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22nd February 2021

Dear Patrick

RIBA Stage 2 Executive Summary Letter

This letter has been produced by BB7 in to summarise the fire safety measures at RIBA Stage 2 - Concept design stage for the Elmsleigh road residential development consisting of Block A and Block B.

This letter provides assurance that BB7 have been involved in the project to consider fire safety aspects and ensure project compliance with Part B (Fire Safety) of the Building Regulations for England and Wales.

During the concept design stage, BB7 Fire has produced a Concept Fire Strategy for the building which has reviewed the following requirements:

- B1 Means of warning and escape;
- B2 Internal fire spread (linings)
- B3 Internal fire spread (structure)
- B4 External fire spread
- B5 Access and facilities for the fire service

The provision of fire safety measures for all above parts has been summarised in the paragraphs below. The aspects that have not been reviewed at the Concept Stage has been outlined to be reviewed in the next stages of the project. However, these are not detrimental to the planning application and can be developed further in later design stages.

Requirement B1 - Means of warning and escape

In the Secretary of State's view, requirement B1 of the Building Regulations is met by achieving the following:

a. There are sufficient means for giving early warning of fire to people in the building.

b. All people can escape to a place of safety without external assistance.

c. Escape routes are suitably located, sufficient in number and of adequate capacity.

d. Where necessary, escape routes are sufficiently protected from the effects of fire and smoke.

e. Escape routes are adequately lit and exits are suitably signed.

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f. There are appropriate provisions to limit the ingress of smoke to the escape routes, or to restrict the fire spread of fire and remove smoke.

g. For buildings containing flats, there are appropriate provisions to support a stay put evacuation strategy.

This should be noted that extent of provisions depends on the use of the building size and its height.

Internal apartments

BB7 has reviewed the internal design of the apartments. The buildings will be provided with two apartment layouts, which are in line with prescriptive guidance recommendations. The two layouts that are to be provided are:

a. Single level apartment with a protected entrance hallway – Apartments following this layout are provided with internal hallway no longer than 9m from the apartment's front doors and any room doors. The hallway forms a means of escape route from all apartment rooms and offers 30 minutes fire resistance.

b. Single level apartment with restricted travel distance – Apartments following this layout have a restricted travel distance from the apartment entrance door to the furthest point within the apartment no greater than 9m. The distance is restricted to ensure that people can escape quickly from the apartment when fire occurs.

Communal escape routes

BB7 has reviewed the communal escape routes within the buildings which are in line with prescriptive guidance recommendations. The means of escape from all residential apartments will be via a ventilated lobby leading to the single staircase. Smoke control will be provided via a natural smoke ventilation shaft with a minimum free area of 1.5m^2. The single staircase will also be provided with a 1.0m^2 Automatic Opening Vent (AOV) at the head of the staircase to provide make up air to the natural ventilation system.

A sprinkler system will be provided throughout both buildings. Sprinkler systems are capable of supressing a fire to significantly reducing the fire size and in some instances extinguishing it. This will provide safer escape conditions from both buildings for longer periods of time.

The travel distances within the lobby leading to the staircase are within the recommended distances permitted by the guidance.

Both buildings will be provided with high level of compartmentation. Due to that "stay-put evacuation strategy" has been chosen as the fire strategy for the residential parts of both buildings. The strategy is considered suitable due to the high degree of compartmentation. The high degree of compartmentation ensures the probability of fire spread beyond the apartment of origin is low. In the unlikely event of a fire occurring within the common parts, the materials and construction used should limit the development and spread of fire.

The final exits in both buildings will also be fully compliant. The residential staircase discharges into a protected corridor which leads to a final exit. No fire risk will be present on the escape routes and the post boxes present in the communal entrances will be of non-combustible as well as will be equipped with sloping roofs so no combustible items could be stored on top of them. This will limit the risk of a fire originating in this location.

Car park

A car park will be located at ground floor level of both buildings and will be accessible from both Block A and B, joining the buildings at this level. A minimum two main escape routes are required for means of escape. These will be provided via exits into the residential blocks and an alternative escape via the vehicular entrance to the car park.

The travel distances within the car park are within the recommended distances permitted by the guidance where two directions of escape is available.

The carpark will be provided with 48 car parking spaces and the occupancy is assumed to be 96 people. Both exits from carpark will be at least 850mm wide and will be opening in the direction of travel to facilitate this.

The car parks are accessed via the residential ground floors corridors in Block A and B. These corridors also serve as the final escape routes from the residential single stair. In order to provide protection to the final escape route from the building, the carpark will be separated from the single staircase by means of a permanently ventilated lobby achieving 1.0m^2 ventilation.

The car park will be provided with a commercial sprinkler system where it connects to the residential elements above. This will significantly reduce the likelihood of a fire in the car park causing an adverse effect on the residential elements above.

Inner rooms

The cycle stores are accessed directly from the car park and therefore these are considered inner rooms. The following arrangements will be adopted for inner rooms in accordance with the guidance:

- The access room is fitted with an automatic fire detection and alarm system to warn occupants of the inner room if a fire starts in the access room.

Ancillary accommodation

The building will be provided with a range of ancillary accommodation including bin stores, cycle stores, a sprinkler tank room and a substation. Where possible ancillary accommodation will be accessed directly from outside. Where not possible, will be accessed internally via ventilated lobby with 1.0m^2 permanent ventilation or 0.4m^2 where sprinklers are provided.

General provisions

The exit widths normally should be no less than 750mm, but in the residential building where stay put strategy is in use, this is not crucial and the minimum size of exits can be based on the needs for everyday use.

There is not expected that a large number of occupants escaping through doors at the same time, only occupants of the apartment affected by the fire. However, the stairs will be no less than 1100mm and the final exits will achieve 1100mm in width also. This is the minimum requirement where firefighting shafts are provided.

All door fastenings and locks provided will be simple fastenings that can be operated from the side approached by people making escape. This is to ensure that anybody can operate the door mechanism when escaping from the building.

Disabled evacuation

Disabled occupants' safety should not be compromised due to the high level of compartmentation, which will ensure that disabled occupants can evacuate themselves from their apartment in the event of a fire and reach a place of safety, away from the location of fire.

Management companies and Housing associations managing the development will be advised to put sufficient thought into the evacuation of disabled occupants and plan accordingly. They should be aware of any needs that occupants of the building may have and consider required provisions when formulating evacuation plans and management plans to ensure people can escape in case of fire.

Active fire safety systems

Fire Detection and Alarm systems

In the Secretary of State's view; to achieve point 'a' of requirement B1 there should be sufficient means for giving early warning of fire to people in the building. BB7 has reviewed the requirements and proposed the following systems:

- Each apartment will be provided with a Grade 2, Category LD2 automatic fire detection and alarm system meeting recommendations of BS 5839 Part 6: 2019. This means a detector head will be provided in all

circulation areas that form part of the escape routes and in all areas that present a high fir risk to occupants, including any kitchen and the principal habitable room.

- A Category L5 automatic fire detection system will be provided in the residential common areas such as staircase and corridors and will be installed in accordance with BS 5839 Part 1: 2017. The purpose of this system is to operate the automatic smoke ventilation systems in the residential lobbies and at the head of the staircase. This system will not be provided with warning devices (alarms) in accordance with the recommendations of the guidance.
- An enhanced Category L3 automatic fire detection and alarm system will be provided in the car park in accordance with BS 5839 Part 1: 2017. The coverage of this system will be extended with alarm sounders to be provided within the inner rooms of the car park.

Fire suppression

A residential sprinkler system is to be provided to the residential areas of the buildings. The system will be designed and installed in accordance with BS9251: 2014 as required where the building is greater than 11m in height. The car park and ancillary accommodation will be provided with a commercial sprinkler system in accordance with BS EN 12845:2015 + A1:2019.

Smoke control

Smoke control systems will be provided to the residential lobbies and the head of the staircase. The lobbies will be provided with a 1.5m^2 natural smoke shaft and the staircase will be provided with 1.0m^2 Automatic opening vent (AOV) at the head of the stairs. This is a common smoke ventilation system for residential buildings and will draw smoke from the corridor and depressurise the corridor relative to the adjoining stair. The operation is as follows:

- Smoke is detected in a common corridor by the smoke detection system
- On activation the AOV within that core, the AOV at the head of the smoke shaft and the AOV at the head of the staircase
- All remaining AOV's will remain closed, unless over-ridden by the Fire and Rescue Service during firefighting activities

There is a requirement under BS 9991 for venting heat and smoke from covered car parks therefore a system of smoke and heat ventilation will be designed in accordance with BS 7346:7. The system's objective is to clear the smoke during the fire and once the fire has been supressed. This will be achieved by either natural or mechanical smoke ventilation and further information will be provided in the next design stage. Either option is considered adequate and can be achieved.

Requirement B2 - Internal fire spread (linings)

The B2 requirement is met in the view of the Secretary of State's view by achieving a restricted spread of flame over internal linings. The building fabric will make a limited construction to fire growth included a low rate of heat release. Particular consideration has been given to circulation spaces where linings may offer the main means by which fire spreads and where rapid spread is most likely to prevent occupants escaping.

These elements are not critical during planning stage but will be reviewed and detailed in the next stage of the project when internal linings are incorporated into the design.

Requirement B3 – Internal fire spread (structure)

Consideration has been given to the elements of structure of the building during the concept design stage. The purpose for the quantified period of fire resistance for the element of structures is:

- Protection for occupants during their evacuation and for people who main remain in the building for an extended period while duties are completed (e.g. fire wardens, those assisting with wheelchair escape or for stay put escape strategy);
- Protection of fire fighters who may be called upon to enter the building sometime after the first ignition to complete search and rescue or firefighting operations; and
- Reduce the danger to people outside and to neighbouring buildings through premature collapse.

The elements of structure within the building will be provided with a fire resistance of 120 minutes, which is based on the building height and class of use. This applies to beams and columns, floors, and loadbearing walls. The fire time of the building is in accordance with the guidance in BS 9991: 2015 and is considered adequate.

Requirement B4 - External fire spread

Resisting fire spread over external walls

The external envelope of a building should not contribute to undue fire spread from one part of a building to another. The recommendations under the guidance states, that external walls should be constructed, so the risk of ignition by an external source to the outside surface of the building and spread of fire the outside surface is restricted, and the materials used to construct external walls, and attachments to them do not contribute to the rate of fire spread up the outside of the building.

BB7 has reviewed the requirement and outlined for the proposed development that any insulation product, filler material (such as the core material of metal composite panels, sandwich panels and window spandrel panels but not including gaskets, sealants and similar) used in the construction of external walls should be class A2-s3, d2 or better in accordance with BS EN 13501-1: 2007.

This is does not apply to masonry cavity wall construction that is the least combustible construction. Any attachments including balconies, solar panels and sun shading etc. must meet these limitations. The surface spread of flame properties of materials will also meet A2-s3, d2 or better.

Regulation 7 of the Building Regulation 2010 has also been taken into account. Where Regulation 7(2) applies to materials which become part of an external wall or specified attachment, consideration should be given to other attachments to the wall which could impact on the risk of fire spread over the wall.

Resisting fire spread from one building to another

The external envelope of a building should not provide a medium for fire spread to adjacent buildings or be readily ignited by fires in adjacent buildings. The intention can be met by constructing external walls so that all of the following are satisfied

- The risk of ignition by an external source to the outside surface of the building is restricted.
- The amount of thermal radiation that falls onto the neighbouring building from window openings and other unprotected areas in the building on fire is not enough to start a fire in the other building.
- Flame spread over the roof and/or fire penetration from external sources through the roof is restricted.

BB7 will carry out external fire spread calculations in the next design stage of the project but from an initial observation the external walls are a considerable distance from the site boundary on each elevation. Where the building relies heavily on compartmentation, the compartment floors and walls reduce the size of compartments. Together with sprinkler protection, the separation between adjacent buildings is not a cause for concern.

Calculations will demonstrate that the radiation from the fire from one building to another is unlikely to spread fire from one building to another in the next design stage of the project.

B5 Requirement – Access and facilities for the fire service

The requirement from Part B Building Regulations 2010 requires that the building is designed and constructed to provide reasonable facilities to assist fire fighters in the protection of life, as well as to provide reasonable access provisions for fire appliances to the building.

BB7 has reviewed vehicle access for fire personnel. The buildings are provided with suitable vehicle access to the perimeter of the building and within the required distance to the fire mains to the buildings.

Consideration has been given to the typical fire and rescue service vehicle access route specifications including widths between roads/gateways, minimum turning circles between kerbs/walls, minimum clearance height and minimum carrying capacity.

Firefighting shaft

As the buildings are more than 18m in height, they will be provided with Firefighting shafts in order to ensure access for firefighting personnel within the building. The following firefighting provisions will be provided within the buildings:

- Firefighting staircase
- Firefighting lobby
- Fire main
- Firefighting lift
- Smoke control

Dry rising fire mains will be provided to ensure the fire and rescue service can carry out firefighting operations quickly without undue delays. As the building will be fitted with a sprinkler system, no point on any storey should be located more than 60m from a fire main outlet.

Fire hydrants

Fire hydrants are required to be provided within 90m of the dry fire main inlet on a route suitable for lying hose. The location and design of existing hydrants on the estate will be verified on the next stage development. If existing hydrant locations are not adequate, then additional hydrants will be provided.

Conclusion

BB7 Fire Ltd have been appointed to assess the viability of the proposals at Elmsleigh Road with respect to compliance to Part B (fire safety) of the Building Regulations 2010, confirm the relevant fire safety design objectives, identify relevant fire legislation which will affect the design and highlight any significant constraints that may arise.

If there are any questions on the proposed fire safety measures, please forward any correspondence to Inland Homes and BB7 will provide further clarity.

Yours sincerely

Jack Staunch

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Fire Engineer