BB7

Richmond College

Fire Safety Strategy Report

November 2018

Revision History

Version	Date	Author	Comments
1.0	12.11.2018	Hrachya Muradyan	First issue for comments
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1 Introduction

1.1 Instructions

BB7 has been commissioned by Clarion Housing Group to produce the fire strategy report for the residential development in Twickenham (Borough of Richmond upon Thames, London).

This report outlines the proposed fire safety strategy following a period of design development.

1.2 Drawings

This report is based on, and should be read in conjunction with, the drawings issued by BPTW partnership.

Issued drawings are as follows:

Table 1 – provided drawings

Designation	Revision	Name
D(B1)100 - D(B1)104	C	Block B1 plans
D(B2)100 - D(B2)104	C	Block B2 plans
D(B3)100 - D(B3)105	C	Block B3 plans
D(B4)100 - D(B4)105	D	Block B4 plans
D(B5)100 - D(B5)105	C	Block B5 plans
D(T1)100 - D(T1)102	A	House Terrace 1
D(T2)100 - D(T2)102	A	House Terrace 2
D(T3)100 - D(T3)102	A	House Terrace 3
D(T4)100 - D(T4)102	A	House Terrace 3
D600	C	Site Ground floor Plan
D605	C	Site Roof Plan

Samples of drawings provided in this report are for illustrative purposes only and reference should be made to the appropriate architect's drawings for full details.

1.3 Limitations

This document has been produced to address compliance with Part B (Fire Safety) of the Building Regulations for England and Wales, or some specific part of these regulations by a competent person who has exercised all reasonable skill, care and due diligence based on information and knowledge available at the time.

The Building Regulations deal explicitly with life safety and the aim of this report is to inform the design team of the recommended measures and to assist in design submission for approval. Whilst fire safety measures introduced for compliance with this life safety objective have a beneficial effect on reducing potential fire losses and extent of any consequential damage, it cannot be guaranteed that a fire will not start on the premises. In view of this the opinion of the nominated insurance company and any other interested stakeholders should be sought.

Information, advice and intellectual property contained within this report is for sole use in connection with the project as named on the cover and should not be used in relation to any other project. The report is not for the use of or reliance on, by third parties and is considered at all stages to remain confidential even after issue to the client. Circulation within the design team is permitted to assist with supplementary design purposes and/or for inclusion with a broader combined regulation submission. Reproduction and wider circulation of the report should only be done in its entirety and with the express permission of the client. It is not permitted to publish or reference any part of this document in any periodical, published document, statement or circular nor online on any website or social media without the written consent of a BB7 director following approval of its form and content.

Systems and measures described establish a principle on which reliance may be placed by other parts of the fire strategy. This is done so on the assumption that all work will be done using appropriate materials and in a workmanlike manner, as per Building Regulations 2010.

Whilst this document details the fundamental strategy for a safe building, there is an ongoing management obligation to ensure that not only the active and passive fire protection facilities are correctly maintained, but that there are appropriate management procedures in place to facilitate a safe evacuation in the event of a fire. This is a fundamental requirement of life safety and is enforceable under the Regulatory Reform (Fire Safety) Order 2005.

Any agreement reached in principle with the statutory authorities should be considered to remain a design risk until formally approved.

2 Brief description of the project

Proposed development is located at Egerton Road and Craneford Way, London and will be constructed comprising 5 apartment blocks and 44 town houses of four different types. Each core of the apartment blocks will be served by a single stair. There will be no basement level.

General information about the designed buildings and layout on site are presented in table 2 and figure 1 below.

Table 2 – general information

	Number of floors	Small Building?*
Block B1	G+3	Yes
Block B2	G+3	Yes
Block B3	G+4	No
Block B4	G+4	No
Block B5	G+4	No
House Terrace 1	G+2	-
House Terrace 2	G+2	-
House Terrace 3	G+2	-
House Terrace 4	G+2	-

* As defined by clause 7.5 of BS9991:2015

3 Statutory control

3.1 The Building Regulations 2010

All buildings in England and Wales must comply with the requirements of the Building Regulations 2010 Part B (fire safety). The regulations provide a series of functional objectives which must be satisfied for approval.

For fire safety, the functional objectives of the Building Regulations relate to:

- 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

One set of guidance for compliance with the minimum standard required by the regulations is set out in BS9991:2015.

Other relevant standards may be used in support of a prescriptive approach and are, where appropriate, referenced within this report. There is, however, no statutory requirement to adopt the recommendations of these prescriptive standards if adequate evidence is provided to demonstrate that the functional objectives of the Building Regulations will be met in some other way.

3.2 Regulatory Reform (Fire Safety) Order 2005

The Fire Precautions Act, Fire Precautions (Workplace) Regulations and other selected fire safety legislation have been repealed and replaced by the Regulatory Reform (Fire Safety) Order (FSO) implemented in April 2006.

The Building Regulations continue to apply to new buildings and extensions but virtually all buildings (except dwellings) are also subject to the FSO when they are occupied. It is a requirement of the legislation that a fire risk assessment be carried out, and where 5 or more people are employed, this assessment should be written and available for inspection by the fire authority if requested.

The FSO will apply to the common parts of Richmond College development and a risk assessment will need to be carried out shortly after completion.

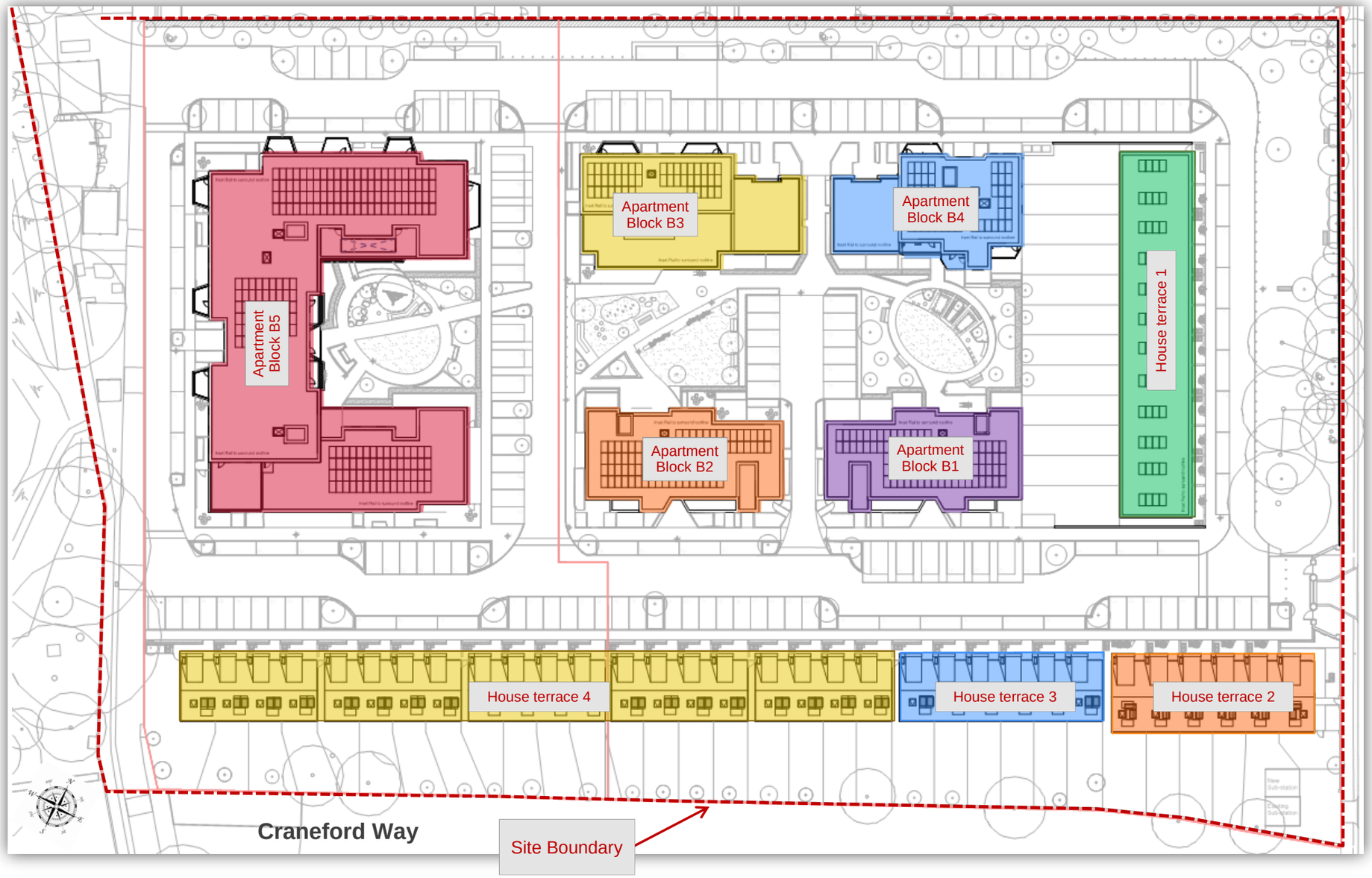


Figure 1 – general layout of the blocks on site

4 Fire detection and alarm

4.1 Apartments

The minimum acceptable fire detection and alarm system for residential apartments is Grade D LD2 in accordance with BS 5839-6:2013. The detectors will cover circulation areas of apartments, the living rooms and the kitchens.

LD1 fire detection and alarm system will be installed within duplex apartments that have a floor level higher than 4.5m above ground. Detectors will be installed in all circulation areas and all rooms or areas in which fire might start, other than toilets, bathrooms or shower rooms.

Where access to the private balconies will be provided from a space with an unenclosed kitchen, installation of additional sounders should be considered on the balconies.

If the balcony is accessed from another part of the apartment (e.g. bedroom), the interior of that room should be clearly visible from all parts of the balcony. If it is not visible then the access room should be provided with fire detection.

4.2 Residential common corridors/lobbies

Smoke detectors will also be installed within the residential common corridors/lobbies. These detectors are not required to activate any alarm devices but solely to activate the smoke control system for the appropriate common escape corridor.

For the open-air roof terraces we would recommend that a sounder/beacon(s) is installed on the terrace. It should be linked to the smoke detectors within the common corridor that is giving an access to the particular terrace. This is to alert the occupants of the terrace and allow time to evacuate via the closest stair core.

4.3 Houses

A category LD2 fire detection and alarm system will be installed in all four house types.

5 Means of escape

5.1 Evacuation strategy

In the residential parts of the building a ‘Stay-put’ strategy will be adopted. The principle of such a strategy is that only the occupants of the apartment containing the fire (the ‘flat of origin’) are expected to make an escape. This approach is supported by national guidance for the Building Regulations and is based on the following assumptions:

- A fire will generally only occur in a flat
- There is no reliance on external rescue
- There is a high degree of compartmentation and therefore a low probability that there will be fire spread beyond the flat of origin
- If a fire does occur within the common parts, the materials and construction used in these areas should limit the development and spread of fire

Houses will adopt a simultaneous evacuation strategy where all the occupants of the particular house should be evacuated immediately on activation of the fire alarm.

5.2 Escape within the apartments

5.2.1 General recommendations

BS9991:2015 recommends four acceptable solutions for internal layout of the apartments:

1. Protected entrance hall which leads to all habitable rooms. The distance from flat entrance door to the door of any habitable room should not exceed 9m.

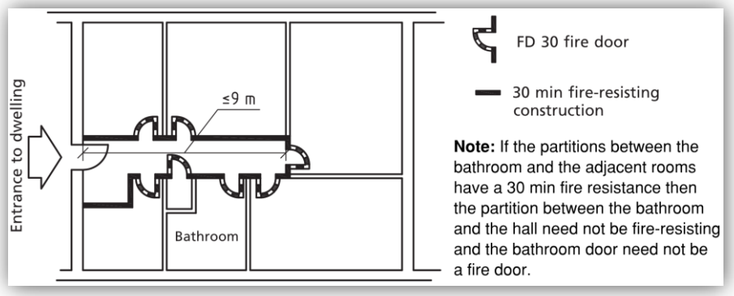


Figure 2 - arrangment with protected entrance hall (Source: BS9991 Figure 11)

2. Studio Apartment with travel distance from the furthest point of the apartment to the apartment entrance door not exceeding 9m. Cooking facilities should be arranged so they are remote from the entrance door and will not hamper the escape route. Travel distance limit of 9m may be extended up to 20m with the installation of a sprinkler system and LD1 fire detection and alarm system.

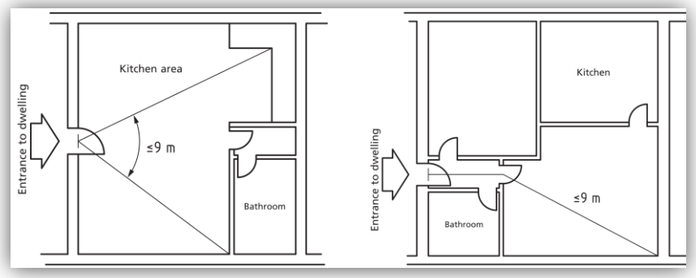


Figure 3- restricted distance from the furthest point
(Source: BS9991 Figure 10)

3. All the habitable rooms have direct access to the apartment entrance hall with an alternative exit provided from the apartment.

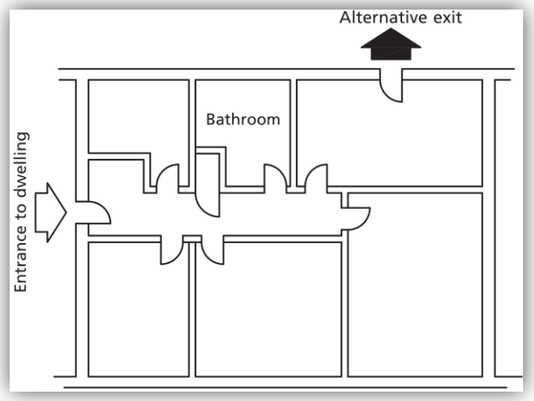


Figure 4 - arrangment with entrance hall and alternative exit
(Source: BS9991 Figure 12a)

4. Open Plan Living with an alternative exit provided from the part of the apartment containing the bedrooms. Where not all the habitable rooms have direct access to the apartment entrance, the bedrooms should be separated from the living accommodation by fire-resisting construction and fire doors.

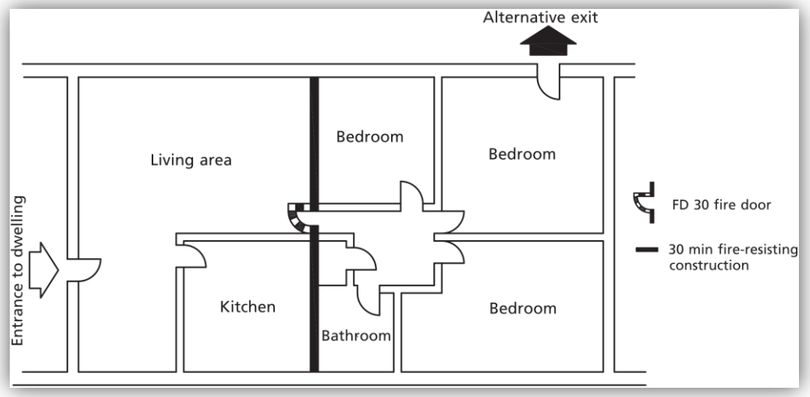


Figure 5: arrangment with alternative exit
(Source: BS9991 Figure 12b)

For the apartments designed on two different levels, and where there is no floor level higher than 4.5m above the ground level, BS9991:2015 recommends that the internal stairway should be constructed as a protected stairway, unless alternative egress windows are provided from each bedroom. For the apartments that have a floor level that is situated higher than 4.5 m above the ground level, protected stairway should be provided together with Grade D LD1 fire detection and alarm system in accordance with BS 5839-6:2013 installed throughout the apartment.

5.2.2 Richmond College development

Three apartment types are identified:

- apartments with internal protected entrance hall (figure 2)
- apartments with an alternative exit from the bedroom area (figure 5)
- apartments on two different levels (duplex)

For the apartments with internal protected hallways, travel distance within the halls, measured from the entrance door to the door to any habitable room, will be less than 9m. This is compliant with the recommendation presented in figure 2 above. This hallway should be separated from habitable rooms with 30min fire resistant walls and doors. Where there is a fire resistant separation between the bathroom and habitable room, separation between the bathroom and internal hallway can be disregarded.

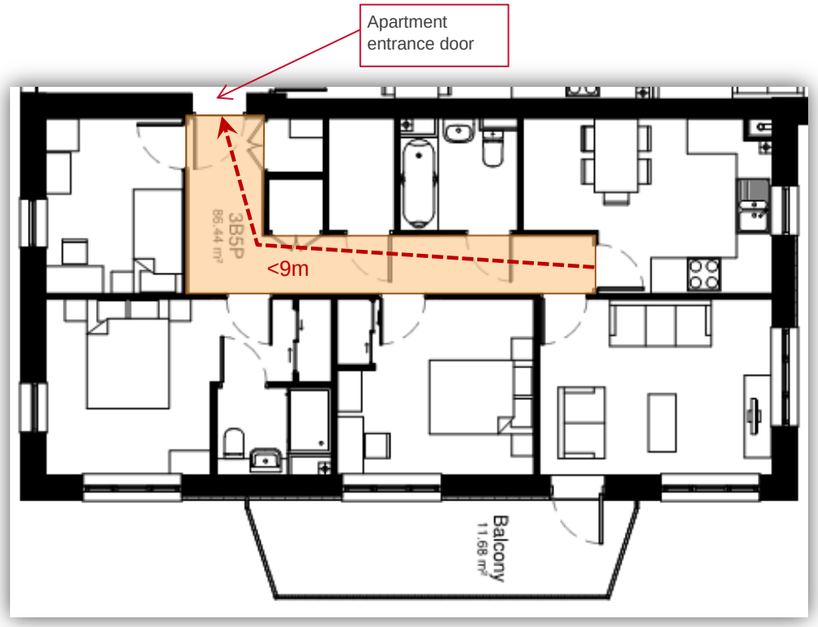


Figure 6- example of travel distance within the apartment internal hallway (block B5)

There will be a number of apartments designed as open plan with an alternative exit from the bedroom area. For such apartments the bedroom zone should be separated from the living zone by 30min fire resisting walls and doors. This will be in line with the option shown in figure 5.

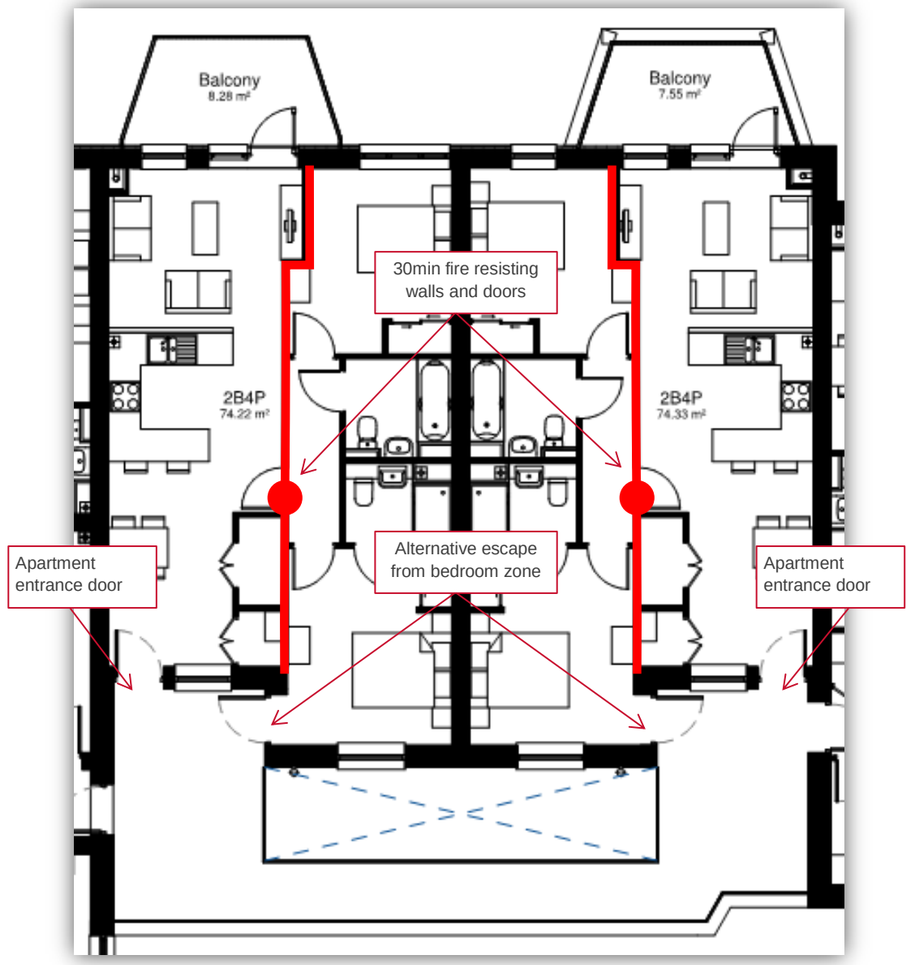


Figure 7 example of the apartment with an alternative exit (block B5)

All the duplex apartments that are proposed in blocks B1-B4 will be provided with an enclosed stairway. This enclosed stairway will provide access to all habitable rooms and will discharge to the final exit from the apartment. This will be in line with the standard recommendations.

For each of the blocks B1-B4 there will be two duplex apartments on the ground and first floor levels that are accessed from ground floor level and two duplex apartments on the second and third floor levels that are accessed from second floor level.

An LD1 fire detection and alarm system will be installed for the duplex apartments that have a floor level higher than 4.5m above ground (apartments on second and third levels).

Access to these higher duplex apartments will be provided by a single staircase that will serve only two duplex apartments in each block. Considering that there will be ground plus three floors in total and no more than two apartments will be served by each staircase, we propose that these parts of the blocks can be treated as a small building and the provision of a 1.0m^2 AOV at the top of the staircase will allow opening of the upper duplex apartments directly into the staircase (see also sections 5.4.1 and 5.4.2).

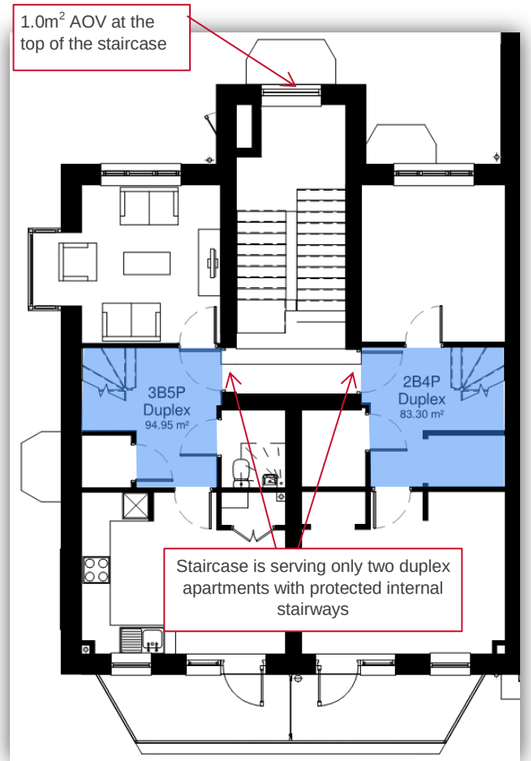


Figure 8 – example of the proposed duplex apartment (block 4)

5.3 Town houses

There are four house types designed for the Richmond College development. All the houses will comprise of ground plus two upper levels.

Proposed layouts show that internal protected stairways will be provided for all four house types and they will deliver directly to a final exit. These internal protected stairways should be enclosed with 30 min fire resisting walls and doors

Proposed designs for town houses are in line with the recommendations of BS9991:2015 section 6.3b) and therefore they are considered acceptable.

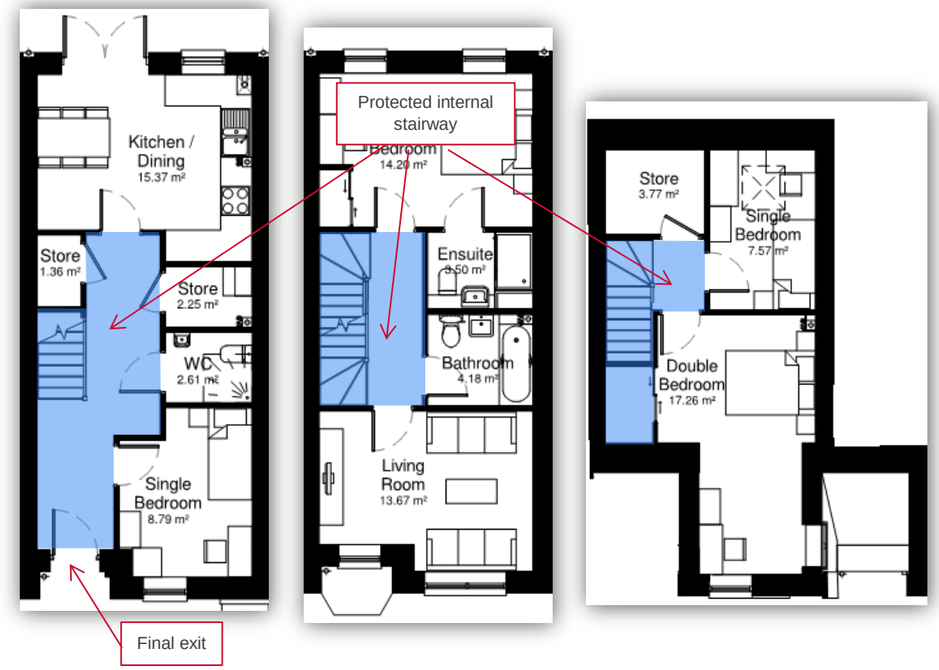


Figure 9 example of the proposed town house (house terrace 2)

5.4 Escape in common parts of the apartment blocks

5.4.1 General recommendations

Special measures should be provided to safeguard escaping occupants from smoke and heat exposure in case of fire. These measures include separation of every apartment from the common stairs by means of a protected lobby or common corridor and limitation of travel distance.

For Small buildings where:

- Height of the top storey does not exceed 11m
- There are no more than 3 storeys above Ground level
- Stair is not connected to a covered car park unless it is provided with sufficient smoke ventilation system
- Stair does not serve any ancillary accommodation unless a separating ventilated lobby is provided
- 1.0m^2 openable vent is provided at the top of the stair

the distance from the furthest apartment entrance door to the escape stair should not exceed 4.5m (7.5m if smoke control system will be provided – see figures 10 and 11)

Apartment doors can open into the staircase if no more than two apartments with internal protected hallways are provided at each storey. In this case an AOV should be provided at the top of the staircase instead of the manual openable vent (OV).

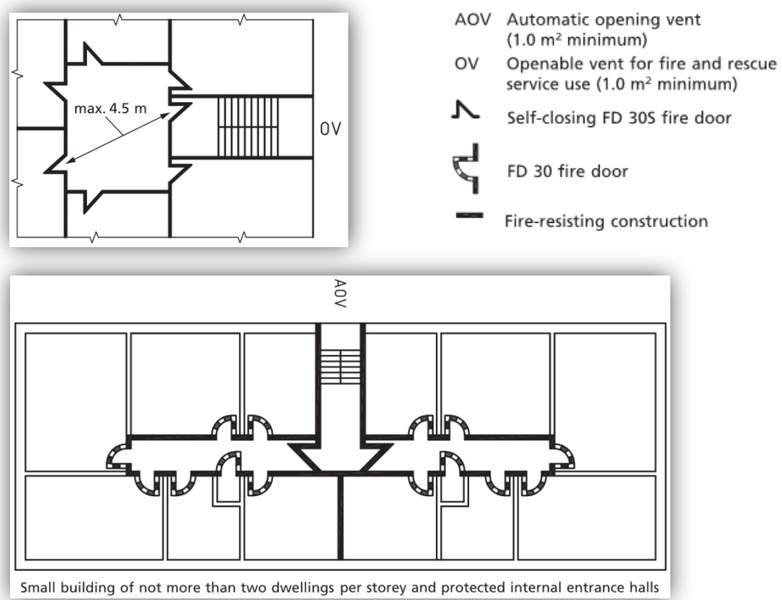


Figure 10 - small single stair buildings (Source: BS9991 Figure 8)

For single stair buildings where the height is more than 11m, ventilation of the protected corridors or lobbies should be provided. Travel distance from the apartment entrance door to the vented section of corridor (stair lobby) should not exceed 7.5m (figure 11a). In this case any apartment, storage space or any other space containing a potential fire hazard should not open into the ventilated lobby. Alternatively, the entire corridor should be vented and the distance from the apartment entrance door to the stair door should not exceed 7.5m (figure 11b). BS9991 allows extension of the travel distance up to 15m if a sprinkler system will be installed throughout the building.

Ventilation of the corridors/lobbies can be provided by means of a natural or mechanical ventilation system.

In the case of a natural ventilation system, smoke should be discharged directly to the outside through 1.5m^2 vents at each floor, installed on the external wall or to a smoke shaft through 1.0m^2 dampers installed on each floor. The smoke shaft should have the following parameters:

- minimum cross sectional area is 1.5m^2 (with minimum dimension of 0.85m)
- closed at the bottom
- extended for a minimum length of 2.5m above the ceiling of the highest storey served

Together with ventilation of the common corridors or lobbies, ventilation of the stairs should be provided through a 1.0m^2 opening at the top of the staircase.

These two systems should be activated simultaneously on detection of smoke in the common spaces providing access to the apartments.

Alternatively, for the ventilation of the common corridors/lobbies, a mechanical smoke ventilation system (MSVS) can be installed. This can lessen the required cross-sectional area of the smoke shaft. Typically required area for such a system is around 0.6-0.8m^2. In addition, installation of mechanical smoke ventilation may allow travel distances greater than the limits of 7.5m and 15m but will need to be demonstrated with computer modelling (CFD analysis).

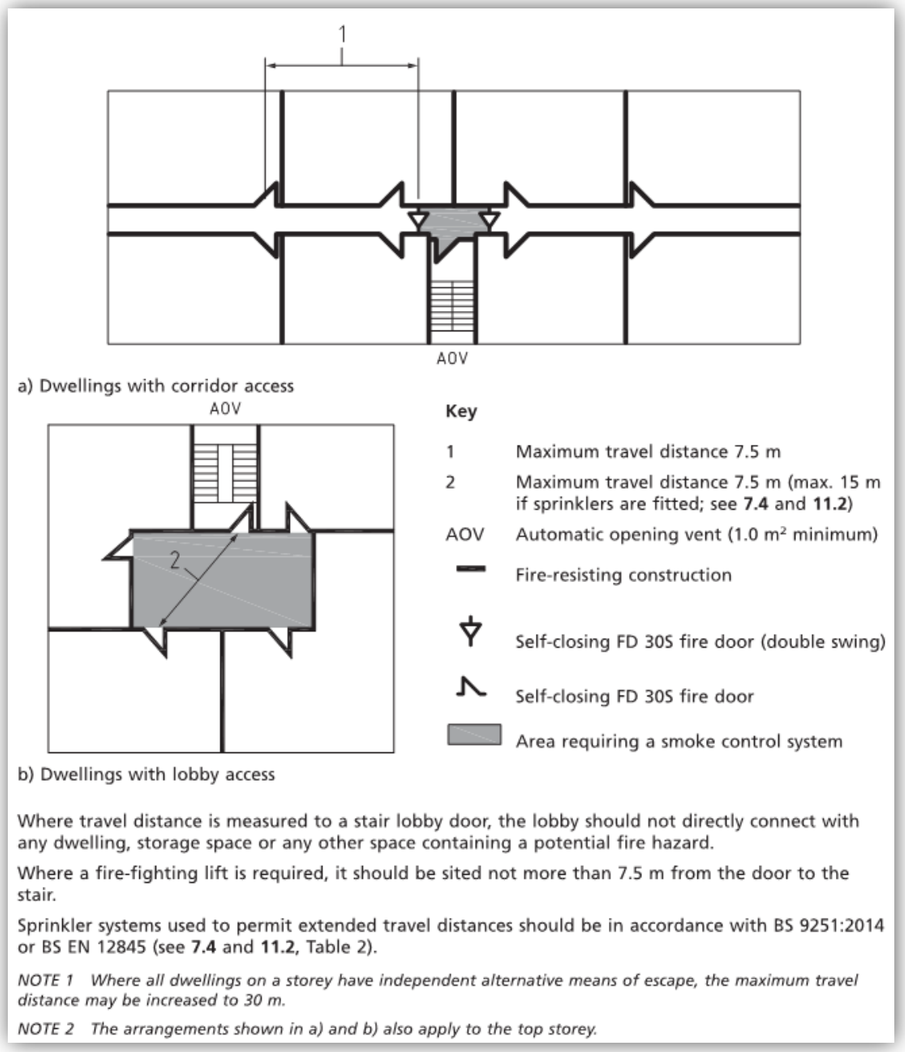


Figure 11 – single escape route to the single stair (Source: BS9991 Figure 6)

5.4.2 Richmond College development

Designed layouts of the common escape corridors will show all the above described options.

For the corridors of the blocks B1 to B4, apartments will open into the vented part of the corridor. Travel distance within the ventilated corridor from the furthest apartment door to the staircase door will not exceed 7.5m. This will be in line with the recommendations presented in figure 11b).

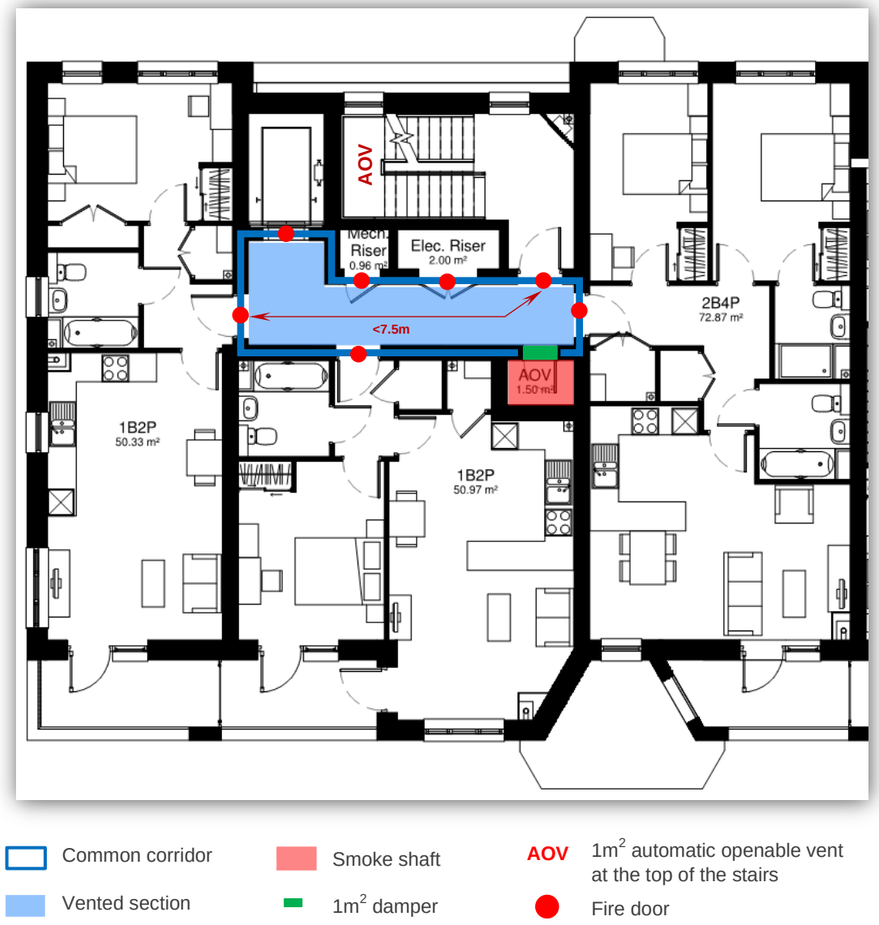


Figure 12 - escape within common corridors (block B2)

A separate stair will serve the duplexes in blocks B1 to B4 with two duplexes per block. These parts of the blocks will have three floors above ground level and the duplex apartments situated on second and third levels will be served by the staircase. Duplex apartments that are on ground and first levels will be provided with their own exits. As the duplex apartments are isolated from the rest of the block they can be considered as small buildings and therefore relevant provisions of the standard recommendations are applied. This will include a 1.0m^2 AOV at the top of the staircase be activated upon detection of smoke anywhere within the staircase. This will be in line with the recommendations shown in figure 10 (see also section 5.2.2 and figure 8).

For the block B5 corridors are designed in line with the recommendations presented in figure 11a). The distance from the furthest apartment entrance door up to the ventilated lobby in front of the staircase will not exceed 7.5m. Ventilation to the stair lobby will be provided through the natural smoke shaft with the cross-sectional area of not less than 1.5m^2 and any single dimension of not less than 0.85m. 1.0m^2 dampers will be provided to the shaft from each floor level.

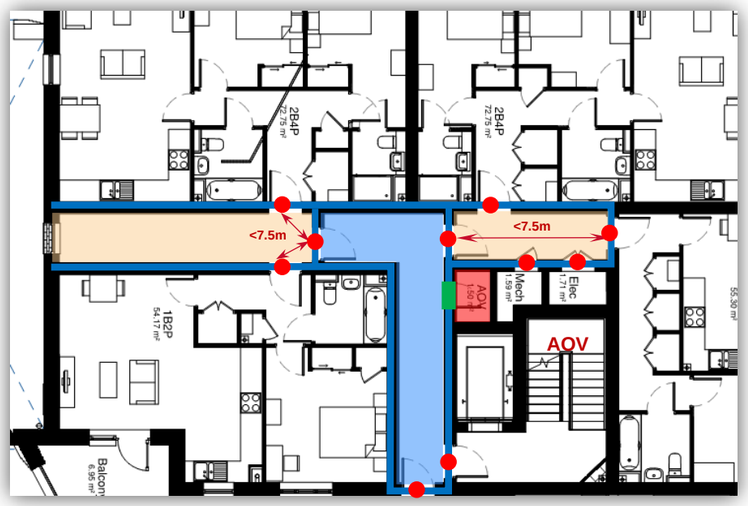


Figure 13 - escape within common corridors (block B5)

A number of apartments on the upper levels of block B5 will be approached via an open balcony. The current design shows open void connections between the balconies on each floor. Smoke from a fire within one of these apartments could travel through the voids to the upper level balconies. In addition, where the width of the soffit above the balcony exceeds 2m, there will be a risk of smoke spread along the balcony (see BS9991:2015 clause 7.3 Note 1). To minimize the risks for the building occupants on their escape route, BS9991:2015 recommends the following measures:

- 30 min fire-resisting construction should be provided for structure of the balcony (in terms of integrity and insulation). The walking surface of the balcony should not be perforated.
- External envelope of the building façade adjoining the balcony should provide at least 30 min fire resistance except any window opening above 1.1m from balcony floor level. Any door from the apartment to the balcony should be 30 min fire resisting and equipped with self-closing device.
- The balcony should be at least 1.8m away from the building façade unless it is proven by calculation that there will be no hazardous heat exposure to the walkway from a fire in the adjacent apartment.
- The width of the soffit above the balcony should not be more than 2.0m unless sufficient downstands (typically 0.3m to 0.6m below any other beam) are installed to channel the smoke through the soffit to the outside.
- Surface materials of the facing wall, balcony soffit and balustrade should be of a Class 0 rating in terms of surface spread of flame.

Figure 14 – balcony approach (block B5)

BS9991:2015 recommends that when protected escape routes form an internal angle with the external enclosure of the building, any opening from the adjacent accommodation to the external façade of the building should be at least 1.8m from any opening to the protected route.

Such layouts are identified in block B5 on ground and typical upper floors.

On ground floor there will be an internal angle with final exit route and the nearest opening from the accommodation will be at a distance of at least 1.8m and therefore it is considered acceptable.

For the upper typical floors, the escape route via the open balcony will be form an internal angle with the external façade of the building and the nearest opening from the accommodation is designed adjacent to the balcony balustrade. Considering the open condition of the balcony and its width and also proposed position of the door to the common escape corridor leading to the staircase, we propose that the designed layout is acceptable with respect to the recommendations of BS9991 since the distance from the accommodation window to the escape route will be more than 1.8m.

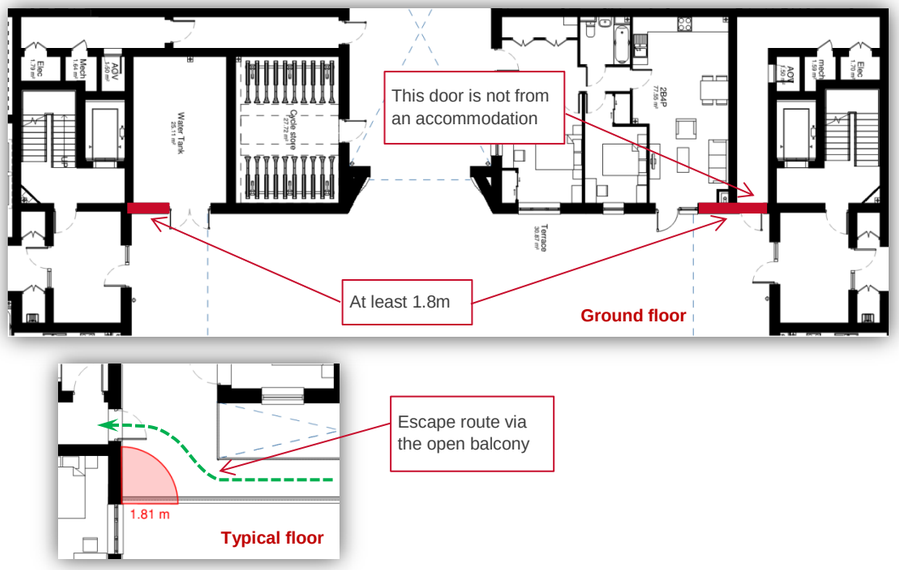


Figure 15 - protected routes forming an internal angle (block B5)

5.5 Final exits

BS9991 recommends that the escape staircase should discharge to the outside directly or via a passageway provided with at least the same protection as the staircase itself.

For this reason all the connections to the final passages on ground floor should be lobbied and be provided with appropriate ventilation.

The corridors/lobbies separating the apartments from the staircase (or final passage) will require the same ventilation system recommended for the residential common corridors/lobbies (see section 5.4.1).

For the connections to other spaces ancillary to the main use of the building, the lobbies should be provided with at least 1.0m^2 permanent ventilation.

In the block B4 service shaft with a water riser will open into the staircase and final exit route from the stairs on ground floor. Considering that the shaft will not contain potential source of fire and also will be enclosed with fire resisting construction from all the sides with fire doors to the staircase, we propose that it should be acceptable.

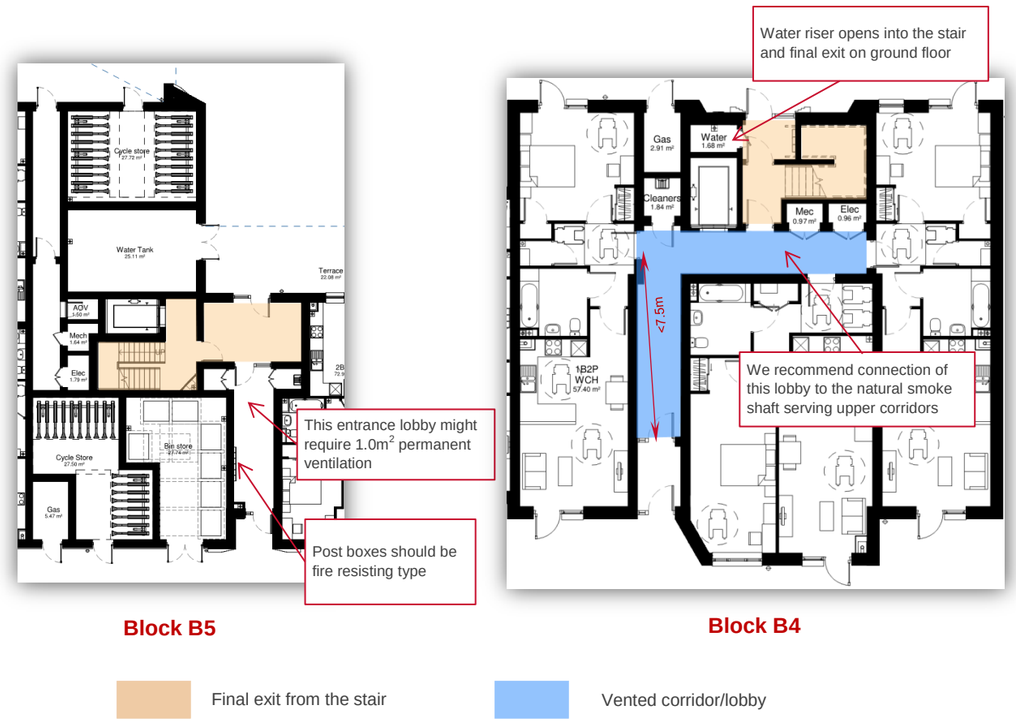


Figure 16 – final exits (blocks B4 and B5)

For block B3 the lobby on ground floor will be common with the bike store, electrical riser room, cleaner's storage and a ground floor apartment. Although ventilation requirements for the lobby separating the apartment from the staircase are different from that required for ancillary spaces, we propose that provision of ventilation as for the apartment lobby will be adequate to cover both situations. As such, we recommend connection of this lobby to the natural smoke shaft serving upper common residential corridors. This recommendation will be applicable to block B4 as well.

Figure 17 – final exit (blocks B3)

Layouts for blocks B1 and B2 will be similar (mirrored). A sterile escape route will be available from the staircase to the outside. Although there will also be a connection to the common corridor serving ground floor apartments and therefore this corridor should be provided with appropriate ventilation. As for the blocks B3 and B4, we recommend that natural ventilation can be provided to this corridor by connecting it to the smoke shaft serving the upper common residential corridors.

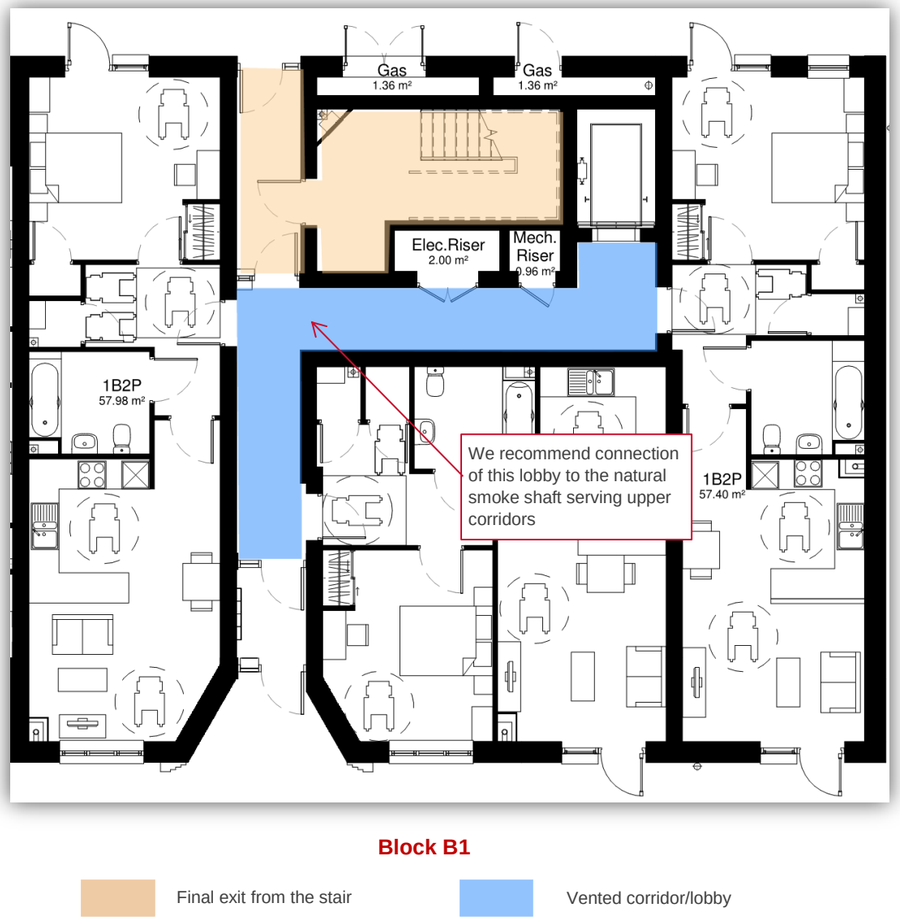


Figure 18 – final exits (blocks B1 and B2)

5.6 Emergency lighting and fire signage

There is no requirement to use fire signage within apartments or for exits in common use.

Fire resisting doors will be provided with signage meeting the recommendations of BS ISO 3864-1 depending on their method of closure, namely:

- to be kept closed when not in use
- to be kept locked when not in use
- held open by an automatic release mechanism.

Emergency lighting, meeting the recommendations of BS 5266-1, should be provided in:

- all common escape routes (including external escape routes)
- ancillary accommodations normally accessible to the occupants
- electrical rooms

6 Internal fire spread

6.1 Structural fire resistance (FR)

There are three basic goals to achieve when considering provision of fire resistance to the structural elements of the building:

- To protect occupants during evacuation as well as occupants who should stay in their apartments as part of a stay put escape policy.
- To protect firefighters during search and rescue or firefighting operations
- To reduce the danger to neighbouring people or buildings through possible structural collapse or falling debris.

BS9991:2015 table 4 recommends minimum provisions for fire resistance of structural elements of the buildings depending on the height of the top storey floor.

60 minutes fire resistance is required for structural elements of the buildings with the height of the top floor level of more than 5m but less than 18m. The height of all apartment blocks as well as town houses will be in this range.

Fire resistance should be applied to the structural frames; beams; columns; loadbearing walls; upper storey floors (if relevant) and any external wall with less than 100% allowed unprotected area on that elevation (see section 7).

6.2 Compartmentation

To reduce the likelihood of fire and smoke spread throughout the building the following will be constructed as fire compartment walls and floors:

- all upper storey floors of the apartment blocks - 60 minutes FR
- the walls between apartments and corridors - 60 minutes FR
- the walls separating apartments - 60 minutes FR
- the walls enclosing apartment internal protected hallways or internal protected stairways of the duplex apartments - 30 minutes FR
- the walls separating living and sleeping zones (where relevant) - 30 minutes FR
- the walls enclosing the internal protected stairways of the houses - 30 minutes FR
- Services passing through the compartment floors should be enclosed within the protected shafts with fire resistance matching the resistance of the structural elements of the building. The doors should have at least half of the fire resistance of the walls but not less than 30 minutes.

6.3 Fire doors (FD)

The following fire doors should be provided:

- apartment entrance doors - FD30S (SC);
- the doors to apartment protected entrance hallways and to protected stairways of the duplex apartments – FD30;
- the doors to protected stairs of the houses – FD30;
- the doors to protected service shafts - FD30 (KLS);
- the doors to protected service shafts that are open into final passageway from the stair - FD30S (KLS);
- the doors into stair from corridor - FD30S (SC);
- the doors to protected lobbies or corridors– FD30S (SC);

S denotes that a smoke seal is required; (SC) indicates self-closer device required and (KLS) means keep locked, shut.

Fire doors to cupboards and to service ducts, which are normally kept locked, do not need to be fitted with a self-closing device.

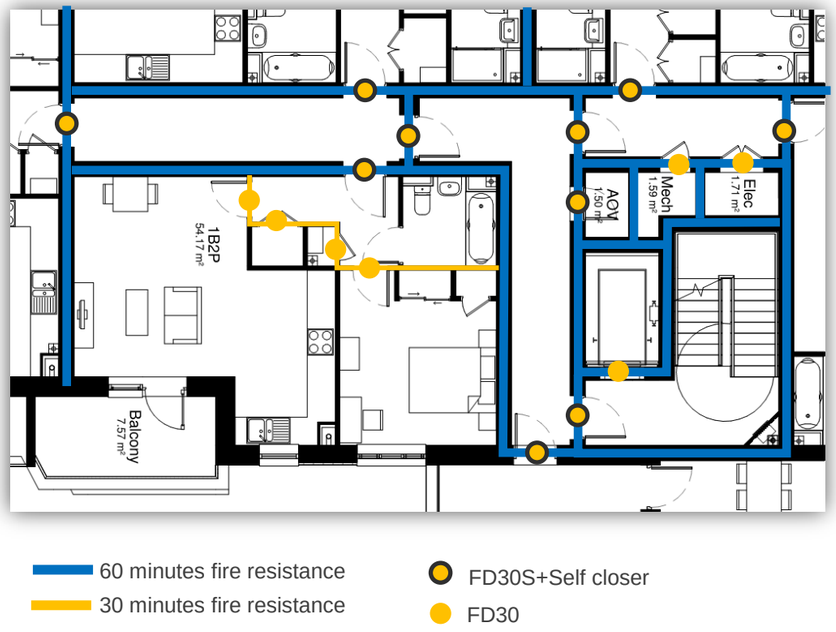


Figure 19 – indicative example of fire compartmentationon (block B5)

This figure is provided to demonstrate the principles of fire separation and should not be regarded as fire compartmentation drawing.

6.4 Internal Linings

Limitation of fire spread inside the building should be accomplished by provision of appropriate lining materials for wall and ceiling coverings. Provided materials should conform to the National classifications.

Table 3 Classification of wall and ceiling linings
(Source: BS9991 clause 20.1)

Location	National Class	European Class
Small rooms of area not more than $4m^2$	3	D-s3, d2
Circulation spaces within apartments / houses	1	C-s3, d2
Other circulation spaces (including escape routes)	0	B-s3, d2

It should be noted that lining materials do not include paint finishes or wallpaper.

7 External Fire Spread

7.1 Boundaries

Fire can spread to neighbouring buildings either by direct flame impingement or by piloted ignition when the opposite building façade is exposed to high levels of radiated heat.

Typically flame propagation by direct contact occurs for distances up to 1.0m. At distances greater than 1.0m heat radiation is the main cause of fire spread.

For the proposed development the distance to the relevant boundary from all the facades is greater than 1.0m therefore assessment of the elevations has been carried out in accordance with BR187:2014. The method of enclosing rectangles (ER) was used which allows an estimate of the permissible distance to the relevant boundary in conjunction with the proportion of provided openings (unprotected areas - UA) on the facades.

The basic assumptions for this method are as follows:

- fire will not start in more than one place at the same time
- fire will not spread beyond the fire compartment
- intensity of radiated heat will be the same from all the openings associated with particular fire compartment

Based on this method, the distance to the boundary at more than 5m allows up to 100% unprotected areas for the facades.

It has been measured from scale drawings that the distance from the building façades up to the site boundary line will be no less than 5m and so unprotected areas on the residential facades oriented to the site boundary can be provided with no limitation. This allowance is based on the recommendation that each floor of the buildings will be constructed as a fire compartment floor.

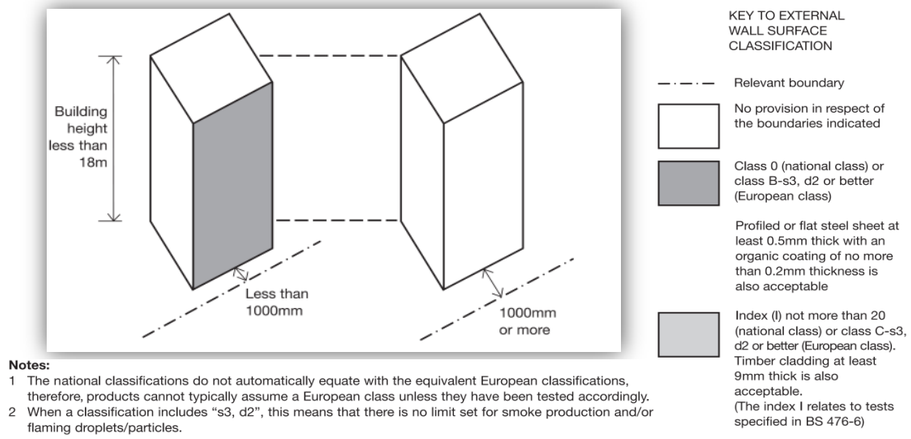
Between two residential blocks in the same site a notional boundary half way between them is assumed. The worst case on site will be between Blocks B3 and B4, with a distance between them of approximately 4m (distance to notional boundary 2m – See figure 21). From BR187 the enclosing rectangle (30 high and 3m wide) at a distance of 2m will allow 100% unprotected area.

7.2 External surfaces

To reduce the likelihood of fire spreading up the external surface of the building, the standard guidance in BS9991 recommends controls over the materials used. Such a risk for fire spread can present the materials used for external claddings and cavities of the facades. Therefore any external wall cladding system should either meet the guidance given in BS9991:2015 section 18.2 or meet the performance criteria described in BR135 “Fire performance of external thermal insulation for walls of multi storey buildings”.

Insulation or filler materials used for external wall constructions of the buildings should be of limited combustibility.

The external surfaces of walls should meet the National classifications as it is shown on figure below.



Notes:
1 The national classifications do not automatically equate with the equivalent European classifications, therefore, products cannot typically assume a European class unless they have been tested accordingly.
2 When a classification includes “s3, d2”, this means that there is no limit set for smoke production and/or flaming droplets/particles.

Figure 20 - provisions for external surfaces of walls

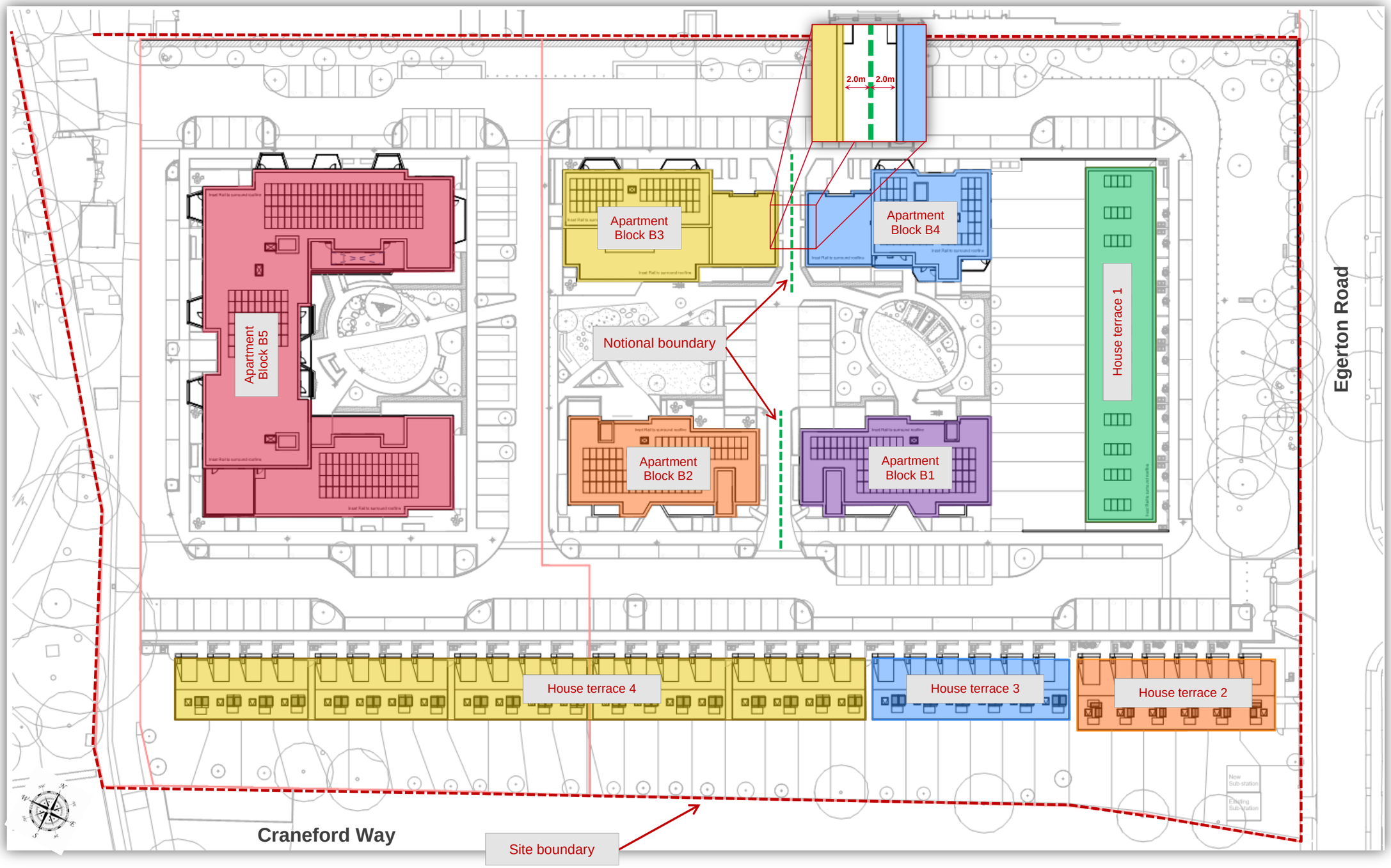


Figure 21 – boundary distances

8 Access for firefighting

8.1 Vehicle and personnel access

The layout and distribution of buildings on site provides sufficient access for fire vehicles.

For all town houses vehicle access will be available to within 45m of all points within each dwelling.

For the apartment blocks dry fire mains will be provided (due to extended distance of over 45m from vehicle access to furthest points within the apartments, measured on a route suitable for laying hose). Inlet connection points for the dry fire mains will be provided on the face of the building so they are clearly visible from the fire appliance. Access will be available for pumping appliances to within 18m to the inlet points.

Outlet points for the fire mains will be provided at each level within protected stair enclosure on the full landings so the distance from outlet point to any point of the floor served, will be no more than 45m, measured on a route suitable for laying fire hose.

8.2 Fire hydrants

Richmond College development is situated in a London metropolitan area, therefore it is assumed that there will be a sufficient number of hydrants in the vicinity and they will be in working order. There is a further assumption that there are no planned upgrades for firefighting water supplies in the vicinity. This is to be clarified with water supply companies and water maps.

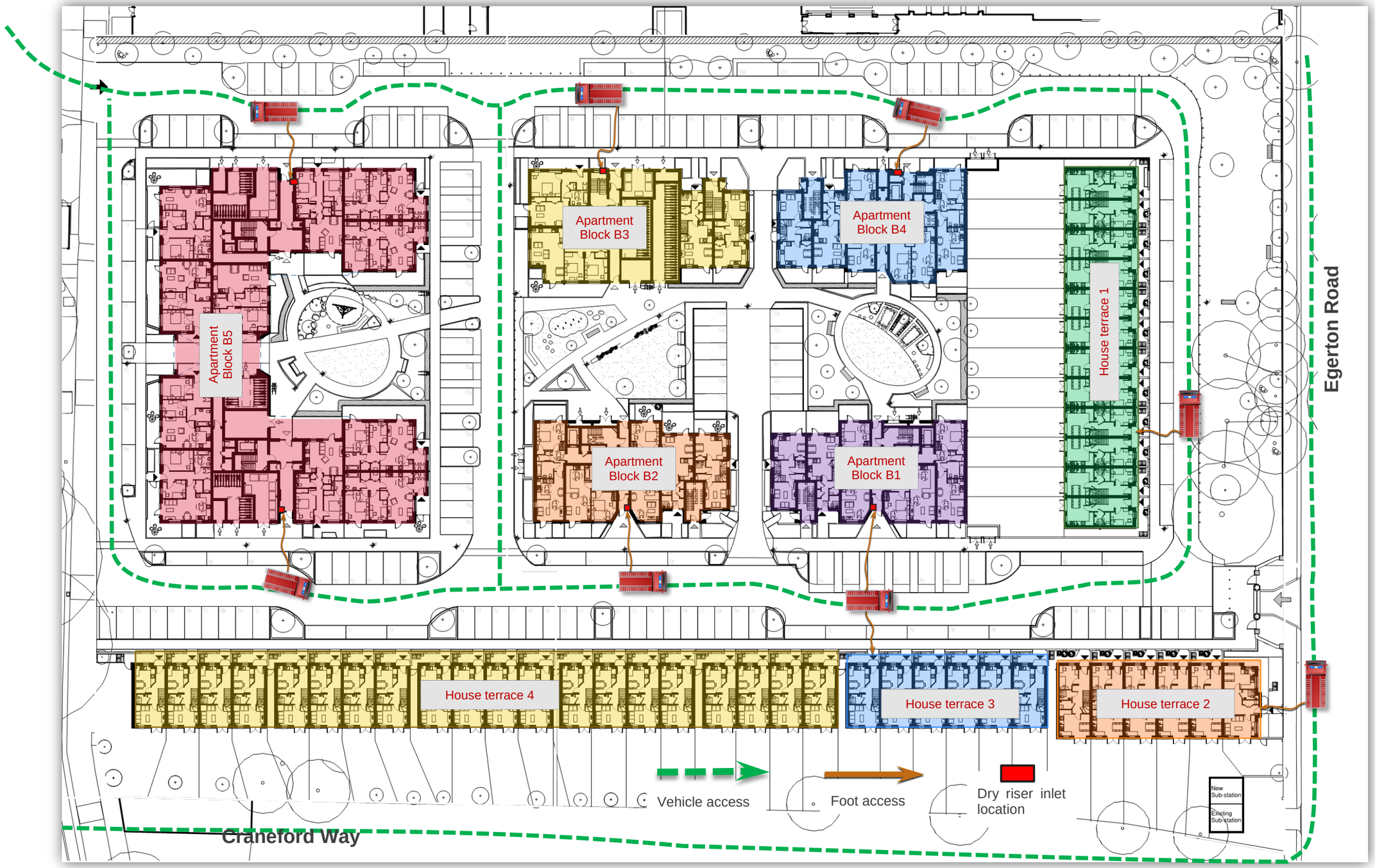


Figure 22 – access for firefighting

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