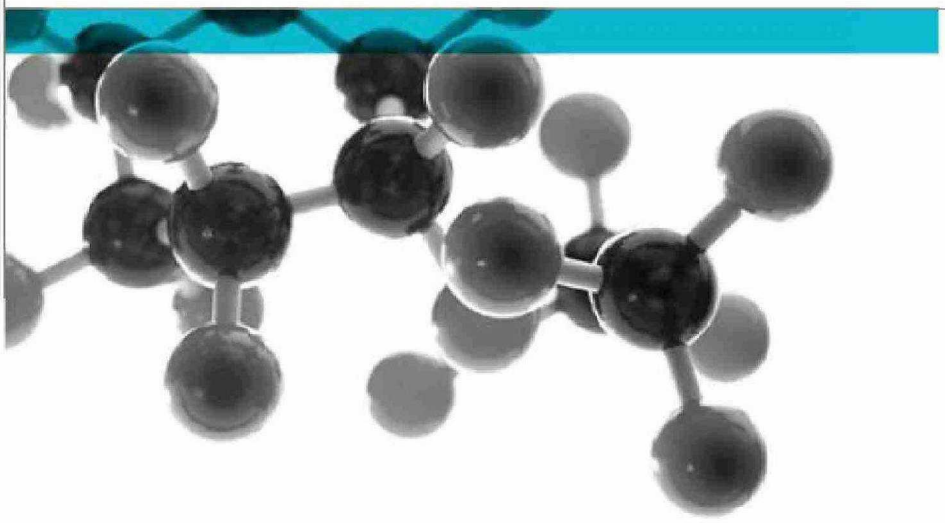
Exova Warringtonfire
Bramah House
65-71 Bermondsey Street
London
SE1 3XF
United Kingdom

T : [redacted]
F :
E : london@exova.com
W: www.exova.com

Grenfell Tower
Outline Fire Safety Strategy



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Prepared by:	Terry Ashton Associate (For and on behalf of Exova Warringtonfire)
Reviewed by:	Sean McEleney Senior Consultant (For and on behalf of Exova Warringtonfire)

Validity

This report is formulated on the basis of the information and experience available at the time of preparation. It is applicable to the above-mentioned project only in accordance with the client's instructions. It is only valid provided no other modifications are made other than those for which a formal opinion has been sought and given by Exova Warringtonfire.

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1 Introduction

The proposed development is the refurbishment of Grenfell Tower, a 24 storey residential block and the incorporation of a nursery, office accommodation, new apartments, a community meeting room and a boxing club.

The refurbishment comprises:

- ground storey level - the creation of a new reception area, a nursery, office accommodation and new stairs providing access to the boxing club and the upper levels of office accommodation;
- mezzanine level - the creation of new residential apartments, office accommodation and a community meeting room;
- walkway level - the creation of a boxing club and office accommodation;
- walkway + 1 level - the creation of four new residential apartments; and
- generally - improvements to the building services.

This report details the applicable statutory controls in respect of fire safety and contains an outline fire safety strategy for compliance with these statutory controls.

The report is based upon discussions held with the design team, the Royal Borough of Kensington & Chelsea and on fire access and fire strategy drawings produced by Studio E LLP.

2 Statutory Considerations

2.1 The Building Regulations 2010

The building work will have to be carried out in conformity with the requirements of Schedule 1 of the Regulations. To satisfy Regulation 4, it will be necessary to ensure that, where a building is altered, it is no more unsatisfactory in relation to the requirements of Schedule 1 than it was before the works were carried out.

The requirements of Schedule 1 relating to fire safety are:

a) B1 (means of warning and escape);

b) B2 (internal fire spread (linings));

c) B3 (internal fire spread (structure));

d) B4 (external fire spread); and

e) B5 (access and facilities for the fire service).

Compliance with these requirements is normally achieved by meeting the standards contained in Approved Document B (ADB)[1] and/or BS 9991[2].

2.2 The Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order came into effect on 1 October 2006. One effect of this Order is that the owner (or the "responsible person" as defined in the Order) will have to carry out a fire risk assessment (or have a fire risk assessment carried out on his/her behalf). Compliance with the Regulatory Reform Order is normally achieved by following the guidance given in the DCLG Guide[3].

2.3 London Building Acts (Amendment) Act 1939

The building was subject to the requirements of Section 20 of the London Building Acts (Amendment) Act 1939. However, Section 20 was repealed on 9 January 2013.

3 Proposed Outline Fire Safety Strategy

3.1 Compliance with The Building Regulations 2010

3.1.1 Compliance with B1 (means of warning and escape)

FIRE DETECTION/ALARM SYSTEM

The nursery and the office accommodation will each be provided with at least a Type "M" system as defined in BS 5839-1[4]. Each system in these elements will be "stand alone".

New apartments will be provided with "LD3" systems of detection and sounders as defined in BS 5839-6[5] except as defined below.

MEANS OF ESCAPE

GENERAL

While the sharing means of escape between residential and non-residential accommodation is not endorsed by current statutory guidance, it is considered that the fire loads in the offices, boxing club and community meeting room would be no greater than those in a typical apartment, and the non-residential accommodation will be separated from the stairs by ventilated lobbies (see below). Therefore, the risks to the occupants of an apartment from a fire in a non-residential demise are not considered to be significantly greater than those from a fire in another apartment.

GROUND STOREY NURSERY

The nursery will have at least two exits direct to the exterior.

MEZZANINE STOREY APARTMENTS

The new apartments in the mezzanine storey will have an exit to the stair serving the boxing club.

MEZZANINE STOREY COMMUNITY MEETING ROOM

The community meeting room will have two exits each of which leads to the stair serving the boxing club.

MEZZANINE STOREY OFFICES

The offices will have exits to the ground storey via a stair to the main entrance lobby and via the stair serving the boxing club.

WALKWAY LEVEL BOXING CLUB

The boxing club will have two exits: one to the stair serving the office accommodation and one via the stair from walkway level to ground storey level.

WALKWAY + 1 APARTMENTS

The new apartments at walkway + 1 level will have access via a new doorway to the existing escape stair serving the residential tower.

NEW STAIR

The new stair serving the office accommodation will be separated as follows:

- from the lift lobbies at walkway and mezzanine levels and from the main entrance lobby at ground storey level by a standard of fire resistance to meet the requirements of B5. That is, construction having a 120 minute standard of fire resistance with the openings therein fitted with self-closing "FD60S" doors or proprietary fire/smoke curtains having the same standard of fire resistance; and

- from all other areas by construction having a 30 minute standard of fire resistance.

EXISTING STAIRS

The existing stair (and the lobbies thereto at each level) which serves the residential apartments forms part of the fire-fighting shaft serving the building. Therefore, the stair and lobbies will be enclosed by construction having a standard of fire resistance to satisfy B5. That is, construction around the perimeter of the shaft having a 120 minute standard of fire resistance with the openings therein (including doorways to new apartments) fitted with self-closing "FD60S" doors and intermediate construction (construction separating the stairs and lifts from the lift lobby having a 60 minute standard of fire resistance with the openings therein fitted with self-closing "FD30S" doors ("FD30" doors in the case of the lifts)).

The stair serving the boxing club will be separated from the remainder of the building at each level by construction having a standard of fire resistance to meet the requirements of B5. That is, construction having a 60 minute standard of fire resistance with the openings therein fitted with self-closing "FD30S" doors.

Access to the stair serving the boxing club from the community meeting room will be via a lobby constructed to have a 120 minute standard of fire resistance. The door between the lobby and the community meeting room will be a self-closing "FD60S" door and the door between the lobby and the stair will be a self-closing "FD30S" door.

SMOKE VENTILATION OF LOBBIES

WALKWAY + 1 LEVEL

The lift lobby serving the residential apartments at walkway + 1 level will be ventilated by the existing supply and extract ventilation system which serves the upper levels which this will be extended down to this level.

(NOTE: this supply and extract system will be overhauled as part of the improvement to the building services. This is covered in a separate report by Max Fordham).

WALKWAY, MEZZANINE AND GROUND STOREY LEVELS

The stair serving the office accommodation effectively forms lobbies between this accommodation and the lift lobbies referred to above. Automatic opening vents (AOVs) 0.4m^2 in area will be provided at the head of the stair and to the corridor of the ground floor office accommodation. These AOVs will provide a means for venting smoke from all the office accommodation.

The lobby between the boxing club and the new stair at walkway level will also be ventilated direct to atmosphere via an AOV 0.4m^2 in area.

SMOKE VENTILATION OF OTHER AREAS

The community room on the mezzanine above ground storey level will be vented direct to the exterior by an AOV 0.4m^2 in area.

OPERATION OF AOVS

All the above-mentioned AOVs will open on activation of smoke detectors sited within each of the areas.

ESCAPE ROUTES WITHIN APARTMENTS

The new apartments will have protected entrance halls (i.e. entrance halls enclosed by construction having a 30 minute standard of fire resistance with the doorways therein fitted with "FD20" doors). Bathrooms and WCs will not be enclosed by fire resisting construction but, where they abut other rooms, they will be separated from the latter by walls having a 30 minute standard of fire resistance.

The travel distance from the apartment entrance door to the door to the furthest habitable room will not generally exceed 9m. Where it does, an "LD1" fire alarm and detection system will be provided.

EMERGENCY LIGHTING

Where necessary, emergency lighting will be provided in the escape routes from the building designed in accordance with the recommendations of BS 5266[6].

3.1.2 Compliance with B2 (internal fire spread (linings))

All new wall and ceiling linings will be the equivalent of the following:

a) in circulation spaces and escape routes other than circulation spaces within the apartments – Class 0 (using the UK testing methods) or Class B-s3, d2 (using the European testing methods); and

b) elsewhere – Class 1 (using the UK testing methods) or Class C-s3, d2 (using the European testing methods), although a Class 3 standard or Class D-s3, d2 could be used within rooms not exceeding 30m^2 in non residential accommodation or 4m^2 in area within the apartments.

NOTES:

(i) the European testing methods referred to above are the new methods developed as part of a harmonisation program for fire testing within Europe as detailed in BS EN 13501-1: 2002[7]. Materials achieving the classifications to either the new European test method or the UK test methods are considered to be acceptable; and

(ii) the plywood linings in the main entrance lobby will have a Class 0 standard by virtue of a process of impregnation during manufacture.

3.1.3 Compliance with B3 (internal fire spread (structure))

FIRE RESISTANCE OF ELEMENTS OF STRUCTURE

All new elements of structure will be constructed to have the same standard of fire resistance as that of the existing elements. This is assumed to be 120 minutes for the structural frame and 60 minutes for floors. An exception to this will be the structural steelwork supporting the galleries connecting to the boxing club stair. This will be constructed or protected to have a 30 minute standard of fire resistance. The basis for this is that there will be a very low fire load in this area and collapse of these structural supports would not have an adverse effect on the structural stability of the building as a whole.

COMPARTMENTATION

Compartment walls and/or floors will be provided:

a) Between apartments and other apartments;

b) Between apartments and common areas;

c) Between the nursery and the remainder of the building;

d) Between the boxing club and the remainder of the building; and

e) Between the offices and the remainder of the building.

Compartment walls and floors will have a 60 minute standard of fire resistance unless they form part of the structural frame of the building (where they will have a 120 minute standard of fire resistance). Doorways within compartment walls will be fitted with self closing doors having a 60 minute standard of fire resistance, except where a different standard will be necessary to satisfy B5.

3.1.4 Compliance with B4 (external fire spread)

It is considered that the proposed changes will have no adverse effect on the building in relation to external fire spread but this will be confirmed by an analysis in a future issue of this report.

3.1.5 Compliance with B5 (access and facilities for the fire service)

A new inlet to the existing dry rising main will be provided in a location where it will be within 18m (and in sight of) where a pumping appliance could pull up.

Access to the building for fire service personnel will be at ground storey level. If access is obtained at ground storey level, fire service personnel will have to proceed up the internal stair to either the mezzanine above the ground storey or to walkway level. Outlets from the dry rising main will be provided in the common lobbies at both these levels and in the mezzanine over walkway level.

Notwithstanding the above, access to the fire-fighting lift will be available at ground storey level

The fire resistance of the enclosures to the fire-fighting shaft are covered in 3.1.1 above.

As stated above, these lobbies will be ventilated.

A concierge office will be incorporated within the main entrance to the building. This is considered to be acceptable as all the occupants of the other areas of the building will be able to escape independently of this area.

3.2 Compliance with the Regulatory Reform (Fire Safety) Order 2005

It is considered that the fire safety measures described above will satisfy the requirements of the Regulatory Reform (Fire Safety) Order.

Portable fire-fighting equipment (fire extinguishers) will be provided in the nursery, boxing club and office accommodation in accordance with the recommendations of BS 5306-8[8].

4 References

1. Approved Document B. Fire safety. Volume 2 – Buildings other than Dwellinghouses. Department for Communities and Local Government - TSO 2006

2. BS 9991: 2011. Fire safety in the design, management and use of residential buildings

3. Fire Safety Risk Assessment – sleeping accommodation. Department for Communities and Local Government 2006

4. BS 5839-1: 2002. Fire detection and alarm systems for buildings: Part 1: Code of practice for system design, installation, commissioning and servicing

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

6. BS 5266: Part 1: 1999 Emergency lighting. Code of practice for emergency lighting of premises other than cinemas and certain other specified premises used for entertainment

7. BS EN 13501-1: 2002. Fire classification of construction products and building elements. Classification using data from reaction to fire tests

8. BS 5306-8: 2000. Fire extinguishing installations and equipment on premises. Part 8: Selection, and installation of portable fire extinguishers – Code of practice