

Design Note – DN 001.1

Project: Upper Brook Street Masterplan (pgo-3209-01)
Subject: Escape from Roof Terraces
Date: 25 October 2023
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1 Summary

This design note has been prepared following the receipt of the substantive response received from the HSE on the Upper Brook Street Masterplan (HSE reference: pgo-3723) dated 12 October 2023. In the advice the HSE have provided they note that having reviewed the details as provided in the planning application pack and they have raised a concern at the planning stage on the design relating to the roof terrace access. Specifically:

1.7 BS9991:2015, paragraph D.6(a) at Annex 6, states: 'Access to communal roof gardens and similar places should be from a protected stairway enclosure or a protected ventilated lobby/corridor.' Proposed 'A1/A2 General Arrangement Plan – Level 01' shows an unprotected access from the Residents Lounge to Roof Terrace.

Design Fire Consultants (DFC) has reviewed the design against the above design advice and fire safety guidance and have provided further information to support the design proposal and assist the HSE in further considering the fire safety features proposed in the design.

The sections below, outline the recommendations in different fire safety guidance, the intent of the guidance and why the proposals are considered to meet the design intent.

2 Relevant Guidance and Fire Safety Strategy

BS 9991

The advice that the HSE has provided in their is based on the guidance in Annex D of BS 9991 specifically Section D.6 which states that access to communal roof gardens and similar places should be from a protected stairway enclosure or a protected ventilated lobby corridor. It then goes on to say that where the roof garden is open to the air, there should be no limit on the travel distance on the roof garden and if the roof garden is enclosed the travel distance should be limited to 18m.

BS 9991 also provides guidance on private balconies which requires the balconies to not have to escape through more than one access room, the interior of the access room should be clearly visible unless provided with a fire detection and alarm system, any cooking risk in the access room should be enclosed in fire-resisting construction unless the cooking facility is remote from the escape routes and the access room is provided with detection and a detection system should be provided in the access room if the distance on the balcony exceeds 7.5m.

Whilst the requirements are different for communal roof terraces and private terraces the risk that the guidance is trying to address is that of a fire developing in an access room that develops to such a size that it would compromise the escape route from the terrace before occupants can escape.

The fire safety measures within the proposals also aim to address this risk albeit via an alternative approach, for building A2 and A3, to that outlined in BS 9991 for communal terraces. It should be

noted that in the revised proposals, the terrace at Level 1 in building A1 has been removed. There is still however a similar provision in Building A3.

The risk of a fire developing in the access room to a point prior to occupants escaping is addressed by the following:

- There is a high degree of visual awareness between the access rooms and the external terraces. The roof terraces are accessed by bi-fold glazed screens together with windows in the case of Building A3. This means that occupants on the terrace will be readily aware of a fire.
- The access rooms (i.e. the amenity spaces) will be provided with detection throughout the amenity areas. The roof terraces will also have sounders and the fire detection in this space can be configured such that there is a single stage alarm for this area. This will provide early warning of a fire and allow the occupants to evacuate readily.
- The building is provided with sprinklers to BS EN 12845 and the ancillary spaces are protected to an OH 3 category. This should mean that the sprinklers will activate controlling any fire that occurs within the space.
- The access rooms are low risk areas with limited ignition sources. There are no cooking facilities within these areas and whilst there is a kitchenette this does not contain a cooker.
- The travel distances within the enclosed space will be less than 18m thereby reducing the risk of travel that could also contain smoke albeit limited by the measures above. The heights of the ceilings are also 3.5m which extends the time it would take for smoke to fill to the point where the escape routes become compromised.
- The number of occupants on the residents lounge and roof terrace combined will be less than 60 persons. This will reduce the queuing at exits and therefore speed up the time to evacuation. The doors also open in the direction of escape, further addressing this risk.

BS 9999

Whilst the design follows BS 9991, BS 9999 provides fire safety guidance for non-residential accommodation which the amenity spaces could be deemed to fall under.

The external terraces are in essence inner rooms. Section 16.3.4 of BS 9999 provides guidance on inner rooms and notes that an inner room can be at risk if a fire starts in the access room and to address this risk it recommends the following:

- The occupant capacity of the inner room does not exceed 60 (30 where occupants require assistance escaping). This is achieved in the design proposals within the overall occupancy being limited to 60 persons.
- The inner room is not a bedroom. This is achieved in the design proposals.
- The inner room is entered directly from the access room. This is achieved in the design proposals.
- The escape route from the inner room does not pass through more than one access room. This is achieved in the design proposals.
- The travel distance from any point in the inner room to the exit(s) from the access room does not exceed the allowable one-way travel distance. If BS 9999 was followed a risk profile of B1 could be applied to this area (A B2 risk profile as standard based on the medium fire load but this would be reduced by one due to the provision of the sprinkler system in accordance with BS EN 12845). In accordance with BS 9999 the maximum travel distance is 24m for a B1 risk profile where only the minimum fire protection measures are provided (see Table 11 of BS 9999). To this, a 5% increase could be applied due to the room height being over 3m (Table 14 of BS 9999) and a 15% increase could be applied due to the fire detection and alarm system (Section 18.2 of BS 9999). This would

feasibly allow 28.8m in total however this would be limited to 28m by the guidance in Table 15 of BS 9999. An overall travel distance of 28m would therefore be permitted using the recommendations of BS 9999 in an enclosed room/area. The overall travel distances within the design proposals are within this.

- The access room is not a place of special fire hazard and is in the control of the same occupier as the inner room. This is achieved in the design proposals.
- One of the following arrangements is made:
 - The enclosures (walls or partitions of the inner room stop at least 500mm below the ceiling; or
 - A suitably sited vision panel not less than 0.1m² is located in the door or walls of the inner room, to enable occupants of the inner room to see a fire has started in the outer room; or
 - The access room is protected by an automatic smoke detector that operations an alarm that is immediately audible in the inner room to a sound pressure level in accordance with the minimum recommended in BS 5839-1 or gives an immediate visual alarm conforming to BS EN 54-23 in the inner room if the ambient noise levels are so great as to make an alarm inaudible.

The latter two points are provided by the design proposals by virtue of the significant levels of glazing between the two spaces and the provision of the fire detection and alarm system to cover this area.

3 Amendments to the design since the planning application

In the pre-application information issued to the HSE there were three instances where the roof gardens were only accessed from amenity accommodation. These were Level 1 of Building A1, Level 14 of Building A2 and Level 1 of Building A3. It appears that the latter was not commented on in the HSE response but since this is the same case, we have addressed this within this note for completeness. In the new planning documentation two of the terraces are still present. Access to the terraces remained unchanged at Level 1 of Building A3. The terrace at Level 1 in Building A1 has been removed. The terrace of Building A2 at Level 14 changed from the pre-application information with access now provided via a protected corridor as shown in Figure 1 below.

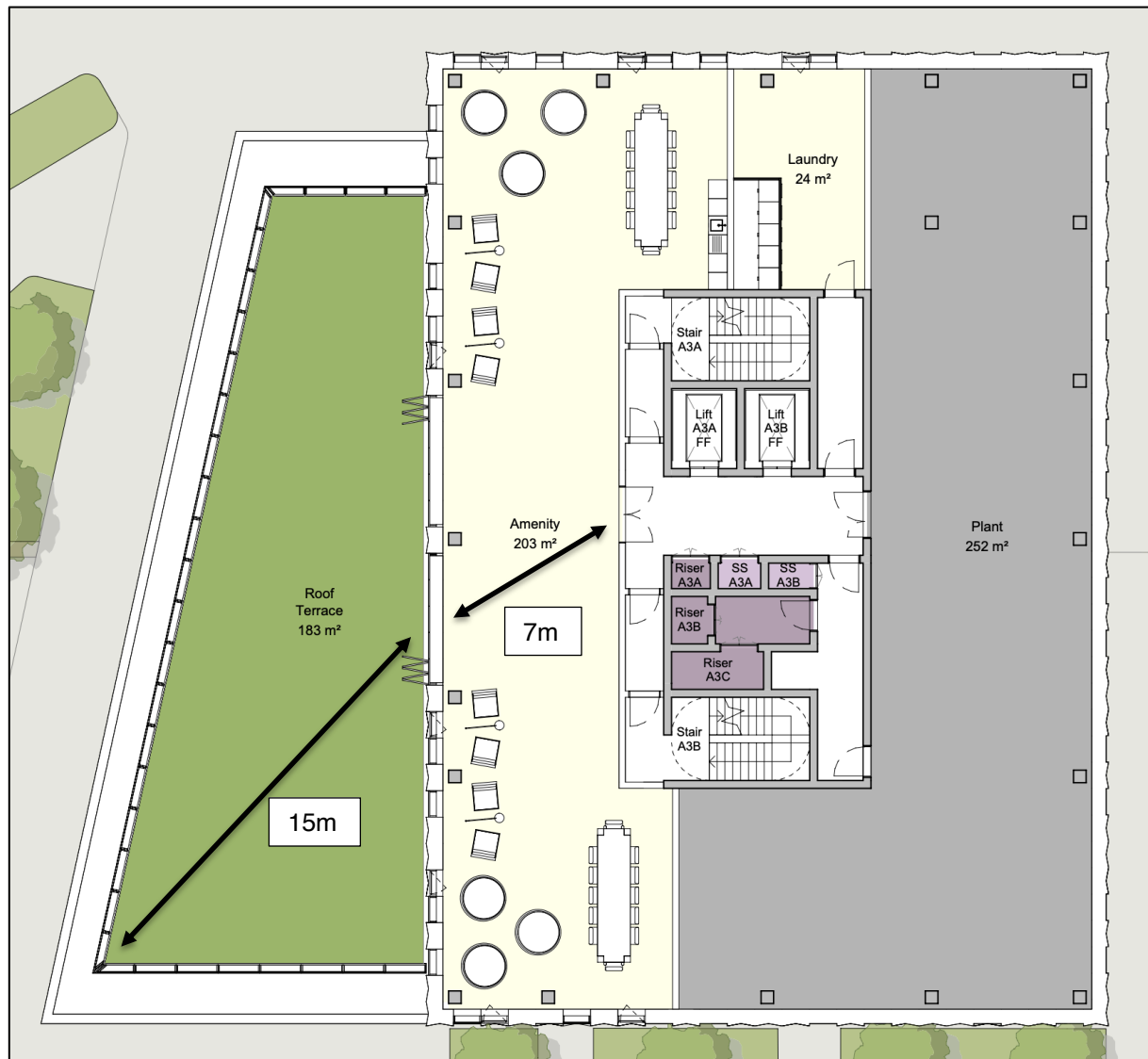
There is no specific smoke shaft serving the immediate section of corridor however as occupants are escaping the doors to the roof terraces will vent smoke and if smoke flows into the lift lobby of Core A2A then this will be vented by the smoke shaft serving this lobby. In addition, the rooms opening into the corridor are low risk and provided with automatic sprinkler protection. It is therefore considered that the proposal for this level meets the HSE advice in their pre-application advice.

Figure 2: Building A1 - Level 1



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Figure 3: Building A3 – Level 1



For the terrace area in Building A3, the rationale in Section 2 has been followed in the alternate approach and we ask that this be considered in the review.

4 Conclusion

The fire safety strategy for the building aims to satisfy the functional requirements of the Building Regulations. Regulation B1 requires *'The building shall be designed and constructed so that there are appropriate provisions for the early warning of fire, and appropriate means of escape in case of fire from the building to a place of safety outside the building capable of being safely and effectively used at all material times'*. BS 9991 provides guidance and is one way of meeting this requirement and BS 9999 provides supplementary guidance.

The proposals adopt an alternate approach to the guidance within BS9991 with escape from the roof terraces through an access room being supported by a limited fire load, managed occupancy numbers, a comprehensive fire detection and alarm system, automatic sprinklers and limited travel distances. It is considered that the proposal meets the intent of what the guidance of BS 9991 is trying to achieve, and this is supported by the proposals being compliant with other fire safety guidance such as BS 9999. Based on these measures we consider the proposals as shown to meet the functional

requirement of the Building Regulations, and we ask that the HSE consider these alternate proposals in their planning review.