

REGULATORY REFORM (FIRE SAFETY) ORDER 2005

Fire Risk Assessment for:

**Grenfell Tower, Grenfell Road,
London W11 1TQ**

for

The Tenants Management Organisation
(TMO) of the Royal Borough of Kensington
and Chelsea

By Carl Stokes on the 20th November 2012

Review Date:

1 January 2014

or before, if any significant changes have taken place, in or adjacent to this building

DATE	REASON FOR REVIEW	BY WHOM	OUTCOME

Area(s) covered by this fire risk assessment:

The common parts of the building, the basement boiler room, the ground floor reception and interview rooms, the external bin room also including the entrance lobby area for the flats and the electrical room along with the staircase. All of the flat/lobby areas and staircase of the 20 floors of residential accommodation, the roof level areas, plant, lift motor and water tank rooms and the external roof.

Area(s) not covered:

All the private residential apartments, the ground floor level electrical substation, Dale Youth Boxing club and Grenfell Nursery, the access area to the upper ground floor level, all of the walkway level and the upper ground floor level offices as these are now empty areas, the roof level ambulance room and any other part of the building not identified above.

The significant findings and action plan of this Fire Risk Assessment are inserted next with this document continuing on page 2.

It is the policy of the TMO to take all reasonable steps to protect all relevant persons including residents, employees, visitors, contractors, any members of the public or any other persons who are lawfully on the premises, from potential injury and damage to their health which might arise whilst they are on these premises. When entrusting tasks to an employee their capabilities are taken into account as regard to Health and Safety so far as they relate to fire aspects. The aim of the fire risk assessment is to comply with The Regulatory Reform (Fire Safety) Order 2005.

The occupier takes the duties imposed by the Equality Act very seriously and seeks to ensure that all reasonable adjustments are made to enable people with disabilities to be treated fairly and not to be placed at any substantial disadvantage as required by The Regulatory Reform (Fire Safety) Order 2005.

Legal Statement

This risk assessment has been undertaken as a requirement of The Regulatory Reform (Fire Safety) Order 2005, the enforcing authority, ie "the police" for the FSO are the fire and rescue authority for the area in which the premises are situated, (Article 25 of the FSO). It is the local Fire and Rescue Service who therefore have the power to undertake an audit of the fire risk assessment to determine if it is suitable and sufficient or not. Other agencies can ask if you have completed a fire risk assessment but it is not for them to view, enforce or make judgement on.

You do not have to give a copy of your risk assessment to anybody, not even the fire authority, if you do give them a copy this could be used against you at a later date. Under Article 9, headed Risk Assessment sub sections 6 and 7 of the FSO it states:

- (6) As soon as practicable after the assessment is made or reviewed, the responsible person must record the information prescribed by paragraph (7) where—
 - a) he employs five or more employees;
 - b) a licence under an enactment is in force in relation to the premises; or
 - c) an alterations notice requiring this is in force in relation to the premises.(It is very unlikely that an open air even would have an alterations notice)
- (7) The prescribed information is—
 - a) the significant findings of the assessment, including the measures which have been or will be taken by the responsible person pursuant to this Order; and
 - b) any group of persons identified by the assessment as being especially at risk.

So legally you have to record any significant findings from the risk assessment if you fall into the categories of 6 a to c above and have this available to be inspected.

The FSO applies to the common parts of the building but the Housing Act 2004 applies to the whole of the building and could impose additional fire safety measures on areas of the building outside the scope of the FSO.

Responsible Person:

Chief Executive of the Royal Borough of Kensington and Chelsea

Building Owners/ Landlord:

The Council of The Royal Borough of Kensington and Chelsea

Person Consulted during the Assessment:

Mr Paul Steadman of the Tenant Management Organisation (TMO) of the Royal Borough of Kensington and Chelsea

Assessment completed by:

Mr C Stokes, ACI Arb, FPA Dip FP (Europe), Fire Eng (FPA), NEBOSH, FIA BS 5839 Part 1 System Designer, BS 5839 Part 6, Competent Engineer BS 5266, IFE Assessor /Auditor (FSO). 19 years Fire Safety experience with local Fire Authority, in enforcement and auditing roles, 4 years as an independent fire risk assessor. Member of the construction industry CPD certification Service for 10 years. Professional indemnity insurance cover provided by Hiscox. Enhanced CRB checked.

H M Government Guide used:

Sleeping Accommodation
Offices and Shops

Local Government Group Fire safety in purpose-built blocks of flats (July 2011)

Any other guides that may be relevant:

Building Regulations 2010 Approved Document B (Volume 2) inc FPA information Managing Agents management policy's, procedures and associated documentation

Any other legislation that could make requirements for fire precautions in the building.

The Equality Act 2010

Building Information

This fire risk assessment was carried out when the building was in normal use and only a visual inspection has been undertaken of the buildings structure and no invasive structural investigation was undertaken to complete the risk assessment. If there was any concern about hidden structural damage or lack of structural integrity of the buildings structure this will be raised with the landlords and commented upon within the following report. As far as I am aware the construction and any refurbishments of this building have gone through the Building Regulations process. Information has been gathered from the buildings occupants and employees of TMO and from an analysis of documents provided by TMO, there is no external cladding on this building.

Description of the building;

This is a purpose built standalone square shaped 24 storey tower block, with a basement boiler room area, three lower levels of offices etc and twenty levels of residential dwellings above. The ground floor level has an electrical sub station and a secured bin storage area and on the roof level is the lift motor room, the cold water tank rooms, some plant rooms and a recently building ambulance communications room. The roof level is accessed via a locked gate off the staircases and this area is restricted to authorised personnel only. On each of the flat/lift lobby areas there are six flats giving a total of 120 apartments in the building. The building is located off a public road and has a garden area on three sides, the building has a flat roof area which is an open space which is restricted to authorised personnel only.

The distance between this building and adjacent properties meets the Building Regulation requirements therefore minimising and preventing any fire spread to adjacent premises.

There is one staircase in the residential part of the tower which runs the height of this part of the building, ie from the walkway level up to the roof level and is fire protected throughout its height with self closing fire rated doors and leads to a final exit at the walkway level. As this buildings is over 18 metres in height it is provided with dry risers with an external inlet inside the main entrance and outlets at each residential floor level and at the roof level. The two lifts in the building are both fire fighter/evacuation lifts, both of the lifts serve each floor level and run the height of the building.

There were no apparent unusual structural features either externally or internally observed and there are no high voltage luminous tubes for signs etc in or on this building. The access arrangements to this building have been considered and the arrangements appear to conform to part B5 of Approved Document B of the Building Regulations. Any changes to road layout etc away from these premises are outside the control of the responsible person.

Construction of the Building:

This is a concrete constructed building with a flat roof, the staircase, the landings and the floor of the building are constructed of concrete, there is a protected staircase which runs the height of the building and has the plaster covered walls painted. The staircase is separated from the lift/flat lobby areas by 30 minute self closing fire rated doors. The basement area is separated from the remained of the building above as are the three office levels.

There appears to be no hidden voids in the building or sandwich panels used and there are no apparent unusual elements of building construction that were considered to add a significant additional contribution to the fire risk.

Use and Layout of the Building;

The twenty residential floor levels of this building have six private residential apartments per floor level giving a total of 120 apartments, the ground floor level has the reception area plus two other occupiers, please see the relevant sections of the Fire Risk Assessment document for more information on this issue. The upper ground floor and walkway level are offices and these areas are presently vacant, these two floor levels have their own independent entrances and exits, the two parts

Use and Layout of the Building continued;

of the building do not rely on any shared escape routes. There is however a interconnecting door from the walkway level offices to the walkway lift lobby area, this is a single leaf door and is not a designate exit route as the offices have an internal exit door out on to the external walkway area. The basement area houses the boilers and associated plant and on the roof level there is the lift motor room and water tanks etc. Also on the ground floor level is a electrical sub station, the electrical room and the bin room, the entrance lobby area on the ground floor for the residential area gives access to the two lifts. These lifts service all the residential floor levels and the walkway level, both are evacuation/fire-fighting lifts so can be used for disabled evacuation if needed.

There is a purpose built domestic refuse chute located in this building, the refuse chute is located in a fire separated room off each flat/lift lobby area with an opening on each residential floor level. The bin storage room is externally accessed and located at the side of the building, the basement boiler room area is separated from the remainder of the building with the basement having its own independent access and exits externally on the ground floor level.

There are no plans or drawings of this building attached to this risk assessment, but the TMO do have plans showing the layout of this building.

The evacuation strategy for this building;

For The Residential part of the building:

For the residents of this building there is a "stay put" evacuation strategy, this means the residents remain within their own dwelling during a fire incident unless the fire is in that dwelling or it is otherwise affected, in which case they should immediately evacuate the dwelling and call the Fire and Rescue Service.

The Fire Service or TMO employees will arrange for a general evacuation of the building at anytime if this is appropriate or the resident can leave at anytime if they so wish. TMO has provided information to all residents in tenant's handbooks, via letters and briefing sheets of 'what to do in the event of an emergency' and articles on fire safety advice and emergency procedures are included in the resident's magazine called "Link".

Also articles are provided reminding tenants that they must not store items in communal areas nor cause obstructions to the means of escape, these articles are produced in the 7 major languages which have been selected as being most likely to meet the needs of the residents. The landlord relies upon the tenants to respond to any emergency in accord with agreed emergency plans and does not facilitate any fire drills or other emergency evacuation exercises.

For the parts of the building where employees could work:

BUT these areas are presently vacant awaiting a decision their future use.

A simultaneous evacuation strategy would be in place for office areas for any RBKC, TMO or any other employees or contractors working in them. Any persons are advised that upon hearing the fire alarm or discovering a fire they must leave the building immediately by the nearest available safe exit route and go to the assembly point. The senior person at the assembly point or a fire warden will call the Fire and Rescue Service if there is a fire in the building, giving details of about whereabouts of the fire and if any persons are missing or unable to escape. The person will then

The evacuation strategy for this building;

For the parts of the building where employees could work continued:

await the arrival of the Fire Service to assist them with any additional information that may be requested.

For employees or contractor on the residential floor levels if a fire is seen etc they will where possible seek refuge in a dwelling and the appropriate emergency action followed as if a resident. As far as it is known having asked the person named above, there have been no fires in this building with-in the last 2 years, there was a minor arson incident in July 2010, nobody was hurt and there was only minimal damage to the floor covering on a flat/lift lobby area. There are no known problems with false alarms from the commercial fire alarm system in the common parts of the residential areas or the office areas or from the domestic detectors in individual dwellings

Number of individual private dwellings in this building:

120

Methodology, for the completion of this fire risk assessment

The adopted risk assessment methodology has been developed in line with guidance from the Health and Safety Executive (5 steps to risk assessment) and PAS79. The assessment involves:

- Gathering relevant information for the building, occupants, processes and past fire history etc.
- Identifying hazards and determining measures to eliminate or control identified fire hazards.
- Determining existing physical fire protection measures and identifying any short comings.
- Discussions with occupiers and employees to determine the effectiveness of fire safety procedures and management policies.
- Subjective assessment of the likelihood of fire occurring.
- Subjective assessment of likely consequences to the occupants of a fire event.
- Assess fire risk and tolerability.
- Document the significant findings from the fire risk assessment.
- Formulating an action plan with the aim being to reduce the fire risk, from the significant findings with both physical and procedural controls,
- Formulating a checking procedures to oversee the "actions to be taken" in the significant findings.
- Formulating a time schedule for reviewing the assessment.

The type and scope of this Fire Risk Assessment is as defined by the Local Government Group Fire safety in purpose-built blocks of flats guidance document July 2011, as a Type 1 assessment, ie Common parts only, non destructive. But there is some over lap into a Type 3 assessment because questions have been asked and answers given about the electrical and heating installations within the flats along with testing and maintenance regimes and also the fire alarm systems installed.

The following rational is adhered to for the completion of this fire risk assessment

From The Building Regulations, Section 1 of B1, Means of Escape from Flats, of Approved Document B Fire Safety (Volume 2) Incorporating Insurers Requirements for Property Protection.

2.3 *The provisions for means of escape for flats are based on the assumption that:*

- a. the fire is generally in a flat;*
- b. there is no reliance on external rescue (e.g. by a portable ladder);*
- c. measures in Section 8 (B3) provide a high degree of compartmentation and therefore a low probability of fire spread beyond the flat of origin, so that simultaneous evacuation of the building is unlikely to be necessary; and*
- d. although fires may occur in the common parts of the building, the materials and construction used there should prevent the fabric from being involved beyond the immediate vicinity (although in some cases communal facilities exist which require additional measures to be taken).*

From BS 9991: 2011 Fire safety in the design, management and use of residential buildings - Code of practice, section 0.2 Flats and maisonettes, General principles.

The provisions for means of escape for flats or maisonettes are based on the assumptions that: (the same as the Building Regulations apart from the end of a.)

- a. fire will occur within the flat or maisonette (e.g. not in a stairwell);*
- b. there can be no reliance on external rescue (e.g. a portable ladder);*
- c. the flat or maisonette will have a high degree of compartmentation and therefore there will be a low probability of fire spread beyond the flat or maisonette of origin, so simultaneous evacuation of the building is unlikely to be necessary; and*
- d. where fires do occur in the common parts of the building, the materials and construction used in such areas will prevent the fire from spreading beyond the immediate vicinity (although in some cases communal facilities exist which require additional measures to be taken).*

Information for Londoners living in high rise properties, this information is provided by the London Fire and Civil Defence Service (LFB 'sweb site)

If you live in a flat or maisonette

Flats and maisonettes are built to give you some protection from fire. Walls, floors and doors will hold back flames and smoke for a time.

If there's a fire outside of your flat, in another part of the building, you're usually safer staying in your flat unless heat or smoke is affecting you.

Important relevant information

This reviewed Fire Risk Assessment (FRA) supersedes any previous FRA's in their entirety because of new guidance documents that have been provided by Government Departments and enforcement agencies since the original FRA's were compiled. In particular the fire safety guidance document produced by the Local Government Group Fire safety in purpose-built blocks of flats dated July 2011 and the amendment of September 2011. Also determinations issued by the Secretary of State concerning the Fire Safety Order in particular the one about the retrospective fitting of cold smoke seals on fire rated doors.

Any other relevant information on this premises

At the time of this assessment the upper ground and walkway level areas of this building are not being used and are vacant, there is some office furniture in these areas but there is nobody employed to work in these areas. It is not known what is going to happen to these areas because of the proposal to construct a new Academy school on the grassed area next to this building along with the demolition of the leisure centre nearby and the construction of a new one.

FIRE RISK ASSESSMENT

FOR: Grenfell Tower, Grenfell Road London W11 1TQ

The following simple risk level estimator is based on a more general health and safety risk level estimator of the type contained in BS 18004 2008:

Potential consequences of fire ⇒ Likelihood of fire ↓	Slight harm	Moderate harm	Extreme harm
Low	Trivial risk	Tolerable risk	Moderate risk
Medium	Tolerable risk	Moderate risk	Substantial risk
High	Moderate risk	Substantial risk	Intolerable risk

Taking into account the fire prevention measures observed at the time of this risk assessment, it is considered that the hazard from fire (likelihood of fire) at these premises is:

Low

Medium

High

In this context, a definition of the above terms is as follows:

Low: Unusually low likelihood of fire as a result of negligible potential sources of ignition.

Medium: Normal fire hazards (e.g. potential ignition sources) for this type of occupancy, with fire hazards generally subject to appropriate controls (other than minor shortcomings).

High: Lack of adequate controls applied to one or more significant fire hazards, such as to result in significant increase in likelihood of fire.

Taking into account the nature of the building and the occupants, as well as the fire protection and procedural arrangements observed at the time of this fire risk assessment, it is considered that the consequences for life safety in the event of fire would be:

Slight harm ✓

Moderate harm

Extreme harm

In this context, a definition of the above items is as follows:

Slight harm: Outbreak of fire unlikely to result in serious injury or death of any occupant.

Moderate harm: Outbreak of fire could foreseeably result in injury (including serious injury) of one or more occupants, but it is unlikely to involve multiple fatalities.

Extreme harm: Significant potential for serious injury or death of one or more occupants.

Accordingly, it is considered that the risk to life from fire at these premises is:

Trivial Tolerable Moderate Substantial Intolerable

Comments:

The risk to the occupants of this premises is considered to be tolerable.

A suitable risk based control plan should involve effort and urgency that is proportional to risk.

Risk level	Action and timescale
Trivial	No action is required and no detailed records need be kept.
Tolerable	No major additional controls required. However, there might be a need for improvements that involve minor or limited cost.
Moderate	It is essential that efforts are made to reduce the risk. Risk reduction measures should be implemented within a defined time period. Where moderate risk is associated with consequences that constitute extreme harm, further assessment might be required to establish more precisely the likelihood of harm as a basis for determining the priority for improved control measures.
Substantial	Considerable resources might have to be allocated to reduce the risk. If the building is unoccupied, it should not be occupied until the risk has been reduced. If the building is occupied, urgent action should be taken.
Intolerable	Building (or relevant area) should not be occupied until the risk is reduced.

(Note that, although the purpose of this section is to place the fire risk in context, the above approach to fire risk assessment is subjective and for guidance only. All hazards and deficiencies identified in this report should be addressed by implementing all recommendations contained in the following action plan. The fire risk assessment should be reviewed regularly.)

A fire risk assessment has been carried out for this building and the significant findings produced. By implementing the actions of the significant findings the risks or hazards will be lowered and therefore making the building safer for its occupants. If appropriate the significant findings should be passed on to any other occupiers in the building so that co-ordinated actions can be taken and visa versa, this also applies to any significant findings from any reviews etc that are undertaken.

You should consider the potential increased risk and hazard of any significant change before the change is introduced, it is usually more effective to minimise a risk or hazard beforehand than trying to achieve it after the event.

FIRE HAZARDS AND THEIR ELIMINATION OR CONTROL

1. ELECTRICAL SOURCES OF IGNITION

YES NO N/A

Are reasonable measures taken to prevent fires of electrical origin?

Are fixed installation periodically inspected and tested?

If appropriate, is portable appliance testing carried out?

If any electrical appliances are present, are trailing leads/adapters suitably limited and sockets not overloaded?

Comments or observations:

According to the TMO electrical data information the 5 year electrical test on the fixed wiring in the common parts of this building was last checked on the 11th December 2009 and is next due to be tested in December 2014, there appeared to be no outstanding items indicated. This information is backed up by the same test and retest dates being on the contractor's label fixed to the supply board in the electrical room of this building. The electrical supply boards and other associated electrical components appear to be industry standard items and are were appropriate housed in standard metal lockable containers. The main electrical room is located off the base of the staircase off the ground floor lift lobby area in a secure room.

The caretakers carry out regular visual inspections of the lighting system which is the main electrical installation in the common parts of this building and which is on a different electrical circuit from the apartments this inspection also encompasses the electrical areas. Some of the lighting units are combined lighting/emergency lighting units. If there is any damage or remedial work is needed this is reported and repair's or replacement lighting units are installed by a contractor on a responsive defect reporting procedure.

There are no other electrical devices or items of equipment, ie supply boards etc in the common parts of this building, the supply boards and electrical meters for the apartments are located within each individual flat.

There are no electrical sockets in the staircases or on the landings etc so trailing leads or multi plugs are not used and there are no solar thermal or photovoltaic systems on or attached to this building.

There are no portable electrical appliances on the flat/lift lobby areas or in the staircase etc ie the common parts of this buildings and testing is not carried out on any resident's private electrical items.

In the office there are portable electrical appliances these electrical items have portable appliance testing labels attached to them, with a last test date of the 2nd July 2012 and a retest date of July 2013. The portable appliance testing of electrical items is carried out by an external contractor with an asset register of all the items and records are kept, personnel electrical items are not used in the building.

Portable electrical appliance testing (PAT) is not carried out on any resident's private electrical items. The use of trailing leads or multi plugs are restricted in this area and they are only used where necessary and there are no solar thermal or photovoltaic systems on or attached to this building.

2. SMOKING

YES NO N/A

Does the no smoking policy appeared to be observed at the time of the inspection?



The residents are allowed to smoke within their own private individual dwellings but not in the common parts of the building and the rest of the building is also a "No smoking" area, at the time of this risk assessment there were no indications that the no smoking policy was being abused. No smoking signage is displayed at the entrance to the building, there is a designated external smoking area for any employees. As there are no employees working in this building at the present time this area is not being used, but it was clean and tidy at the time of the assessment.

3. ARSON

YES NO N/A

 y y y y

As well as the electrically operated door entry control system on the entrance door of this building, there is also a reception area which is manned 24 hours a day, these

The boiler room was mostly clear of any waste or rubbish, please see section 8 below and the section 8 items on the significant findings sheets, there were no items on top of the boilers. There are spare items of engineering equipment in the boiler room, these items are related to these boiler's and are made of metal, these items were against walls etc and did not cause an obstruction or trip hazard. This boiler room is fire separated from the remainder of this building with no gaps seen around the pipes as they leave or return to this room. At the time of this risk assessment there were no leaks of oil/lubricant or other types of liquid from the boilers or the associated machinery seen on the floor. Access to this boiler room is restricted to authorised persons only because of the type of key needed to access the room.

YES NO N/A

Is combustible material kept away from the plant or equipment?

The lift motor room and other items of plant are located in a purpose built room internally at the roof level above the lifts, at the time of the risk assessment there did not appear to be any leaks of oil or other types of liquid from any plant or machinery. There is a planned maintenance programme of inspections for the plant within the building which is carried out by a third party contractor(Independent Lift Services Limited), with the records kept centrally in the "Hub" in Kensal Road but there is a record book kept in the lift motor room to aid the service engineers. The last service date in the lift record books was the 30th October 2012.

There was no access to the EDF sub station area of the building as this is restricted to employees of this company but it is assumed that this area is kept clean and tidy and any equipment maintained and serviced in accordance with any contractual agreements.

YES NO N/A

 y y y y

inspections. So push bikes or push chairs etc could be left in these areas but not combustible items.

I would recommend that the caretaker is asked to regularly check these areas to make certain items are not stored or left here, if they do then the items must be removed immediately, this would include push bikes and push chairs etc as well. The means of escape route, the staircase and the flat/lift lobby areas, apart from level 12 were clear at the time of the risk assessment and it is part of the landlords cleaning contract that the contract cleaners remove any waste from the means of escape route.

The caretakers also ensure that any quantities of waste and combustible material are removed from the building to the external refuse bins, therefore not allowing a build up of any combustible waste materials or rubbish in the common parts of the building.

Residents have not introduced any items into the common parts of the building, apart from some residents do have door mats outside their flat doors, these are low risk and did not appear to cause an obstruction or be a trip hazard. The roof level lift motor room, the water tank rooms and the other areas were free of any combustible storage the time of this assessment. The basement boiler room area and the ground floor electrical room did contain combustible storage though.

There is a purpose built domestic waste rubbish chute in this building, this is located in a specific fire separated room situated off the flat/lift lobby area, there are openings on each of the residential floor levels. The secure the bin room area is located at the ground floor level and is externally accessed, this bin room was clean and tidy with no loose items of rubbish on the floor of the room at the time of this assessment, all the waste was contained within the refuse bins.

There are no carpets in the common parts of this building, the flooring of the flat/lift lobby areas is linoleum over the concrete floor and the staircase is bare concrete.

9. HAZARDS INTRODUCED BY OUTSIDE CONTRACTORS & BUILDING WORK

YES NO N/A

Are fire safety conditions imposed on outside contractors?

If contractors carry out lone working are there suitable precautions taken?

Is there satisfactory control over works carried out in the building by outside contractors (including "hot work" permits)?

If there are in house maintenance personnel, are suitable precautions taken, including use of hot work permits?

☒☐☐

Comments or observations:

Only authorised contractors, who have to provide method statements and schedules of work or TMO employees carry out work in the building, TMO has policies and procedures for contractors or in house employees carrying out work in their buildings, including "hot work" or other permit work these policies and procedures are kept under review and altered as and when necessary or in the light of new information.

No construction refurbishment or maintenance work was being carried out in the building at the time of the visit nor were there any contractors on site.

YES NO N/A

There are no dangerous substances stored or used in the common parts of this building, this risk assessment has not taken into account any substances that may be within any domestic dwelling, but there are clauses in the tenancy agreements to restrict such substances. As the office areas are vacant at present there are no substances in these areas.

YES NO N/A

The building does not have any problems at the present time with rats, pigeons, squirrels or other rodents or insects but this issue is kept under review to mitigate any damage that these types of vermin could cause to the fabric or structure of the building and electrical cabling or wiring. If droppings or guano are noticed then action can be taken to inform the pest control company employed by TMO to monitor the pest situation and measures will be taken to eradicate the problem.

YES NO N/A

 y y y

Are the escape routes unobstructed?

Do the escape routes lead to suitable final exits?

Are travel distances in dead ends suitably limited?

Are travel distances suitable for disabled people?

Is there adequate provision of final exits?

Are exits easily and immediately openable where necessary?

Where necessary do the fire exits open in direction of escape route?

Do the final exit doors have appropriate securing devices? ☒

Do the dwelling entrance doors appear to be fire rated?

Are any other doors protecting the escape route suitably fire rated and in a good condition?

Where appropriate are any fire doors fitted with self closing devices and do these function correctly?

Are store and cupboard fire doors kept locked shut? y

Where appropriate are the doors/flaps to rubbish chutes or the fire doors to the rubbish chute rooms suitable?

Is the floor covering suitable to prevent slips, trips and falls? y

Comments or observations:

This building appears to have been constructed in accordance with the Building Regulations with the layout of the building including the travel distances, escape routes, width of escape routes and exits appropriate for the present use. The means of escape routes/ the staircase leads directly to a final exit. As stated in section 8 above the lower three floor levels are totally separate from the upper residential floor levels. The lifts in this building are evacuation lifts so they could be used as a means of escape route but the protected staircase is the main means of escape route in an emergency. This staircase is fire protected for its full height and has an independent final exit at the walkway level.

The main entrance/exit door on the ground floor level is over ridden by the inner door handle, this over rides the locking device fitted to the entrance door in a single action. The walkway level door has a "push bar" fitted to it, both of these exit doors open in the direction of travel. There is a secondary exit from the basement boiler room and exit signage is provided, please see the significant findings sheets item 9 for some advice on this secondary exit.

There was adequate protection for the means of escape route from the building with no visual damage observed during the assessment, there are no openings off the staircase apart from the entrance/exit doors to each flat/lift lobby area. Each flat/lift lobby area also has the apartment entrance doors and the refuse chute room door off it. The tenanted apartments within this building have recently had their flat entrance doors replaced with new self closing 30 minute certified fire rated doors which meet the requirements of the Building Regulations. The letter box on these new doors is fire rated and cold smoke seals are fitted as standard, there is a level threshold for compliance with Part M of the Building Regulations. A key is not needed to open these new flat entrance doors from the internal face of the door again complying with Building Regulation requirements. Information on these new doors which also have acoustic, safety and security properties (PAS 23 and 24) as well as fire along with the fire certification documentation is held at the Hub in the TMO offices. The other flat entrance doors which have not been replaced are flush solid fire rated doors with perco self closing devices fitted on the ones looked at, these are the originally fitted doors. please see the significant findings sheets for more information on the flat entrance which have not been replaced by the TMO and the locations of any non compliant doors.

On the flat entrance doors that have not been replaced the standard letter box and flap is in the lower half of the door and in some cases these doors are fitted with multiple locks. It is assumed that the occupants of these flats can exit the flat in an emergency without any undue delay.

The door to each of the refuse chute rooms is a 30 minute fire rated door fitted with a self closing device and cold smoke seals, the staircase doors are also 30 minute fire rated doors but do not have cold smoke seals on them. This is because the inflow air route for the automatic ventilation system installed on each flat/lift lobby area comes in via the small gaps around these doors. The doors on the cupboards of the walkway lift area appear to be fire rated but if they are not the presently fitted doors are suitable and fulfil the function that is required of them as they are close fitting solid doors.

At the time of this risk assessment the escape routes were clear of obstructions, there were some pots of plants on a few flat/lift lobby areas, these plants were located in the corners or against the walls of the building and did not appear to be an obstruction or could cause a trip hazard in an emergency so I believe are acceptable and in accordance with the managed policy on items on the means of escape routes.

The door/flap to rubbish chute openings of the purpose built refuse chute were suitable and shut fully apart from the one on the 10th floor level.

At the time of the risk assessment the flooring materials on the escape routes within the common parts of the building appeared suitable to prevent slips, trips and falls during an evacuation, there were no signs of any damage to the floors or any unevenness.

On the twentieth floor level of the staircase is a locked gate which restricts access to the roof level. The caretakers carry out checks and report any deficiency's to the "Hub" so repairs can be undertaken.

14. MEASURES TO LIMIT FIRE SPREAD AND DEVELOPMENT

YES NO N/A

It is considered that there is:

A reasonable standard of compartmentation provided?

A reasonable limitation of the fire loading in the means of escape routes/corridors that might promote fire spread?

The wall and ceiling linings are in a good condition?

If fitted, is any fire rated glazing in good condition?

Where necessary are fire dampers provided to protect the means of escape against fire, smoke and combustion products in the early stages of a fire?

If fitted, is the ductwork of any mechanical ventilation system cleaned and any filters changed regularly?

Comments or observations:

This building appears to have appropriate fire separation and compartmentation and from a visual inspection of the structure of the building there appeared to be no areas that raised concern about structural damage to the building or fire stopping issues. The basement boiler room area has been classed as one fire compartment, the roof level area apart from the protected corridor and the lift motor is also one fire compartment.

There were no obvious signs that in the areas covered that bad workmanship would mean that the fabric or fire integrity was or could be compromised. No invasive structural investigation was undertaken to complete this risk assessment. There were no visible breaches of the compartment or wall and ceilings linings at the time of this risk assessment, apart from the area mentioned on the significant findings sheets. These holes in the wall linings are where there has been some cables have passed through the walls the work has not been made good. I would recommend that in future that checks are carried out after contractors have undertaken work in the building to make certain that all wall and ceiling linings have been made good so that the wall and ceiling linings are kept in a good state of repair.

At the time of this assessment the fire loading of the common parts of the building was considered to be good, please see the sections on "housekeeping" and "arson" for more information.

In the ground floor locked electrical room there was adequate fire stopping of the internal wiring routes out of this room at the time of this assessment.

From information provided there are no fire dampeners in this building and there is automatic ventilation provide in the flat/lift lobby areas, please see section 19 below for more information and natural ventilation is used to vent the staircase and ground floor lobby area.

15. EMERGENCY ESCAPE LIGHTING**YES NO N/A**

If any is fitted, is the emergency lighting system currently installed in the building, to a reasonable standard?

Is there adequately normal or borrowed lighting to back up any fitted emergency lighting system installed?

Where necessary, does the emergency lighting cover any external escape routes?

If fitted, are all emergency lighting units, clean and visually in a good condition?

Comments or observations:

There are emergency lighting units installed in the staircase enclosure of this building, on the flat/lobby areas, in the ground floor entrance lobby area and on the walkway level area, in the boiler room and in the roof level lift motor, plant and water rooms. I believe this provides an adequate level of illumination should the normal supply systems fail. There is street lighting on the public road outside the building which would illuminate by borrowed light the external route from the building including the walkway level during the hours of darkness. In the event of a supply systems failure in the building the exterior lighting would still function as it is on a different circuit. The emergency lighting system in this building was not checked during this assessment.

The installed emergency lighting system consists of self contained units, not a centralised battery system or a generator back up system, the neon indicator lights are visible on the emergency lighting units. The glare limits of the emergency lighting units are within the acceptable ranges of BS 5266 and the colour of the light produced is white, there are no twin pack lighting units in use.

16. FIRE SAFETY SIGNS AND NOTICES**YES NO N/A**

Is there suitable pictogram fire signage in this building?

Are any signs displayed clearly legible, fixed securely in position and unobstructed?

If necessary, are there pictogram fire safety notices in the building with the assembly point indicated?

Comments or observations:

Given the simple layout of the residential area of this building, there is only one staircase so no escape signage is provided in the staircase of this building, there is an escape sign over each door to the staircase from the flat/lift lobby area though and to the exit door on the walkway level. The positioning of the escape signage is I believe in accordance with H M Government Guidance. There is escape signage provided in the basement boiler room to indicate the alternative exit route, the "Push Bar to Open" sign is missing from the door of the exit from the walkway level. There are no fire action notices displayed in the residential part of this building as the residents have been instructed on the actions to be taken in the event of any

emergency in other ways, please see the section on evacuation strategy at the beginning of this document. There are smoke detectors on each flat/lift lobby area but these are to operate the smoke vents on each of these areas, there are no sounders for the fire alarm system provided within the residential part of the building. There is no signage on the entrance/exit door of this building describing the action of the release/ securing device fitted to the door because the normal door handle over rides the locking mechanism of the door in a single action and is used every time by a person leaving the building.

To aid the emergency services each floor level is permanently numbered in a large font opposite the lifts.

In the ground floor level reception area and on the roof level in all of the rooms there are fire action notices displayed next to each break glass call point of the installed fire alarm system.

Pictogram signage is used so that anybody who does not use English as their first language can understand the signage.

17. MEANS OF GIVING WARNING IN CASE OF FIRE **YES** **NO** **N/A**

Is a suitable manually operated electrical fire alarm system provided in the common parts of the building?

Does it have automatic fire detection, if required?

Is the system suitable for the occupancy and fire risk?

If the system extends into the private flats is it suitable?

Has remote transmission of the system been considered?

Comments or observations:

There is an automatic smoke detector located in each flat/lift lobby area on every residential floor level of this building and a full fire alarm and warning system installed in the office areas of the building. The basement boiler room area has a manual system and the roof level lift motor room and plant rooms have automatic and manual systems all these devices are linked into the single fire alarm panel located in the ground floor entrance lobby area. There are no sounders of the fire alarm system in the residential parts of the building the detectors are only located here to operate the ventilation system. The small cupboards on the walkway level do not have automatic fire detection fitted this is because these areas have very low fire loading.

As the result of a flooding incident two years ago of the ground floor lift lobby area a new fire alarm control panel had to be installed, this control panel is housed in a MDF constructed box with an aperture cut into the cover so that the indicator lights of the panel can be seen. .

There was no access to all the individual dwellings but from the flats looked at there appears to be a mixture of different types of domestic smoke alarms, there are self contained battery operated ones and also electrically powered/operated hardwired ones, it is not known if automatic detection is in every flat. The TMO in newsletters etc has advised residents to fit domestic smoke detectors and there are some central records of devices being fitted in some flats before residents moved in.

A "Stay Put" evacuation strategy is currently in place for all residential flats in the building and this is considered to be acceptable.

YES NO N/A

Evacuation/Fire fighting Lift
Automatic Opening Ventilation System
Hose Reels

There is a dry riser installed in this building with the inlet inside the ground floor entrance lobby and visible from the fire appliance parking place, which will be on the main road outside the building. The outlets for the dry riser are on each floor level of the residential parts of the building and the roof level, these dry riser outlets and the inlet are housed in standard secure metal boxes. There are signs fixed to the walls of the staircase to indicated which floor levels an outlet is located on, the use of the dry riser will be under the total control of the Fire Service if it is used.

Both the lifts in the building are evacuation/ fire fighting lifts, the lifts have the standard fire fighter over ride controls fitted so that the Fire and Rescue Service can take control of these lifts and use them as they see fit to do so in the event of an emergency. The power supply's to each lift are as required for a fire fighter/evacuation lift along with all the other requirements for weight and size etc but there is no roof hatch in the lifts. TMO use a third party contractor to maintain and service the lifts and dry riser and they are responsible for their operation and effective working. The evacuation/ fire fighting lift could be used as part of a person's PEEP's if needed.

There is an automatic opening ventilation system located on each lift/lobby landing area, the vents are opened on the activation of the fire alarm detector for that floor level, there is a manual over ride facility located in the main entrance lobby. Please see the section 17 above, "Means of giving a warning in case of fire" for more information of the lift/flat lobby area detectors.

There are fire fighting hose reels in the basement boiler room, these hose reels were in test date according to the servicing labels attached to each item, the last test date being August 2012.

20. PROCEDURES AND ARRANGEMENTS

YES NO N/A

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Comments or observations:

The TMO caretakers walk the residential and TMO controlled parts of this building on a regular basis and there are defect reporting policies and procedures in place so that any discrepancies or damage can be repaired or items replaced. The Fire and Rescue service can be called at any time by any resident if there is an emergency situation and the tenant would meet the Fire Service on their arrival as would be the situation for a fire in any private dwelling. As the other occupiers are separate from the residential areas of the building not intermixed and the residents are not totally reliant on the actions of the other occupiers this fire risk assessment has only covered the residential areas procedural arrangements.

The Health and Safety Advisor of the TMO has regular liaison meetings with the local fire and rescue service commander to pass on information and arrange familiarisation visits if needed or requested.

As far as I can tell and from information I have been given the policies and procedures are subject to reviewing at set intervals or are altered if new or relevant information becomes available.

21. TRAINING AND DRILLS

YES NO N/A

Are TMO employees given adequate fire safety instruction and training on induction and adequate periodic "refresher training" at suitable intervals, with records kept?

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Is the content of the staff training provided suitable with practical instruction on fire fighting equipment?

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Comments or observations:

All TMO employees receive induction training which includes fire training periodic "refresher training" at regular intervals, records of this training are kept by the Human Resources (HR) department at 300 Kensal Road North Kensington. Caretakers, wardens and office managers receive training to be fire marshals/ wardens by a third party fire training company the fire warden are also the nominated persons and by being recorded as a fire warden you are also the nominated person, training records again kept by the HR department. The topics and areas covered by the training packages are available from either TMO's HR or the Health and Safety team or direct from the training provider. I have been shown copies of the training documents and they appear to cover all the areas and topics that are mentioned in the H M Government risk assessment guidance booklets. The practical training involves using the types of portable fire fighting appliances currently provided in the TMO buildings.

If anybody receiving this training does not use English as their first language this fact is taken into account so that they comprehend the information given to them.

Prior to moving into this building all residents are issued with a handbook which includes some fire safety advice and are given a tour of the building by a Neighbourhood Officer, there is no documentary evidencing required by TMO for the issuing of the handbook.

Contractors are reported by TMO to be required to have a construction phase plan which should be agreed before work commences and be acted upon including provision of a suitable number and type of fire extinguishers and someone trained to use them as part of the fire safety arrangements for the project where appropriate.

At present there is only at the most two employees who work in this building mostly there is only one person at the front desk, therefore I believe that the undertaking fire drills is not appropriate. This is because there is only one person to respond to any fire drill, the reception person is trained on what to do if the buildings fire alarm system sounds. It is their job to implement the fire alarm policy.

22. CO-OPERATION WITH ANY OTHER EMPLOYERS **YES** **NO** **N/A**

If this building is shared with other occupiers is fire risk Information co-ordinated between occupiers?

Have you received appropriate information on other occupiers fire risks and general fire precautions?

Comments or observations:

This is a multi occupied building, the basement, ground floor reception area, the two levels of offices, upper ground floor and walkway level (these areas are now vacant and empty), the roof level and all the residential levels are under the control of the TMO. The ground floor areas of the Boxing Club and the Grenfell Nursery are occupied by other persons and under their control. The TMO as the landlords are responsible for co-ordinating the fire risk assessment's significant findings of the other occupiers and co-ordinating any emergency response from any relevant information given. A copy of the significant findings from this risk assessment will be forwarded on to these other occupiers so that they can respond to any relevant information. If or when the office areas are brought back into use a fire risk assessment should be completed for these areas and the significant findings of that document and this assessment exchanged and any findings acted upon. The small ground floor EDF electrical sub station which is unmanned and only visited infrequently and restricted to employees of this company has not been asked for any significant findings as this area is accessed externally and there is no needed for the company employees to enter the residential parts of the building and TMO employees cannot access this area.

23. TESTING AND MAINTENANCE **YES** **NO** **N/A**

Is the structure of the premises adequately maintained?

Is there weekly testing and six monthly servicing of fire detection and fire alarm system, with records kept?

Is there a monthly visual and annual testing of the emergency escape lighting, with records kept?

Is there a monthly visual and annual maintenance of the fire extinguishing appliances, with records kept?

Is there a monthly testing and annual servicing and maintenance of any automatic opening vents along with any associated equipment/devices, with records kept?

✓

YES NO N/A

Is there routine checks of final exit doors and/or security fastenings, with records kept?

Is there periodic inspection of any external escape staircases and gangways, with records kept?

Six monthly inspections, (pipe & pump(s)) and annual testing of any wet or dry rising mains, with records kept?

Monthly inspections of switches and annual testing of the fire fighting/evacuation lifts, with records kept?

Weekly inspections and annual testing of the sprinkler installations, with records kept?

Annual inspection and test of lightning protection system, with records kept?

Monthly and annual testing and servicing, under load of any back up/stand by generators, with records kept?

Comments or observations:

From the asset records provided to me by the TMO the emergency lighting and fire alarm systems along with the dry riser, fire fighter lifts and the hose reels installed in this building are all subject to a maintenance contracts. Testing, servicing and maintenance is being carried out by professional third party contractors on a planned preventive maintenance programme with records kept centrally by TMO at the "Hub" and by the contractor for all these systems, no test certificates have been seen to confirm this.

RGE Services are under contract to TMO to provide portable fire fighting equipment, testing, servicing and maintenance, the fire extinguisher in this building, the basement boiler room, the lift motor room, the ground floor electrical room plus other areas were out of test date according to the contractors label on the extinguishers. The last test date was on the 8th August 2011. Some located in the roof level areas had "condemned" written on them in large black writing with a last test date of 2009 or 2010. This seems to indicate that monthly occupier inspections are not being carried out.

It is not known if the caretaker is undertaking the monthly occupier's tests of the installed emergency lighting system, fire extinguishers and structural items as per the caretakers check list this would include the external stairs and lift checks with the results being kept as a record of testing having been undertaken.

Definitions:

Responsible person: The person ultimately responsible for fire safety as defined in the Regulatory Reform (Fire Safety) Order 2005. which is:-

"responsible person" means—

- a) in relation to a workplace, the employer, if the workplace is to any extent under his control;
- b) in relation to any premises not falling within paragraph (a)—
 - i. the person who has control of the premises (as occupier or otherwise) in connection with the carrying on by him of a trade, business or other undertaking (for profit or not); or
 - ii. the owner, where the person in control of the premises does not have control in connection with the carrying on by that person of a trade, business or other undertaking.

"relevant persons" means—

- a) any person (including the responsible person) who is or may be lawfully on the premises; (members of the public in a shop or licensed premises, contractors or visitors in a factory) and
- b) any person in the immediate vicinity of the premises who is at risk from a fire on the premises, but does not include a fire-fighter who is carrying out his duties in relation to a function of a fire and rescue authority under section 7, 8 or 9 of the Fire and Rescue Services Act 2004 (fire-fighting, road traffic accidents and other emergencies). This could include people in flats above a ground floor shop or the staff living over a licensed premises.

Child; Anyone who is not over compulsory school age, i.e. before or just after their 16th birthday.

You must, before you employ a child, provide a parent with clear and relevant information on the risks to that child identified by the risk assessment, the measures you have put in place to prevent/protect them from fire and inform any other responsible person of any risks to that child arising from their undertaking.

Combustible materials: A substance that can be burned.

Compartment wall and/or floor: A fire-resisting wall or floor that separates one fire compartment from another.

Competent person: A person with enough training and experience or knowledge and other qualities to enable them properly to assist in undertaking the preventive and protective measures.

Dangerous substances: A substance which because of its physico-chemical or chemical properties and the way it is used or is present at the workplace creates a risk or a substance subject to the Dangerous Substances and Explosive Atmosphere Regulations 2002 (DSEAR). Small quantities of substances are not considered a major hazard for instance DSEAR talks of quantities of 25 litres and more so a few plastic bottles of cleaning materials and other such substances are not relevant and would be normal. For example the local corner shop or supermarket would not

record as dangerous substances all the items they sell in their shop, including bleach, white spirit, paint and glue etc.

Material change: An alteration to the premises, process or service which significantly affects the level of risk to people from fire in those premises.

Means of escape: Route(s) provided to ensure safe egress from the premises or other locations to a place of total safety.

Premises: Any place, such as a building and the immediate land bounded by it, any tent, moveable or temporary structure or any installation or workplace.

Significant findings: A feature of the premises or items from which the fire hazards and persons at risk are identified this information comes from completing the fire risk assessment. It can also contain the necessary information, instruction and training needed and how it will be given. From the significant findings can come an:-

An Action plan: The actions you have taken or will take to remove or reduce the chance of a fire occurring or the spread of fire and smoke, including time frames and who will supervise or carry out the work needed.

Travel distance: The actual distance to be travelled by a person from any point with-in the floor area to the nearest storey exit or final exit, taking into account the layout of walls, partitions and fixings in the building. If the building has been constructed in accordance with The Building Regulations and no unauthorised alterations have then place then the travel distances will be satisfactory.

Where necessary: The Order requires that fire precautions (such as fire fighting equipment, fire detection and warning, and emergency routes and exits) should be provided (and maintained) 'where necessary'.

What this means is that the fire precautions you must provide (and maintain) are those which are needed to reasonably protect relevant persons from risks to them in case of fire. This will be determined by the findings of your risk assessment including the preventative measures you have or will have taken.

Who is at Risk in the building:

This is a term used in risk assessment documents and the Fire Safety Order 2005, for the purposes of this risk assessment persons who are at risk are deemed to be anybody who is lawfully entitled to be in the building, ie relevant persons, but excluding fire fighters engaged in emergency activities. Please see the definition of "relevant persons" as described above.

Young person:

(a) A person aged 16 years, from the date on which he attains that age until and including the 31st August which next follows that date.

(b) A person aged 16 years and **OVER** who is undertaking a course of full-time education at a school or college which is not advanced education.

(c) A person aged 16 years and over who is undertaking approved training that is not provided through a contract of employment.

REFERENCES:

Fire Safety Design and Management

BS 5588-12: 2004. *Fire precautions in the design, construction and use of buildings Managing fire safety.* Now incorporated in:

BS 9999: 2008. *Code of practice for fire safety in the design, management and use of buildings and BS 9991:2011.*

LACoRS. *Housing Fire Safety Guidance (Now Local Government Regulation)*

Local Government Group Fire safety in purpose-built blocks of flats (July 2011)

Fire Detection and Fire Alarm Systems

BS 5839-1: 2008. *Fire detection and fire alarm systems for buildings - Code of practice for system design, installation, commissioning and maintenance.*

BS 5839-6: 2004. *Fire detection and fire alarm systems for buildings - Code of practice for the design, installation and maintenance of fire detection and fire alarm systems in dwellings.*

BS 5839-8: 2008. *Fire detection and fire alarm systems for buildings - Code of practice for the design, installation, commissioning and maintenance of voice alarm systems.*

BS 5839-9: 2003. *Fire detection and fire alarm systems for buildings - Code of practice for the design, installation, commissioning and maintenance of emergency voice communication systems.*

Fire Extinguishing Appliances

BS 5306-1: 2006. *Code of practice for fire extinguishing installations and equipment on premises - hose reels and foam inlets.*

BS 5306-3: 2009. *Fire extinguishing installations and equipment on premises - Code of practice for the inspection and maintenance of portable fire extinguishers.*

BS 5306-8: 2012. *Fire extinguishing installations and equipment on premises - Selection and installation of portable fire extinguishers - Code of practice.*

BS EN 3. *Portable fire extinguishers.*

BS EN 671-3: 2000. *Fixed fire-fighting systems. Hose systems. Maintenance of hose reels with semi-rigid hose and hose systems with lay-flat hose.*

BS 5306-0:2011 *Fire protection installations and equipment on premises Part 0: Guide for selection of installed systems and other fire equipment*

BS EN 1869: 1997. *Fire blankets.*

BS ISO 14520-1:2006 *Gaseous fire-extinguishing systems. Physical properties and system design. General requirements*

Emergency Escape Lighting

BS 5266-1: 2011. *Emergency lighting - Code of practice for the emergency lighting of premises.*

BS 5266-7: 1999 (BS EN 1838: 1999). *Lighting applications - Emergency lighting.*

BS 5266-8: 2004 (BS EN 50172: 2004). *Emergency escape lighting systems.*

Fire Safety Signs

BS 5499-1: 2002. *Graphical symbols and signs - Safety signs, including fire safety signs. Specification for geometric shapes, colours and layout.*

BS 5499-4: 2000. *Safety signs, including fire safety signs. Code of practice for escape route signing.*

BS 5499-5: 2002. *Graphical symbols and signs - Safety signs, including fire safety signs. Signs with specific safety meanings.*
BS 5499-10: 2006. *Safety signs, including fire safety signs. Code of practice for the use of safety signs, including fire safety signs.*

Fixed Fire Extinguishing Systems and Equipment

BS 5306-2: 1990. *Fire extinguishing installations and equipment on premises - Specification for sprinkler systems.*
BS 9990: 2006. *Code of practice for non-automatic fire-fighting systems in buildings.*
BS EN 12845: 2004. *Fixed fire-fighting systems - Automatic sprinkler systems - Design, installation and maintenance.*

Miscellaneous

BS 476-22: 1987, 'Fire tests on building materials and structures, methods for determination of the fire resistance of non-load-bearing elements of construction'
BS 7176: 1995. *Specification for resistance to ignition of upholstered furniture for non-domestic seating by testing composites.*
BS 7273-4: 2007. *Code of practice for the operation of fire protection measures - Actuation of release mechanisms for doors.*
BS 7671: 2008. *Requirements for electrical installations. IEE Wiring Regulations. Seventeenth edition.*
PAS 79: 2012. *Fire risk assessment - Guidance and a recommended methodology.*

Lightning

BS EN 62305-1: 2006. *Protection against lightning. General principles.*
BS EN 62305-2: 2006. *Protection against lightning. Risk management.*
BS EN 62305-3: 2006. *Protection against lightning. Physical damage to structures and life hazard.*
BS EN 62305-4: 2006. *Protection against lightning. Electrical and electronic systems within structures.*