited areas of two-storey schools, therefore, it may be reasonable to modify the general recommendations for means of escape, particularly in the number of stairways provided. It is assumed that no windows in these schools will be permanently sealed; if they are, consideration must be given to additional safeguards. The detailed recommendations that follow include several that apply specifically to two-storey schools (paras 2.11(3), 2.20 and 2.29).
Chapter two
Means of escape: Planning

Room exits

Doors and windows

2.1 Exits from rooms will normally be through doorways, but ground-floor windows may provide alternative means of escape in the circumstances described in paragraphs 2.9 and 2.10.

Number of room exits

2.2 More than one room exit must be provided from any room where:

(1) the room is an assembly space, dining space or space likely to have more than 100 occupants, in which case Table 1 will apply;

or

(2) the room is on part of an upper floor and opens directly into a stairway enclosure. In this case the second exit door must lead by a separate escape route to a final exit (this does not apply in two-storey schools where either a single stairway is permitted, as in paragraph 2.20, sub-paragraphs (1)-(3), or the stairs are separated, as in paragraph 2.29, nor does it apply to any lavatories opening into stairways, which need have only one exit);

or

(3) the room opens into a horizontal circulation area (including any area which can be associated with the horizontal circulation area by the use of movable partitions) which is an area of high fire risk; in this case the second exit must lead by a separate route to a final exit;

or

(4) in a laboratory or other high fire risk room, a single exit door would be in a hazardous position.

Exits from assembly halls and other large spaces

2.3 The exits described in 2.2(1) should be remote from one another. Lecture theatres seating more than 60 on fixed tiered bench seats may also require more than one exit, depending on arrangement of seats.

2.4 Where an exit does not discharge either direct to the open air or into a stairway enclosure, the distance to an external doorway or a stairway should be short and the route direct. At its narrowest point the route should not be less than the width of the exit. If more than one exit uses part or the whole of the same escape route, the width of the route should be increased accordingly.

Table 1—Number and Width of Exits from every Part of Assembly Halls, Dining Spaces and all Rooms likely to have over 100 Occupants.

<table>
<thead>
<tr>
<th>No. of occupants</th>
<th>Minimum no. of exits</th>
<th>Minimum clear width of each doorway when open</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-200</td>
<td>2</td>
<td>850 mm</td>
</tr>
<tr>
<td>201-500</td>
<td>2†</td>
<td>1350 mm</td>
</tr>
<tr>
<td>501-750</td>
<td>3‡</td>
<td>1350 mm</td>
</tr>
<tr>
<td>751-1000</td>
<td>4‡</td>
<td>1350 mm</td>
</tr>
</tbody>
</table>

* With fixed seating, the same as the number of seats; otherwise, on the basis of 0.45 m² of floor area per child in assembly halls and 0.90 m² of floor area per child in dining spaces and gymnasia.
† Each exit should lead by a separate route to a final exit.
‡ At least 3 of the exits should lead by separate routes to a final exit. The fourth exit may use part or the whole of the escape route from one of the other exits.

2.5 Doors from rooms that may have more than 50 occupants should open in the direction of escape, or swing both ways. The fastenings to these doors, and all doors except from rooms which are not dual-purpose areas, should be as in paragraph 2.43.

2.6 In assembly halls designed to seat more than 200 occupants, seats should be fixed together in groups of at

3 Paragraphs 2.3-2.7 apply to assembly halls when they are used solely for school activities. If they are licensed for public assembly, it will usually be necessary to obtain the approval of the local licensing authority whose requirements may not be satisfied by these recommendations. Additional requirements of a minor nature necessary to satisfy the local licensing authority may be provided within building allocations, but further capital investment on the educational programme will not be available to permit school halls to be treated as places of public assembly.

* See paragraph 2.25 for widths of stairways serving assembly halls only.
least four if the hall is likely to be used frequently by a seated audience. In large assembly halls, consideration may need to be given to the desirability of fixing some or all of the seats to the floor, and to their arrangement, if fixed.

2.7. If the stage of an assembly hall is likely to be used for any purpose requiring scenery or costumes, or if a projection room is provided, adequate means of escape from these areas (and also the arrangement and construction of the projection and ancillary rooms) is specially important.

**Exits from boiler rooms**

2.8 (1) Exits from boiler rooms housing boilers over 45 kw capacity output should be to the open air only, and not less than 3 m from any other exit from or point of access to the building.

(2) There should be an alternative means of escape (which may be a vertical ladder) where any point in the boiler room is more than 6 m from the exit.

(3) Where an internal approach is proposed for boiler rooms of less than 45 kw capacity output, it must be through two separate self-closing fire doors, type 1, with a space between them forming a ventilated smoke-lock.

(4) Any boiler room should be separated from the escape routes by construction having the fire resistance required by Part E of the Building Regulations for elements of structure.

**Windows and window exits**

2.9 All planning guidance in this BULLETIN assumes that ground floor spaces normally occupied in a building will have windows of a type which, in an emergency, would permit escape (see also para 1.22). Should the spaces have no windows permitting escape, then consideration must be given to the provision of additional safeguards. For example, any such space accommodating more than twenty-five people should have two separate exits from that space (see diagram 21). Smaller rooms with one door only should have alternative escape routes from that door.

2.10 Escape routes from ground-floor rooms or spaces may be obtained through windows, provided that:

(1) the bottom of the opening lights are not more than 900 mm above the floor or 1200 mm above the ground;

(2) the design and placing of the windows permit easy escape through them;

(3) the windows can be opened easily;

(4) the spaces concerned are not assembly halls, dining areas or infant schools as a whole.

**Horizontal circulation areas**

**Number of ways out of horizontal circulation areas**

2.11 All horizontal circulation areas forming part of an escape route should have at least two ways out leading by separate escape routes to final exits, except that there need be only one way out from:

(1) a ground-floor corridor with a fixed partition designed to serve not more than 160 children and in which no room exit door is more than 18 m from the external door of the corridor (diagram 18);

(2) a ground-floor corridor with a movable partition or a ground-floor dual-purpose area (diagram 24), in either case designed to serve not more than 120 children and in which no room exit door is more than 12 m from an external door;

(3) the first floor of a two-storey school or two-storey part of a school which is permitted under the condition specified in paragraph 2.20(1)-(3) to have only one stairway (diagrams 18 and 24);

(4) a dual-purpose area on any floor above the ground floor provided that

(i) the area is designed to serve not more than 120 children,

(ii) no room exit door opening into the dual-purpose area is more than 12 m from the nearest stairway, and

(iii) the dual-purpose area opens into a horizontal circulation area from which there are at least two ways out (diagram 23).

**Wall and ceiling lining materials**

2.12 All wall and ceiling lining materials in horizontal circulation areas forming part of escape routes should be noncombustible or possess a Class 0 surface. Any spaces which may be associated with these horizontal circulation areas by the use of movable partitions should have equivalent lining materials.

**Planning limitations**

2.13 If the horizontal circulation area between two stairways or external doors, or in a dead end, consists wholly of corridor with fixed partitions then (except as in paragraph 2.16):

(1) at least one door from every room opening into the corridor should be within 30 m of the nearest external door or stairway (diagram 15)
NOTE:
All distances shown are in metres and are the MAXIMA recommended.
12 m (40 ft)  24 m (80 ft)
18 m (60 ft)  30 m (100 ft)

Way out

Self closing fire doors

types 1 and 2

Dual purpose area

Diagram 15
Corridors with fixed partitions
Between stairways or external doors: any floor with two ways out (paragraph 2.11).
1. One door of every room within 30 m of nearest stairway or external door.
2. Smoke stop doors across corridor at about 60-m intervals.

Diagram 16
Dead end: Any floor with two ways out (paragraph 2.11)
1. One door of every room within 18 m of nearest stairway or external door.
2. Number of children in rooms opening off a dead-end (diagram 16, rooms ABC) or combination of dead-ends (diagram 17, rooms ABCD) is limited to 160 on ground floor and 120 on upper floors.

or, in a dead-end corridor (diagrams 16 and 17), within 18 m of the nearest external door or stairway;

2. nodeadend(diagram 16) or, where two or more dead ends converge (diagram 17), no combination of dead ends should be designed to serve more than 160 children on the ground floor or 120 children on an upper floor;

3. type 2 fire doors should be fitted across the corridor at intervals of about 60 m (diagram 15);

4. dead ends should be separated from any other part of the corridor by a type 2 door across the corridor just beyond the staircase nearest the dead end (diagram 16).
2.14 If the horizontal circulation area between two stairways or external doors or in a dead end consists wholly or partly of

(i) corridor with movable partitions,

or

(ii) dual-purpose areas, then (except as in paragraph 2.16)

(1) at least one door from every room opening into the circulation area should be within 18 m of the nearest external door or stairway (diagrams 20, 22–27) or, in a dead end (diagrams 20 and 23), within 12 m of the nearest external door or stairway;

(2) no dead end or, where two or more dead ends converge, no combination of dead ends should be designed to serve more than 120 children (diagrams 20 and 23);

(3) type 2 fire doors should be fitted across the circulation area at intervals of about 45 m.

2.15 If dual-purpose or open-planned areas are part of an escape route, the precautions about door locks recommended in paragraph 2.42 should be taken into account. Their effect is that a dual-purpose area should never be permitted to be locked at any time when that part of the school is occupied. The recommendation in the Department of Education and Science's booklet SAFETY IN SCIENCE LABORATORIES (DES Safety Series No 2)\(^9\) about the security of laboratories should be considered in this connection. If local education authorities decide to have laboratories or any other rooms locked for security reasons when the school may be occupied, this would obviously preclude their use as dual-purpose areas forming part of any escape routes.

2.16 In single-storey schools or parts of schools and on the ground floors of schools of greater height, the limitations of paragraphs 2.13 and 2.14 will apply if escape is possible only through the normal circulation area. If, however, every room opening into a horizontal circulation area has a second way out direct to the open air, either through an external door or through a window, subject to the restrictions described in paragraph 2.10, then no planning limitations on the horizontal circulation area are necessary.

Other recommendations

2.17 The widths of corridors forming part of an escape route should be adequate for the numbers likely to use them. Main corridors are unlikely to be less than 1.8 m wide for normal circulation; this will be adequate in the case of fire. Short corridors serving small numbers (eg, in a small administrative wing or serving a single classroom) might be less than 1.8 m without endangering life in a fire. All corridors should be well lighted and ventilated. Consideration may also have to be given to the provision of simple emergency lighting on escape routes where there is no natural lighting.

2.18 If steps are required for small changes of level in horizontal circulation areas, there should be at least three risers together. For such steps each riser should not be more than 152 mm and the treat not less than 305 mm (paragraph 2.27 does not apply in this case).

2.19 All glazing in partitions between any room of high fire risk and any horizontal circulation area should

(1) be fixed

(2) have a fire resistance of not less than half-an-hour and

(3) not extend below 900 mm above floor level.

The nomogram in BS Code of Practice CP 153, Part 4, provides additional information on glazing areas.

\(^9\) HMSO (1973).
The number of stairways

2.20 A two-storey school or two-storey part of a school may have only one stairway provided that:

1. it is designed to serve not more than 120 children (diagrams 18 and 24); and
2. the distance between the stairway and the door of the furthest room is not more than 12 m where the horizontal circulation area leading to the stairway is a corridor having fixed partitions (diagram 18), or a corridor having movable partitions (diagram 24) or is a dual-purpose area (diagram 19); and
3. the stairway is enclosed on the ground and first floors and the only internal doors opening into the stairway enclosure on each floor are from lavatories or horizontal circulation areas which are not dual-purpose areas; and
4. no part of this stairway enclosure is an area of high fire risk, or includes any flame-producing apparatus.

Otherwise all parts of a school above the ground floor should have at least two stairways.

2.21 More than two stairways may be required:

1. to conform with the recommendations in paragraphs 2.13(1) and 2.14(1) about the maximum distance to the nearest stairway in horizontal circulation areas; or
2. to satisfy the recommendations in Tables 2, 3 and 4 about the width of stairways in relation to the number of children who will be using them; or
3. to conform with the recommendations in Table 1 about exits from assembly halls when they are on a floor above the ground floor.

Diagram 19

Interconnected and open-plan areas

First Floor with only one exit (also Ground floor, if escape is not possible through windows—see paragraphs 2.9 and 2.10).

1. Total number of children limited to 120.
2. One door of every inner room to be within 12 m of the exit from the floor.
3. Maximum distance from the door to any part of an inner room should not exceed 12 m.
4. Every point on the floor to be within 24 m of the exit from the floor.
5. Dual-purpose area must NOT be an area of high fire risk.
6. There should be no smaller rooms inside an inner room.

NOTE:

The travel distances indicated on this diagram should be measured in a straight line across the floor. If an unbroken length of fixed furniture, island benches or other obstruction in the path of escape exceeds either 5 m in length and 1.5 m in height, or 9 m in length and 1 m in height, it must be so placed that the travel distance is not increased beyond the recommended maxima.

In the past, some buildings have been provided with external "fire-escape" stairways. Experience has shown that these are often vulnerable to attack by fire from ad joining doors and windows, that proper maintenance is frequently neglected, that under some weather conditions they may be unsafe in use and that the occupants are often unfamiliar with them. For these reasons, external fire-escape stairways should not be used in new buildings more than two storeys high. If the use of an external fire-escape staircase is unavoidable it should not pass near to windows, but any window within the following distances of an escape staircase should be fixed shut and glazed with 6 mm wired glass to give at least half hour fire resistance: horizontally 1.8 m, vertically downwards 9 m, vertically upwards 1.8 m. The distances should be measured from the nearest tread or landing of the staircase. All doors giving access to the stairs below top level should be half hour fire resisting, self-closing doors.
Diagram 20

Any upper floor with at least two ways out
Also ground floor, if escape is not possible through windows—see paragraphs 2.9 and 2.10.
1. Total number of children is limited in accordance with the number and width of stairways (Tables 1 and 2).
2. The total number of children in a dead end is limited to 120.
3. The maximum distance from the door to any part of an inner room should not exceed 12 m.
4. One door of every inner room should be within 18 m of the nearest exit from the floor if there are alternative routes from that door. If escape is possible in one direction only from that door it should be within 12 m of the nearest exit from the floor.
5. Every point on the floor from which there are alternative routes should be within 30 m of the nearest exit from that floor.
6. Every point on the floor from which all possible escape routes are contained within an angle of 45° should be within 24 m of the nearest exit from that floor.
7. If a “second inner room” is provided it should not exceed 15 m² in area and must have alternative escape routes which are separated by two type 2 fire doors (not shown in the diagram but which could be positioned at A and B).

Diagrams 21A and 21B

Internally planned rooms
Any floor from which no window escape is possible.
1. In Room “A”, if the number of children exceeds 25, TWO separate exits from the room are required, the distance from the room doors to exits to be a maximum of 18 m or, if the corridor is a dead-end, a maximum of 12 m.
2. Smaller internal B and C rooms have alternative directions of escape from their doors. One of these routes must NOT exceed 18 m.
3. Any point in any internal room must be within 12 m of the nearest exit from the room.
4. If room D is a fire risk, the conditions in diagram 21B must apply.

Note:
The travel distances indicated on this diagram should be measured in a straight line across the floor. If an unbroken length of fixed furniture, island benches or other obstruction in the path of escape exceeds either 5 m in length and 1.5 m in height, or 9 m in length and 1 m in height, it must be so placed that the travel distance is not increased beyond the recommended maxima.
Stairway widths

2.22 No stairway should be less than 1050 mm wide. No stairway should become narrower in the direction of escape.

The widths recommended in Tables 2, 3 and 4 will allow a building to be evacuated quickly in an emergency. Architects may consider that these widths would not be enough in all cases for normal day-to-day use (when traffic will often be in both directions at the same time). It is emphasised that the widths recommended have only been considered for emergency use. Furthermore, in Tables 2 and 3 it has been assumed that approximately the same number of children will be using each stairway.

2.23 In buildings or parts of buildings with two or three stairways interconnected at every floor level by horizontal circulation areas, the minimum width of the stairways (except as mentioned in paragraph 2.25) should be as in Tables 2 or 3, according to the height of building and the total number of children accommodated on all floors above the ground floor.

2.24 In buildings or parts of buildings with more than three stairways interconnected at every floor level by horizontal circulation areas, the minimum width of each stairway (except as mentioned in paragraph 2.25) should be as in Table 4 according to the height of the building and the estimated number of children on all floors above the ground floor who would normally use each stairway.

2.25 A stairway that serves a part of an assembly

| Height of building in storeys (from final | Maximum number of children on all upper floors* |
| exit doors) | 260 | 290 | 330 | 360 | 390 |
| 2 | 300 | 340 | 380 | 430 | 480 |
| 3 | 340 | 390 | 440 | 500 | 560 |
| 4 | 390 | 450 | 510 | 580 | 650 |
| 5 | 430 | 500 | 570 | 650 | 730 |
| 6 | 470 | 550 | 630 | 720 | 810 |
| 7 | 510 | 600 | 690 | 790 | 890 |
| 8 | 550 | 650 | 750 | 860 | 970 |
| 9 | 600 | 710 | 820 | 940 | 1060 |

Minimum width of each stairway

| 1050 mm | 1200 mm | 1350 mm | 1500 mm | 1650 mm |

* See note at foot of Table 4.

Table 3—Minimum width of stairways where there are three stairways

| Height of building in storeys (from final | Maximum number of children on all upper floors* |
| exit doors) | 470 | 520 | 580 | 640 | 700 |
| 2 | 540 | 610 | 690 | 770 | 850 |
| 3 | 610 | 700 | 800 | 900 | 1000 |
| 4 | 690 | 800 | 910 | 1030 | 1150 |
| 5 | 760 | 890 | 1020 | 1160 | 1300 |
| 6 | 840 | 990 | 1140 | 1300 | 1450 |
| 7 | 920 | 1090 | 1260 | 1430 | 1600 |
| 8 | 1000 | 1180 | 1370 | 1560 | 1740 |
| 9 | 1070 | 1270 | 1480 | 1690 | 1890 |

Minimum width of each stairway

| 1050 mm | 1200 mm | 1350 mm | 1500 mm | 1650 mm |

* See note at foot of Table 4.
hall, but does not also serve some other part of the building, should be at least the width of the assembly hall exit leading to it. If a stairway also serves other parts of the building, its width generally should be determined from Tables 2, 3 or 4, but, from the level of that part of the assembly hall which the stairway serves to ground level, the width of the stairway should in no case be less than the width of the assembly hall exit doors leading to it.

2.26 Stairways should be clear of all obstructions. Any stairway (but not steps of the kind referred to in paragraph 2.18) that is more than 1650 mm wide should be divided with one or more hand-rails, and no part of a stairway so divided should be less than 1050 mm wide. (This means that a stairway that needs to be more than 1650 mm wide should be at least 2100 mm wide). There should be a continuous handrail on each side; no handrail should project more than 90 mm into the recommended width, unless the width of the stairway is increased accordingly.

### Table 4—Minimum width of each stairway where there are more than three stairways

<table>
<thead>
<tr>
<th>Height of building in storeys (from final exit doors)</th>
<th>Maximum number of children using a stairway*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimum width of each stairway</td>
</tr>
<tr>
<td></td>
<td>1050 mm</td>
</tr>
<tr>
<td>2</td>
<td>160</td>
</tr>
<tr>
<td>3</td>
<td>190</td>
</tr>
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<td>4</td>
<td>220</td>
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<td>250</td>
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<td>310</td>
</tr>
<tr>
<td>8</td>
<td>340</td>
</tr>
<tr>
<td>9</td>
<td>370</td>
</tr>
<tr>
<td>10</td>
<td>400</td>
</tr>
</tbody>
</table>

* For the purpose of calculating the widths of stairways and the numbers and widths of exits generally, the number of children in any part of a school should be calculated on the following basis:

- **Dining Rooms (or areas used for dining) and gymnasiums:** 0.90 m² of floor area per child.
- **Teaching Rooms:** The maximum number of children for which the room is designed.
- **Assembly Halls:** 0.45 m² of floor area per child.

For Colleges of Further Education, where room occupancy is generally less than in schools, the number of students may be taken as 80% of the Maximum Student Capacity (MSC) of the accommodation on the upper floors. All the above stairway widths are compatible with the dimensions recommended in Building Bulletin 42. (THE CO-ORDINATION OF COMPONENTS FOR EDUCATIONAL BUILDING, HMSO, 1968).
Diagram 23
Dead end: Any floor with at least two ways out (paragraph 2.11)
1. One door of every room within 12 m of nearest stairway or external door.
2. Number of children in rooms opening off a deadend (rooms ABC and the dual-purpose area in diagram 23) or a combination of dead ends (cf. diagram 17) is limited to 120.

Diagram 24
Ground floor with only one exit in school of any height or first floor of 2-storey school with only one stairway (paragraph 2.11(2) + (3))

Diagram 25
Dual-purpose areas with fixed partitions—2
Serving rooms having at least two separate ways out. Between stairways or external doors: any floor.
1. One way out of every room or space within 18 m of nearest stairway or external door.
2. Type 2 fire doors across horizontal circulation area at about 45 m intervals.

NOTE:
1. The dual-purpose areas shown in diagrams 25, 26 and 27 may be areas of high fire risk (see paragraph 2.2(3)).
2. None of the limitations shown in diagrams 25, 26 and 27 need apply to the ground floor in any school if the conditions of paragraphs 2.9, 2.10 and 2.16 are satisfied.
3. For limitations on the use of wall and ceiling lining materials see paragraph 2.12.
4. In the rooms with only one exit, no point should be more than 12 m from the nearest exit from that room.
5. The same conditions should apply if any of the partitions are of a sliding folding type, each of which must include a pass door.
Stairway flights

2.27 Every stairway should be designed to ensure ease and safety according to the use for which it is designed. Risers should not be more than 163 mm. Preferably treads should not be less than 280 mm and must never be less than 250 mm. No flight of stairs should have more than 16 or less than 3 risers. (See paragraph 2.18).

2.28 There should not be more than two successive flights without a change of direction. The length of landing between flights, whether there is a change of direction or not, should not be less than the width of the stairway, where doors open onto landings (except at the top of steps or a stairway; see paragraph 2.41) the doors, when fully open, should not reduce the effective passageway round the landing to less than the width of the stairway by doors during their swing; in no case should it be reduced to less than 900 mm during the swing of the doors (diagram 28).

2.29 Throughout its entire height, every stairway should be enclosed from the ceiling of its top floor to its final exit doors. In a two-storey school (or two-storey part of a school) any two stairways are separated on the ground floor by two self-closing type 1 fire doors (or pairs of doors) one in the enclosing wall of each stairway, then only one similar door (or pair of doors) is required at first floor level. If the stairways are separated on the first floor by two such doors in the enclosing wall of each stairway then only one similar door is required at ground floor level.¹

2.30 The internal and external enclosing walls of every stairway enclosure, and the stairway, landings and floors (excluding floor finish) within the enclosure should have not less than the period of fire resistance recommended in Table 6.

2.31 Any glazed screens or fanlights incorporated in the internal walls of a stairway enclosure should have the same fire resistance as is recommended for those walls. Fanlights should be fixed. In buildings or parts of buildings more than four storeys high, glazing should be restricted to the doors into the stairway enclosure (see paragraph 2.35 below and British Standard Code of Practice 152 and 153 for glazing).

2.32 No part of a stairway enclosure shall be an area of high fire risk nor should its use be likely to cause obstruction to persons attempting to escape from the building.

¹ This recommendation is made in order to prevent stairway enclosures being extended so that they meet one another—a condition which could otherwise easily arise on the ground floor of a school and which should be avoided except in the circumstances described in paragraph 2.29 as related to a two-storey school.

Diagram 26

Dual-purpose areas with fixed partitions—2
Serving rooms having at least two separate ways out. Between stairways or external doors: any floor.
1. One way out of every room or space within 18 m of nearest stairway or external door.
2. Type 2 fire doors across horizontal circulation area at about 45-m intervals.

NOTE:
1. The dual-purpose areas shown in diagrams 25, 26 and 27 may be areas of high fire risk (see paragraph 2.2(3)).
2. None of the limitations shown in diagrams 25, 26 and 27 need apply to the ground floor in any school if the conditions of paragraphs 2.9, 2.10 and 2.16 are satisfied.
3. For limitations on the use of wall and ceiling lining materials see paragraph 2.12.
4. In the rooms with only one exit, no point should be more than 12 m from the exit.
Opening into stairway enclosures

2.33 Every opening into a stairway enclosure from within the building should be provided with a type 1 door or pair of doors.

2.34 Except on the ground floor of two-storey schools (or parts of schools) that have only one stairway (to which paragraph 2.20(3) refers), and provided that the recommendation about room exits in paragraph 2.2(2) is satisfied, a door from any room (except a boiler room, a store, a cleaners' cupboard, or any area of high fire risk) may open directly into a stairway enclosure, but the number of doors should be as few as possible.

2.35 Every door into a stairway enclosure from a horizontal circulation area should be self-closing and of type 1 (see Terminology). In buildings or parts of buildings more than four storeys high any glazing in the door should not be less than 900 mm from the floor.

Final exits from stairway enclosures

2.36 Every stairway enclosure should have direct access through its own external doors to the open air clear of the building and not open into an enclosed courtyard. These external doors should be clearly visible and so placed as to make clear the direction of escape to the open air. There should be no doors across the escape route between the bottom of the stairway and the external doors, other than the internal doors of an external lobby, if provided.

2.37 External exit doors from every stairway enclosure should, when open, be at least the full width of the stairway and, where they may be used by children leaving both the ground and upper floors, should be wider than the stairway at least the amount shown in Table 5.

Dual-purpose areas with fixed partitions—2

Serving rooms having at least two separate ways out. Between stairways or external doors: any floor.

1. One way out of every room or space within 18 m of nearest stairway or external door.

2. Type 2 fire doors across horizontal circulation area at about 45-m intervals.

Note:

1. The dual-purpose areas shown in diagrams 25, 26 and 27 may be areas of high fire risk (see paragraph 2.2(3)).

2. None of the limitations shown in diagrams 25, 26 and 27 need apply to the ground floor in any school if the conditions of paragraphs 2.9, 2.10 and 2.16 are satisfied.

3. For limitations on the use of wall and ceiling lining materials see paragraph 2.12.

4. In the rooms with only one exit, no point should be more than 12 m from the exit.

Table 5—Additional Width for External Doors Serving Ground and Upper Floors.

<table>
<thead>
<tr>
<th>No. of children from ground floor using doorway*</th>
<th>Minimum addition to stairway width required for external doorway</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to 50</td>
<td>300 mm</td>
</tr>
<tr>
<td>51—100</td>
<td>500 mm</td>
</tr>
<tr>
<td>101—150</td>
<td>800 mm</td>
</tr>
<tr>
<td>151—200</td>
<td>1050 mm</td>
</tr>
</tbody>
</table>

*See notes at foot of Table 1 and Table 4.

Wall and ceiling lining materials

2.38 The lining materials to walls and ceilings in stairway enclosures should be non-combustible or possess a Class 0 surface (see Terminology under "lining material").
Doors

General recommendations

2.39 Specific recommendations have already been made about:

(1) the number of room exit doors (paragraphs 2.2 and 2.3),
(2) the distance of room exit doors from stairways or external doors (paragraphs 2.11(1)-(4), 2.13(1), 2.14(1) and 2.20(2)),
(3) doors across horizontal circulation areas (paragraphs 2.13(3) and 2.14(3)),
(4) doors into stairway enclosures (paragraphs 2.28 and 2.32-2.35), and
(5) ground-floor exit doors from stairways (paragraphs 2.36 and 2.37).

Recommendations of a more general nature are contained in the following paragraphs.

2.40 All doors across escape routes (except from rooms or spaces having less than 50 occupants, lated according to the notes to Table 1 and Table 4) should open in the direction of escape or swing both ways. Every door opening outwards into a corridor should be arranged so that when open it does not obstruct the corridor. Revolving or sliding doors should not be provided across any escape route.

2.41 Every door opening on to steps (including any door at the head of a stairway) should have a landing at least 900 mm long between the door in its closed position and the edge of the top step (diagrams 28 and 29). Where there are landings between flights, paragraph 2.28 will apply.

2.42 Doors across escape routes should always be capable of being easily opened from the side from which escape is required.11 A lock, if provided, should not require a key to open the door in any direction likely to be used for escape.12

2.43 To be effective, fire doors (see Terminology) across corridors and into stairway enclosures must be kept closed whenever possible. Wedges must not be used because they can make it difficult to close the door in an emergency. Spring catches and cabin hooks must not be fitted to doors into stairway enclosures, but may, under special circumstances, across corridors provided that they can be released immediately. Notices: “Fire Doors: Keep Shut” are to be fitted in prominent positions, on both sides of all fire doors and these doors should always be closed when the buildings are unoccupied.

Diagram 28

Arrangement of doors opening on to landings*

Diagram 28 shows a good arrangement in which no part of the doors at any time reduces the effective passageway round the landing to less than the width of the stairway.

* Except at the top of steps or a stairway (see paragraph 2.41).

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11 It should be noted that doors across horizontal circulation areas between stairways may need to be used for escape in either direction.

12 This recommendation will be satisfied in respect of external doors, where locks will generally be needed, if the doors can at all times be opened from the inside either by pressure (as when panic bolts are fitted) or by turning a single knob (espagnolette bolts are one way of securing a pair of doors so that both doors are released by the action of a single knob). Except in the circumstances described in paragraph 2.16 external doors from teaching rooms will not form part of a required escape route and therefore they need not satisfy this recommendation. Theoretically this recommendation should apply to other doors from teaching rooms, but in practice it is not considered either practicable or essential to do so, unless they are also dual-purpose areas.
Diagram 29

Diagram 29 shows a different arrangement which may be used where it is necessary to reduce the length of the stairway enclosure to a minimum. The doors when fully open do not reduce the effective passageway round the landing to less than the width of the stairways; the effective passageway is not reduced to less than 900 mm during the swing of the doors.
Chapter three
Structural fire precautions

General requirements

3.1 The structural fire precautions considered necessary for safety in schools include:

1. limiting the use of combustible materials,
2. the use of fire resisting construction,
3. restricting the spread of smoke and flames both on and within the construction,
4. precautions limiting the spread of fire from building to building.

Compliance with the standards now recommended is regarded as essential for the safety of life; it will also limit damage to the structure. Recently there has been an increase of arson, particularly when schools are unoccupied. This often results in extensive damage because of the delay in raising the alarm and in some cases because materials are readily ignited. Designers and occupants should always consider which materials offer the least fire load and the best protection. In this way the spread of fire and smoke damage, particularly through roofs, with consequent disruption of school activities, can be kept to a minimum at little or no extra cost.

3.2 From 1 July 1975 the standard of structural fire precautions required is that defined in Part E of the Building Regulations 1972, as amended by the Building (First Amendment) Regulations 1973 and Building (Second Amendment) Regulations 1974 (see Appendix 2). The Department will advise Local Education Authorities, as may be necessary, of any consequent changes in the required standards if further amendments are made to the Building Regulations. The interpretation and application of Part E of the Building Regulations for maintained schools is set out in the subsequent paragraphs. It is intended that after some years' experience and with any amendments that may prove to be necessary, the standards outlined in Administrative Memorandum 11/73, including those considered in this BULLETIN for structural fire precautions, will provide the basis for enabling educational buildings to become subject to constructional requirements in the national Building Regulations.

Procedure

3.3 Authorities, through their officers, will be responsible for complying with these requirements, at the design and construction stage of projects. The Department should be informed, at an early stage in the design process, if an authority wishes to depart from these standards, giving details of the reasons for any variations thought to be appropriate.

Interpretation and application of Part E of the Building Regulations

3.4 Regulation E 1. Interpretation of Part E.
3.4.1 This regulation incorporates the definitions to be used when applying Part E of the Building Regulations.
3.5 Regulation E 2. Purpose Groups.
3.5.1 Day schools and colleges are included in Purpose Group VII.
3.5.2 Day special and residential 14 special schools are included in Purpose Group II. Small single storey special schools and special wings to normal schools may, subject to a waiver being agreed, comply with Purpose Group VB. It is recommended that the fire stopping in paragraph 3.8 should apply to these buildings and to those mentioned in paragraph 3.5.3.
3.5.3 All other residential accommodation, e.g. hostels, student residences, are subject to the requirements for Purpose Group III.
3.6 Regulation E 5. Fire Resistance.
For day schools and colleges the following table (Table 6) shall apply in lieu of the references to Purpose Group VII in Tables Part I and Part 2 in Regulation E 5.
3.6.1 Examples.
To illustrate how Table 6 should be used the following hypothetical buildings can be taken as examples:

1. A single storey building of height 3 m and floor area 790 m². Since the floor area and cubic capacity do not exceed the limits shown on the first line of the table there are no requirements for the fire resistance of the elements of structure.

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13 Administrative Memoranda 11/73 (Department of Education and Science) and 7/73 (Welsh Education Office) published 24 May 1973, and Administrative Memoranda 4/74 (DES) and 1/74 (Welsh Office) published 10 April 1974.

14 This BULLETIN does not deal with residential accommodation but these references are included to clarify the position about structural fire precautions.
Table 6—Standards to apply in lieu of Tables Part 1 and Part 2 in Regulation E 5 of the Building Regulations

<table>
<thead>
<tr>
<th>No. of storeys</th>
<th>Maximum height (m)</th>
<th>Maximum floor area of a storey or compartment (m²)</th>
<th>Maximum cubic capacity of building or compartment (m³)</th>
<th>Minimum fire resistance in ground floor or upper storeys of elements of structure and compartment walls (notes 1 and 2) (hours)</th>
<th>Minimum fire resistance in basement storey of elements of structure and compartment walls (note 2) (hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No limit</td>
<td>800</td>
<td>5000</td>
<td>Nil (note 3)</td>
<td>1 (note 4)</td>
</tr>
<tr>
<td>2-4</td>
<td>No limit</td>
<td>No limit</td>
<td>No limit</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2-4</td>
<td>15</td>
<td>800</td>
<td>8500</td>
<td>1½</td>
<td>1½</td>
</tr>
<tr>
<td>5-7</td>
<td>28</td>
<td>No limit</td>
<td>No limit</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5 and over</td>
<td>No limit</td>
<td>No limit</td>
<td>No limit</td>
<td>1½</td>
<td>2</td>
</tr>
</tbody>
</table>

Note 1: For non-residential educational buildings a roof beam in a structural frame is regarded as an element of structure if, in the case of fire, the early collapse of the beam would deform the remaining structure.

Note 2: Except Boiler Rooms, which in every case should be separated from all other parts of the building by construction having a fire resistance of at least 2 hours. Additionally where a boiler room is adjacent to a building more than 4 storeys high, the whole of its roof structure should have a fire resistance of at least 2 hours and be non-combustible.

Note 3: Except
i. compartment walls and supports to a gallery which should have a minimum ½ hour fire resistance
ii. external walls (and their supports) requiring fire resistance because of their proximity to a boundary (see Regulation E 7).

Note 4: Nil, if the basement storey has a floor area not exceeding 50 m² and is not a boiler room.

Note 5: Any internal oil storage must be in a completely separate compartment with a catch pit which is imperforate.

2. A single storey building of height 3.6 m and floor area 1000 m². Since the floor area exceeds 800 m² the designer has the choice of providing elements of structure of ½ hour minimum fire resistance, or of dividing the area into 2 parts neither of which exceeds 800 m² in area by a compartment wall having ½ hour minimum fire resistance.

3. A sports hall of height 6.9 m and floor area 495 m² (cubic capacity 3415.5 m³) would be within the limits specified in the first line of the table and no fire resistance is specified for the elements of structure.

4. A sports hall of the dimensions in 3 which is part of a larger single storey sports centre of cubic capacity 5400 m³ would need E111ER to have elements of structure with ½ hour minimum fire resistance OR to be in a compartment of less than 800 m² in area and 5000 m³ in volume.

5. A three storey building 15 m wide, 15 m long and 9 m high (thus, cubic capacity 2025 m³). The third line of the table applies, and elements of structure should thus have a minimum fire resistance of ½ hour.

6. A five storey building 21 m long, 25 m wide and 15 m high (cubic capacity 7875 m³). The fifth line of the table applies and elements of structure should thus have a minimum fire resistance of 1 hour.

3.7 Regulation E 7. External Walls. Table 1 of Schedule 9, Part 11 shall apply to determine the distance from the relevant boundary. Similar considerations should be given to the relationship of separate buildings on the same educational site.

3.8 Regulation E 14. Fire stopping. E 14 (1), (2) and (3) as Building Regulations. For E 14 (4) substitute:

Fire stops to restrict the passage of smoke and flame are required in cavities in walls, floors and roofs as follows:

(a) At any junction of cavities in compartment, external or stairway walls, floors or roofs with cavities in other similar walls, floors or roofs. Junctions between all walls and ceilings, where the wall breaks the continuity of the ceiling, should also be firestopped.

(b) At intervals no greater than 20 metres in any direction in a cavity where all surfaces within that cavity have Class 0 and Class 1 surface.
(c) At intervals no greater than 8 metres in any direction and with junctions at ceilings in a cavity where any surfaces within that cavity have Class 2 or Class 3 surfaces.

(d) Surfaces of Class 4 should not normally be exposed within cavities. Where this is unavoidable then the continuous volume of that cavity should be restricted to 4 metres in any direction between fire stops.

Where any services pass through fire stops, the effectiveness of the fire stop must be maintained.

3.9 Regulation E 15. Restriction of spread of flame over surfaces of walls and ceilings.

For the purposes of day schools terms in Regulation E 15(1)(a) and E 15(1)(b) shall be amended and extended as follows. Proviso (i) of Regulation E 15(2) shall not apply:

"CIRCULATION SPACE" shall mean stairways, lobbies and corridors forming part of the escape routes. All wall and ceiling surfaces in these spaces shall be Class 0 except that 20% of the total wall and ceiling surfaces may be Class 1. This calculation can exclude doors but must include all sliding and folding partitions, glazing, display boards and applied trim exceeding 300 mm in exposed girth.

"SMALL ROOMS" shall mean spaces not exceeding 30 m² in area. All wall and ceiling surfaces in these rooms shall be at least Class 3 and if the room is an area of high fire risk the provision of Class 1 surfaces is strongly recommended.

"ROOMS OTHER THAN SMALL ROOMS" (including interconnected spaces exceeding 30 m²) shall have wall and ceiling surfaces of at least Class 1 except that 20% of the total wall and ceiling surfaces may be Class 3. This calculation can exclude doors but must include all sliding and folding partitions, glazing, display boards and applied trim exceeding 300 mm in exposed girth. If these spaces include areas which are primarily circulation then these areas should have Class 1 surfaces.

Heating systems using ducted warm air

3.10 If any systems of this type are provided, particular care is necessary to ensure that any ducts passing through compartment walls and floors are fully protected by fire dampers with the appropriate fire resistance. Should ducts pass through fire stops in ceiling voids, care must be taken to ensure that the resistance of the fire stop to the passage of flame and smoke is not reduced. Where ducting or the ceiling void is used to carry air into more than one space, it is essential that the plant is shut down by the action of smoke detectors as soon as any combustion gas enters the system. Particular care should be taken to ensure that smoke laden air is not drawn across or through escape routes.
Chapter four
Fire warning systems and fire fighting

General requirements for fire-warning systems

4.1 An audible fire-warning system should be provided in every school as the first link in the chain of precautions. The occupants must be warned quickly of any outbreak so that they can leave the building without delay.

4.2 There are three main types of warning system:

(I) Electric bells actuated manually from one or more call-points. Provision should be made so that the warning, once actuated, continues to sound automatically. Modern systems of this kind overcome the disadvantage described in (3) below, but are more expensive to install and maintain.

(2) Electric bells actuated by some kind of automatic detector. These may also be incorporated in the system described in (I) above. Automatically actuated systems are usually installed in buildings where a fire might burn undiscovered for some time. The installation of such systems will have to be justified in each case and are not normally required in day schools.

(3) Hand-operated fire-bells or sounders mounted at suitable points in the building. These may be used in certain small schools (see paragraph 4.7). They need no maintenance but have a disadvantage; a warning, once given, should continue until everyone is out of the building, and with hand-operated bells this may not be possible. Any one sounder should be audible throughout the building.

4.3 The same type of system should be used throughout all parts of a school and each category of equipment should be standard throughout the school, and, if possible, throughout a local authority’s area.

4.4 In schools which consist of several separate buildings, the same system should be installed in all parts, but the system in each separate building may be self-contained, so that an alarm may be sounded in one part without automatically operating throughout the rest of the school.

4.5 Whatever type of system is installed, whether intermittent or continuous sound, it should differ from any other signal used in the school. When sounded, it should be capable of being heard above any other noise likely to be going on. If a class change bell is used as a fire alarm it is recommended that a continuous tone be the warning for fire and an intermittent tone for class changes (but see also paragraph 4.8).

Installation of fire-warning systems

4.6 Precise recommendations cannot be made in this BULLETIN about the type of fire-warning system to be installed in a particular school or about the method of installing it, since a satisfactory solution in any one case will depend largely upon the design of the school and the nature of the escape routes from it, provided in accordance with Chapters 1 and 2. Designers are recommended to discuss the question with the Chief Fire Officer of the appropriate Fire Authority.

Type of system

4.7 In schools of one storey, with less than 160 children, a system of hand-operated fire-bells or sounders will be sufficient, provided that any one sounder is audible throughout the premises. In schools of which any part is more than one storey high, an electric warning system, manually operated from call-points of the kind described in paragraph 4.11, will normally be required.

4.8 Power for electric systems should be supplied from batteries maintained at full charge by trickle charging, or from some other source independent of the public electricity supply.

Call-points

4.9 Call-points should be in prominent positions preferably on escape routes and should be placed so that the walking distance to the nearest call-point is nowhere more than 30 m.

4.10 There should be at least one call-point on every floor. A call-point should be provided in or close to every kitchen, laboratory, workshop, housecraft and craft room, and assembly hall.

4.11 Call-points for electric systems should preferably be of the "break-glass release" type; it should, however, be possible to sound the warning for practice purposes without breaking the glass.

4.12 Indicator boards, which show the call-points from which the warning has been given, will rarely be necessary except in larger schools.
Fire fighting by the fire brigade

4.13 Earlier parts of this BULLETIN have been concerned with measures of "passive defence" against fire. It is also necessary to consider what active measures are required to assist the fire brigade and the school's occupants to combat the spread of fire.

4.14 The Chief Fire Officer should always be consulted early in the planning stage about facilities for fire fighting by the fire brigade. Local conditions may differ from area to area, but the following basic facilities will normally be needed:

(1) **Means of access to the building.** When the building is some way back from the public highway, road access for fire appliances will be necessary. Any entrance through which appliances may need to pass should be a clear 3 m in width and there must also be adequate space to enable appliances to turn into an entrance. Any roadway should be at least 3.7 m wide because of the operating widths of fire appliances. A wheeled escape can be man-handled over fairly firm ground when dismounted from its carrier, but for it to be used at all heights up to its maximum it is desirable that there should not be any obstruction within 6 m of the building.

(2) **Water supply.** Even where there is a good supply of water available in public mains, it may still be necessary to install one or more hydrants on the site if the building is set far back from the road. The fire brigade should not normally have to lay more than 91.4 m of hose and, as this figure includes the distance to the top floor, the distance of the building from the nearest hydrant must allow for this.\(^\text{15}\)

(3) **Internal equipment.** Internal hydrants or dry risers will not normally be required in schools unless the building is more than four storeys in height or there are special circumstances.

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Fire fighting by the school's occupants

Types of equipment

4.15 Fire-fighting equipment is needed in schools, but it should be strictly limited to what is necessary and to what can be used effectively with little training after the safety of the children has been ensured (see para 5.2). The Chief Fire Officer should be consulted about the nature and installation of fire-fighting equipment in particular cases, especially in high buildings. The usual types of equipment are:

1. **Hose reels** may be considered by the Chief Fire Officer to be essential, especially in larger buildings or where there are special risks, as an alternative to water (gas-expelled) or soda acid extinguishers.

2. **Portable fire extinguishers** may prove to be the most satisfactory means of dealing with the types of fires generally met with in smaller schools. Such fires fall into two categories; those involving ordinary combustible materials such as wood, paper and textiles, and those involving flammable liquids such as oils, solvents used in chemistry, and cooking fat. For dealing with the first of these, either water (gas-expelled) extinguishers (which expel only water) or soda-acid extinguishers (which expel mainly water) are suitable. For fires involving flammable liquids either foam, dry powder or carbon dioxide extinguishers may be used: in this case there should be no water (gas-expelled) or soda-acid extinguisher because of the possibility of their use on outbreaks for which they are unsuitable.\(^\text{16}\)

In schools, carbon tetrachloride, methyl bromide or other extinguishers which may produce a toxic gas should never be used.

3. **Buckets of sand** when provided in conjunction with an appropriate portable fire extinguisher, are useful in a laboratory particularly for the containment of spillages of flammable or other heavy liquids. Nearly every kind of outbreak likely to occur in a laboratory can be dealt with by one or the other.

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\(^{15}\) If the public water supply is limited, it may be necessary to make special arrangements. With little expense, natural sources can often be utilised if preparations are made beforehand.

\(^{16}\) In some laboratories where very volatile liquids are used or fragile equipment is installed, dry powder or carbon dioxide extinguishers may be preferable to foam.
(4) **Buckets of water** are the cheapest type of equipment. They are, however, undesirable in every other way; they usually become dirty, they are likely to be misused and the water evaporates. Furthermore, their value in fire fighting is limited; the bucket must be carried close to the fire before being used, is emptied in one throw and the water cannot be directed with any accuracy.

(5) **Blankets** are invaluable in dealing with people whose clothes are alight; they should be wrapped and rolled in a blanket. Blankets can also be used to smother small fires involving cooking fat and other flammable liquids. Blankets should be of either glass fibre or asbestos.

4.16 Each type of fire-fighting equipment should be standardised throughout a school and should be in accordance with the appropriate British Standard. Any equipment, whether hose reel, extinguisher or bucket, involving the use of water, must not be used in firefighting if live electrical services are known or thought to be present.

### Installation of equipment

4.17 At least one portable fire extinguisher should be provided in each position as specified in Table 7. Water (gas-expelled), soda-acid and foam extinguishers should be of about 9 litres capacity and dry powder types should contain about 1 kg powder. Carbon dioxide extinguishers should contain not less than 1 kg carbon dioxide when used in laboratories or housecraft rooms and not less than 2 kg when used in kitchens.

4.18 In addition to the extinguishers provided in accordance with Table 7, water (gas-expelled) or soda-acid extinguishers should be provided throughout the building so that the walking distance to the nearest of these extinguishers does not exceed 30 m from any point. Extinguishers should be of about 9 litres capacity and should be placed on escape routes; if in a room, the extinguisher should be near the door. There should be an extinguisher adjacent to every fire warning call-point. A shelf or bracket should be provided for every extinguisher so that the handle or carrying device of the extinguisher is about 1.1 m above the floor level (The recommendations about the placing of extinguishers also apply in general to the extinguishers mentioned in Table 7).

4.19 Two buckets of sand should be provided in every laboratory.

4.20 A glass-fibre or asbestos blanket in a suitable container fixed to the wall should be provided, adjacent to the fire extinguisher, in every kitchen, laboratory, housecraft room, pottery craft room and metal workshop, and every assembly hall.
Chapter five
Precautions by the occupants

5.1 The earlier chapters of this Bulletin have been written primarily for those designing schools but architects alone cannot secure the safety of a building's occupants; any building can quickly become dangerous unless there is foresight and care in its day to day use. No alterations, however minor, should be made to the structure particularly to doors, walls and ceilings, or windows which may provide an escape, without first taking professional advice. Only the occupants and those responsible for them can ensure that the building continues to be safe, and that everyone who uses the building knows what to do if there is a fire.

5.2 A teacher's first and overriding duty in case of fire is, of course, to look after the children; no attempt should be made to fight the fire until their safety has been ensured.

Action in the event of fire

5.3 The Fire Brigade should be called immediately to any fire, however small.

5.4 Evacuation procedures will vary according to the design and type of individual schools. Evacuation should be carried out according to the procedures agreed in consultation with the local Chief Fire Officer (see para 5.22).

5.5 Small fires may be tackled by the staff, using the methods appropriate to the type of fire (See Chapter 4 above).

Everyday precautions

Stairways and doors

5.6 Stairways and final exit doors must never be obstructed, and all exit doors must be capable of being opened easily and immediately from the inside while there is anyone in the building. Stairways and exit doors should be kept in good repair. No combustible material should be stored or allowed to accumulate in the stairway enclosures. Ideally, doors across escape routes should not be fitted with locks, but, where they are so fitted, it is essential that they should be kept unlocked with the key removed the whole time the building is occupied.

5.7 The purpose of fire doors into stairway enclosures and across escape routes is to prevent smoke and dangerous gases blocking any escape route. This should be explained to all the occupants of a school, together with the importance of ensuring that such doors, which should have notices as in para 2.43, are closed if there is a fire in any part of the building. All fire doors should be closed at night and during weekends and holidays so that, if there is an outbreak of fire, its spread will be reduced and the damage by smoke contained.

Interconnected and open-plan areas

5.8 In large open-plan rooms fixed furniture and equipment such as that used for cooking and science teaching should be positioned where there is no risk of its forming a hazard on escape routes. In such open-plan areas, materials or loose furniture should not be allowed to accumulate and impede the movement of the occupants. It is essential that all pupils should have an unobstructed passage to the exits in such areas.

Rubbish and the storage of combustible material

5.9 Care should be taken with the storage of all flammable materials. Rubbish and combustible waste material should not be allowed to accumulate, particularly in laboratories, workshops, craftrooms and boiler rooms. Particular care should be taken with the storage of any material of this type in caretakers' rooms and stage storage areas. Such material should be put in a metal or other non-combustible container and properly disposed of as soon as possible.

Guards

5.10 Every open fire (gas, electricity or solid fuel) must be provided with a fire guard complying with the appropriate British Standard Specification. Other heating appliances, such as convectors and storage heaters, may require protection to ensure that they are not misused, e.g. by blocking air grilles. Regular maintenance is strongly recommended.

Electrical supply and fittings

5.11 Fuses that have blown must only be replaced, after establishing the cause, with fuses of the correct rating, never of a higher rating or, as sometimes happens, with thick copper wire. Flexible cable to fittings should be as short as possible and should be inspected.
regularly and replaced immediately if worn. Additions or alteration to wiring should be undertaken only by a competent electrician. Special care should be taken over improvised stage lighting and when fairy lights or other types of lighting are used for decorative purposes.

Laboratories

5.12 The precautions against fire that should be taken in laboratories are dealt with in SAFETY IN SCIENCE LABORATORIES (DES Safety Series No 2).

5.13 Hazardous experiments and demonstrations should not be carried out near the door of a laboratory or workshop.

5.14 Unless a separate store, detached from the main building, is provided, the amount of petrol and other flammable liquids stored on the premises should be severely limited. With petrol, there is a statutory requirement that, unless its storage has been licensed by the local authority (who may attach to the licence conditions as they consider appropriate) not more than 14 litres in the aggregate may be stored, in separate containers each containing not more than 0.5 litres.

Housecraft rooms

5.15 Electric irons should be provided with pilot lights and with efficient stands in case they are left switched on; metal stands are acceptable if air can circulate below them, but thick asbestos mats are better. Flexible cable is frequently damaged by being put away wound round an iron that is still hot; irons should be allowed to cool down before being put away. Attention should be drawn to this point by suitable notices in housecraft rooms.

Furnishings and equipment

5.16 Great care should be taken that curtains, furnishings, educational and display materials, which may be added to the building by the occupants, do not constitute a particular fire hazard. For example, collecting a large quantity of plastic waste material for a teaching project will introduce a new risk unless properly controlled. Inherently fire retardant materials, such as woven glass fibre, should be used wherever possible but where these are not suitable fire retardant treated materials should be used.

5.17 However, most furnishing materials and equipment used in general and specialist teaching areas are to some extent flammable. It is therefore essential when furnishing a school to give the most careful attention to the selection of materials, with special reference to their fire characteristics. Advice might be sought from responsible organisations as to the suitability for use of various materials, based on the proposed purpose and association with other materials in the school. When areas provide a higher-than-average density of plastic-based materials, e.g. laboratories and informal seating areas, safety rules should be strictly observed. With the greater use of mobile and loose furniture in schools, it can be difficult to maintain clear unobstructed escape routes (see para 5.8).

5.18 Great care must be taken when using paper or flimsy materials either for decorations or for costumes, especially where heating is by any kind of open fire. Such decorations, and also evergreens, should not be suspended from light fittings or tiled ceilings; fire occurring in suspended, and highly flammable, materials spreads rapidly, and blazing pieces may drop over a wide area before everyone in the room has a chance to escape. Cotton wool and most plastic materials, particularly foamed plastics, should not be used for these purposes.

5.19 Fancy dresses and costumes are often by their very nature highly flammable and the greatest care should be exercised when school plays or parties are being held. At such times open and portable fires are undesirable but if used must be adequately protected with fire guards. In order to minimise the risk of dresses and costumes catching alight, mirrors should not be placed above fires in "dressing rooms".

Vandalism

5.20 There is concern about the increased incidence of school fires caused by vandalism after school hours or during holidays, often resulting in extensive material damage and disruption of children's education. The opportunity for such acts of vandalism may be reduced by ensuring that windows and external and internal doors are properly secured after school hours and that flammable material is not left needlessly

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17 By virtue of the Petroleum (Consolidation) Act, 1928 (18 & 19 Geo. 5 ch. 32) HMSO. Attention is also drawn to the Petroleum (Consolidation) Act—Model Code of Principles of Construction and Licensing Conditions, Part I HMSO 1968.

18 e.g. Furniture Industries Research Association; Rubber and Plastics Research Association; International Wool Secretariat; Fire Research Station.
accessible to intruders. In some areas it may be worth while to install equipment to detect intruders. Special care should be taken when maintenance work, painting, etc. is taking place.

Community and dual use

5.21 Where school premises are used by members of the public, especially outside normal school hours, additional safety considerations may arise particularly where the handicapped are involved. Escape routes and exits should be clearly marked for the benefit of those who may not be familiar with the lay-out of the building. Those responsible for such out of hours activities should be carefully briefed about the position of telephones, escape routes, fire alarms, fire fighting equipment, etc. Substantial ashtrays should be provided in rooms where smoking is likely to occur. Thorough checks should be made by the person or persons directly responsible, of all parts of the premises at the end of an evening or session to ensure that no smouldering fires or cigarettes are left burning, that all doors and windows are properly secured, etc.¹⁹

Periodic action

Fire inspections

5.22 The Chief Fire Officer should be consulted about periodic inspection of school premises by Fire Brigades Officers or other responsible persons to ensure that escape routes are properly available and no fire hazards have been introduced. Headteachers may wish to designate one or more persons to take a special interest in safety, particularly possible fire hazards and the precautions appropriate to their school. Some guidance for such persons is contained in FIRE PREVENTION MATERIAL FOR SCHOOLS, prepared by the Fire Protection Association, 1968.

Fire drills

5.23 It is important to ensure that periodic fire drills (by which is meant practice evacuations of the building, not fire-fighting practice) are carried out in every school. Again, the advice of the Chief Fire Officer should be sought on details. Clearly one such drill should take place soon after new occupants arrive at the beginning of every school year.

¹⁹ See free advice leaflet, “Fire Safety Check List for Youth Clubs,” and other material issued by the Fire Protection Association.

Fire warning systems

5.24 Independent electric fire warning systems should be tested once a week and any fault rectified immediately. Tests, results and action taken should be recorded.

Fire extinguishers

5.25 Fire extinguishers should be maintained and recharged according to the manufacturer’s instructions. When in position they should be well away from any fire, radiator or heat-producing appliance and should not stand in direct sunlight. Spare extinguishers and refills should be stored in a cool dry place and never in store-rooms attached to classrooms.²⁰

5.26 All the above recommendations should be read in conjunction with the others contained in the Department of Education and Science Safety Series publications.

²⁰ BSCP 402: Part 3: 1964—"Fire-fighting installations and equipment—Portable fire extinguishers for buildings and plant"
Short index

This Index is not intended to be exhaustive. The contents page at the front of this Bulletin refers the reader to the main subjects covered. Several points, however, are either not covered by separate entries in the contents page or are covered more than once in different connections. This short index draws these points together. The references are to paragraph numbers unless otherwise stated.

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The Table below indicates the rapid increase, since the late '60s, in the total number of fires at educational establishments. The most significant feature is the increase in malicious ignition (arson) from 1971 onwards and this line includes only the confirmed incidents. Many other cases of arson will be recorded under "doubtful" or "unknown". Thus the percentage of fires in maintained schools probably caused by arson has risen from about 10% in the mid sixties to over 50% in 1973/4. The extensive damage caused by fires started deliberately is reflected in the values in the bottom line.

During the period covered by the table the number of maintained schools was about 28,500 and the number of pupils rose by 25% to 8.5 million. Very few pupils indeed have been directly involved when a fire occurred, partly due to the majority of larger fires taking place outside school hours. Nevertheless there must be concern when education is disrupted until permanent accommodation is again available.

Table 8—Fires in educational establishments in England and Wales

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number notified, through Fire Brigades, in all schools, colleges, universities etc.</td>
<td>650</td>
<td>870</td>
<td>910</td>
<td>1486</td>
<td>1639</td>
<td>1889</td>
<td>2070</td>
<td>—</td>
</tr>
<tr>
<td>Notified fires included above but in maintained day schools only</td>
<td>500</td>
<td>600</td>
<td>621</td>
<td>852</td>
<td>930</td>
<td>1042</td>
<td>1230</td>
<td>—</td>
</tr>
<tr>
<td>Causes of notified fires above:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heating, cooking &amp; services</td>
<td>169</td>
<td>206</td>
<td>—</td>
<td>232</td>
<td>189</td>
<td>199</td>
<td>224</td>
<td>—</td>
</tr>
<tr>
<td>Smoking materials</td>
<td>40</td>
<td>75</td>
<td>—</td>
<td>88</td>
<td>69</td>
<td>59</td>
<td>90</td>
<td>—</td>
</tr>
<tr>
<td>Children with matches</td>
<td>52</td>
<td>46</td>
<td>—</td>
<td>88</td>
<td>113</td>
<td>136</td>
<td>144</td>
<td>—</td>
</tr>
<tr>
<td>Malicious ignition (arson)</td>
<td>0</td>
<td>53</td>
<td>—</td>
<td>156</td>
<td>208</td>
<td>306</td>
<td>398</td>
<td>—</td>
</tr>
<tr>
<td>Others, including &quot;doubtful&quot;</td>
<td>188</td>
<td>133</td>
<td>—</td>
<td>164</td>
<td>209</td>
<td>205</td>
<td>230</td>
<td>—</td>
</tr>
<tr>
<td>Unknown</td>
<td>52</td>
<td>119</td>
<td>—</td>
<td>124</td>
<td>142</td>
<td>137</td>
<td>144</td>
<td>—</td>
</tr>
<tr>
<td>Number of major fires costing over £10,000 in 1972 in maintained schools</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>12</td>
<td>18</td>
<td>36</td>
<td>29</td>
<td>67</td>
</tr>
<tr>
<td>Value at constant 1972 prices (£M) of these major fires</td>
<td>—</td>
<td>—</td>
<td>0.56</td>
<td>0.89</td>
<td>0.94</td>
<td>2.19</td>
<td>3.26</td>
<td>4.47</td>
</tr>
</tbody>
</table>

— figures not available on same basis.
* not separately recorded but included with other causes for 1958, probably about 25.

Information from the Fire Research Station, Home Office Statistical Department and the Fire Protection Association.
Appendix 2

The Building Regulations 1972—Part E

The following section is a reprint of Schedule I of the Building (First Amendment) Regulations 1973. Regulation 16 of the 1973 Amendments replaced the entire Part E of the Building Regulations 1972 by the Schedule. Part E was again amended by Regulation 10 of the Building (Second Amendment) Regulations 1974 which replaced the proviso to paragraph E5(4)(b)(ii) by:

"Provided that any beam or column (whether or not it forms part of a structural frame) which is within or forms part of a wall, and any column which gives support to a wall or gallery, shall have fire resistance of not less than the minimum period, if any, required by these regulations for that wall or that gallery;".

SCHEDULE I

PART TO BE SUBSTITUTED FOR PART E (STRUCTURAL FIRE PRECAUTIONS) OF THE PRINCIPAL REGULATIONS

PART E

Structural Fire Precautions

Interpretation of Part E

E.1.—(1) In this Part and in Schedules 8 and 9—

"basement storey" means a storey which is below the ground storey; or, if there is no ground storey, means a storey the floor of which is situated at such a level or levels that some point on its perimeter is more than 1.2 m below the level of the finished surface of the ground adjoining the building in the vicinity of that point;

"compartment" means any part of a building which is separated from all other parts by one or more compartment walls or compartment floors or by both such walls and floors; and, if any part of the top storey of a building is within a compartment, the compartment shall also include any roof space above such part of the top storey;

"compartment wall" and "compartment floor" mean respectively a wall and a floor which complies with Regulation E9 and which is provided as such for the purposes of Regulation E4 or to divide a building into compartments for any purpose in connection with Regulation E5, E6 or E7;

"door" includes any shutter, cover or other form of protection to an opening in any wall or floor of a building, or in the structure surrounding a protected shaft, whether the door is constructed of one or more leaves;

"element of structure" means—

(a) any member forming part of the structural frame of a building or any other beam or column (not being a member forming part of a roof structure only);

(b) a floor, including a compartment floor, other than the lowest floor of a building;

(c) an external wall;

(d) a separating wall;

(e) a compartment wall;

(f) structure enclosing a protected shaft;

(g) a loadbearing wall or loadbearing part of a wall; and

(h) a gallery;

"externally non-combustible" means externally faced with, or otherwise externally consisting of, non-combustible material;

"fire stop" means a barrier or seal which would prevent or retard the passage of smoke or flame within a cavity or around a pipe or duct where it passes through a wall or floor or at a junction between elements of structure; and "fire-stopped" shall be construed accordingly;
"ground storey" means a storey the floor of which is situated at such a level or levels that any given point on its perimeter is at or about, or not more than 1·2 m below, the level of the finished surface of the ground adjoining the building in the vicinity of that point; or, if there are two or more such storeys, means the higher or highest of these;

"height of a building" has the meaning ascribed to it in regulation E3;

"open carport" means a carport of not more than one storey, which is open on two or more of its sides; and for the purpose of this definition a side which includes or consists of a door shall not for that reason be regarded as an open side;

"permitted limit of unprotected areas" means the maximum aggregate area of unprotected areas in any side or external wall of a building or compartment, calculated as prescribed in Part I of Schedule 9;

"protected shaft" means a stairway, lift, escalator, chute, duct or other shaft which enables persons, things or air to pass between different compartments and complies with the requirements of regulation E10;

"relevant boundary", in relation to a side or external wall of a building or compartment, means that part of the boundary of the premises (as defined in regulation A2(1)) or of the notional boundary (as prescribed in regulation E7(1)(c)) which is adjacent to that side or wall and either coincides with, is parallel to or is at an angle of not more than 80° with that side or wall;

"separating wall" means a wall or a part of a wall which is common to two adjoining buildings;

"unprotected area", in relation to an external wall or side of a building, means—
(a) a window, door or other opening;
(b) any part of the external wall which has fire resistance less than that specified by this Part for that wall; and
(c) any part of the external wall which has combustible material more than 1 mm thick attached or applied to its external face, whether for cladding or any other purpose.

(2) Any reference in this Part to a building shall, in any case where two or more houses adjoin, be construed as a reference to one of those houses.

(3) If any part of a building other than a single storey building—
(a) consists of a ground storey only;
(b) has a roof to which there is only such access as may be necessary for the purposes of maintenance or repair; and
(c) is completely separated from all other parts of the building by a compartment wall or compartment walls in the same continuous vertical plane,
that part may be treated, for the purposes of this Part, as a part of a single storey building.

(4) Any reference in this Part to a roof or part of a roof of a specified designation shall be construed as a requirement that the roof or part of a roof shall be so constructed that a specimen constructed to the same specification, if exposed to test by fire in accordance with BS 476: Part 3: 1958, would comply with the relevant test criteria specified in relation to that designation:

Provided that any roof or part of a roof shall be deemed to be of the specified designation if it conforms with one of the specifications set out against that designation in Schedule 10.

(5) Any requirement in this Part that an element of structure, door or casing shall have fire resistance of a specified period shall be construed as meaning that it shall be so constructed that a specimen constructed to the same specification, if exposed to test by fire in accordance with BS 476: Part 8: 1972, would (subject to the provisions set out in the Table to this regulation) satisfy the requirements of that test as to stability, integrity and insulation for not less than the specified period:

Provided that an element of structure, door or casing shall be deemed to have the requisite fire resistance if—
(i) it is constructed to the same specification as that of a specimen which prior to 31st August 1973 was either exposed to test by fire in accordance with BS 476: Part 1: 1953 and (subject to the provisions set out in the Table to this regulation) satisfied the requirements of that test as to collapse, passage of flame and insulation for not less than the specified period or was assessed by an appropriate authority as capable of satisfying those requirements; or

(ii) in the case of a wall, beam, column, stanchion or floor to which Schedule 8 relates, it is constructed in accordance with one of the specifications set out in that schedule and the notional period of fire resistance given in that schedule as being appropriate to that type of construction and other relevant factors is not less than the specified period.

### Table to Regulation E1

(Provisions as to method of test and minimum period of fire resistance referred to in paragraph (5))

<table>
<thead>
<tr>
<th>Part of building</th>
<th>Method of test</th>
<th>Minimum period as to—</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BS 476: Part 8: 1972</td>
</tr>
<tr>
<td></td>
<td></td>
<td>stability</td>
</tr>
<tr>
<td></td>
<td></td>
<td>integrity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>insulation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BS 476: Part 1: 1953</td>
</tr>
<tr>
<td></td>
<td></td>
<td>collapse</td>
</tr>
<tr>
<td></td>
<td></td>
<td>passage of flame</td>
</tr>
<tr>
<td></td>
<td></td>
<td>insulation</td>
</tr>
<tr>
<td>1. External wall situated 1 m or more from relevant boundary</td>
<td>exposure of inside of wall to test by fire</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 min</td>
</tr>
<tr>
<td>2. External wall situated less than 1 m from any point on relevant boundary</td>
<td>exposure of each side of structure separately to test by fire</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>3. Separating wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Compartment wall</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Structure (other than an external wall) enclosing protected shaft</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Compartment floor</td>
<td>exposure of underside of floor to test by fire</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>7. Floor of upper storey in building of purpose group 1 which has 2 storeys</td>
<td>exposure of underside of floor to test by fire</td>
<td>†30 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>†15 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>†15 min</td>
</tr>
<tr>
<td>8. Casing referred to in regulation E1(3)(c)</td>
<td>exposure of exterior to test by fire</td>
<td>30 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 min</td>
</tr>
<tr>
<td></td>
<td></td>
<td>030 min</td>
</tr>
</tbody>
</table>

* "as period of fire resistance specified"

† These requirements are referred to in Part VII of Schedule 8 as "modified 1 hour"

a No requirement if the distance between the casing and every pipe within the enclosure except a pipe penetrating the casing exceeds 50mm.
**TABLE TO REGULATION E1—continued.**

<table>
<thead>
<tr>
<th>Part of building</th>
<th>Method of test</th>
<th>Minimum period as to—</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>BS 476: Part 8: 1972</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>stability</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>BS 476: Part 1: 1953</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>collapse</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. Door other than a door described in item 10 or 11</td>
<td>exposure to test by fire when fitted in its frame</td>
<td>•</td>
<td>•</td>
<td>no requirement</td>
<td></td>
</tr>
<tr>
<td>10. Door referred to in both regulations E1(5) and regulation E9[(a)(i)] or E13[(2)(d)] or E18[(6)(c)(ii)]</td>
<td>exposure to test by fire when fitted in its frame</td>
<td>30 min</td>
<td>20 min</td>
<td>no requirement</td>
<td></td>
</tr>
<tr>
<td>11. Door referred to in both regulations E1[(6)] and regulation E10[(7)(a)] or E10[(7)(b)]</td>
<td>exposure to test by fire when fitted in any rebated frame</td>
<td>30 min</td>
<td>30 min</td>
<td>no requirement</td>
<td></td>
</tr>
</tbody>
</table>

*—*"as period of fire resistance specified"*

**Designation of purpose groups**

E2. For the purposes of this Part every building or compartment shall be regarded according to its use or intended use as falling within one of the purpose groups set out in the Table to this regulation and, where a building is divided into compartments used or intended to be used for different purposes, the purpose group of each compartment shall be determined separately:

Provided that where the whole or part of a building or compartment (as the case may be) is used or intended to be used for more than one purpose, only the main purpose of use of that building or compartment shall be taken into account in determining into which purpose group it falls.

**TABLE TO REGULATION E2**
(Designation of purpose groups)

<table>
<thead>
<tr>
<th>Purpose group (1)</th>
<th>Descriptive title (2)</th>
<th>Purposes for which building or compartment is intended to be used (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I ... Small residential ...</td>
<td>Private dwelling-house (not including a flat or maisonette)*</td>
<td></td>
</tr>
<tr>
<td>II ... Institutional ...</td>
<td>Hospital, home, school or other similar establishment used as living accommodation for, or for treatment, care or maintenance of, persons suffering from disabilities due to illness or old age or other physical or mental disability or under the age of five years, where such persons sleep in the premises</td>
<td></td>
</tr>
<tr>
<td>III ... Other residential ...</td>
<td>Accommodation for residential purposes other than any premises comprised in groups I and II</td>
<td></td>
</tr>
</tbody>
</table>

*Note: By regulation E20 certain small garages and open car-ports are treated as being of purpose group I.*
### TABLE TO REGULATION E2—continued

<table>
<thead>
<tr>
<th>Purpose group (1)</th>
<th>Descriptive title (2)</th>
<th>Purposes for which building or compartment is intended to be used (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV ...</td>
<td>Office ...</td>
<td>Office, or premises used for office purposes, meaning thereby the purposes of administration, clerical work (including writing, book-keeping, sorting papers, filing, typing, duplicating, machine-calculating, drawing and the editorial preparation of matter for publication), handling money and telephone and telegraph operating, or as premises occupied with an office for the purposes of the activities there carried on.</td>
</tr>
<tr>
<td>V ...</td>
<td>Shop ...</td>
<td>Shop, or shop premises, meaning thereby premises not being a shop but used for the carrying on there of retail trade or business (including the sale to members of the public of food or drink for immediate consumption, retail sales by auction, the business of lending books or periodicals for the purpose of gain, and the business of a barber or hairdresser), and premises to which members of the public are invited to resort for the purpose of delivering there goods for repair or other treatment or of themselves carrying out repairs to, or other treatment of, goods</td>
</tr>
<tr>
<td>VI ...</td>
<td>Factory ...</td>
<td>Factory within the meaning ascribed to that word by section 175 of the Factories Act 1961 (a) (but not including slaughter houses and other premises referred to in paragraphs (d) and (e) of subsection (1) of that section)</td>
</tr>
<tr>
<td>VII ...</td>
<td>Other place of assembly</td>
<td>Place, whether public or private, used for the attendance of persons for or in connection with their social, recreational, educational, business or other activities, and not comprised within groups I to VI</td>
</tr>
<tr>
<td>VIII ...</td>
<td>Storage and general</td>
<td>Place for storage, deposit or parking of goods and materials (including vehicles), and any other premises not comprised in groups I to VII*</td>
</tr>
</tbody>
</table>

*Note: By regulation E20 certain small garages and open carports are treated as being of purpose group I.

### Rules for measurement

**E3. In this Part—**

(a) the height of a building, or (where relevant) of part of a building as described in regulation E.5(1)(b), means the height of such building or part, measured from the mean level of the ground adjoining the outside of the external walls of the building to the level of half the vertical height of the roof of the building or part, or to the top of the walls or of the parapet (if any), whichever is the higher;

(b) (i) the area of any storey of a building or compartment shall be taken to be the total area of that storey bounded by the inner finished surfaces of the enclosing walls or, on any side where there is no enclosing wall, by the outermost edge of the floor on that side;

(ii) the area of any room or garage shall be taken to be the total area of its floor bounded by the inner finished surfaces of the walls forming the room or garage; and

(iii) the area of any part of a roof shall be taken to be the actual visible area of such part measured on a plane parallel to the pitch of the roof; and

(a) 1961 c. 34.
the cubic capacity of a building or compartment shall be ascertained by measuring the volume of space contained within—
(i) the inner finished surfaces of the enclosing walls or, on any side where there is no enclosing wall, a plane extending vertically above the outermost edge of the floor on that side; and
(ii) the upper surface of its lowest floor; and
(iii) in the case of a building or of a compartment which extends to a roof, the under surface of the roof or, in the case of any other compartment, the under surface of the ceiling of the highest storey within that compartment, including the space occupied by any other walls or any shafts, ducts or structure within the space to be so measured.

Provision of compartment walls and compartment floors

E4.—(1) Any building of a purpose group specified in column (1) of the Table to this regulation which has—
(a) any storey the floor area of which exceeds that specified as relevant to a building of that purpose group and height in column (3) of the Table; or
(b) a cubic capacity which exceeds that specified as so relevant in column (4) of the Table,
shall be so divided into compartments by means of compartment walls or compartment floors or both that—
(i) no such compartment has any storey the floor area of which exceeds the area specified as relevant to the building in column (3) of the Table; and
(ii) no such compartment has a cubic capacity which exceeds that specified as so relevant in column (4) of the Table:
Provided that if any building of purpose group V is fitted throughout with an automatic sprinkler system which complies with the relevant recommendations of CP 402.201: 1952, this paragraph shall have effect in relation to that building as if the limits of dimensions specified in columns (3) and (4) of the Table were doubled.

(2) In any building which exceeds 28 m in height, any floor which separates one storey from another storey, other than a floor which is—
(a) within a maisonette; or
(b) above the ground storey but at a height not exceeding 9 m above the adjoining ground,
shall be constructed as a compartment floor.

(3) The following walls and floors shall be constructed as compartment walls or compartment floors—
(a) any floor in a building of purpose group II;
(b) any wall or floor separating a flat or maisonette from any other part of the same building;
(c) any wall or floor separating part of a building from any other part of the same building which is used or intended to be used mainly for a purpose falling within a different purpose group in the Table to regulation E2; and
(d) any floor immediately over a basement storey if such storey—
(i) forms part of a building of purpose group I which has three or more storeys or a building or compartment of purpose group III or V; and
(ii) has an area exceeding 100 m².
### TABLE TO REGULATION E4

(Dimensions of buildings and compartments)

<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Height of building</th>
<th>Limits of dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Floor area of storey in building or compartment (in m²)</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
</tbody>
</table>

#### Part 1—Buildings other than single storey buildings

<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Height of building</th>
<th>Floor area of storey</th>
<th>Cubic capacity of building or compartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>II (Institutional)</td>
<td>Any height</td>
<td>2000</td>
<td>No limit</td>
</tr>
<tr>
<td>III (Other residential)</td>
<td>Not exceeding 28 m</td>
<td>3000</td>
<td>8500</td>
</tr>
<tr>
<td></td>
<td>Exceeding 28 m</td>
<td>2000</td>
<td>5000</td>
</tr>
<tr>
<td>V (Shop)</td>
<td>Any height</td>
<td>2000</td>
<td>7000</td>
</tr>
<tr>
<td>VI (Factory)</td>
<td>Not exceeding 28 m</td>
<td>2000</td>
<td>28000</td>
</tr>
<tr>
<td></td>
<td>Exceeding 28 m</td>
<td>2000</td>
<td>5000</td>
</tr>
<tr>
<td>VIII (Storage and general)</td>
<td>Not exceeding 28 m</td>
<td>2000</td>
<td>21000</td>
</tr>
<tr>
<td></td>
<td>Exceeding 28 m</td>
<td>1000</td>
<td>No limit</td>
</tr>
</tbody>
</table>

#### Part 2—Single storey buildings

<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Height of building</th>
<th>Floor area of storey</th>
<th>Cubic capacity of building or compartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>II (Institutional)</td>
<td>Any height</td>
<td>3000</td>
<td>No limit</td>
</tr>
<tr>
<td>III (Other residential)</td>
<td>Any height</td>
<td>3000</td>
<td>No limit</td>
</tr>
</tbody>
</table>

### Fire resistance of elements of structure

E5.—(1) In this regulation and in the Table to this regulation—

(a) subject to any express provision to the contrary) any reference to a building of which an element of structure forms part means the building or (if a building is divided into compartments) any compartment of the building of which the element forms part; and

(b) any reference to height means the height of a building, not of any compartment in the building, but if any part of the building is completely separated throughout its height both above and below ground from all other parts by a compartment wall or compartment walls in the same continuous vertical plane, any reference to height in relation to that part means the height solely of that part.

(2) Subject to the provisions of this regulation and of regulation E6, every element of structure shall have fire resistance of not less than the relevant period set out in the Table to this regulation:

Provided that:

(a) any external wall shall not have fire resistance of less than half an hour;

(b) any separating wall shall not have fire resistance of less than one hour;

(c) any compartment wall or compartment floor which separates a part of a building falling within purpose group II or III from any other part of the building falling within a purpose group other than purpose group II or III shall not have fire resistance of less than one hour;

(d) any element of structure which forms part of more than one building or compartment shall be so constructed as to comply with the greater or greatest of the relevant requirements specified in the Table; and

(e) any element of structure shall not have fire resistance of less than the minimum period required by these regulations for any element which it carries.

(3) Any compartment wall separating a flat or maisonette from any other part of the same building shall not be required to have fire resistance exceeding one hour unless—
(a) the wall is a loadbearing wall or a wall forming part of a protected shaft; or
(b) the part of the building from which the wall separates the flat or maisonette
is of a different purpose group and the minimum period of fire resistance
required by the provisions of this regulation for any element of structure n
that part is one and a half hours or more.

(4) Nothing in paragraph (2) shall apply to—
(a) any part of an external wall which is non-loadbearing and may, in accordance
with regulation E7, be an unprotected area; or
(b) in the case of a single storey building or a building consisting of a ground
storey and one or more basement storeys, any element of structure which
forms part of the ground storey and consists of—
(i) part of an external wall which does not support a gallery and which may,
in accordance with regulation E7, be an unprotected area; or
(ii) a structural frame or a beam or column:
   Provided that any beam or column (whether or not it forms part of a
structural frame), and any column which gives support to a wall or gallery,
shall have fire resistance of not less than the minimum period, if any,
required by these regulations for that wall or that gallery; or
(iii) an internal loadbearing wall or a loadbearing part of a wall unless that
wall or part is, or forms part of, a compartment wall or a separating wall,
or forms part of the structure enclosing a protected shaft or supports a
gallery.

**Table to Regulation E5**
(Minimum periods of fire resistance)

In this Table—
“cubic capacity” means the cubic capacity of the building or, if the building is
divided into compartments, the compartment of which the element of structure forms
part; and
“floor area” means the floor area of each storey in the building or, if the building
is divided into compartments, of each storey in the compartment of which the element
of structure forms part.

**Part I—Buildings other than single storey buildings**

<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Maximum dimensions</th>
<th>Minimum period of fire resistance (in hours) for elements of structure(*) forming part of—</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ground storey or upper storey</td>
</tr>
<tr>
<td></td>
<td>Height (in m)</td>
<td>Floor area (in m²)</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>1 (Small residential) House having not more than three storeys ... ... ... ...</td>
<td>No limit</td>
<td>No limit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House having four storeys ...</td>
<td>No limit</td>
<td>250</td>
</tr>
<tr>
<td>House having any number of storeys ... ... ... ...</td>
<td>No limit</td>
<td>No limit</td>
</tr>
</tbody>
</table>

---

46
<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Maximum dimensions</th>
<th>Minimum period of fire resistance (in hours) for elements of structure(*) forming part of—</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height (in m)</td>
<td>Floor area (in m²)</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>III (Other residential)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building or part (†) having not more than two storeys ... ... ...</td>
<td>No limit</td>
<td>500</td>
</tr>
<tr>
<td>Building or part (†) having three storeys ... ... ...</td>
<td>No limit</td>
<td>250</td>
</tr>
<tr>
<td>Building having any number of storeys ... ... ...</td>
<td>28</td>
<td>3000</td>
</tr>
<tr>
<td>Building having any number of storeys ... ... ...</td>
<td>No limit</td>
<td>2000</td>
</tr>
<tr>
<td>IV (Office) ... ... ...</td>
<td>7·5</td>
<td>250</td>
</tr>
<tr>
<td>7·5</td>
<td>500</td>
<td>No limit</td>
</tr>
<tr>
<td>15</td>
<td>No limit</td>
<td>3500</td>
</tr>
<tr>
<td>28</td>
<td>5000</td>
<td>14000</td>
</tr>
<tr>
<td>No limit</td>
<td>No limit</td>
<td>No limit</td>
</tr>
<tr>
<td>V (Shop) ... ... ...</td>
<td>7·5</td>
<td>150</td>
</tr>
<tr>
<td>7·5</td>
<td>500</td>
<td>No limit</td>
</tr>
<tr>
<td>15</td>
<td>No limit</td>
<td>3500</td>
</tr>
<tr>
<td>28</td>
<td>1000</td>
<td>7000</td>
</tr>
<tr>
<td>No limit</td>
<td>2000</td>
<td>7000</td>
</tr>
<tr>
<td>VI (Factory) ... ... ...</td>
<td>7·5</td>
<td>250</td>
</tr>
<tr>
<td>7·5</td>
<td>No limit</td>
<td>1700</td>
</tr>
<tr>
<td>15</td>
<td>No limit</td>
<td>4250</td>
</tr>
<tr>
<td>28</td>
<td>No limit</td>
<td>8500</td>
</tr>
<tr>
<td>28</td>
<td>No limit</td>
<td>28000</td>
</tr>
<tr>
<td>over 28</td>
<td>2000</td>
<td>5500</td>
</tr>
</tbody>
</table>
### Table to Regulation E5—continued

<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Maximum dimensions</th>
<th>Minimum period of fire resistance (in hours) for elements of structure (a) forming part of—</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Height (in m)</td>
<td>Floor area (in m²)</td>
<td>Cubic capacity or upper storey (in m³)</td>
</tr>
<tr>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>VII (Assembly) ... ... ...</td>
<td>7:5</td>
<td>250</td>
<td>No limit</td>
</tr>
<tr>
<td></td>
<td>7:5</td>
<td>500</td>
<td>No limit</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>No limit</td>
<td>3500</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>5000</td>
<td>14000</td>
</tr>
<tr>
<td></td>
<td>No limit</td>
<td>No limit</td>
<td>No limit</td>
</tr>
<tr>
<td>VIII (Storage and general) ... ...</td>
<td>7:5</td>
<td>150</td>
<td>No limit</td>
</tr>
<tr>
<td></td>
<td>7:5</td>
<td>300</td>
<td>No limit</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>No limit</td>
<td>1700</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>No limit</td>
<td>3500</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>No limit</td>
<td>7000</td>
</tr>
<tr>
<td></td>
<td>28</td>
<td>No limit</td>
<td>21000</td>
</tr>
<tr>
<td></td>
<td>over 28</td>
<td>1000</td>
<td>No limit</td>
</tr>
</tbody>
</table>

**Notes to Part 1**

For the purpose of regulation E5(2), the period of fire resistance to be taken as being relevant to an element of structure is the period included in column (5) or (6), whichever is appropriate, in the line of entries which specifies dimensions with all of which there is conformity or, if there are two or more such lines, in the topmost of those lines.

(a) A floor which is immediately over a basement storey shall be deemed to be an element of structure forming part of a basement storey.

(f) The expression "part" means a part which is separated as described in regulation E5(1)(b).

(a) The period is half an hour for elements forming part of a basement store which has an area not exceeding 50 m².

(b) This period is reduced to half an hour in respect of a floor which is not a compartment floor, except as to the beams which support the floor or any part of the floor which contributes to the structural support of the building as a whole.

(c) No fire resistance is required if the elements form part of a basement storey which has an area not exceeding 50 m².

x The items thus marked are applicable only to buildings, not to compartments, except in relation to purpose group III; see also regulations E7(3) proviso (i) and E8(7) proviso (a).

y If the building is fitted throughout with an automatic sprinkler system which complies with the relevant recommendations of CP402:201:1952, any maximum limits specified in columns (3) and (4) shall be doubled.
<table>
<thead>
<tr>
<th>Purpose group</th>
<th>Maximum floor area (in m²)</th>
<th>Minimum period of fire resistance (in hours) for elements of structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Small residential</td>
<td>No limit</td>
<td>z</td>
</tr>
<tr>
<td>(2) Institutional</td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td>(3) Other residential</td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td>IV Office</td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td>V Shop</td>
<td>2000</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>No limit</td>
<td>z</td>
</tr>
<tr>
<td>VI Factory</td>
<td>2000</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>No limit</td>
<td>z</td>
</tr>
<tr>
<td>VII Assembly</td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>No limit</td>
<td>z</td>
</tr>
<tr>
<td>VIII Storage and general</td>
<td>500</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>1900</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>3000</td>
<td>z</td>
</tr>
<tr>
<td></td>
<td>No limit</td>
<td>z</td>
</tr>
</tbody>
</table>

Notes to Part 2

For the purpose of regulation E5(2), the period of fire resistance to be taken as being relevant to an element of structure is the period included in column (3) in the line of entries which specifies the floor area with which there is conformity or, if there are two or more such lines, in the topmost of those lines.

z See regulations E7(3) proviso (i) and E8(7) proviso (b).

Fire resistance of floors in conjunction with suspended ceilings

E6.—(1) In the Table to this regulation—
(a) "height" has the meaning assigned to that expression by regulation E5(1)(b); and
(b) references to classes are to classes as defined in regulation E15(1).

(2) In the application of regulation E5 to floors, no account shall be taken of any fire resistance attributable to any suspended ceiling other than a suspended ceiling constructed as described in the Table to this regulation.
### Table to Regulation E6
(Suspended ceilings)

<table>
<thead>
<tr>
<th>Height (1)</th>
<th>Type of floor (2)</th>
<th>Required fire resistance of floor (3)</th>
<th>Description of suspended ceiling (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 15 m</td>
<td>Non-compartment</td>
<td>1 hour or less</td>
<td>Surface of ceiling exposed within the cavity not lower than Class 1</td>
</tr>
<tr>
<td></td>
<td>Compartment</td>
<td>Less than 1 hour</td>
<td></td>
</tr>
<tr>
<td>15 m or more</td>
<td>Any</td>
<td>1 hour or less</td>
<td>Surface of ceiling exposed within the cavity not lower than Class 0; supports and fixings for the ceiling non-combustible</td>
</tr>
<tr>
<td></td>
<td>Any</td>
<td>More than 1 hour</td>
<td>Ceiling of non-combustible construction and jointless; supports and fixings for the ceiling non-combustible</td>
</tr>
</tbody>
</table>

**External walls**

E7.—(1) For the purposes of this regulation—

(a) any reference to Schedule 9 shall be construed as referring to the provisions of Part I of that schedule together with (at the option of the person intending to erect the building) the provisions of Part II, Part III or (if applicable) Part IV;

(b) any part of a roof shall be deemed to be part of an external wall or side of a building if it is pitched at an angle of 70° or more to the horizontal and adjoins a space within the building to which persons have access not limited to the purposes of maintenance or repair; and

(c) if a building is to be erected on land which will be occupied in common with another building (whether it be the only other building or any one of a number of other buildings) and either the building to be so erected or that other building is a building of purpose group I (except a building described in regulation E20 which complies with regulation E18 or E19) or a building of purpose group III—

(i) in the application of the provisions of this regulation to any side or external wall of the building to be so erected which faces a side or external wall of that other building, a notional boundary shall be assumed to pass between those buildings;

(ii) such notional boundary shall be so situated as to enable the adjacent sides and external walls of both buildings to comply with the requirements of this regulation; and

(iii) if that other building is an existing building, it shall be treated as if it were a new building of the same purpose group and having the same unprotected areas and fire resistance as the existing building.

(2) Any side of a building except as provided by regulation E18 (Small garages) or E19 (Small open carports) shall comply with any relevant requirements relating to permitted limits of unprotected areas specified in Schedule 9.
(3) Any external wall which is situated within a distance of 1 m from any point on the relevant boundary and any external wall of a building which exceeds 15 m in height shall—

(a) be constructed wholly of non-combustible materials apart from any external cladding which complies with paragraph (4) or any internal lining which complies with regulation E15; and

(b) be so constructed that any fire resistance required by these regulations is attained by the non-combustible part alone:

Provided that the requirements of this paragraph shall not apply to—

(i) an external wall of a building which is within the limits of size indicated by the letter “x” in Part 1 of the Table to regulation E5 or of a building which is not divided into compartments and is within the limits of size indicated by the letter “a” in Part 2 of that table if, in either case, that building does not exceed 15 m in height;

(ii) an external wall of a building or part of a building of purpose group III which consists of flats or maisonettes if that building has not more than three storeys or that part is separated as described in regulation E5(1)(b) and has not more than three storeys; or

(iii) an external wall of a part of a building if that wall is situated 1 m or more from the relevant boundary and that part is separated as described in regulation E5(1)(b) and does not exceed 15 m in height.

(4) Any external cladding which is situated within a distance of 1 m from any point on the relevant boundary and any external cladding on a building which exceeds 15 m in height shall have a surface complying with the requirements for Class 0 specified in regulation E15(1)(e):

Provided that, if an external wall of such a building is 1 m or more from the relevant boundary, any part of such cladding below a height of 15 m from the ground may consist of timber of not less than 9 mm finished thickness or of a material having a surface which, when tested in accordance with BS 476: Part 6: 1968, has an index of performance (I) not exceeding 20.

(5) Any beam or column forming part of, and any structure carrying, an external wall which is required to be constructed of non-combustible materials shall comply with the provisions of paragraph (3) as to non-combustibility.

Separating walls

E8.—(1) Subject to the exceptions specified in paragraph (2), any separating wall shall be imperforate and shall form a complete vertical separation between any buildings separated (including any roof space therein).

(2) Nothing in paragraph (1) shall prohibit—

(a) the passage through a separating wall of a pipe if the pipe complies with regulation E12; or

(b) an opening in a separating wall which is necessary as a means of escape from fire, if the opening is fitted with a door which—

(i) complies with the requirements of regulation E11; and

(ii) has fire resistance which is not less than the period required by regulation E5 for the separating wall.

(3) Subject to the exceptions specified in paragraph (4), any separating wall which forms a junction with a roof shall be carried above the upper surface of the covering of that roof to a distance of not less than 375 mm (measured at right angles to such upper surface).

(4) A separating wall shall not be required to comply with the provisions of paragraph (3)—

(a) if the buildings separated by the separating wall are so constructed that—

(i) any part of the roof which is within 1·5 m of the separating wall is designated AA, AB or AC; and
(ii) the deck of such part of the roof is of solid or hollow slab construction of non-combustible material; and

(iii) the junction between the separating wall and such roof is fire-stopped;

or

(b) if—

(i) each of the buildings separated by the separating wall is of purpose group I, II, IV or VII; and

(ii) neither building exceeds 12.5 m in height; and

(iii) any part of the roof which is within 1.5 m of the separating wall is covered with non-combustible material or asphalt; and

(iv) the junction between the separating wall and the roof covering is fire-stopped;

or

(c) if—

(i) each of the buildings separated by the separating wall is a building of purpose group I having not more than three storeys; and

(ii) any part of the roof which is within 1.5 m from the separating wall is designated AA, AB or AC; and

(iii) the junction between the separating wall and the roof is fire-stopped.

(5) If any external wall is carried across the end of a separating wall, such external wall and separating wall shall be bonded together or the junction of such walls shall be fire-stopped.

(6) Any combustible material which is built into or carried through, across the end of or over the top of a separating wall shall not be of such a type or used in such a way as will render ineffective the resistance of that wall to the effects or spread of fire:

Provided that—

(a) if a building is constructed in compliance with the requirements of paragraph (4)(b), nothing in this paragraph shall prohibit the continuation over the top of the separating wall of—

(i) any boarding, with or without sarking felt or sarking paper, if such boarding is used as a base for the roof covering and the boarding is solidly bedded on mortar or other not less suitable material where it rests on the separating wall; or

(ii) any wood wool slabbng, with or without sarking felt or sarking paper, if the slabbng is solidly bedded on mortar or other not less suitable material where it rests on the separating wall; or

(iii) any tiling or slating battens (other than such battens used in connection with (ii) above), if the battens are solidly bedded on mortar or other not less suitable material where they rest on the separating wall and the space between them is filled with mortar or other not less suitable material up to the underside of the roof covering; and

(b) if a building is constructed in compliance with the requirements of paragraph (4)(c), nothing in this paragraph shall prohibit the roof covering from passing over the top of the wall or any combustible material falling within the provisions of sub-paragraph (a)(i), (ii) or (iii) from forming part of a roof which is designated AA, AB or AC.

(7) Any separating wall shall be constructed wholly of non-combustible materials apart from any surface finish which complies with regulation E15 and the required fire resistance shall be attained independently of any such combustible surface finish:

Provided that the requirements of this paragraph shall not apply to—

(a) a wall separating buildings which are not divided into compartments and are within the limits of size indicated by the letter "x" in Part 1 of the Table to regulation E5; or

(b) a wall separating single storey buildings which are not divided into compartments and are within the limits of size indicated by the letter "z" in Part 2 of the Table to regulation E5.
(8) Any beam or column forming part of, and any structure carrying, a separating wall which is required to be constructed of non-combustible materials shall itself comply with the requirements of paragraph (7) as to non-combustibility.

Compartment walls and compartment floors

E9.—(1) Any compartment wall or compartment floor shall be imperforate with the exception of any one or more of the following—

(a) (i) in the case of a compartment wall separating a flat or maisonette from any space in common use giving access to that flat or maisonette, an opening fitted with a door which complies with the requirements of regulation E11 and has fire resistance of not less than half an hour; or

(ii) in any other case, an opening fitted with a door which complies with the requirements of regulation E11 and has fire resistance of not less than the minimum period required by regulation E5 for the wall or floor;

(b) an opening for a protected shaft;

(c) an opening for a ventilation duct (other than a duct in, or consisting of, a protected shaft) if any space surrounding the duct is fire-stopped and the duct is fitted with an automatic fire shutter where it passes through the wall or floor;

(d) an opening for a pipe which complies with the requirements of regulation E12;

(e) an opening for a chimney, appliance ventilation duct or duct encasing one or more flue pipes, in each case complying with the relevant requirements of paragraphs (5) and (6) and of Part L; or

(f) an opening for a refuse chute which complies with the requirements of Part J.

(2) Where a compartment wall or floor joins any compartment wall, external wall or separating wall or any structure enclosing a protected shaft, such structures shall be bonded together at the junction or the junction shall be fire-stopped.

(3) Where any compartment wall forms a junction with a roof, such wall shall be carried above the upper surface of the roof covering for a distance of not less than 375 mm, measured at right angles to the surface of the roof, unless either—

(a) the roof complies with the requirements of regulation E8(4)(a); or

(b) the compartment wall is in a building of purpose group III, IV or VII not exceeding 12.5 m in height, and the roof complies with the requirements of regulation E8(4)(b)(iii) and (iv):

Provided that nothing in this paragraph shall prohibit the continuation over the top of the wall of any construction which complies with the requirements of regulation E8(6).

(4) Any combustible material which is built into or carried through or across the ends of any compartment wall or compartment floor or carried over the top of any compartment wall shall not be of such a type or used in such a way as will render ineffective the resistance of that wall or floor to the effects or spread of fire.

(5) If any chimney, appliance ventilation duct or duct encasing one or more flue pipes passes through a compartment floor or compartment wall—

(a) any flue in the chimney; or

(b) the passage in the appliance ventilation duct; or

(c) the space within the duct encasing the flue pipe or pipes, shall be separated from that compartment floor or compartment wall and from each compartment adjoining that floor or wall by non-combustible construction having fire resistance of not less than half the minimum fire resistance required by regulation E5 for the compartment floor or compartment wall through which it passes.

(6) If any chimney, appliance ventilation duct or duct encasing one or more flue pipes forms part of a compartment wall—

(a) any flue in the chimney; or

(b) the passage in the appliance ventilation duct; or
(c) the space within the duct encasing the flue pipe or pipes, shall be separated from any compartment adjoining that wall by non-combustible construction having, at any level, fire resistance of not less than half the minimum fire resistance required by regulation E5 for the compartment wall at that level.

(7) Any compartment wall or compartment floor which is required by regulation E5 to have fire resistance of one hour or more (except where that requirement arises solely by virtue of proviso (c) to regulation E5(2)), shall be constructed wholly of non-combustible materials apart from—

(i) any floor finish; or
(ii) any surface finish to a wall or ceiling which complies with the requirements of regulation E15; or
(iii) any ceiling which complies with the description specified in the Table to regulation E6;

and, apart from any such ceiling, the required fire resistance of the wall or floor shall be obtained without assistance from any combustible material permitted by this sub-paragraph:

Provided that the requirements of this paragraph shall not apply to—

(a) the following walls and floors in a building or part of purpose group III which consists of flats or maisonettes—

(i) if that building has three storeys or that part is separated as described in regulation E5(1)(b) and has three storeys, any wall or floor other than a wall within a basement storey or a floor immediately over a basement storey;
(ii) if that building has four storeys or that part is separated as described in regulation E5(1)(b) and has four storeys, any floor other than a floor immediately over a basement storey; and
(b) any existing floor in a building or part of purpose group IV, V, VI, VII or VIII which is altered or extended if, after alteration or extension, that building does not exceed 15 m in height or that part is separated as described in regulation E5(1)(b) and does not exceed 15 m in height.

(8) Any beam or column forming part of, and any structure carrying, any compartment wall or compartment floor which is required to be constructed of non-combustible materials, shall itself comply with the provisions of paragraph (7) as to non-combustibility.

**Protected shafts**

E10.—(1) In this regulation, “protecting structure” means any wall or floor or other structure which encloses a protected shaft other than—

(a) a wall which also forms part of an external wall, separating wall or compartment wall; or
(b) a floor which is also a compartment floor or a floor laid directly on the ground; or
(c) a roof.

(2) No protected shaft shall be constructed for use for any purposes additional to those specified in regulation E1(1) other than for the passage of a pipe or duct or as sanitary accommodation or washrooms, or both.

(3) Subject to the provisions of this regulation, any protected shaft shall be completely enclosed.

(4)(a) Any protecting structure which is required by regulation E5 to have fire resistance of one hour or more shall be constructed wholly of non-combustible materials apart from any surface finish which complies with the requirements of regulation E15:
Provided that the requirements of this sub-paragraph shall not apply to protecting structure which is situated within the ground storey or an upper storey of a building or part of purpose group III consisting of flats or maisonettes if that building has three storeys or that part is separated as described in regulation E5(1)(b) and has three storeys.

(6) Any beam or column forming part of, and any structure carrying, protecting structure which is required to be constructed of non-combustible materials shall itself comply with the provisions of sub-paragraph (a) as to non-combustibility.

(5) Any wall, floor or other structure enclosing a protected shaft but not being protecting structure may contain such openings as shall be in accordance with other provisions of these regulations.

(6) There shall be no opening in any protecting structure other than any one or more of the following—

(a) an opening for a pipe which complies with the requirements of regulation E12;

(b) an opening fitted with a door which has fire resistance complying with the provisions of paragraph (7) and complies with the provisions of regulation E11;

(c) (if the protected shaft contains a lift) an opening which complies with the provisions of paragraph (8); and

(d) (if the protected shaft serves as, or contains a ventilating duct) an inlet to or outlet from that duct or an opening for that duct.

(7) Any door fitted in an opening in protecting structure shall have fire resistance for the following minimum period—

(a) if the protected shaft is in a building of purpose group III, IV or VII and is wholly or partly above the level of the adjoining ground, not less than half an hour; or

(b) in any other case, either not less than half the period required by other provisions of this Part for the protecting structure surrounding the opening or not less than half an hour (whichever is the greater).

(8) Any protected shaft containing a lift or lifts—

(a) shall be ventilated to the external air by means of one or more permanent openings situated at the top of the shaft and having a total unobstructed area of not less than 0.1 m² for each lift in the shaft; and

(b) shall not contain any pipe conveying gas or oil or any ventilating duct; and

(c) may have an opening in its protecting structure for the passage of the cables operating the lift into the room containing the lift motor:

Provided that if the opening is at the bottom of the shaft the opening shall be as small as practicable.

(9) (a) If a protected shaft serves as, or contains, a ventilating duct—

(i) the duct shall be fitted internally with automatic fire shutters so constructed, at such intervals and in such positions as may be necessary to reduce so far as practicable the risk of fire spreading from a compartment to any other compartment, or such other provision shall be made as will reduce such risk so far as practicable; and

(ii) the duct shall not be constructed of, or lined with, any material which substantially increases such risk.

(b) In addition, in the case of a protected shaft containing a ventilating duct, the shaft shall be so constructed with additional barriers to fire between the duct and the shaft as may be necessary to reduce so far as practicable the risk of fire spreading from a compartment to any other compartment.
(10) If a protected shaft consists of a stairway, it shall not contain any pipe conveying gas or oil or any ventilating duct.

Fire-resisting doors

E11.—(1) This regulation shall apply to any door which is required by the provisions of this Part to have fire resistance.

(2) In this regulation—

"automatic self-closing device" does not include rising butt hinges except in relation to a door to which paragraph (5) applies; and

"electro-magnetic or electro-mechanical device susceptible to smoke" refers only to any such device which will allow the door held open by it to close automatically upon the occurrence of each or any one of the following—

(i) detection of smoke by automatic apparatus suitable in nature, quality and location;
(ii) manual operation of a switch fitted in a suitable position;
(iii) failure of electricity supply to the device, apparatus or switch;
(iv) if a fire alarm system is installed in the building, operation of that system.

(3) (a) Any door to which this regulation applies shall (subject to paragraph (7)) be fitted with an automatic self-closing device.

(b) No means of holding any such door open shall be provided other than a fusible link or, if the door is so constructed and installed that it can readily be opened manually, an electro-magnetic or electro-mechanical device susceptible to smoke.

(c) No part of a hinge on which any such door is hung shall be made either of combustible material or of non-combustible material having a melting point less than 800°C.

(4) Any door fitted in an opening which is provided as a means of escape in the event of fire or might be so used shall be so constructed and installed that it can readily be opened manually and shall not be held open by any means other than an electro-magnetic or electro-mechanical device susceptible to smoke:

Provided that there may also be installed so as to close the same opening a door which cannot readily be opened manually if—

(i) such door is fitted with an automatic self-closing device and is held open by a fusible link;
(ii) the manually openable door has fire resistance of not less than half an hour; and

(iii) the required fire resistance is achieved by the two doors together.

(5) Any door to which reference is made in regulation E9(1)(a)(i), E13(2)(b) or E18(6)(c)(ii) shall be either a single leaf door swinging in one direction only or a double leaf door each leaf of which swings in the opposite direction from the other leaf.

(6) Any door which is fitted in protecting structure (as defined in regulation E10(1)) and is not required by the provisions of regulation E10(7) to have fire resistance of more than half an hour may consist of any single or double leaf door (the leaf or each leaf of which swings in one or both directions), other than a double leaf door both leaves of which swing in one and the same direction and have rebated meeting stiles, if—

(a) the door opens into a hall, lobby or corridor enclosed by walls or partitions having fire resistance of not less than half an hour; and

(b) the clearance between the leaf or leaves of any such doors and its frame and (if the floor has two leaves) between the leaves is as small as is reasonably practicable.

(7) Notwithstanding paragraph (3)(a), a door which is not fitted with a self-closing device may be installed in an opening in the structure which encloses a protected shaft containing exclusively a lift or lifts if either—
(a) the door has fire resistance for a period of not less than half an hour and there is also installed so as to close the same opening another door which is fitted with an automatic self-closing device, is held open by a fusible link and has fire resistance for a period not less than that prescribed by the relevant provisions of this Part for the structure surrounding the opening; or

(b) (unless the opening is in a compartment wall and is one of two openings provided at the same level to allow access to a lift from different sides) the door has fire resistance for a period not less than that prescribed by relevant provisions of this Part for the structure surrounding the opening.

(8) Without prejudice to the requirements of paragraphs (4) to (7), two fire-resisting doors (each being either a single or a double leaf door) may be installed in an opening if each by itself is capable of closing the opening and the required fire resistance is achieved by the two doors together.

Penetration of elements of structure by pipes

E12.-(1) In this regulation "pipe"—

(a) excludes a flue pipe and any pipe used for ventilation purposes other than a ventilating pipe as defined in regulation N2(1); and

(b) includes pipe fittings and accessories.

(2)(a) Subject to the provisions of paragraph (3), the nominal internal diameter of that part of a pipe which passes through—

(i) an opening in a separating wall; or

(ii) an opening in a compartment wall or compartment floor other than any such opening which is wholly enclosed within a protected shaft; or

(iii) an opening in protecting structure,

shall not exceed the relevant dimension prescribed in the Table to this regulation:

Provided that if, on either side of the structure penetrated and within a distance of 1 m (measured along the pipe) from the point of penetration, the pipe which penetrates the structure, being of specification (a), is connected to a pipe of specification (b) or (c) or, being of specification (b), is connected to a pipe of specification (c), the maximum internal diameter of the pipe shall be determined as though it were of the same specification as the pipe to which it is connected.

(b) Any opening shall be as small as is reasonably practicable and shall be firestopped around the pipe.

(3) Notwithstanding the requirements of paragraph (2)(a), a pipe which forms part of an above ground drainage system comprising pipes which comply with specification (b) in the Table and have a nominal internal diameter not exceeding 150 mm in the case of a stack pipe or 100 mm in the case of a branch pipe may pass through an opening in a separating wall between houses or an opening in a compartment wall or compartment floor between flats or maisonettes if—

(a) the pipe, being a stack pipe, is contained in each storey within an enclosure or, being a branch pipe, discharges into a stack pipe contained within an enclosure formed in part by the wall penetrated by the branch pipe;

(b) any such enclosure—

(i) extends, in each storey, from the floor to the ceiling of that storey or, if the ceiling is suspended beneath a floor, to that floor;

(ii) has each side formed by a separating wall, compartment wall or external wall or by casing;

(iii) has an internal surface, excluding any supporting members, which complies with the requirements for Class 0 specified in regulation E15(1)(e);

(iv) has no access panel situated in a bedroom or circulation space; and

(v) is not used for any other purpose except to accommodate pipes conveying water;
(c) any such casing—
(i) is imperforate except for any opening made for the passage of a pipe or fitted with an access panel;
(ii) consists of any material other than sheet metal; and
(iii) (including any access panel) has fire resistance of not less than half an hour; and

(d) any opening made for the passage of a branch pipe through a side of an enclosure or for the passage of a stack pipe through a floor at the base or top of an enclosure (including, in the case of a maisonette, any floor within the dwelling) is as small as is reasonably practicable and is fire-stopped around the pipe.

**Table to Regulation E12**

(Maximum nominal internal diameter of pipes)

<table>
<thead>
<tr>
<th>Specification of pipe</th>
<th>Maximum nominal internal diameter of pipe (in mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Pipe made of any non-combustible material which, if exposed to a temperature of 800°C, will not soften and will not fracture to such an extent as to permit flames or hot gases to pass through the wall of the pipe</td>
<td>150</td>
</tr>
</tbody>
</table>
| (b) Pipe made of lead or aluminium or alloy thereof; asbestos-cement pipe; or unplasticised polyvinyl chloride pipe complying with BS 4514: 1969 | 100 if it penetrates structure (other than a separating wall) enclosing a protected shaft not regularly used for the passage of people
38 in all other cases |
| (c) Pipe made of any other material | 38 |

**Stairways**

E13.—(1) Every stairway (including any landing thereof) which forms part of a building shall, whether the stairway is internal or external, be constructed of non-combustible material except—

(a) an internal stairway which is situated—
(i) within a maisonette; or
(ii) within any storey which comprises elements of structure for which the fire resistance required by this Part is less than one hour; or
(iii) within the ground storey or an upper storey of a building or part of purpose group III which consists of flats or maisonettes if that building has not more than three storeys or that part is separated as described in regulation E5(1)(b) and has not more than three storeys; or
(iv) within a building or compartment of purpose group V but not within a protected shaft; or

(b) an external stairway which is situated between the ground and a floor or flat roof the level of which, at the head of the stairway, is not more than 6 m above the finished surface of the ground adjoining the foot of the stairway:

Provided that nothing in this paragraph shall prohibit the addition of any combustible material to the upper surface of any stairway or landing.
(2) In any building of purpose group I which has three or more storeys, any internal stairway (including any hall or landing associated therewith and any part of a floor which affords passage between flights of the stairway) shall be separated from all other parts of the building by structure complying with the following requirements—

(a) the structure shall have fire resistance for not less than the minimum period required by regulation E5 for elements of structure forming part of the storey in which it is situated; and

(b) any opening in the structure which gives access to a habitable room or kitchen shall be fitted with a door which has fire resistance of not less than half an hour and complies with the requirements of regulation E11.

Fire-stopping

E14.—(1) Any fire stop required by the provisions of this Part shall be so formed and positioned as to prevent or retard the passage of flame.

(2) Any fire stop shall—

(a) if provided around a pipe or duct, be made of non-combustible material or (if it is in a floor or wall constructed of combustible material) of timber not less than 38 mm thick and be so constructed as not to restrict essential thermal movement; and

(b) if provided in a cavity, be made of non-combustible material or (if it is in a floor or wall constructed of combustible material) of timber not less than 38 mm thick.

(3) Any fire stop formed as a seal at the junction of two or more elements of structure shall be made of non-combustible material if all such elements are required by this Part to be non-combustible.

(4) Any cavity in an element of structure which—

(a) is continuous throughout the whole or part of such element; and

(b) has a surface of combustible material exposed within the cavity which is of a class lower than Class O in regulation E15,

shall be fire-stopped—

(i) at any junction with another element of structure or with a ceiling under a roof; and

(ii) in such a position that there is no continuous cavity (without a fire stop) which in one plane exceeds either 8 m in a single dimension or 25 m² in area,

but nothing in this paragraph shall prohibit the insertion of combustible filling in a cavity.

Restriction of spread of flame over surfaces of walls and ceilings

E15.—(1) For the purposes of this regulation and the Table thereto—

(a) "ceiling" includes any soffit and any rooflight, skylight, or other part of a building which encloses and is exposed overhead within a room, circulation space or protected shaft;

"circulation space" means any space which is solely or predominantly used as a means of access between a room and a protected shaft or between either a room or a protected shaft and an exit from the building or compartment;

"small room" means a room which is totally enclosed and has a floor area not exceeding that specified in column (2) of the Table to this regulation, according to the purpose group of the building or compartment; and

"trim" means any architrave, cover mould, picture rail, skirting or similar narrow member;

(b) any reference to the surface of a wall shall be construed as a reference to that surface excluding the surface of any door, door frame, window, window frame, fireplace surround, mantelshelf, fitted furniture or trim;

(c) any reference to the surface of a ceiling shall be construed as a reference to that surface excluding the surface of the frame of any rooflight or skylight;
(d) any part of a ceiling which slopes at an angle of 70° or more to the horizontal
and is not part of a rooflight or skylight shall be deemed to be a wall;

(e) any reference to a surface being of Class O shall be construed as a require-
ment that—

(i) the material of which the wall or ceiling is constructed shall be non-
combustible throughout; or

(ii) the surface material (or, if it is bonded throughout to a substrate, the
surface material in conjunction with the substrate) shall, if tested in
accordance with BS 476: Part 6: 1968, have an index of performance (I)
not exceeding 12 and a sub-index (ii) not exceeding 6:

Provided that the face of a plastics material having a softening point less than
120°C if tested by method 102C of BS 2782: 1970 shall not be regarded as a
surface of Class O unless—

(i) the material is bonded throughout to a substrate which is not a plastics
material and the material in conjunction with the substrate satisfies the
test criteria prescribed in (ii) above; or

(ii) the material satisfies the test criteria prescribed in (ii) above and is used as
the lining of a wall so constructed that any surface which would be exposed
if the lining were not present satisfies the said test criteria and is the face of
a material other than a plastics material having a softening point less than
120°C;

(f) any reference to a surface being of a class other than Class O shall be con-
strued as a requirement that the wall or ceiling shall be so constructed that a
specimen constructed to the same specification, if exposed to test by fire in
accordance with BS 476: Part 7: 1971, would comply with the test criteria as to
surface spread of flame specified in relation to that class:

Provided that a wall or ceiling shall be deemed to have a surface of the requisite
class if it is constructed to the same specification as that of a specimen which
prior to 31st August 1973 was either proved to satisfy the relevant test criteria
prescribed in clause 7 of BS 476: Part 1: 1953 or was assessed by an appropriate
authority as capable of satisfying those criteria;

and

(g) in relation to a requirement that a surface shall be of a class not lower than
a specified class, Class O shall be regarded as the highest class followed in
descending order by Class 1, Class 2, Class 3 and Class 4.

(2) The surface of a wall or ceiling in a room, circulation space or protected shaft
shall be of a class not lower than that specified as relevant in the Table to this regula-
tion.

Provided that—

(i) a wall may have a surface of any class not lower than Class 3 to the extent
permitted by paragraph (3); and

(ii) a ceiling may either have a surface of any class not lower than Class 3 to
the extent permitted by paragraph (4) or may consist of plastics material
to the extent permitted by regulation E16.

(3) Any part of the surface of a wall in a room may be of any class not lower than
Class 3 if the area of that part (or, if there are two or more such parts, the total area
of those parts) does not exceed the lesser of the following—

(a) half the floor area of the room; or

(b) (in the case of a building or compartment of purpose group I, II, or III)
20 m² or (in any other case) 60 m².

(4) Any part of the surface of a ceiling may be of any class not lower than Class 3
if that part of the surface is the face of a layer of material the other face of which is
exposed to the external air and—

(a) (i) the ceiling is that of a room in a building or compartment of purpose
group II, III, IV, V or VII or that of a circulation space in a building or
compartment of any purpose group; and
(ii) the area of that part does not exceed 2·5 m²; and
(iii) the distance between that part and any other such part is not less than 3·5 m; or

(b) (i) the ceiling is that of a room in a building or compartment of purpose group VI or VIII; and
(ii) the area of that part does not exceed 5 m²; and
(iii) the distance between that part and any other such part is not less than 1·8 m; and
(iv) that part and all other such parts are evenly distributed over the whole area of the ceiling and together have an area which does not exceed 15% of the floor area of the room; or

(c) the ceiling is that of a balcony, verandah, open carport, covered way or loading bay which (irrespective of its floor area) has at least one of its longer sides wholly and permanently open; or

(d) the ceiling is that of a garage, conservatory or outbuilding which (irrespective of whether it forms part of a building or is a building which is attached to another building or wholly detached) has a floor area not exceeding 40 m².

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**TABLE TO REGULATION E15**

(Surfaces of walls and ceilings)

<table>
<thead>
<tr>
<th>Purpose group of building or compartment</th>
<th>Maximum floor area of small room (in m²)</th>
<th>Class of surface for both walls and ceilings (except where separately specified)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>Small rooms (see col. (2))</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(3)</td>
</tr>
<tr>
<td>I (Small residential)</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>House having not more than two storeys</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Any other house</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>II (Institutional)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>III (Other residential)</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>IV (Office)</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>V (Shop)</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>VI (Factory)</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>VII (Assembly)</td>
<td></td>
<td>30</td>
</tr>
<tr>
<td>VIII (Storage and general)</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

**Exceptions permitting ceilings to consist of plastics materials**

E16.—(1) The provisions of regulation E15(1) shall apply for the interpretation of this regulation.

(2) Any part of the ceiling of a room or circulation space may consist of—
(a) rigid polyvinyl chloride sheeting which is classified as self-extinguishing when tested in accordance with method 508A of BS 2782: 1970 if the face of the sheeting which is not the surface of the ceiling is exposed to the external air; or
(b) one or more panels of such plastics materials as are permitted by paragraph (3) if the upper and lower surfaces of any part of the ceiling which is not formed by a panel of plastics material and the surfaces of all other parts of the structure which enclose the space over the ceiling are of a class not lower than that prescribed in the Table to regulation E15 for the ceiling of such a room or circulation space.

(3) Panels to which paragraph (2)(b) refers may consist of one or more sheets or membranes of either—

(a) polyvinyl chloride which has a degree of flammability of not more than 75 mm when tested in accordance with method 508C of BS 2782: 1970 or which has very low flammability when tested and classified in accordance with method 508D of BS 2782: 1970, if—

(i) the nominal thickness of the sheet or membrane (or, if a panel consists of two or more sheets or membranes, their nominal aggregate thickness) does not exceed 1 mm; and

(ii) no panel has an area exceeding 4 m²; or

(b) any plastics material which has a softening point of not more than 120°C when tested by method 102C of BS 2782: 1970 and a burning rate of not more than 50 mm/min when tested in a thickness of 3 mm in accordance with method 508A of BS 2782: 1970, if—

(i) the nominal thickness of the sheet or membrane (or, if a panel consists of two or more sheets or membranes, their nominal aggregate thickness) does not exceed 3 mm;

(ii) the aggregate area of the plastics material, if situated in a building or compartment of purpose group II, III or VII, does not exceed 30% of the floor area of the room or 15% of the floor area of the circulation space, as the case may be;

(iii) no panel has any side exceeding 5 m in length or an area exceeding 4 m² if situated in a room or 2 m² if situated in a circulation space; but if two or more panels are grouped so that each is less than 575 mm from another, the said maximum dimensions shall be applied to the smallest rectangle which would wholly enclose all such panels; and

(iv) every panel is loosely mounted in such a way that it will fall out of its mountings when softened by heat.

Rois

E17.—(1) No part of the roof of a building which—

(a) has a cubic capacity exceeding 1500 m³; or

(b) is wholly or partly of purpose group VI or VIII; or

(c) is a house in a continuous terrace of more than two houses, shall be so constructed as to be designated BD, CA, CB, CC, CD, DA, DB, DC or DD, or be covered with thatch or wood shingles.

(2) Any part of a roof which is designated BA, BB or BC shall be not less than 6 m from any point on a boundary.

(3) Any part of a roof which is designated AD, BD, CA, CB, CC or CD or is covered with thatch or wood shingles shall be not less than 12 m from any point on a boundary unless such part is—

(a) of an area not exceeding 3 m²; and

(b) separated from any other part of the same roof which is so designated or covered with thatch or wood shingles by an area of roof which is at least 1·5 m wide and which is covered by non-combustible material.
in which case such designated part or part covered with thatch or wood shingles shall be not less than 6 m from any such point.

(4) Any part of a roof which is designated DA, DB, DC or DD shall be—
   (a) not less than 22 m from any point on a boundary; and
   (b) of an area not exceeding 3 m²; and
   (c) separated from any other part of the same roof which is so designated by an area of roof which is at least 1·5 m wide and covered with non-combustible material.

(5) If any part of a roof cannot be designated under regulation E1(4) on account of the low softening temperature of its covering material, such part shall be not less than 12 m or twice the height of the building (whichever is the greater) from any point on a boundary, unless such part is—
   (a) of an area not exceeding 3 m²; and
   (b) separated from any other part of the same roof which is covered with the same material or any other material which for the same reason cannot be so designated by an area of roof which is at least 1·5 m wide and covered with non-combustible material,
in which case such part shall be not less than 6 m from any such point.

(6) Nothing in this regulation shall prevent any part of a roof being constructed of such glass or rigid polyvinyl chloride sheeting as cannot be designated in accordance with regulation E1(4) (but which, in the case of such sheeting, is classified as self-extinguishing when tested in accordance with method 508A of BS 2782: 1970) where either—
   (a) that part of the roof is not less than 6 m from any boundary; or
   (b) that part of the roof is less than 6 m from any boundary and the roof is that of a garage, conservatory or outbuilding having a floor area not exceeding 40 m² (whether or not attached to or forming part of another building) or is the roof of, or a canopy over, a balcony, verandah, open carport, covered way or detached swimming pool.

Small garages

E18.—(1) The following provisions (subject to the provisions of regulation E19 regarding small open carports) shall apply to any garage which has a floor area not exceeding 40 m².

(2) If such garage is a separate building and—
   (a) is not less than 2 m from any boundary and any house within the boundary; or
   (b) (being less than 2 m from any boundary) complies with the requirements of paragraph (3); or
   (c) (being less than 2 m from any house within the boundary) complies with the requirements of paragraph (4),
it shall not be required to comply with any regulation in this Part except regulation E17 and any other provisions expressly referred to in this regulation.

(3) Any such garage which is less than 2 m from any boundary shall be so constructed that any part of an external wall which is less than 2 m from the boundary is externally non-combustible and the walls of the garage have an internal surface which fulfils the requirements for Class O specified in regulation E15(1)(e).

(4) Any such garage which is less than 2 m from any house within the same boundary shall be so constructed that any part of an external wall which is less than 2 m from such house is externally non-combustible and the walls of the garage have an internal surface which fulfils the requirements for Class O specified in regulation E15(1)(e);
but these requirements shall not apply if every part of any external wall of such house which is less than 2 m from the garage—

(a) is externally non-combustible; and

(b) has resistance to external fire of not less than half an hour; and

(c) has no unprotected area which exceeds 0·1 m² or is less than 1·5 m from any other unprotected area in that part.

(5) In the application of the foregoing paragraphs (3) and (4), any exposed surface of a frame member forming the structure of a wall shall not be deemed to be part of the internal surface of that wall.

(6) If a garage to which paragraph (1) applies is attached to or forms part of a house, it shall be so constructed that—

(a) any floor immediately over such garage has fire resistance of not less than half an hour; and

(b) any wall between such garage and such house has fire resistance of not less than half an hour; and

(c) any opening in such wall is—

(i) at its lowest point, not less than 100 mm above the level of the garage floor; and

(ii) fitted with a door, shutter or cover which has fire resistance of not less than half an hour and complies with the requirements of regulation E11.

Small open carports

E19.—(1) Any open carport (as defined in regulation E1(1)) which has a floor area not exceeding 40 m² and complies with the conditions of this regulation shall not be required to comply with any regulation in this Part except regulation E17.

(2) The conditions of this regulation are as follows—

(a) that such carport is a detached building; or

(b) that such carport is part of a detached building which consists additionally only of a garage which also has a floor area not exceeding 40 m² and would, if it were a separate building, comply with the provisions of regulation E18; or

(c) that such carport is a single storey part of a building which consists additionally only either of a house alone or of a house and garage (the garage having a floor area not exceeding 40 m²) and that, if the presence of the carport were disregarded—

(i) the house, where there is no garage, would comply with the requirements of regulation E7; or

(ii) the house and garage, if they would then constitute one building, would comply with the requirements of regulation E7; or

(iii) the house and the garage, if they would then constitute separate buildings, would comply with the requirements of regulations E7 and E18 respectively;

Provided that, where this regulation applies by virtue of the erection of an open carport as an extension to an existing house or garage or both, the conditions in sub-paragraphs (b) and (c) shall be applicable as though any reference therein to compliance with regulations E7 and E18, or either of them, were omitted.

Purpose group of small garages and open carports

E20. Notwithstanding the provisions of regulation E2, for the purposes of every relevant provision of this Part a detached building which consists only of a garage or of an open carport or of both, where the garage or the open carport or (as the case may be) each of them has a floor area not exceeding 40 m², shall be regarded as falling within purpose group 1 as set out in the Table to regulation E2.
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