



Fire Safety Design Strategy for Building Works and Refurbishments



Project Admiral Poole

Rodney Court, Whatleigh Cl, Poole BH15 1RL

Nelson Court, 9 Lagland St, Poole BH15 1RT

Grenville Court, South Rd, Poole BH15 1PZ

Drake Court, 1 Lagland St, Poole BH15 1RP

Fire Design Strategy

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Summary

This document sets out the standards that apply to Project Admiral Poole in relation to the refurbishment work for Rodney Court, Nelson Court, Grenville Court, Drake Court and their design requirement for Fire Safety. In some areas, the standards detailed will exceed the current UK Building Regulations Approved Document B requirements following their current review and government consultation documents in relation to external spread of fire and overall fire test data. Information on future direction of fire safety in relation to higher risk residential building (HRRBs) of 10 storeys or more will play a major influence in this design strategy. Building Regulations are a set of *minimum* standards which only apply to newly constructed buildings or work on buildings which come within the definition of a 'material change of use' or 'material alteration' (as defined in the Building Regulations 2010) and the purpose of this guide will be to provide a policy specifying the standard that is recommended for this refurbishment project. This document also seeks to establish a well-defined link between current legislation and the continued building fire safety management to allow the Responsible Person (RP) and/ or building 'Safety Manager', together with any contractor or other vested party, to understand what is required by the local authority inspecting and enforcing officers. The design not only aims to apply the specifications required but also to ensure the residential blocks are safe buildings to live in.

1. Introduction

Contractors should follow the information set out in this policy in relation to fire safety. These refer to UK Acts, Orders, regulations, government guidance and British and European Standards. Although it is not intended to be a comprehensive list of all relevant standards, it identifies those elements of building design where the refurbishment has to meet specific requirements.

2. Objective and Scope of this Document.

- a. This document sets out the fire safety design standards with which the project is expected to comply. In the event that documents referred to within this document are superseded, the most recent versions are to be referred to (e.g. the current draft of Approved Document B)
- b. If a fire safety aspect is not covered in this fire safety design, the relevant codes of practices, British Standards and building regulations are to be applied and followed. In the event that documents referred to within this document are superseded, the most recent versions are to be referred to. Any other doubts or concerns on Fire Safety must immediately be referred to Prism Fire Risk Management Ltd who will in turn consult with the local Fire Authority if deemed necessary.

- c. This document applies to all four residential blocks under the scope of the refurbishment.

3. Responsibilities.

- a. Within the Fire Safety Order, Article 3 (b) the Responsible Person of a building which is not a workplace is identified as:
- i) "Person in control of the building in connection with any trade or undertaking"
 - ii) "the owner, where the person in control of the building does not have any connection with any trade or undertaking"

For the purposes of this document the responsible person will be taken in two stages:

1. Refurbishment
2. Handover and Beyond

Refurbishment

During refurbishment the principal contractor will become the responsible person as they have direct control of the undertaking of any work proceedings during the project. Any fire safety risk assessments produced during the refurbishment phase will be on behalf of and relate to the principal contractor

The principal contractor must therefore ensure:

- they receive competent advice in relation to fire safety.
- adequate resources are available to ensure a good standard of fire safety is maintained.
- adequate monitoring arrangements are in place to ensure that the agreed standard of fire safety is maintained
- contractors adequately discharge their duties relating to Fire Safety
- any deviations from the fire design strategy are formally agreed
- liaise with any conditions or requirements set by any Joint Competency Authority created to oversee the project

Handover and Beyond

On completion of the refurbishment the buildings will be handed over complete with all Regulation 38 notifications and the fire safety file. It is expected that if a Joint Competency Authority has been created then they will review all information prior to handover back to the owner of the buildings.

The owner will regain control of the buildings and should then appoint a building `Safety Manager` who will ensure:

- all fire safety elements are properly maintained
 - the fire safety strategy is kept up to date
 - the fire safety strategy is communicated to all relevant stakeholders
-
- Any fire risk assessments completed on behalf of the owner are acknowledged, maintained and reviewed annually or if sooner if deemed necessary

4. Legislation and Standards.

- a. A variety of legislation and standards will be referred to in this document for a full bibliography consult Appendix A.

5. Approved Document B, BS 9999 & Fire Engineering.

- a. When carrying out 'notifiable work' (that is building work which requires an application under the Building Regulations), the requirements of those regulations must be met. There are, however, 3 different methods of meeting these requirements for the purposes of fire safety; Approved Document B to the Building Regulations, BS 9999:2017/BS9991:2015 Design and management of fire safety standards or BS 7479 (series) of Fire Engineering solutions.
- b. Notifiable work occurs when work under Regulation 5 of the Building Regulations is carried out, for example when a new building is erected or an existing one is adapted or refurbished and then that work must be "notified" to a building control body. In all cases the work must comply with the requirements of the Building Regulations 2010, however as mentioned in paragraph 4d there are 3 methods of meeting these requirements:
- c. Approved Document B is the simplest method of showing compliance and should be the first approach used when designing a new or refurbished building. This method entails following the guidance in Approved Document B Volume 2 "buildings other than dwellinghouses". This involves following simple easy to use guidance and tables which show acceptable methods for planning early warning and means of

escape, fire/smoke resistance and control, restricting fire spread and access for the fire service.

N.B. Due to the Grenfell disaster and subsequent independent review of building regulation and fire safety “Building a safer Future”, the current editions of Approved document B are under review. Draft guidance has now been published (July 2018) and this project aims to relate to those volumes as well as current editions. The draft editions also allow in some cases, where necessary, for interaction with such other design standards such as BS9999:2017 or BS9991 :2015

- d. If design compliance cannot be achieved by using the method specified in Approved Document B alone, then the approaches defined in BS 9999 2017 can be used. Using the approach defined in BS 9999 allows features such as high ceilings, automatic detection and suppression systems to be used to increase acceptable travel distances or even decrease the size or numbers of exits or stairs.

- e. If the specified design can still not be achieved using the approaches defined in BS then a Fire Engineered approach can be used.

N.B. For this there is a suite of documents under the BS 7974 series which must only be used by a specialist competent person. These standards allow detailed professional knowledge to be used to arrive at a final design which will satisfy more complicated projects.

- f. Application of any of these 3 methods must only be done by a competent person and although some parts of buildings can be fire engineered and others may appear to be done in accordance with Approved Document B guidance or BS 9999. The approaches should never normally be mixed and if an approach is applied to part of a building then the same approach should be applied to the whole building. However, it must be noted that the new draft Approved document B allows for cross referencing to other standards such as BS9999 or BS9991 if required.

- g. Where an extension or refurbishment of a defined area is undertaken it must not be considered in isolation and all surrounding areas must be accounted for in the design so as not to create a material alteration for the purposes of the Building Regulations and potentially adversely affecting the fire protection arrangements in adjacent areas.

6. Fire detection and warning systems.

- a. The project fire safety advisor will advise on the type of fire alarm system to be installed as defined in BS 5839 parts 1 and/or 6. This will be entirely dependent upon the project brief and linked directly to the evacuation strategy and/or any proposed/current automatic venting system.
- b. Types of system may include:
 - i. `Mixed` system for `Simultaneous` evacuation

Such as a system will include each individual flat to be fitted with a fire alarm system to BS5839-6 Grade D LD2 where:

“Grade D: A system of one or more mains-powered smoke alarms, each with an integral standby supply. (The system may, in addition, incorporate one or more mains-powered heat alarms, each with an integral standby supply.)”

“Category LD2: a system incorporating detectors in all circulation spaces that form part of the escape routes from the premises, and in all specified rooms or areas that present a high fire risk to occupants”

Within each flat lobby an additional heat detector rated to 80° c is to be located which is interlinked with a mains communal route fire alarm system to BS5839-6 Grade A LD3 where:

“Grade A: A fire detection and fire alarm system, which incorporates CIE conforming to BS EN 54-2 and power supply equipment conforming to BS EN 54-4, and which is designed and installed in accordance with all the recommendations of sections 1 to 4 inclusive of BS 5839-1:2013”

“Category LD3: a system incorporating detectors in all circulation spaces that form part of the escape routes from the premises.

Such a fire alarm system will thus alert the occupants of an individual flat in which a fire starts to escape and also trigger the main alarm should the fire activate the interlinked heat detector, warning all other occupants to escape (see 7 Evacuation Strategies)

- ii. Individual system for `Stay Put` policy

Such as a system will include each individual flat to be fitted with a fire alarm system to BS5839-6 Grade D where:

“Grade D LD2: A system of one or more mains-powered smoke alarms, each with an integral standby supply. (The system may, in

addition, incorporate one or more mains-powered heat alarms, each with an integral standby supply.)”

“Category LD2: a system incorporating detectors in all circulation spaces that form part of the escape routes from the premises, and in all specified rooms or areas that present a high fire risk to occupants.

Such a fire alarm system will thus alert the occupants of an individual flat in which a fire starts to escape. The internal compartmentation of the building is then designed to withhold the fire until intervention by the emergency services (see 7 *Evacuation Strategies*)

- c. For a `Mixed System` the following should also be incorporated:
- Any main fire alarm control panel should be an `addressable` type and be provided with a `Control enable` switch. This switch should also be tamper-proof to avoid the possibility of deliberate disfunction of the system.
 - All detectors sited in cupboards, voids, storerooms and infrequently used rooms shall be fitted with a remote indicator to assist in the locating of a fire or fault.
 - Every device shall be given a unique system reference number. The number will indicate the loop and device number e.g. L2/05.
 - The panel shall be programmed so that all devices are given a text address that corresponds with each building's room numbering scheme. The format should ideally be floor number/room number/loop number/device number.
 - Manual call points are to be considered as an addition to automatic detection and manufactured to BS EN 54 Part 11. Such call points should also be fitted with anti-tamper devices to minimise deliberate or accidental activation, while maintaining a simple, but maximum, two-action procedure
- d. As a minimum all cables for fire systems will be fire resistant in accordance with BS 5839 - 1. Any higher standard must be confirmed with the project fire safety advisor and project principal contractor/designer.
- e. Visual alarm devices should be installed within any area where it is

foreseeable tenants or visitors will require a supported means of alarm identification than sound only. Vibrating devices should also be provided where this extends to a sleeping risk also.

- f. Smoke detectors must be optical and addressable type compatible with any control and indicating equipment and shall conform to BS EN 54 Part 7. The detector shall fit a common base. The common base shall be either of the pattress or flush fixing type as appropriate.
- g. All heat detectors must be of the addressable type compatible with any control equipment and conform to BS EN 54 Part 5. The detector shall fit a common base. The common base shall be either of the pattress or flush fixing type as appropriate.
- h. Combined heat and smoke detectors must have the combined properties of both heat and smoke detectors and shall conform to BS EN 54 Part 7, as described above. Combined detectors identity being either heat or smoke shall be determined to suit the areas installed and must be programmed as such by the named specialist.
- i. All detectors shall have an LED to indicate that it has operated and shall fit a common base.
- j. Sounder Bases. All sounder bases shall be loop powered and have adjustable sound output. Minimum sound output must be tested on installation and any subsequent periodic inspection to ensure the following:
 - 75dB(A) at any bedhead
 - 60dB(A) within any circulation space
 - 65dB(A) within any plant room
- k. The principal contractor shall employ a third party UKAS accredited approved fire alarm specialist to design, supply, install, test and commission an automatic and manual addressable fire alarm system to meet the requirements of BS 5839 as identified to satisfy the client, client insurer, and any Joint Competency Authority or their representatives. The complete fire detection and alarm system shall be designed, installed, tested and commissioned in accordance with the British Approvals Fire Equipment Scheme SP201.
- l. Automatic Opening Venting (AOV) detection. Should any AOV be installed at the head of the main staircase, its primary purpose will be to

enable the removal by thermal up draught of any buoyant products of combustion within the main circulation area. To enable these one of two systems should be employed:

- Mixed system (Simultaneous evacuation). An optical smoke detector will be incorporated within the BS5839-6 Grade A LD3 system adjacent to the AOV. The unit will be activated by either direct smoke within the circulation space which will activate the whole system, or by the activation of any interlinked heat detector from an individual flat, which will activate the whole alarm.
- Stand-alone ('Stay Put' policy). With no communal BS5839-6 Grade A LD3 system in place a single optical smoke detector will be placed adjacent to the AOV. The unit will be activated by smoke entering the circulation space from an individual flat and travelling upward the rough convective thermal movement. In this case the activation will open the AOV only.

In either case the AOV should be fitted with a control panel to BS7346-8:2013 and also include a manual activation/override and reset switch.

- m. In all cases any work carried out adapting, installing or any other work which may involve the current systems being rendered inoperative must be carried out under a documented agreement with the project Principal Contractor and any Joint Competency Authority representative. Any fire risk assessments will need to illustrate the mitigation circumstances allowing such a process.
- n. There are no expected refuges within the refurbishment project. There are no expected evacuation chairs within the refurbishment
- o. Due consideration should be given to all relevant mechanical plant associated to be interfaced with the fire detection and alarm system. As a minimum the following list of items must be linked to the fire alarm system: Air Handling Units, Gas and any fuel intake, Fire Shutters, Magnetic Locks on building exits and internal means of escape, smoke extraction systems. All such interfaces should be identified and agreed with the project principle designer/contractor and any Joint Competency Authority representative, or suitable local authority enforcement officer.
- p. The cause and effect of alarms and ancillary equipment connected is an important aspect of fire safety and even the best systems have to take

into account “the human factor”. Understanding human reaction to fire or alarm activation is important information for any fire risk assessor as from this they will be able to estimate peoples’ actions when these systems are activated.

7. Fire evacuation principles.

- a. The correct fire detection and alarm system can only installed once the appropriate evacuation strategy has been established and agreed.

This will either be:

- Simultaneous evacuation
- `Stay Put` Policy

Simultaneous evacuation

There will be an expectation that when the main fire alarm is activated and sounding, that all residents will leave the building via the main staircase and assemble outside at a pre-arranged and identified area. Whilst this may seem the most functional and systematic way of evacuating the building the following must be considered prior to implementing such a strategy:

The elderly and young*

The infirm or those residents with equality issues*

All buildings have a single central staircase and should simultaneous evacuation be chosen then consideration for firefighting operations taking place within the same relatively small area as resident escape has to be taken.

* For these residents, unless alternative or special arrangements are made then the fire service will have to deploy personnel to assist in their escape. They can only do this if information about each flat is provided prior to attendance. *Therefore, dependant upon the risk profile of the building, such a simultaneous evacuation may be discriminatory.*

`Stay Put` policy

There will be an expectation that the building, both internally and externally will resist or minimise the spread of any ignition source through the application of the correct standard of materials and compartmentation. Building safety is critical to any stay-put policy where BS 9991: 2015 states:

“A strategy normally adopted in blocks of flats and maisonettes whereby, when a fire occurs in a flat or maisonette, the occupants of that dwelling evacuate, but occupants of all other dwellings can safely remain in their dwellings unless directly affected by heat and smoke or directed to leave by the fire and rescue service”

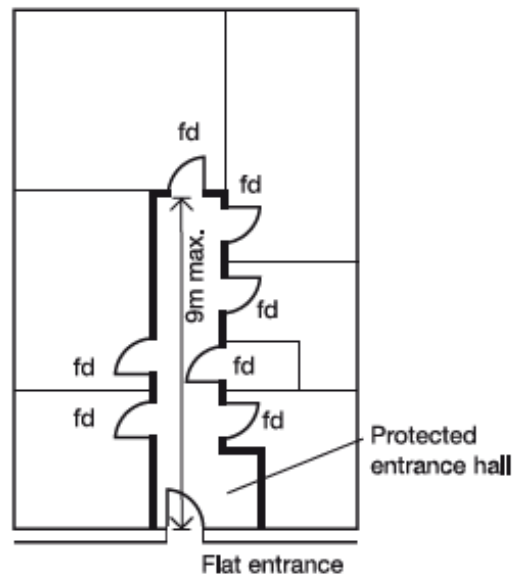
‘Stay Put’ then allows for the attending fire service to carry out any immediate actions without the need for evacuation assists, only possible rescue. However, for it to work correctly, in addition to the effective need for a safe building design, the correct and detailed information needs to be understood by all residents.

8. The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR).

- a. During refurbishment works , any area which would be subject to these regulations must seek advice from the fire safety advisor and /or principal contractor. These regulations require employers to protect workers from the risks from explosive atmospheres. In order to ensure compliance, there is a requirement to:
 - Carry out a risk assessment of any work activities involving dangerous substances or the creation of flammable atmospheres.
 - Provide technical measures to eliminate or reduce as far as is reasonably practicable the identified risks
 - Provide equipment and procedures to deal with accidents and emergencies
 - Provide information and training to all contractors
 - Classify places where explosive atmospheres may occur into Hazard area classification (HAC) zones, and identify the zones where necessary.
- b. Any work in hazardous areas as categorised in DSEAR will be carried out under a permit to work system and be signed off by the principal contractor or their representative.

9. Means of Escape Strategy.

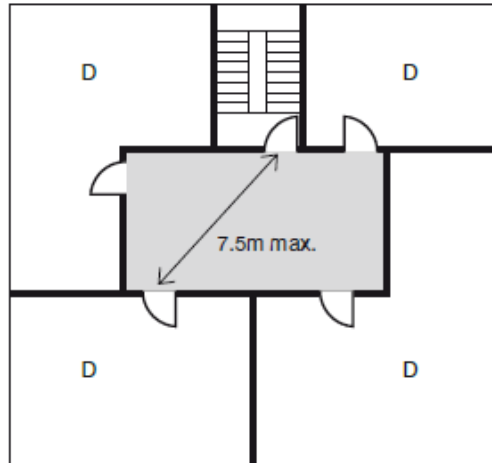
- a. All means of escape shall be based on protected escape routes and travel distances and not on escape windows, which are not relevant for the buildings of this project. Generally, the following should be adhered to if the Building or part of building is designed in accordance with Approved Document B or BS9991:
 - To provide a protected entrance hall which serves all habitable rooms, planned so that the travel distance from the flat entrance door to the door of any internal room does not exceed 9 metres.



N.B. All internal doors should be fire doors except any bathroom if the walls are of fire resisting construction. All internal fire doors are not required to have self-closing devices or passive seals but should have a minimum 25mm rebate.

While this approach must be taken for all flats above 4.5 metres for the sake of a common approach in overall fire safety design, the above should also be considered for all flats below 4.5 metres from the ground floor.

- As the building have a single common stair only (not including any lifts), the following should be ensured:
 - i. Every flat is separated from the common staircase by a protected lobby
 - ii. The travel distance from any flat entrance door to the protected lobby does not exceed 7.5 metres as they are a single direction escape only.



- To reduce the risk of a fire in a flat affecting the means of escape from other flats of the common staircase, the common area should be a protected corridor with effective compartmentation between. The minimum period of fire resistance should be:

- 60 minutes for any floor or walls separating flats and any refuse storage area
- 60 minutes for any firefighting shaft

- The protected staircase and/or adjoining lobby should be provided with an automatic opening vent (AOV) to minimise smoke ingress from other areas of the building and keep the staircase accessible for either evacuation and/or firefighting operations.

Such vents will either be:

- Natural
- Mechanical

For natural ventilation, any AOV within the lobby should be placed high enough to ensure flow of smoke in that its top edge should be at least a least as high as the top of the stair access door. An AOV should also be in place on the top storey at the head of the stair to outside and have a minimum free area of 1.0 square metre.

For mechanical ventilation the design and control of such systems using pressure differentials should be to BS EN 12101-6:2005.

Any AOV system should be operated by the interlinking of automatic smoke detectors from any fire detection and alarm system installed.

- The single staircase should be within a fire resisting enclosure and

have class `0` rated linings to minimise the internal spread of flame. Any exit from the staircase should be direct to exit or by a protected passageway to a final exit which should contain a lobby entrance to avoid smoke ingress. The staircase itself must be a minimum 1100mm in width.

- Any shafts within the building such as laundry or refuse should be encased within appropriate fire resisting structure and also include an effective mechanism for reducing the introduction of smoke and flame from extraneous sources.

b. Fire doors. All doors which lead onto the protected route where residents converge to leave or enter the building must be a fire door of minimum 30 minutes resistance for stability, Integrity and Insulation (REI). This resistance includes both the door leaf and frame and should consist of the following:

- Solid door leaf of 44mm (30 mins) thickness and be third party accredited types e.g. BWF `Certifire` /BM Trada `Q Mark` FD30*
- Door frames to have minimum 25mm solid or `planted` rebate and have minimum density of 450kg/m³ (softwood is allowed for 30 minute doors)
- Three 100mm (four screw) steel hinges to BS EN 1935 grade 7 or above and be CE approved. Wood screws of No 8 size 30mm
- Appropriate self-closing unit to BS 1154 which allow a controlled closing (power rating 3 or above) of the door leaf into the rebate past any latching system
- Gaps between leaf and frame to be not more than 3mm top and side rails with 5-8mm bottom threshold
- Appropriate single strip combination cold smoke and intumescent seals fitted into the frame of 20mm width and 5mm depth.
- All door hardware to BS476(20)
- Any intrusions such as a spy glass with intumescent fittings
- No door leaf should be damaged exposing the core and no top rail can be altered during installation

*Accredited doors with have appropriate markings as per each scheme to identify the type of door leaf (or frame). Each leaf will also have a specific serial number assigned as associated certification to determine its correct use (e.g. FD30 TT timber door for timber frame).

- c. Security of external doors. All external doors fitted with electrically operated door release mechanisms shall fail to secure in the event of a power failure or on fire alarm, however they must be suited to a master key so that a key holder or any other appointed person can re-open to check the fire panel. All final fire exits will be fitted with green break glass release mechanisms in accordance with BS7273-4: 2015 or by a mechanical means of opening compliant with Part M of the Building regulations 2010 and the Equalities Act 2010 such as a push bar or pad, but not a thumb turn.
- d. The final exit should open in the direction of travel
- e. Means of escape for disabled or vulnerable people will be determined by the overall evacuation strategy undertaken. There is no requirement for the use of any refuges associated communication system. The overall fire management of the buildings may determine identified individuals with any mobility or equality issues.
- f. The use of the lifts during escape should *not* be considered unless one is an evacuation lift as designed to BS 5810 and BS 9999. Lifts should be configured with a firefighter override switches to enable the car to be returned to the ground floor and doors to remain open.

N.B. Unless designed to BS EN 81 it is not a firefighting lift and is not designed for the evacuation of rescue of residents or movement of equipment to aid firefighting operations.

To enable any lift to be a firefighting type the following must be provided:

- Serve every floor of a building
- Minimum size is 8 persons (630 kg)
- Be 1100mm wide x 1400mm deep
- Door must be minimum of 800mm wide
- Reach top floor from ground in 60 seconds
- Have built in water protection from fire fighting run-off
- Have self-rescue facilities (an escape hatch and ladder)
- Have a communication system between the lift car and the ground floor
- Have fail safe (dual/backup) power supplies, installed in protected cable

- Be its own dedicated protected lift shaft

10. External Spread of Flame

- The external envelope of the buildings should not provide a medium for fire spread resulting in any potential for life risk. This includes adequately resisting fire spread over the face of the walls and from one building to another. The roof of the building shall adequately resist the spread of fire having regard to the position of the building.
- With the current government consultation currently underway regarding the proposed banning of combustible materials used for any external façade system on residential buildings, it would be deemed impractical to refer to guidance within the current edition of Approved Document B or BS 9991 with relevance to either diagram 40 or Figure 17 in either document.*
- This design strategy proposes to use the new `draft` Approved Document B released in July 2018 which states for any external material used it should only conform to the following:

Table B1 Reaction to fire equivalence	
BS EN 13501 classification	Equivalent
A1	Non-combustible
A2	Limited combustibility
B	Class 0
C	Class 1 to BS 476-7
D	Class 3 to BS 476-7

Therefore, *all* external materials used should either be:

- Composed completely of European class A2 -s3 d2 `limited combustibility` or above and *not* of class 0
 - An alternative should be by meeting test performance criteria given in BRE 135 using full scale test results from BS 8414-1 / 8414-2
- Any cavity barriers in place must have been tested from each side separately and should provide as a minimum:

- 30 minutes integrity (E30)
- 15 minutes insulation (I 15)

Any cavity barriers provided around openings such as window or door frames should be formed of either:

- 0.5mm thick steel
- 38mm thick timber

No cavity barrier in place should be more than 20 metres apart

e. Boundaries between buildings are already fixed due to current building structures, therefore the use of A1 or A2 materials to the external face should be applied to the full height

f. For balconies within these buildings the escape route from it should not pass through more than one access room. As it was noted only the living room provides direct access this is acceptable. The interior of the living room should be clearly visible from the balcony although any automatic detection to BS 5839-6 will cover areas which are not.

- All balconies should conform to details provided within BS 6180-2011 `Barriers in and about buildings` code of practice

11. Fixed Fire-Fighting installations (Suppression & Sprinklers).

a. Sprinkler systems can reduce the risk to life and reduce the damage caused in a fire.

They should always be designed and installed by approved competent persons and only used as a compensatory feature under the guidance of the fire safety advisor or similar through consultation with the local FRS. New sprinkler systems must be designed in accordance with BS 9251: 2005 and BS EN 12845:2004.

For the tower blocks in question the following should apply:

- Category 2 sprinkler system
- Minimum flow rates of 60 litres per minute (lpm) through a single nozzle or 42 lpm for multiple nozzles
- Minimum design of 4 nozzles for each residential flat
- Minimum duration of 30 minutes for residential properties
- Minimum nozzle spacing's of no more than 2 metres from any wall or corner, no closer than 4 metres apart

12. Emergency lighting

- a. All new, replacement or refurbished emergency escape lighting shall be designed, installed and commissioned by a competent person to BS 5266-1: 2016.
- b. The lux levels achieved for each area to comply with the minimum standards contained within BS 5266-8. To assist the main communal escape to be used at all times, the horizontal illuminance on the floor along the centre line of the main communal staircase up to 2 metre minimum width should be not less than 1 lux.
- c. The positions to be emphasized shall include:
 - i. Near to the main stairs so that each flight of stairs receives direct light
 - ii. Near any other change in level of the main communal staircase
 - iii. Mandatory emergency exits and safety signs
 - iv. At each change of direction
 - v. At each intersection of any corridors
 - vi. Outside and near to each final exit
 - vii. Near to firefighting equipment and fire alarm manual call points
 - viii. Plant rooms
 - ix. All lifts cars
 - x. All lobbies on each floor
 - xi. Lift Motor generator and plant room
- d. All emergency lighting systems in new buildings or major refurbishments should be fully addressable and self-testing with a 3- hour battery backup supply. All test facilities will be local and obvious to the light fittings they relate to and all test facilities include key switch/neon indicators
 - All emergency light units except the final exit should be non-maintained units to X 0 180 standard
 - Only the final exit luminaire should be a maintained unit to X 1 180 standard
 - All external units should be to IP 65 rating for water ingress protection
- e. Low energy consumption, such as mains powered LED, should be specified for all units installed.
- f. Higher risk areas, such as the ground floor stores or refuse area are to be provided with emergency lighting levels of 10% of normal lighting levels or a minimum of 15 lux .

13. Emergency Fire Signage.

- a. All fire signs will be fitted in accordance with BS 5499-4:2013 & BS 5499- 10: 2014 together with The Health and Safety (Safety Signs and Signals) Regulations 1996.

N.B. *BS EN ISO 7010 signs may be used but must not be mixed together with BS5499 types within the same building*

- All 'safe condition signs should be photo luminescent types which clearly and unambiguously show the direction of escape
- All identified fire doors (including flat entrance doors) should be fitted with "fire door keep shut" signs on both sides, with the exception of any cupboards which will be marked "fire doors keep locked" on the facing edge only
- Fire action notices should be located adjacent to manual call points detailing the exact location and the nearest assembly point
- An appropriate convergence sign showing any agreed assembly point should be clearly positioned in a conspicuous place away from the building. **N.B.** the conditions surrounding this sign will be influenced by the type of evacuation strategy determined for the buildings.

14. Access and Facilities for the Fire & Rescue Service.

- a. Each building should allow proper access for fire-fighting purposes and provide reasonable facilities to assist fire-fighters in the protection of life.
- They should be within 90m of a fire hydrant which should be clearly indicated by a plate in accordance with BS 3251:1976
 - Access routes for fire and rescue vehicles should be of a minimum width of 3.1m between any solid barriers such as gateways and 3.7m between kerbs and be capable of carrying a minimum of 12.5 tonnes. There should also be a minimum height clearance of 3.7m
 - All blocks should be fitted with a dry rising fire main and any landing valve should not exceed 45 metres to the furthest point in any flat due to it being located in the protected staircase
 - Fire service access to the main inlet valve of the rising mains should not exceed 18 metres

- All rising mains should be inspected and tested to BS 9990:2015
- Consideration should be given to providing the fire service with direct access to keys and plans of each floor together with other information such as utility shut offs and design information. This should be provided via a premises information box (PIB) located within the ground floor lobby. The local fire and rescue service (Dorset) already have general override keys to allow access into all PIBs provided

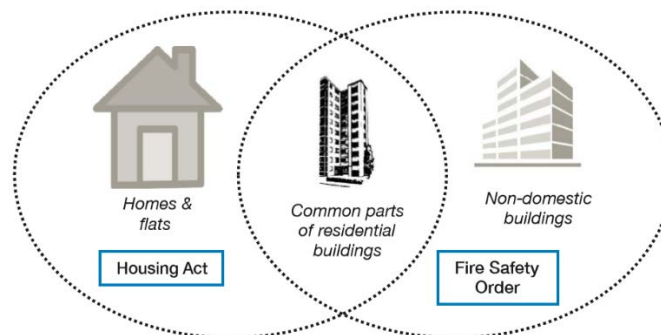
15. Fire Risk Assessments.

- a. The project principal contractor shall ensure suitable and sufficient fire risk assessments during the refurbishment shall be in place in accordance with Regulation 3 of the Management of Health and Safety at Work Regulations 1999. All such risk assessments will be periodically reviewed in connection with any project phases.
- b. Following completion of the project and handover the responsible person shall ensure a suitable and sufficient fire risk assessments are be in place in accordance with Article 9 of the Regulatory Reform (Fire Safety) Order 2005 and all duty holders and residents are made aware of its contents on initial completion and after any review. It is also the duty of the responsible person to ensure this is reviewed on an *annual* basis or earlier should any such need arise, particularly if:
 - There is a reason to suspect it is no longer valid
 - A notice has been received from a regulator
 - There has been a significant change to the building
- c. All fire risk assessments are to take into account the following areas of significant findings:
 - *Fire Hazards, their elimination and/or control*
 - I. Electrical sources of ignition
 - II. Smoking
 - III. Arson
 - IV. Heaters (fixed and portable)
 - V. Cooking
 - VI. Housekeeping
 - VII. Lightning Protection
 - VIII. Other (gas services/DSEAR/dangerous substances)
 - *Current Fire Precaution Measures Present*
 - I. Means of escape
 - II. Means of giving warning

- III. Emergency escape lighting
 - IV. Fire extinguishers and associated manual appliances
 - V. Other fixed systems
 - VI. Signs and notices
- *Management procedures*
 - I. Arrangements
 - II. Testing and maintenance
 - III. Staff instruction
 - IV. Document information
- *Additional information*
 - I. Other health and safety considerations
 - II. Further comments and conclusions
 - III. References

d. Each risk assessment should be provided with an appropriate risk matrix and significant finding action plan detailing any remedial works or recommendations.

e. In accordance with recommendation 3.4 (a) of `Building a Safer Future` the fire risk assessment for the HRRB should be undertaken for the `whole building` **N.B.** Currently the Fire Safety Order is responsible for the communal areas and the Housing Act for the occupied parts



This approach does not provide a comprehensive or suitable and sufficient assessment against the identified risks

f. Recommendation 3.4 (a) also identifies the competence required for a suitable person to complete the fire risk assessment for higher risk buildings. Currently the highest level of competence for fire risk assessors is through varying schemes also this design strategy suggests the use of UKAS accredited schemes only such as the Exova Warrington Fire, fire risk assessor's certification scheme (FRACS) or similar.

16. Building Regulations 2010, Regulation 38

- a. All relevant fire safety information shall be provided by the competent person/contractor who is responsible for installing any fire safety equipment or measures, be they passive or active, to the appointed Fire Safety Manager of the buildings who will notify the Responsible person it has been correctly provided and filed on handover. The purpose of this is to ensure the relevant person is aware of all fire safety measures in place for the lifecycle of the building.
- b. Hand over will not be completed if the appropriate documentation is not provided

17. Fire and Emergency File

- a. In accordance with Building Regulation 38 and British Standard 9999 Annex H, the principal contractor/designer is required to provide a fire and emergency file for the project. This information is to be separate and not to be confused with the documentation that is provided within the operations and maintenance (H+S) manual and / or CDM 2015.
- b. Each individual building shall have its own fire and emergency file. The file should contain design information and operational records. The design information forms the basis of an ongoing history document to which additional material is added when the building is occupied and at regular intervals thereafter. The principal designer is largely responsible for those parts of the fire safety file that contain design information. The fire safety manager is responsible for those parts of the fire and emergency file that contain operational records, the fire safety policy statement and the fire safety documentation. Annex H of BS 9999 and Appendix D of Building a Safer Future shall be referred to as a guide for the file.
- c. The fire and emergency file should:
 - I. provide a full description of the assumptions and philosophies that led to the fire safety design, including explicit assumptions regarding the management of the building, housekeeping and other management functions
 - II. explain the nature of the fire safety planning, construction and systems designed into the building, and their relationship to overall safety and evacuation management
 - III. draw on the documentation produced at the design stage to describe the use of the various protection systems in each type

of potential incident

- IV. set out the responsibilities of management with regard to fire safety
- V. provide a continuously updated record of all aspects of the building that affect its fire safety

18. Fire Safety Documentation

- a. Article 17 of the fire safety order requires that the responsible person must ensure that the premises and any facilities, equipment and devices provided in respect of the premises are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair.
- b. To evidence the requirement of Article 17 a robust and effective testing and inspection programme should be instigated to include:
 - A daily visual check of the emergency light luminaires and fire panel to ensure LED lights are illuminated and the system/unit is operable
 - A weekly sequential test of a manual call point and visual check of the main panel by a nominated person
 - A weekly check to also include housekeeping in general areas, particularly the protected staircase together with other identified areas.
 - A monthly power test by a nominated person of the emergency lighting system together with operation of any automatic opening vent overrides and electronic final exit overrides
 - A six monthly check of all fire doors for effective closing , and gap tolerances.
 - A six monthly competent persons inspection of any BS5839-6 Grade A mixed fire detection system within the protected route
 - An annual competent persons inspection of any BS5839-6 Grade D fire detection system within each flat
 - An annual competent persons service of fire extinguishers and `full duration test` of the emergency lighting system

- An annual review of the fire risk assessment (suggested)

c. all records and certificates of competency works together with assessments are required to be available at any time for audit by a regulator of any JCA or their representative

d. In direct response to paragraph 8.25 and recommendation 8.2 of `Building a Safer Future`, this design strategy suggests the use of a digital downloadable software programme for recording all Article 17 requirements

e. The `Aries` fire management programme provides a fire safety overview of multiple buildings and allows effective completion of all management records and certification together with periodic alerts. This allows real time fire safety management of all the project buildings with direct access 24/7 by the responsible person, fire safety manager and any regulatory officer. For further information visit www.prismsafety.co.uk www.ariesfire.co.uk

Appendix A

BS5839-1 & 6 2013 Fire Detection and Fire Alarm Systems
BS5266-1 & 8 Emergency Escape Lighting
BS 5499-4 Escape Route Signing
BS 5306-3 Fire Fighting Equipment (maintenance)
BS 5306-8 Fire Fighting Equipment (installations)
Building Regulations 2010 Approved Document M – Access to and use of buildings
Intumescent Fire Seal Association (IFSA) Information sheet No:3 2012
The Health and Safety (Safety Signs and Signals) Regulations 1996
HM Government Fire Risk Assessment: Sleeping accommodation
BS 9990 Non automatic fire-fighting systems in buildings :2015
The Electricity at Work Regulations 1989
The Electrical Equipment (Safety) Regulations 1994
BS 7671 Inspection and Testing of Electrical Installations
BS 4790 Determination of the effects of a small source of ignition on textile floor coverings
BS 476-22 1987 Fire Tests on Buildings. Non loadbearing elements of structure
BS 8214 2016 Timber based fire door assemblies– code of practice
Gas Safety (Installation and Use) Regulations 1998
The Petroleum (Consolidation) Regulations (PCR) 2014
The Smoke and Carbon Monoxide Alarm (England) Regulations 2015
The Smoke-free (Premises and Enforcement) Regulations 2006
The Smoke –free (Signs) Regulations 2007
BS EN 62305-1 2011 Protection against Lightning : General Principles
BS EN 572-9 :2004 Glass in Buildings: Basic Soda Lime Silicate Glass Products
FIA Guidance on the application of primary visual devices (VAD) : 2017
`Building a Safer Future` Independent Review of Building Regulations and Fire Safety
Building Regulations 2010 Approved Document B Volume 2 2006 edition
Building Regulations 2010 Approved Document B Volume 2 2018 draft edition
BS 9999 Fire Safety in the Design, Management and use of Buildings- Code of Practice: 2017
BS 9991 Fire Safety in the Design, Management and use of Residential Buildings- Code of Practice: 2015

Local Government Association: Fire Safety in Purpose Built Blocks of Flats

BS 6180 Barriers in and about Buildings:2011

BS 9251 Fire sprinkler systems for domestic and residential properties: 2014

BRE 135

BS8414 1&2 Fire Performance of External Cladding Systems:2015

Design strategy completed by



A Bolder

FRACS MIFSM GFireE TechIOSH DipNEBOSH DipFD

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