



London District Surveyors Association

Fire Safety Guide

No 1

Fire Safety in Section 20 Buildings

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Foreword

Section 20 of the London Building Acts (Amendment) Act 1939 (as amended primarily by the Building (Inner London) Regulations 1985) is principally concerned with the danger arising from fire within certain classes of buildings which by reason of height, cubical extent and/or use necessitate special consideration. The types of buildings coming within these categories are defined under Section 20 of the amended 1939 Act which (together with other appropriate sections of this and other Acts) is reproduced in 1.02 of this guide for the assistance of applicants.

The effect of the amendments to Section 20 was to harmonise it with the requirements of the Building Regulations 1985.

As buildings vary so much in height, cubic capacity, layout, siting, use and construction the relevant Council will deal with each case on its merits. Basically the principles incorporated in this Guide seek to provide not only such fire-fighting facilities as would enable the fire brigade to tackle the seat of a fire with the utmost speed, but also to provide early warning of fire, contain an outbreak of fire and to prevent its rapid spread throughout a building prior to the arrival of the fire brigade. Additionally the principles seek, in certain buildings (or parts of buildings) to ensure the safety of the structure against fire.

This Guide has been prepared in order to assist applicants in detailing proposals for consideration by the relevant local authority under Section 20 and it contains general information as to the conditions which may be imposed by a Council when approving any such proposals. Applicants are therefore advised to consult the relevant Council's officers at the earliest stages of design so that a clear indication of the conditions most likely to be imposed may be taken into account before detailed drawings are prepared for submission to the relevant Council for approval.

It should also be pointed out that the copyright of the former Greater London Council Code of Practice for Section 20 buildings, on which this document is based, rests with the London Residuary Body.

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London District Surveyors Association

Fire Safety Guide No 1

Fire Safety in Section 20 Buildings

London Building Acts (Amendment) Act 1939 – Section 20

**Guide for buildings of Excess Height and/or Additional Cubical
Extent requiring approval under Section 20 of the London Building
Acts (Amendment) Act 1939.**

Note

This Guide is applicable only to buildings erected, altered and/or extended within the inner London area, i.e., the area administered by the former London County Council.

This must not be taken as a statutory document. It is intended to be a general guide.

London District Surveyor's Association.

Part 1

General

1.01 Submission of Applications

- 1** One of the effects of the amendments to Section 20 is that applicants should be able to obtain consent to their proposals within the same timeframe as that of their application under the Building Regulations.

- a** To meet this objective, the following procedures should be followed:

- b** A letter of application should be submitted to the appropriate Council and the following information should be given:

- 2 Particulars needed**

- a** Particulars of the occupation with details of the trades, processes or use of the various parts of the building and of any other buildings within the curtilage of the site. If the building, or part thereof, is for speculative letting, this should be stated, together with all possible information as to the future use.

- b** The systems of heating and ventilation proposed, including the type of fuel for heating purposes.

- c** Details of the voltage, capacity and type of transforming plant and switch gear.

- 3 Drawings needed**

- a** Applications should be accompanied by complete plans, sections and elevations (in duplicate) drawn to a scale of 1:100 (or in the case of very large buildings the drawings may be to a scale of 1:200, provided they clearly indicate the proposals). The Council may require larger scale detail plans of certain parts to be submitted for approval.

- b** The drawings should show by figured dimensions:

- i** the heights of the various parts of the building and the level of the footway (if any) immediately in front of the centre of each face. Where there is no footway, the level of the ground before excavation should be indicated;

- ii** the superficial area of each floor in the building;

- iii** in a building of the warehouse class or building or part of a building used for the purposes of trade or manufacture: the cubical extent of the building as a whole; and the cubical extent of each floor and portion of the building so used.

- 4** A site plan (in duplicate) drawn to a suitable scale should be submitted showing the surrounding buildings and streets and all means of access to the site.

- 5** In cases where applications are also necessary under other legislation the Council's officers should be consulted.

1.02 Controlling Acts

- 1 The following extracts from the London Building Acts (Amendment) Act 1939 as amended by The Building (Inner London) Regulations 1985 together with extracts from and references to the London Building Act 1930, are given for guidance.

2 Section 20. Precautions against fire in certain buildings and cubical extent of buildings

This section applies where –

- a a building is to be erected with a storey or part of a storey at a greater height than – (i) 30 metres; or (ii) 25 metres if the area of the building exceeds 930 square metres;
 - b a building of the warehouse class, or a building or part of a building used for the purposes of trade or manufacture, exceeds 7,100 cubic metres in extent unless it is divided by division walls in such a manner that no division of the building is of a cubical extent exceeding 7,100 cubic metres.
- 3 A wall is a division wall for the purposes of subsection (2) of this section if –
 - a it extends from its foundations to form a complete separation in one vertical plane between the divisions of the building or the parts of the building; and
 - b it has a fire resistance of not less than four hours; and
 - c any openings in the wall comply with the requirements of subsections (4A) and (4B) of section 21 of the Act; and
 - d where the difference in height of any roofs which adjoin the wall is less than 375 millimetres either – (i) the wall extends to a height above the roof of the highest building or part of the building which adjoins the wall of not less than 375 millimetres measured at right angles to the upper surface of that roof; or (ii) any part of the roof within 1.5 metres of the wall is constructed so that – (1) it is designated for purposes of resisting fire penetration and spread not less than the standard AA in British Standard 476: Part 3: 1958 published by the British Standards Institution; (2) its deck is of solid or hollow slab construction of non combustible materials not less than 100 millimetres in thickness; and (3) the junction between it and the wall is fire-stopped by means of a seal of non combustible materials provided to close any imperfection of fit so as to restrict penetration of smoke and flame.
 - 4 Subject to sub-section (5) of this section, the Council after consulting the fire authority may impose conditions for the provision and maintenance of –
 - (a) fire alarms; (b) automatic fire detection systems; (c) fire extinguishing appliances and installations; (d) effective means of removing smoke in case of fire; (e) adequate means of access to the interior, exterior and site of the building for fire brigade personnel and appliances.
 - 5 Paragraphs (a) to (c) of subsection (4) of this section shall not apply to any building to which this section applies in respect of which a fire certificate issued by the Health and Safety Executive is for the time being required under the Health and Safety at Work etc. Act 1974.
 - 6 The Council after consulting the fire authority may impose additional conditions in respect of any special fire risk area for – (a) restricting the use of any such area in the building; (b) the provision and maintenance of proper arrangements for lessening so far as is reasonably practicable danger from fire in the building.

- 7** For the purposes of subsection (6) of this section a 'special fire risk area' includes an area — (a) where any of the following apparatus is installed — (i) a heat producing appliance designed to produce in excess of 220 kilowatts of heat; or (ii) a fixed internal combustion engine (including a gas turbine engine) designed to produce in excess of 44 kilowatts of power; or (iii) electrical oil-cooled transformers or oil-filled switchgear each with an oil capacity in excess of 250 litres operating at a supply voltage in excess of 1,000 volts; (b) where any flammable or combustible solid, liquid or gaseous substances are manufactured, treated, handled or stored in quantities likely to constitute a fire hazard including — (i) fuel oil, diesel oil or petroleum spirit; (ii) nitrate film or celluloid; (c) where a cellulose or other flammable liquid spraying room is located; or (d) where any storey of a garage, vehicle park, loading bay or loading dock is located — (i) in a basement; or (ii) at ground level or above and is not adequately ventilated. For the purposes of this paragraph, a 'basement' means a storey of which the floor is at any point more than 1.2 metres below the finished surface of the ground adjacent to it.
- 8** For the purposes of subsection (7d) of this section, a storey is 'adequately ventilated' if and only if — (a) it contains openings or ducts in its external enclosures which afford permanent ventilation from the external air; and (b) the openings or ducts are arranged on opposing faces so as to provide adequate cross ventilation to all parts; and (c) the unobstructed area of the openings or ducts is in total not less than five per cent of the floor area of that storey of the garage, vehicle park, loading bay or loading dock.
- 9** The owner or occupier of a building to which this section applies shall, before or at the same time as any notice is given or plans are deposited in respect of the building, deposit at the principal office of the Council two copies of plans of the building in accordance with regulations made by the Council.
- 10** The Council shall impose any conditions which it may impose under this section within five weeks from the date on which plans are deposited in respect of the building in accordance with this section or within such extended period as may before the expiration of the five weeks be agreed in writing between the person who deposited the plans and the Council.
- 11** The provisions of this section shall not apply to any building which being at a greater distance than two miles from Saint Paul's Cathedral is used solely for the manufacture of the machinery and boilers of steam vessels or for a retort house and which consists of one floor only and is constructed throughout of brick, stone, iron or other incombustible materials.

12 Section 21. Uniting of buildings

(1) Buildings shall be deemed to be united when any opening is made in the party wall or the external walls separating the buildings or when the buildings are so connected that there is access from one building to the other without passing into the external air and a building shall be deemed to be united with an underground railway station when the building and the underground railway station are so connected that there is access from the building to the underground railway station without passing into the external air.

- 13** Buildings shall not without the consent of the Council be united unless they are wholly in one occupation and when so united and considered as one building would be in conformity with the London Building Acts.
- 14** A building (not being part of a railway station) shall not without the consent of the Council be united with an underground railway station unless the building to be united is solely in the occupation of the railway company to whom the underground railway station belongs and the means of access between the building and the station is afforded by a doorway in the building opening into a passage or subway used solely as an approach to or exit from the underground railway station and a lobby inside the building leading from the doorway and unless -
- a** the floor jambs and head of the doorway and the floor ceiling and enclosures of the lobby are constructed of incombustible materials not less than three inches in thickness;
 - b** the full extent of the opening of the doorway and the entrance to the lobby inside the building are each fitted with self-closing doors possessing such a degree of resistance to the action of fire as the Council may determine;
 - c** the doors open inwards towards the building and with the doorways and lobby are so constructed fitted and maintained so as to form when closed a watertight separation between the building and the said passage or subway.
- 15** Subject to the following provisions of this section where an opening is to be made in -
- a** any division wall; or
 - b** any party wall; or
 - c** two external walls,
- separating divisions of a building of the warehouse class or a building used for the purposes of trade or manufacture or separating such buildings and such divisions or buildings (as the case may be) if taken together would extend to more than 7100 cubic metres, the Council may impose conditions under section 20 of this Act.
- 16** Subsection of (15) of this section shall not apply if:
- a** the width of any opening in any wall of a storey (or if there is more than one opening in any such wall, the width of all such openings taken together) does not exceed one-half of the length of the wall, and
 - b** each opening is closed by two steel plate doors, metal covered doors or steel rolling shutters, one on each side of the wall, and
 - c** those doors or shutters are -
 - i** constructed in accordance with specifications 1 or 2 or 3 or 4, and
 - ii** installed in accordance with the general installation requirements of the Rules for the Construction and Installation of Firebreak Doors and Shutters of the Fire Offices' Committee dated February 1985.
- 17** Whenever it is proposed in respect of any buildings which were united when they were in one occupation that they shall be in more than one occupation the owner thereof or if the buildings are the property of different owners then each of the owners shall thereupon give notice of the intended change of occupation to the district surveyor and unless the Council consent to the retention of the openings

by which the buildings are united shall before the buildings are occupied by more than one occupier cause all such openings to be stopped up with brick or stone work not less in thickness than thirteen inches or (when the wall is of a less thickness than thirteen inches) than the thickness of the wall and properly bonded or otherwise united with the wall and shall cause to be removed any timber placed in the wall in connection with such openings and not in conformity with the London Building Acts or the Building Regulations 1985.

- 18** Notwithstanding the existence in any party wall or two external walls or in any division wall of an opening uniting buildings or affording communication between divisions of a building (as the case may be) the provisions of this section shall extend and apply to --

- a** all openings at any time after the thirty-first day of July nineteen hundred and eight made or proposed to be made in any such wall or walls; and
- b** to such buildings as if they had not been previously united.

19 Section 144. Power to annex conditions to consents etc

a The attention of applicants is invited to the provisions of this Section which states (inter alia):

i In any case where the Council have power in virtue of the London Building Acts to grant their consent to the doing or omission of any act or thing the Council may give their consent subject to such terms and conditions in relation to the subject matter of such consent as the Council think fit and any such terms and conditions and any conditions imposed under section 20 of this Act may include conditions applying to any building or structure or land other than that in respect of which the consent is given or the conditions imposed.

ii Any term or condition subject to which any consent to the doing or omission of any act or thing is given in virtue of the London Building Acts shall when accepted and any conditions imposed under section 20 of this Act shall in any event be binding on the owner and occupier of the building or structure or land to which the term or condition applies and if at any time any such term or condition is not observed or fulfilled the owner or occupier in default shall be liable to a fine as provided by those Acts.

20 Publications referred to in this document

BS 476 Fire tests on building materials and structures

Part 8 Test methods and criteria for the fire resistance of elements of building construction

Part 20 Method for determination of the fire resistance of elements of construction (general principles)

Part 21 Methods for determination of the fire resistance of loadbearing elements of construction

Part 22 Methods for determination of fire resistance of non-loadbearing elements of construction

Part 23 Methods for determination of the contribution of components to the fire resistance of a structure

Part 24 Method for determination of the fire resistance of ventilation ducts.

BS 799 Oil burning equipment Part 5 Oil storage tanks.

BS 5041 Specification. Fire hydrant systems equipment Part 1 Landing valves for wet risers.

BS 5274 Specification for fire hose reels (water) for fixed installations.

BS 5306 Fire extinguishing installations and equipment on premises
Part 1 Code of practice for hydrant systems, hose reels and foam inlets
Part 2 Code of practice for sprinkler systems.

BS 5345 Code of practice for selection installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture).

BS 5410 Code of practice for oil firing
Part 2 Installations of 44kW and above output capacity for space heating, hot water and steam supply purposes.

BS 5588 Fire precautions in the design and construction of buildings
Part 5 Code of practice for fire fighting stairways and lifts.

BS 5839 Fire detection and alarm systems in buildings
Part 1 Code of practice for installation and servicing.

BS 6207 Specification for mineral-insulated cables
Part 1 Copper-sheathed cables with copper conductors.

BS 6387 Specification for performance requirements for cables required to maintain circuit integrity under fire conditions.

BS 6644 Specification for installation of gas fired hot water boilers of rated inputs between 60kW and 2MW (2nd and 3rd family gases).

London District Surveyors Association Fire Safety Guides
No.2 Fire safety in atrium buildings
No.3 Phased evacuation from office buildings.

1.03 Part 1 Definitions

- 1 The definitions contained in **B2/3/4** apply, except as outlined below.
- 2 '**B2/3/4**' means **B2/3/4** of Schedule 1 of The Building Regulations 1985.
- 3 '**Budget lock**' means a lock operated by a carriage type key inserted into a square socket and complying with the following:
 - a the budget lock should be at a height of approximately 1.5m above floor level and so positioned that there is no obstruction to prevent the key being inserted into the socket and turned to release the locking mechanism;
 - b the budget lock should be surrounded by a prominently raised escutcheon plate which can be readily located by touch in smoke logging conditions and the plate should have preferably a tapered centre hole leading to the socket of the lock to aid the location of the key OR the budget lock should be incorporated in the centre of a raised knob or turn handle of standard design provided with a tapered locating hole leading to the socket of the lock for the key; and
 - c the socket of each budget lock should be 8 mm square and not less than 25 mm in depth.
 - d the budget lock should be of hardened steel.

- 4 **'Council'** means the appropriate London Borough Council or the Court of Common Council of the City of London.
- 5 **'Fire brigade access level'** means a level at which there is suitable entry to the building and to a fire fighting shaft from an area to which fire brigade appliances have access.
- 6 **'Self-closing'** means that the door should be fitted with an automatic self-closing device which is capable of closing the door from any angle and against any latch fitted to the door.
- 7 **'Small car park'** means a car park not exceeding 500 m² in area.
- 8 **'Standard of fire resistance'**. Where an element of structure door or form of construction is specified as having a 30 minute, 60 minute, 120 minute or 1, 2 or 4 hour period of fire resistance they are determined by reference to the methods specified in BS 476: Parts 8, 20, 21, 22 or 23.
- 9 **'Steel rolling shutter'** means a shutter constructed in accordance with specification 3 and installed in accordance with the general installation requirements of the Construction and Installation of Firebreak Doors and Shutters of the Fire Offices' Committee dated February 1985 but including the provision to each shutter of an automatic closing arrangement actuated by a fusible link set to operate at a temperature not exceeding 74° Celsius.
- 10 The **measurement of the height of any such storey** or part of a storey as is mentioned in this section shall be taken at the centre of that face of the building where the measurement is greatest from the level of the footway immediately in front of that face or where there is no such footway from the level of the ground before excavation to the level of the highest part of the interior of the storey.
- 11 **Area** in relation to a building means the superficies of a horizontal section thereof made at the point of its greatest surface inclusive of the external walls and of such portions of the party walls as belong to the building. (See London Building Act 1930, Section 5.)
- 12 **Building of the warehouse class** means a warehouse manufactory brewery or distillery or any other building exceeding in cubical extent one hundred and fifty thousand cubic feet (4247.530 m³) which is neither a public building nor a domestic building. (See London Building Act 1930, Section 5.)
- 13 **Cubical extent** in relation to the measurement of a building means the space contained within the external surfaces of its walls and roof and the upper surface of the floor of its lowest storey but excluding any space within any enclosure on the roof of the building used exclusively for accommodating a water tank or lift gear or any like apparatus:

Provided that where a building on one or more of its sides is not enclosed by a wall or walls the building where unenclosed shall be deemed to be enclosed by walls with the external surface thereof in a vertical plane extending downwards from the outer edge of the roof. (See London Building Acts (amendment) Act 1939; section 4).

Part 2

Recommendations For All Buildings

2.01 Fire alarms

A fire alarm system complying with the current edition of BS 5839 should be provided throughout every building except buildings comprising flats and/or maisonettes.

Notes

- i In some instances, it may be necessary for such fire alarm installation to be automatic (viz. actuated by smoke and/or heat detectors in addition to the normal call points) where the use of the building (or part) warrants it (e.g., in hotels).*
- ii In office buildings where the means of escape is based on phased evacuation a number of additional features (such as a public address system) will be necessary (See LDSA Fire Safety Guide No. 3 Phased evacuation from office buildings.)*

2.02 Fire extinguishing appliances and installations

1 Details and particulars to be submitted

a Before work is commenced plans and particulars should be submitted to the Council for approval showing details of all fire extinguishing installations and, where applicable, of the proposed water supplies.

b Fire extinguishing appliances and installations

Fire extinguishing appliances and installations should be provided within the building, and in any building within the same curtilage and ownership where the latter present a risk to the building (e.g., by their proximity to it). The type of appliances and installation which the Council may require should be provided as follows:-

2.03 External private fire hydrants

- 1** External private hydrants should be provided where a rising main serving a building is more than 40m from a statutory street hydrant.

2.04 Dry rising mains

Dry rising mains should be provided in accordance with BS 5306: Part 1 in the following positions:-

- a** In the lobbies of the fire-fighting shafts.
- b** In the case of blocks of flats or maisonettes within the corridor or lobby adjacent to the fire-fighting shafts.
- c** In such other positions as may be necessary for fire-fighting purposes.

Note

Dry rising mains should be installed progressively storey by storey after the building reaches a height where any storey is greater than 18m above the adjacent street level.

2.05 Wet rising mains

Where any storey exceeds 60m in height wet rising mains in accordance with BS 5041: Part 1 and BS 5306: Part 1 should be provided. Such wet rising mains should be independent of any other water supplies and should be in place of the dry rising mains referred to in 2.04.

Note

Wet rising mains should be installed progressively as dry rising mains until the building reaches a height of 60m and thereafter as wet rising mains unless other arrangements to give fire-fighting facilities during the progress of works are agreed with the Council.

2.06 Dry falling mains

- 1 Dry falling mains should be installed in accordance with the principles of BS 5306 Part 1 (Dry rising mains). Separate dry falling mains should generally be provided in the lobbies of the fire-fighting shafts or in other approved positions in a building having a depth of 9m below fire brigade access level. They should be installed progressively storey by storey. The inlets should be in a position at fire brigade access level satisfactory to the Council.

2.07 Automatic sprinkler installations

- 1 An automatic sprinkler installation in accordance with BS 5306: Part 2 should be provided throughout all buildings.

Consideration will be given to –

- a Installations in accordance with other recognised specifications
- b The provision of a suitable automatic extinguishing installation in lieu of sprinklers in a building or parts of a building where the use of water might entail a risk.
- c The omission of sprinkler installations in:-
 - i flats and/or maisonettes; and
 - ii open-sided vehicle parks which are provided with openings in the external enclosures affording permanent ventilation to each storey from the external air to an extent not less than 5% in free area of the floor area of the vehicle park so arranged on opposing faces as to provide adequate cross ventilation to all parts;
are so designed that no car parking space is more than 30m from a source of the ventilation referred to above;
are so positioned next to streets or upon a site as to permit easy access for fire brigade appliances to a sufficient part of its perimeter to enable fire within any part of the structure to be attacked from the exterior;
have any petrol service facilities external to the main structure with a satisfactory standard of separation.

Note

Regarding sprinkler installations generally:

- i *Where the space above an imperforate false ceiling irrespective of its depth, is sealed completely and does not contain any combustible materials, sprinkler heads need only be provided on the underside of the false ceiling. In other cases not conforming with these conditions, sprinkler heads would be*

required both above and below the false ceiling unless the Council otherwise decides after consideration of submitted details of the false ceiling, the equipment and services located in the void space above the false ceiling and any use to which the void space is put.

ii In cases where it appears that any alteration to the building, erection of partitioning, etc., may impair the efficient operation of the sprinkler installation, a condition will be imposed requiring any necessary alteration to the sprinkler installation to be carried out to the satisfaction of the Council.

iii Where a plenum extract system in a false ceiling void is designed to extract smoke and hot gases (in lieu of natural smoke ventilation via openable windows) sprinklers will not be required within the ceiling void. The ceiling void should be surrounded by non combustible construction and contain no combustible material.

2.08 Automatic fire extinguishing installations (other than sprinklers)

- 1** Areas not covered by sprinklers should be provided with a suitable alternative fixed automatic fire extinguishing system in accordance with the relevant part of BS 5306.
- 2** In certain instances where adequate separation, ventilation and fire brigade access is provided, consideration will be given to the omission of any extinguishing installation in certain areas. Such areas include:-
 - a** Oil fuelled heating chambers.
 - b** Oil storage chambers.
 - c** Transformer chambers or high voltage switchrooms.
 - d** Telecommunications frame rooms.

2.09 Hose reels and hand fire appliances

Hose reels in accordance with BS 5306: Part 1 and BS 5274 connected to a suitable water supply and suitable hand fire appliances of approved type, pattern and capacity, should be provided in all buildings.

Note

Consideration will normally be given to the omission of hose reels and hand fire appliances in flats and/or maisonettes.

2.10 Smoke control systems

- 1** Smoke extraction should be provided from each storey by openable windows or by a mechanical smoke extract system.

Note

A more complex smoke control system may be required in some buildings for means of escape purposes.

- 2** If ventilation is to be provided by openable windows these should be equivalent to 2½% of the total floor area and be well distributed at high level so as to provide cross ventilation. No openable windows should be locked shut without an

approval to the locking arrangements being first obtained. Where it is required that windows be kept locked closed the locking arrangements should normally be by a budget type lock to the satisfaction of the Council. (See also 1.03.)

- 3** A mechanical smoke extract system should be designed to achieve either 6 air changes/hour; or a clear space of 1.75m above floor level to the base of the smoke layer.(For the purposes of achieving this design requirement a fire size of 9m² area with a heat output of 1.5MW should be assumed.) Where the means of escape in case of fire is based on a single stage evacuation the heat output of the fire should be assumed to be 1MW.*

* Where a heat output is specified for a design fire size in this document an allowance has been made for heat loss to the structure and to the sprinkler spray.

a The fans should be located in an area enclosed by construction having a one hour standard of fire resistance.

b The following should be provided and the operation of any one should cause the smoke control system to operate:-

- i** sprinkler flow switches;
- ii** fire brigade override switch; and
- iii** smoke detectors in the return air duct or ducts at each storey level.

The system should be capable of extracting smoke for a period of at least one hour.

c The necessary extract plant should be provided in not less than two equal parts sited remote from each other such that a fault or failure in one will not jeopardise the other.

Note

The detectors referred to above should also be linked into the fire control centre. Provision should be made to ensure that any regular testing of the fire alarm installation does not jeopardise the reliability of the smoke control plant.

d The fans should be capable of extracting smoke at a temperature of 300°C for one hour irrespective of any design smoke temperature.

e The fans and associated smoke control equipment should be wired in protected circuits designed to ensure continued operation in the event of fire and should -

- i** consist of mineral-insulated, metal-sheathed cables complying with the requirements of BS 6207: Part 1, or other heat resisting cables; or be cables complying with BS 6387 'British Standard specification for cables required to maintain circuit integrity under fire conditions (The cables should be of the category appropriate to the particular installation.);
- ii** be separate from any other circuit provided for other purposes.

f The electrical supply to the fans should, in each case, be connected to a sub-main circuit exclusive thereto after the main isolator of the building.

g A secondary source of electrical power (a generator or other suitable source of power) should be provided to ensure that the smoke control system can operate for a period of not less than one hour in the event of failure of the normal electrical supply.

h Replacement air should be provided as necessary to ensure that the design objectives can be achieved.

i The discharge points for the smoke extract system should be located such that they will not cause smoke to be recirculated into the building or to spread to adjoining buildings.

Note

If the building is to incorporate an atrium a separate smoke control system should be provided in accordance with The London District Surveyors Association Fire Safety Guide No. 2 Fire Safety in Atrium Buildings.

- 4 All areas below ground level should be vented either naturally by pavement lights or stall board lights, of a type satisfactory to the Council, equivalent in area to 2½% of the total area of the floor or by a mechanical extract system to be agreed on the merits of the individual case.

Note

Favourable consideration will normally be given to mechanical smoke extract systems providing six air changes/hour in office accommodation below ground level. High fire risk areas, such as storage, would need to be subject to special consideration.

- 5 Oil filled transformers and other special fire risk areas should, except where otherwise specified, be independently vented by natural venting equivalent to 5% of the area of the room.

2.11 Smoke control systems – Retail premises

- 1 Smoke extraction should be provided from each floor by either openable windows or by a mechanical extract system.
- 2 If ventilation is to be provided by openable windows these should be as specified in 2.10(2).
- 3 A mechanical smoke extract system should be designed to keep a clear space of at least 1.75m above floor level to the base of the smoke layer.
For the purpose of achieving this design requirement a fire size of 9m² should be assumed with a heat output of 5MW.
- 4 The system should otherwise be as specified in 2.10(3) above.

Note

If a retail store is to incorporate an atrium it should include a smoke control system in accordance with the London District Surveyor's Association Fire Safety Guide on Fire Safety in Atrium Buildings.

- 5 All areas below ground level including all areas of special fire risk and ancillary areas should be vented in accordance with 2.10(4) and 2.10(5) except that where appropriate the design fire size should be in accordance with 2.11(3). In the case of stockrooms special consideration will be needed where a mechanical system is to be used.
- 6 In the case of enclosed shopping complexes the smoke control system should be as specified in B2/3/4.

Note

Guidance on smoke control methods in enclosed shopping complexes is given in a Building Research Establishment report. (See Smoke control methods in enclosed shopping complexes of one or more storeys. A design summary HMSO 1979.)

2.12 Smoke control systems in car parks and loading bays

- 1 Smoke extraction should be provided by natural ventilation or by a *mechanical* smoke extract system.
- 2 If ventilation is to be provided by natural means this should be by an area of vent equivalent to 2½% of each floor area uniformly distributed to provide cross-ventilation. In the case of small car parks the ventilation may be provided at least in part by the entry ramp provided that it is direct to open air or by a combination of natural venting including the ramp supported by some additional mechanical extraction (viz. a system providing at least ten air changes per hour.)

Note

Where loading bays are entered direct from the external air no additional ventilation will normally be required. If the car park or loading bay is below ground level the ventilation should be by pavement lights or stall board lights.

- 3 A mechanical smoke extract system should be designed to achieve either
 - a 10 air changes/hour uniformly distributed across the car park (provided that if the floor area is less than 4000m² the vehicle park must be approached directly from outside the building e.g. via a ramp or suitably vented service road.)

Note

If the car park is less than 4000m² in area and is not directly approached from outside the building a higher extract rate may be required; or

- b a clear space of 1.75m high below the base of the smoke layer. For the purposes of achieving this design requirement a fire size of 5m x 1.75m with a heat output of 1.5MW should be assumed.

The system should otherwise be as specified in 2.10.

2.13 Smoke control systems in factories or warehouse buildings

- 1 Smoke extraction should normally be provided from each floor by natural means with a vent area equivalent to 2½% of the floor area or in the case of a special fire risk area by a vent area equivalent to 5% of the floor area. This can be provided by openable windows or where appropriate by automatic roof vents. The latter should be capable of being actuated by fusible links at a temperature of 74°C and by a fire brigade override control near ground level within a separated area of low fire risk. If venting is to be provided by openable windows they should be as specified in 2.10(2).
- 2 Where it is not practical to provide venting by natural means consideration will be given to a mechanical system of extraction. The design of a mechanical system would be dependent on the type of risk and the size of fire which could occur. Each case will need to be assessed on its individual merits.

2.14 Fire brigade access to the exterior of the building

- 1 The building should abut upon a street or streets or upon open spaces of sufficient width and extent to give satisfactory access and working space for fire brigade appliances.

- 2** Open spaces or access strips likely to be used for fire appliances should be constructed and paved so as safely to support the heaviest type of appliance. Details of the loading and distribution will be supplied when approval is granted.

For full details of these requirements reference should be made to the current information sheet FP Gen 20 obtainable from the local Fire Prevention offices of the London Fire and Civil Defence Authority.

2.15 Fire brigade access to the interior of the building

1 Fire fighting shafts – provision and siting

a In buildings controlled by virtue of their height, fire fighting shafts equipped with fire fighting stairways, dry (or wet) rising mains and fire fighting lifts, should be provided to serve every storey.

b In buildings controlled by virtue of their cubical extent, fire fighting shafts equipped with fire fighting stairways, should be provided where the building has more than one storey and is over 7.5m in height. Fire fighting shafts equipped with fire fighting stairways, dry (or wet) rising mains and fire fighting lifts should be provided in such buildings where they exceed 18m in height.

c In buildings where there is a storey more than 9m below fire brigade access level, fire fighting shafts equipped with fire fighting stairways, dry falling mains and lifts should be provided to serve every storey from fire brigade access level downwards.

- 2** The number and siting of shafts should be as follows:-

- a** one for a building with a floor area less than 900 sq m;
- b** two for a building with a floor area between 900 and 2000 sq m
- c** three for a building with a floor area between 2001 and 3500 sq m; and
- d** one for every 1500 sqm of floor area or part thereof in buildings with a larger floor area.

Notes

i The fire fighting shafts should be located so that every part of every storey other than fire brigade access level is no more than 60m from the entrance to a fire fighting shaft measured along the route a hose would be laid or if the internal layout is unknown at the design stage so that every part of every storey is no more than 40m in a direct line from the entrance to a fire fighting shaft.

ii In the case of buildings controlled by virtue of their height, the areas referred to in (a)-(d) should be taken as those that occur in the first storey over 25m in height.

3 Fire fighting shafts – general arrangements

a Fire fighting shafts should be designed in accordance with the recommendations of BS 5588: Part 5 except that, notwithstanding Clause 8.6 of the BS a separate vent shaft for the stairway in internally – sited fire fighting shafts need not be provided in sprinklered buildings.

Note

*Fire fighting shafts in blocks of flats and/or maisonettes should be provided in accordance with the recommendations of BS 5588: Part 1.**

**In preparation.*

2.16 Fire control centres

- 1 The fire brigade when responding to an emergency in a building should have the indicator panels and associated manual controls for the building's fire protection systems located together in one place designated as the fire control centre.

This will enable the operational status of the fire protection systems to be readily visible and allows any necessary manual operation of an installation to be carried out without undue delay.

All office buildings, enclosed shopping complexes, retail stores, hotels and hospitals should be provided with a Fire Control Centre.

Fire control centres may be considered necessary in other buildings such as storage buildings dependent upon their size, complexity and use.

- 2 Subject to the equipment required to be contained therein, a fire control centre may be located in
 - i a suitably protected area,
 - ii a room dedicated solely as a fire control centre,
 - iii or combined with a management/security centre within the building.

Note

Any console layout within a combined fire/security centre should clearly differentiate between fire and security systems.

- 3 A fire control centre should, unless the Council otherwise consent:-
 - a be manned, by a competent person, familiar with the use and operation of the equipment contained therein, whilst the building is occupied;
 - b be located in a room or area of low fire risk separated from other areas to the same standard of fire resistance as the elements of structure of the area in which it is situated;
 - c should be adjacent to a fire brigade access point preferably the main entrance to the building and accessible direct from open air; and
 - d in addition to the normal lighting, be provided with a 3 hour non-maintained system of lighting supplied from a source entirely independent of the normal lighting to enable the fire control centre to be observed and operated satisfactorily in the absence of the normal lighting supply.
- 4 A fire control centre should contain some or all of the following as appropriate:-
 - a indicator panels showing the status of all automatic fire protection installations and/or facilities including the main fire alarm panel;
 - b manual override switches associated with such installations and/or facilities (other than those which are required to be located either adjacent to their equipment or elsewhere e.g., overrides for gaseous fire extinguishing systems or sprinkler system main or floor isolating valves);
 - c manual overrides for any large air conditioning system or those involving recirculation;
 - d communication facilities providing a direct link between the centre and all fire fighting lobbies;
 - e dedicated telephone with direct dialling for external calls;

f a public address system communicating with all parts of the building, installed and wired in accordance with BS 5839: Part 1. (The system should be audible throughout the building and be capable of communicating with all parts of the building simultaneously or with individual locations only (e.g., individual floors). The system should be so arranged that the loss of equipment on any floor does not prevent communication with all other floors);

g detailed instructions of the building's fire evacuation plan;

h floor plans of the building indicating all fire fighting equipment and installations;

i at least two keys to the locks on windows locked by means of budget locks provided in a suitably labelled glass-fronted box (see 1.03(3));

j telephone numbers of principal building staff/engineers e.g., lift engineer, electrician, plumber, security etc.; and

k such other facilities as directed by the Council.

2.17 Display of plans etc

1 In all cases of buildings constructed with basement storeys the Council will require a suitable plan(s) of such underground storey(s) to be hung in an approved position in the ground storey, such plan(s) to indicate thereon the location of essential controls (e.g., gas, electricity and water) so as to assist in the direction of fire fighting in the event of fire in the basement storey(s).

2 Similar plans may be required at other floor levels where considered necessary to assist fire fighting operations. In particular, where openable windows are locked by means of budget locks the position of such windows should be indicated:-

i upon a floor plan which should be displayed and maintained in an approved position within a staircase or within the lobby of a fire fighting lobby approach staircase, or

ii where the openable windows are uniformly sited (and this should always be the case wherever possible) by a permanent notice in the fire lift or other approved position.

The plan referred to in (i) or the notice referred to in (ii) should specify the method of identifying the openable windows and the type of release mechanism provided.

Note

Guidance on the provision and display of building plans is contained in the current information sheet FP Gen 24 available from the local Fire Prevention offices of the London Fire and Civil Defence Authority.

Part 3

Special Fire Risk Areas

3.01 Heat producing appliances producing in excess of 220 kilowatts of heat

1 Oil fuel boiler chambers

a Where provided externally as a detached building and within 6m of the main building, the chamber should be enclosed by walls and a roof of non combustible construction having a standard of fire resistance of not less than four hours. Any openings within the external walls should be fitted with self-closing, 30 minute doors. Any door and vent openings should be positioned so as to present the least risk possible to the main building.

b All boiler chambers, whether in or adjoining the main building, should be enclosed by walls and a roof of non combustible construction having a standard of fire resistance of not less than four hours. Any openings in the walls giving access to the building should be protected by a single self-closing, 120 minute door. Where in a multiple staircase building, access from the remainder of the building to the boiler room is permitted from a staircase or from part of the building used by the public, such access would need to be provided through a ventilated lobby having a two hour standard of fire resistance with the access openings to the lobby each fitted with a self-closing, 60 minute door. The amount of natural ventilation, direct to the outer air, should be not less than 0.9 m².

c Other openings (i.e., those not giving access to the building) should be protected by self-closing, 30 minute doors.

d Where, in accordance with the above, openings are permitted in the enclosing walls of the boiler chamber, each opening should be provided with a non combustible threshold not less than 75 mm above the general level of the boiler chamber unless other approved means are taken to prevent the spread of oil in the event of a leakage.

e Apart from the boiler plant and such other apparatus as is necessary for its operation, no other equipment should be installed in the boiler chamber.

2 Oil fuel storage

a Where the oil storage is less than 6m from adjacent buildings the following should be complied with:-

the tanks should be contained within a chamber with walls and roof of non combustible construction having not less than a four hour standard of fire resistance. Any access doorways, should each be fitted with a steel self-closing, insulated 120 minute door. All necessary access doors and vent openings should be positioned so as to present the least risk to adjacent buildings.

An alternative, in suitable cases the oil storage tanks may be permitted in the open, provided they are effectively screened from adjacent buildings by imperforate walls having a four hour standard of fire resistance.

b Where oil storage adjoins, or is within a building, it should be enclosed by walls and a roof of non combustible construction having a fire resistance of not less than four hours. Any openings in the walls giving access to the building should be protected by a single self-closing insulated 120 minute door.

Note

Where a boiler chamber is located more than 12m above ground level the main oil storage tank should be sited in accordance with and should conform with 3.01(2a) or 3.01(2b) foregoing. In such cases a service tank not exceeding 910 litres in capacity may be sited adjacent to the boiler chamber provided it is separated therefrom and totally enclosed with non combustible construction having a standard of fire resistance of not less than four hours. In addition, the supply pipe between the main storage chamber and the service tank should be within its own non combustible duct having a similar period of fire resistance.

Where the service tank chamber is entered direct from the boiler chamber, provision should be made for automatic dumping of the oil in accordance with Section 31 of BS 5410: Part 2. For this purpose, a pipe of adequate diameter should be taken by the most direct route from the bottom of the service tank to the storage tank or tanks. A dumping valve, normally closed, should be fitted in this pipe at a point within the service tank chamber and should be arranged to open automatically if the fire valve or the alarm system operates. Applicants should seek early consultation with the Council's officers in such cases.

c In all cases the sill level of access doorways should be raised above the floor level so as to form a catchpit within the chamber having a capacity not less than 10 per cent greater than the total capacity of the tank(s) therein. The walls and floor of the oil fuel storage chamber should be constructed of impervious non combustible materials and ventilation and pipe ducts, etc., should be arranged so as to maintain the catchpit formation and the fire resisting standard of the enclosures.

d Adequate permanent installed lighting fittings of totally enclosed pattern should be provided in the storage tank chamber and only transfer pumps and such other electrical equipment as must necessarily be installed in close proximity to the storage tanks should be within the storage chamber and all such apparatus should be of the totally enclosed type. The controls for any electrical equipment or lighting circuit within the storage tank chamber should be installed outside the tank chamber and any electrical immersion heater fitted in the oil tanks should be thermostatically controlled and should be so arranged as to remain submerged at all times.

The installation should also be in accordance with the relevant provisions of the current editions of BS 5410 'Oil Firing' and BS 799 'Oil-burning Equipment'.

3 Other boiler chambers

These should be separated from the remainder of the building by walls and floors and roof of non combustible construction having a standard of fire resistance not less than that required for the part of the building in which they are situated and any internal opening thereto should be provided with a self-closing 60 minute door.

For gas boilers rated between 60kw and 2Mw, the installations should be in accordance with BS 6644:1986.

4 Ventilation to boiler chambers and oil fuel storage chambers

a Every boiler chamber should be provided with ventilation adequate to ensure a supply of air sufficient for both combustion and general ventilation. Where the boiler chamber is ventilated by natural means and forced or induced draught is not provided, the air necessary for combustion should be afforded by permanent openings, at low level to the outside air, a total free area of not less than 0.2m² being provided for each 300kw of installed boiler capacity. In addition

permanent openings to the outer air having a total free area of not less than 0.1 m² per 300kw of installed boiler capacity should be provided at high level to effect general ventilation and to remove smoke and fumes. If a mechanical system of ventilation is necessary it should be independent of any system serving other parts of the premises.

Notwithstanding the foregoing, if the fuel used is town or natural gas then the required natural ventilation openings for combustion and general ventilation should be 645mm² for every 0.58kw at low level and half that area at high level.

b Oil fuel storage chambers should be ventilated direct to the outer air but only to the extent necessary to avoid stagnation of the air therein.

c Any shafts necessary for ventilating boiler chambers and oil fuel storage chambers should be enclosed and separated from the remainder of the building by non combustible materials having the same standard of fire resistance as the enclosures to the chamber or as required for the remainder of the building whichever is the greater.

5 Generally

a Details of all oil fuel installations and ventilation arrangements to all boiler rooms will be required to be submitted to the Council for approval and no oil fuel or oil in bulk should be used or stored upon premises until approval of the Council has been obtained thereto.

b A fixed automatic fire extinguishing installation may be required in some circumstances, eg. where difficulty of access for fire fighting arises, and a fixed automatic fire extinguishing installation will be required to be provided in all cases where the full requirements for oil fuel boiler chambers and oil fuel storage chambers in 3.01(1) and 3.01(2) cannot be met.

3.02 Fixed internal combustion engines

Fixed internal combustion engines (including a gas turbine engine) designed to produce in excess of 44 kilowatts of power.

- 1** Petrol driven engines, where installed in any part of a building, should be in a room separated from the remainder of the building by non combustible construction having a standard of fire resistance of not less than four hours. Any door therein should be a self closing 120 minute door. The room should be ventilated direct to the outer air.

Note

Additional works may be required by The Chief Officer of the London Fire and Civil Defence Authority under the Petroleum (Consolidation) Act 1928.

- 2** Diesel oil driven engines, where within the building, should be enclosed by walls and a roof, of non combustible construction having a standard of fire resistance of not less than four hours. Any openings in the walls should be protected by a single self-closing 120 minute door.

Note

Oil storage in connection with the foregoing should comply with the requirements for oil fuel storage in 3.01(2).

- 3** Electrical installations should be in accordance with the current edition of the Regulations of the Institution of Electrical Engineers.

3.03 Transformer substations

Transformer sub-stations and switch rooms containing electrical oil cooled transformers or oil filled switch gear with an oil capacity in excess of 250 litres, operating at a supply voltage in excess of 1000 volts.

- 1** Where the transformer sub-station and/or switch room is provided externally as a detached building and is within 6m of the main building or is adjoining the main building, it should be enclosed by walls and a roof of non combustible construction having a standard of fire resistance of not less than four hours. All openings in the external walls or roof should be positioned so as to present the least risk to the main building, i.e. in the external wall furthest removed from the main building.
- 2** Where provided within the building the transformer chamber or switch room should be situated against an outer wall and the walls and floors separating it from the remainder of the building should be of non combustible construction having a standard of fire resistance of not less than four hours.
- 3** Floors and walls should be imperforate except as provided for in the following.
- 4** Proper and easy access for fire fighting, inspection and maintenance should be provided direct from the external air whenever possible.
- 5** In difficult cases, where it is impossible to approach the transformer chamber or switch room from the external air, internal communication may be permitted.
- 6** Where the communication is from a portion of the building not occupied by the public and not being a stairway the doorway should be fitted with a hinged 120 minute door fitting closely into a steel or iron frame and arranged to be kept locked shut by triple action bolts, secured on the outside by a padlock or similar fastenings such as can be easily broken by the fire brigade.
- 7** Where the internal communication is from a portion of the building occupied by the public or from a stairway (other than in a building having only one stairway) the communication should be by means of a lobby naturally ventilated to the outer air to an extent not less than 0.4m², constructed with walls and floors of non combustible construction having not less than a two-hour standard of fire resistance and the doors from the building or stairway into the lobby and from the lobby into the chamber or room should each be self-closing 60 minute doors.
- 8** To prevent a build up of heat, ventilation to the outer air should be provided and maintained and any trunking or ducts for this purpose should be separated from the remainder of the building by construction having not less than a four-hour standard of fire resistance.
- 9** Adequate precautions should be taken to prevent the spread of fire resulting from the leakage or ignition of oil by the provision of a suitable catchpit or other means, as defined in 3.01(2)(c).
- 10** Where it is necessary to provide arrangements for the transfer of plant, an opening not exceeding 6m² in area may be provided if it is fitted with a steel or iron frame continuous around all four sides of the opening with a 75mm rebate into which is fitted a steel panel comprising a 6mm thick steel plate stiffened with

100mm by 6mm steel stiles and rails secured to each face or with steel angle or tee framing on the inner face. The panel should be hung on not less than three hinges and secured shut by not less than three steel bolts and nuts, through the thickness of the frame and panel in positions opposite and in line with the hinges. The plant access panel should be made smoke-proof. If a portion of the panel is to be hinged to open as an access door, the opening portion should be constructed as a steel door in conformity with the foregoing and should be hung to a steel frame fitted into the opening and secured to the wall and panel. If owing to the width of the access panel it is necessary for it to be in two leaves it should be hinged on both sides as described above and be arranged to close upon and be bolted as described above to a central steel upright not less than 100mm wide and 6mm, in thickness which may be made moveable to facilitate plant access.

The panel should be marked permanently in 25mm block letters 'THIS PANEL NOT TO BE OPENED EXCEPT TO TRANSFER PLANT'.

- 11 The electrical equipment generally should conform to the appropriate specifications of the British Standards Institution current at the time of installation and should be type-tested to withstand the maximum fault energy to which it is liable to be subjected. Full details of the electrical arrangements should be submitted for approval.

Notes

i In certain cases the Council may require that the aggregate capacity be divided among a number of transformers, or group of transformers, separated from each other by non combustible screens of adequate strength having a standard of fire resistance of not less than four hours to limit the possibility of spread of fire from one transformer, or group of transformers, to another.

Each transformer or group of transformers should be provided with separate sumpage or other approved means of preventing the spread of oil in the event of leakage.

ii Transformer chambers not complying with 3.03(1 to 8) will need to be protected by a suitable automatic extinguishing installation.

3.04 Nitrate film and celluloid storage

- 1 Full particulars regarding the storage of celluloid and celluloid film etc are available from the London District Surveyors Association.

3.05 Cellulose and other flammable liquid spraying rooms

- 1 A room used for spraying cellulose or other flammable liquids should, wherever possible, be situated in the topmost storey. Where such a position is not possible the room should abut upon an external wall.
- 2 All spraying rooms should be enclosed with walls or partitions constructed of non combustible materials having not less than a one hour standard of fire resistance.
- 3 All spraying rooms should be provided with at least two doorways in approved positions with the doors thereto hung to open outwards and provided with a sight panel of clear fire resisting glazing.

- 4 All doorways to a spraying room should be fitted with self closing 30 minute doors and, where large doors not readily made self-closing are provided, they should be kept closed whilst spraying is in progress and be permanently marked to that effect in 50mm block letters.

Note

In the case of certain proprietary car finishing booths the Council would be prepared to give consideration to modifying the standard of the enclosures referred to upon the submission of full details having regard to the risk in relation to the building as a whole.

- 6 Electrical equipment and wiring systems should comply with the current edition of the Regulations of the Institution of Electrical Engineers, and should be suitable for use in a 'Zone 1 area' (BS 5345) except that if installed outside the vapour stream and not within or on the immediate threshold of a spraying booth where a spraying booth is used or if installed more than 1.500m above the highest point at which spraying takes place where no spraying booth is used, equipment and wiring systems suitable for use in a 'Zone 2 area' may be employed.
- 7 Any heating should preferably be by means of steam or hot water. Other types of heating may be approved if safe in a flammable atmosphere.

Note

The surface temperature of any heating apparatus should not exceed 200°C.

- 8 The spraying room should be adequately ventilated to the outer air by mechanical means to the satisfaction of the Council.
- 9 Details of the proposed ventilation, heating, lighting and electrical arrangements for the spraying rooms will be required to be submitted before the work is commenced and the arrangements should be carried out to the satisfaction of the Council.
- 10 All spraying hoods should be constructed of non combustible materials and not more than two spraying hoods or booths should be connected to a common exhaust trunking. The exhaust should be at low level.

Note

i Special consideration by the Council will be necessary of any proposals for belt conveyors or other systems of production involving spraying within compartments in which other processes are also carried on. In these circumstances adequate provision for the separation of the spraying area particularly where the belt conveyer perforates such separation, should be made which may also necessitate a rolling steel shutter or a fire door of the appropriate standard operated by a fusible link.

ii The storage and use for spraying purposes of liquids which are petroleum mixtures as defined in the Petroleum (Mixtures) Order 1929 are subject to the licensing provisions of the Petroleum (Consolidation) Act 1928, and any requirements made under this Act should be complied with. The Licensing authority for this purpose is the London Fire and Civil Defence Authority

iii The storage and use of cellulose solutions are subject to Regulations made under the Factories Act 1961 and may also require the approval of H.M. Inspector of Factories.

3.06 Loading bays

1 Loading bays in a basement and/or car park

Note

Loading bays serving trade or manufacturing use should be separated from all other areas including car parks.

a Where a loading bay is within a car park or within a basement used for loading and unloading of goods it should be separated from any other part of the building by non combustible construction having not less than a four-hour standard of fire resistance. All supporting members thereto, together with the supporting members to the building above should be constructed or protected to a similar standard of fire resistance.

b Access from the loading bay to the remainder of the building should be by means of a ventilated lobby constructed to not less than a four-hour standard of fire resistance. The doorways between the loading bay and the lobby and between the lobby and the remainder of the building should each be fitted with a 30 minute self-closing door and, in addition, with a steel rolling shutter fitted on each side of the ventilated lobby next the respective floor areas. The steel rolling shutters should each be fitted with a fusible link set to fuse at a temperature not exceeding 74 C and be provided with mechanical gearing.

c The floor of the lobby should be constructed of solid non combustible material and raised 150mm above the level of the loading bay.

d The lobby should be provided with natural ventilation to the external air not less than 0.4m² in free area. Any shaft or duct in connection therewith should be separated from the remainder of the building by construction of not less than a four-hour standard of fire resistance and should be sited so as to prevent the spread of fire, by way of adjacent openings in the external walls, to other parts of the building or to adjoining buildings.

Note

Consideration may be given to the omission of the ventilated lobby where loading/unloading facilities are provided to the basements of contiguous 'lock-up' type shop premises or other similar developments. Where this is permitted the following standards would need to be observed:-

i the vehicular area should be otherwise generally in accordance with the standards applicable to underground vehicle parks.

ii the basement of each of the shop premises should be separated from the vehicular area by non combustible construction having not less than a four-hour standard of fire resistance with any openings therein protected by a single steel rolling shutter on a fusible link and, in addition with a self-closing 60 minute door.

iii the basement of each of the shop premises should be separated from the remainder of the shop premises over by non combustible construction having not less than a two-hour standard of fire resistance with all stairs, lifts and shafts in the basement enclosed to a similar standard of construction with any access openings therein protected by self-closing 60 minute doors.

iv the provision of not less than 0.9m² of permanent ventilation from the basement of each shop or other suitable alternative acceptable to the Council.

v the basement portion of each of the shop premises should be used generally for storage purposes only with no retail trade or access for the public thereto.

2 Loading bays at or about ground level or above and not adequately ventilated

Loading bays at or about ground level approached directly from and open to the external air on at least one side, should be separated from the remainder of the building by non combustible construction having not less than a two-hour standard of fire resistance. Openings between the loading bay and the remainder of the building should be fitted with a single steel rolling shutter on a fusible link set to fuse at a temperature not exceeding 74°C.

3 Loading bays used additionally for the garaging of vehicles

a Loading bays at or about ground level intended also to be used for the garaging of vehicles should be separated from the remainder of the building by solid non combustible construction having not less than a two-hour standard of fire resistance.

b Access to the remainder of the building from the loading bay should be by means of a ventilated lobby constructed to not less than a two-hour standard of fire resistance provided with inner and outer self-closing 30 minute doors and a single steel rolling shutter on the loading bay side on a fusible link as described in (2)(a). The lobby should be provided with permanent ventilation to the external air to an extent not less than 0.4m² in area and the floor of the lobby should be raised 150mm above the level of the loading bay.

4 Loading bays used additionally for the garaging of vehicles and not exceeding 500m² in area

a Loading bays at or about ground level intended also to be used for the garaging of vehicles and not exceeding 500m² in area, should be separated from the remainder of the building with any openings therein protected all as described in (2)(a) and in addition by a self-closing 30 minute door.

5 Generally

a Loading bays should be provided with fire-extinguishing appliances and installations in accordance with Part 2 of this Guide; this would normally include an automatic sprinkler installation or such other extinguishing equipment satisfactory to the Council.

b All steel rolling shutters and any 30 minute or 60 minute doors fitted to openings should be kept in the closed position when loading and unloading is not taking place and a permanent notice in 50mm plain letters to that effect should be provided on each side of the opening.

c Loading bays below ground level whether used for the garaging of vehicles or not should conform with the general requirements for car parks as regards mechanical ventilation, smoke outlets, sprinklers, etc., in accordance with Part 2.

d Loading bays should be provided with smoke control in accordance with Part 2.

Note

Keeping of Petroleum Spirit for Fuelling Motor Vehicles

The keeping of petroleum spirit is subject to the provisions of the Petroleum (Consolidation) Act, 1928, and the regulations made thereunder, and any requirements made under the Act or regulations must be complied with. (In this connection, car parks containing 12 or more cars generally require licences.)

3.07 Car parks

Note

Attention is drawn to the need for consultation with the London Fire and Civil Defence Authority regarding the requirements of the Petroleum (Consolidation) Act 1928.

1 General requirements for all car parks

Construction generally

Car parks should be constructed wholly of non combustible materials.

2 Stairways

a A sufficient number of stairways should be provided throughout the car park for fire-fighting purposes.

b Stairways should generally be sited next to external walls with access direct to the external air at ground level and should not be more than 60m apart.

c Fire-fighting lobby-approach stairways and fire lifts should be provided where necessary in accordance with 2.15.

3 Special fire risk areas

a The car park should be separated from all other special fire risk areas by walls and floors having the appropriate standard of fire resistance (viz the standard of fire resistance applicable to the higher risk). Such separations should be imperforate except where permitted in 3.06.

4 Heating, lighting, electrical and ventilation arrangements

a In most cases it will be necessary to submit details of the various installations for approval.

b Car parks should be provided with adequate ventilation and, except where specifically referred to herein, this should be by natural means with permanent openings aggregating not less than 2½ per cent. of the floor area so arranged to create through currents of air and sited so as to prevent the spread of fire (by way of adjacent openings in the external walls) to other parts of the building.

5 Repair service

Any portion of a car park used for repair services should be separated from the main floor area by non combustible walls and/or partitions possessing not less than a one hour standard of fire resistance. Doorways in such separation should each be fitted with a 30 minute self-closing door and all necessary precautions will need to be taken to ensure that any flame producing apparatus is a safe distance from the main car park risk.

6 Loading bays

Loading bays where permitted to be within or united with car parks should be in accordance with 3.06.

7 Electrical and mechanical equipment

a Electrical apparatus (including luminaires) if installed below the general car park floor level, or in other similarly hazardous positions, should be of a type suitable for use in potentially explosive atmospheres (apparatus Group 11A) Zone 1 areas in accordance with BS 5345.

b Electrical apparatus (including luminaires) if installed at floor level or within 1.2m above floor level should be of a type suitable for use in potentially explosive atmospheres (apparatus Group 11A) Zone 2 areas in accordance with BS 5345.

c All electrical apparatus in the car park should be suitably protected from mechanical damage.

Note

Where a mechanical system of parking is proposed the Council will require full details to be submitted.

d Any electrical equipment installed within the air stream of a mechanical extract ventilation system should be of a type suitable for use in potentially explosive atmospheres (apparatus Group 11A) Zone 1 areas in accordance with BS 5345.

8 Heating equipment

a Any heating equipment inside the car park should be of a type safe in the presence of flammable vapour.

Note

Motor coach parks etc.

Proposals involving the accommodation of motor coaches, lorries or similar public service vehicles in enclosed and covered areas require special consideration to limit the extent of fire spread and to ensure adequate facilities for fire fighting, including the removal of heat and smoke. The Council's officers should be consulted at an early stage of the design.

3.08 Underground car parks

1 Separation

a The car park should be separated from any other part of the building by non combustibile construction having not less than a four hour standard of fire resistance.

b Small car parks should be separated from any other part of the building by non combustibile construction having not less than a two hour standard of fire resistance.

c All supporting members thereto should be to a similar standard of fire resistance.

2 Elements of structure

a The elements of structure within the car park together with any necessary compartment walls and floors should have not less than a two hour standard of fire resistance.

b The car park should be subdivided into compartments so that each storey forms a separate compartment and no compartment exceeds 14000m³ in extent (see Note (ii) hereunder).

c Stairway and lift shafts should be enclosed by non combustibile construction having not less than a two hour standard of fire resistance with openings therein fitted with self-closing 30 minute doors and with steel rolling shutters on the floor area side.

d Where necessary for the proper sub-division into compartments ramps should be provided with a single steel rolling shutter on a fusible link set to fuse at 74°C.

e Openings in compartment walls should be fitted with a single steel rolling shutter on a fusible link and perforations in compartment walls and floors for ventilation and similar openings should be fitted with dampers of a type acceptable to the Council held open only by means of a fusible link.

Note

i in cases where fire-fighting is difficult it may be necessary to further sub-divide the car park into smaller compartments.

ii compartmentation may be as specified in B2/3/4 subject to the fire resistance of the structural elements being of the standard specified therein.

3 Communication with remainder of building at same level

a Access should be by way of a ventilated lobby constructed to not less than a four hour standard of fire resistance. The doorways between the car park and the lobby and between the lobby and the remainder of the building should each be fitted with a self-closing 30 minute door and in addition with a steel rolling shutter fitted on each side of the ventilated lobby next the respective floor areas. The shutters should each be fitted with a fusible link and be provided with mechanical gearing.

b The floor of the lobby should be constructed of solid non combustible material and should be raised not less than 150mm above the level of the vehicle park floor.

c The lobby should be provided with natural ventilation to the external air to an extent not less than 0.4m² in free area. Any shaft or duct in connection therewith should be separated from the remainder of the building by construction having the same standard of fire resistance as the enclosures to the lobby.

d In the case of a small car park the ventilated lobby may be constructed to a two-hour standard of fire resistance and the doorway openings therein each fitted with a 60 minute self-closing door in lieu of shutters and 30 minute doors.

4 Communication by stairway or passenger lift with the ground and/or the upper storeys

a The enclosure to the stairway or lift, where within the car park should be constructed of non combustible construction possessing not less than a four-hour standard of fire resistance.

b Access from the car park to the stairway or lift should be by means of a lobby constructed and ventilated as described in 3.08(3). The doorway between the car park and the lobby, and between the lobby and the stairway or lift should each be fitted with a 30 minute self-closing door and in addition the doorway between the garage and the lobby should be fitted on the car park side with a steel rolling shutter on a fusible link and provided with mechanical gearing.

c In the case of a small car park the enclosure to the stairway or lift and to the ventilated lobby may be constructed to a two-hour standard of fire resistance with the doorway openings therein each fitted with a self closing 60 minute door.

5 Communication by stairway to the ground storey only

a Where the stairway communicates with the ground storey only, and is sited to the satisfaction of the Council, consideration will be given to the following relaxations of the standards referred to in 3.08(4) each case being considered on its merits.

b The enclosure to the stairway in the basement and ground storeys may be constructed to have a standard of fire resistance of not less than two hours.

c The ventilated lobby between the car park and the stairway may be omitted and the doorway between the car park and the stairway fitted with a 30 minute self-closing door and a steel rolling shutter on a fusible link on the car park side and provided with mechanical gearing. The doorway at the head of the stairway should be fitted with a self-closing 30 minute door.

6 Prevention of vapour accumulation

a Wherever practicable all basement car parks should be provided with natural ventilation by means of permanent openings positioned to induce cross currents and having a total area of not less than 2½ per cent. of the area of the floor. Entrances may be included as providing part of this ventilation when closed only by lattice type gates, and any such gates, shutter or doors to entrances should be locked shut only by means of a padlock fastening such as can be easily broken by fireman in an emergency.

b In addition to natural ventilation, mechanical ventilation should be provided independent of any ventilating plant for other parts of the building. Where natural ventilation to the full standard described in 3.08(6)(a) is provided, it will usually be sufficient for the mechanical ventilation to provide for three changes of air per hour.

c Where natural ventilation to the standard of 3.08(6)(a) cannot be provided, the mechanical ventilation will be required to overcome the worst conditions likely to arise from the discharge of exhaust gases. The plant will need to be arranged so that it can be run in two equal parts, each capable of providing not less than three changes of air per hour when run separately, and so controlled that in the event of failure of one part the other part continues to function. A secondary source of electrical supply (or other suitable source of power) should be provided to ensure that one part of the ventilation plant continues to function in the event of a failure occurring in the principal source of supply. When the plant is not controlled automatically it is recommended that a competent person be in constant attendance to supervise the plant.

d Ventilating ducts should be constructed of non combustible materials and where adjacent to or passing through other parts of the building the ducts should be constructed or protected so as to afford the same standard of fire resistance as required for the separation of the car park.

7 Smoke control

Smoke control should be provided as described in Part 2.

8 Basement plans

Suitable plans of all basement storeys should be displayed in accordance with 2.17.

9 Deep basements

Proposals involving the formation of multi-storey car parks below ground will require special consideration to ensure adequate facilities for fire-fighting, smoke control and special arrangements to ensure adequate ventilation.

3.09 Enclosed car parks above ground which are not adequately ventilated

1 Separation

a The car park should be separated from the remainder of the building by walls and floors of non combustible construction having not less than a two hour standard of fire resistance.

b Small car parks should be separated from the remainder of the building in accordance with B2/3/4.

2 Elements of structure

The elements of structure, together with any necessary compartment walls and floors should have a standard of fire resistance of two hours.

The elements of structure for small car parks should be in accordance with B2/3/4.

3 Compartmentation

Compartmentation should be in accordance with B2/3/4.

All openings in compartment walls should be fitted with steel rolling shutters on fusible links.

Small perforations in compartment walls and floors should be protected as described in 3.08(2).

4 Communication with remainder of building

Communication between the car park and other parts of the building at the same level.

a Access should be by means of a ventilated lobby constructed to not less than a two-hour standard of fire resistance and provided with inner and outer 60 minute self-closing doors. The lobby should be provided with permanent ventilation to the external air to an extent not less than 0.4m² in free area.

b Access from small car parks may be direct by doorway communication (without a ventilated lobby) provided that such doorway is fitted with a self-closing 60 minute door.

5 Communication by stairway or passenger lift

a The enclosure to the stairway or lift, where within the car park should be of non combustible construction having not less than a two hour standard of fire resistance.

b Access from the car park to the stairway or lift should be by means of a lobby, constructed and ventilated as described in 3.09(4)(a)

c The doorway between the car park and the lobby, and between the lobby and the staircase or lift should each be fitted with a 30 minute self-closing door and in addition the doorway from the car park to the lobby should be fitted with a steel rolling shutter on a fusible link and provided with mechanical gearing.

6 Smoke control

Smoke control should be provided as described in Part 2.

Part 4

Buildings the Major Use of Which Constitutes a Special Fire Risk

Note

These will generally be buildings of additional cubical extent whose principal use will be for the manufacture treatment handling or storage of flammable or combustible solids, liquids or gaseous substances in quantities likely to constitute a hazard and include warehouses, factories, departmental stores, flour and spice mills etc. but may also include speculative buildings.

4.01 Construction generally

- 1** The building, including its roofs, should be constructed generally throughout of non combustible materials. Any external cladding should also be entirely of non combustible materials.

4.02 Fire resistance of elements of structure

- 1** Elements of structure should have a four hour standard of fire resistance within multi-storey buildings used for the bulk storage of flammable or combustible liquids or solids.
- 2** In all other cases the elements of structure should have the standard of fire resistance to meet B2/3/4.

Note

In buildings used for the manufacture treatment or handling of flammable or combustible liquids or solids where arrangements are made for the bulk storage of the liquids or solids other than those for use on a daily basis it should only be necessary for the bulk storage areas to have elements of structure having a four hour standard of fire resistance.

4.03 Heating lighting, electrical and ventilating arrangements

- 1** Conditions will normally be imposed requiring details of the heating, lighting, electrical and ventilating arrangements to be submitted to the Council for approval before commencement of the works and for such works to be provided and maintained to the satisfaction of the Council.
- 2** Periodic inspections may be made of the approved heating, lighting, electrical and ventilation installations.



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