

Fire Safety Strategy Report

RIBA Stage 3

Partridge Way

TX 141445 (Issue 04)

Wood Green, N22 8DW





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EXECUTIVE SUMMARY

Socotec UK Ltd. have been appointed by Martin Arnold Associates (on behalf of London Borough of Haringey) to provide fire safety consultancy services for the design of the Partridge Way development, in Wood Green, London.

It is intended that this report will inform discussions with the overall design team and may, after design team coordination, be issued to the approving authorities (including their statutory consultation with the local fire and rescue service) in support of the Building Regulations submissions for the project.

This fire safety strategy has been developed to satisfy the life safety requirements with respect to fire under the Building Regulations 2010 (including amendments). This has been achieved through compliance with the prescriptive recommendations for life safety of BS 9991 in the first instance. In line with the objectives set by the client, the strategy has not been developed to include any additional specific measures for the protection of property. However, features that are included for life safety will contribute to some extent to property protection and business continuity.

Apart from where noted in this report, the design will be in accordance with the recommendations of BS 9991. To facilitate ease of review by the building control body, the items departing from BS 9991 guidelines or posing unusual fire safety challenges and variations from the prescriptive guidance documents are identified in Table 1, along with the respective proposed alternative solutions.

This development comprises the construction of a new residential building, featuring 23 residential units located in a nine-storey block adjacent to the Trinity Road/Partridge Way junction. The height of the top-most storey is 23.8 m above ground whilst the total height of the building is 30 m. The building will comprise of a single stair core designed as a firefighting shaft, provided with a firefighting lift and a dry rising main.

A 'stay-put' evacuation regime will be adopted within the residential areas, whereby only the occupants within the apartment of fire origin will be signalled to escape upon detection of a fire. Occupants elsewhere in the building may escape of their own accord, on becoming aware of a fire, or under the direction of the fire and rescue service if deemed necessary.

Common means of escape will be via a protected stair lobby provided with natural smoke ventilation achieved via external AOVs on the building façade for all storeys. Escape from each group of flats will be via a single centrally located stair serving all residential areas of each floor. All flats in this residential building will be provided with a Category 2 automatic water fire suppression system (AWFSS) designed and commissioned in accordance with BS 9251 [1] whilst ancillary areas on the ground floor will be fitted with quick response type sprinkler in accordance with BS EN 12259-1.

The structural elements of the building should achieve a 60-minute fire resistance. The buildings are provided with a high degree of compartmentation, separating all apartments and giving protection to the means of escape. All floors will be designed as compartment floors.

Fire-fighting operations will be carried out through a combination of vehicle perimeter access and fire-fighter access internally via the firefighting shaft. Suitable water supplies will be provided to the site via the public fire hydrant network. Once inside the building, fire-fighters would benefit from the firefighting stair, firefighting lift, dry rising main and the automatic natural smoke venting system.

Non-exhaustive guidance has been provided within the appendices of this report relating to management issues. Under CDM legislation and Regulation 38 of the Building Regulations, this report should be provided to tendering contractors and building management to assist with the ongoing provision of fire safety within the development.

Table 1 – Summary of fire safety design challenges

Design item	Challenge	Proposal	Reference
B1	Ancillary areas have doors that open onto the final discharge routes from the stair	It is proposed to provide a single-lobby separation between the stair and the ancillary areas (i.e. bike & bin and cleaner's store, as well as post and switch rooms)	3.8

1. INTRODUCTION

1.1 Background

- 1.1.1 Socotec have been appointed by Martin Arnold Associates to provide fire safety consultancy services for the design of the Partridge Way development in Wood Green, London.
- 1.1.2 This report documents the fire safety strategy at RIBA Stage 3. As a RIBA Stage 3 report, the proposals are preliminary and as such, will continue to represent an approval risk until an agreement is achieved with the building control (BC) body. It is intended that this report will inform discussions with the overall design team and may, after design team coordination, be issued to the approving authorities (including their statutory consultation with the local fire and rescue service) in support of the Building Regulations submissions for the project.
- 1.1.3 This document is not intended to portray detailed design information. As a strategic document supporting and informing the wider design, it should be read in conjunction with the wider project design documentation.
- 1.1.4 This report should be read in conjunction with the fire safety mark-ups, provided in Appendix B.

1.2 Legislative requirements

- 1.2.1 The strategy has been developed to satisfy the requirements for fire safety under the Building Regulations 2010 (as amended), namely:
- 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 and rescue service
- 1.2.2 The fire safety strategy will be developed to satisfy the requirements for fire safety as set out by the Building Regulations. The strategy has not been developed to address property protection. However, the features that are included for life safety, as required by the Building Regulations 2010, will contribute in some extent to property protection.
- 1.2.3 The strategy has been developed in cognisance of the Construction (Design and Management) Regulations 2015 (CDM 2015) [2], which sets out what designers are required to consider protecting anyone involved in the construction or ongoing use of a project.
- 1.2.4 This strategy does not provide a comprehensive assessment of site fire safety during the building works or the phasing of these works. The Fire Protection Association [3] and the Health and Safety Executive (HSE) [4] issue guidance on identifying and managing fire precautions during the works, which should be consulted by the contractor or their specialist advisor when developing their construction fire safety plan.

1.3 Aims and objectives

- 1.3.1 The overall aim of this report is to present the fire safety strategy. This is supported by several objectives as follows:

- identify fire safety design challenges and outline proposed solutions;
- to present any opportunities for the rationalisation of the fire safety design; and
- raise queries that require response to assist fire strategy development.

1.4 Design basis and guidance

- 1.4.1 In general, the necessary level of life safety will be achieved by utilising the recommendations of BS 9991 [5].
- 1.4.2 Fire engineering principles are employed to support alternative solutions where strict adherence to the codes would conflict with the wider aspirations for the scheme. Departures from the BS 9991 guidance are identified and alternative proposals (and associated analysis approaches) are documented for facilitating review with the project's approvers. In accordance with the fire safety engineering principles detailed in the PD 7974 [6] codes of practice, it is considered appropriate that all fire precautions are determined based on there being one seat of fire (i.e. accidental fires).

1.5 Regulatory Approvals

- 1.5.1 The regulatory approvals process will involve the following parties:
- The building control body / approved inspector appointed on the scheme; and
 - London Fire Brigade (local fire and rescue service, statutory consultee). All aspects of the fire safety design remain subject to review (including their statutory consultation with the local fire and rescue service), and, ultimately, formal approval by the building control body.

1.6 Reference Information

- 1.6.1 This strategy is based on information provided to Socotec as listed in Table 2. Additional information or variations to that supplied may render the conclusions and recommendations within this report invalid.

Table 2 – Project documentation referenced

Description	Reference	Revision
Proposed Ground floor plan	0226 - 103	P01
Proposed First floor plan	0226 - 104	P01
Proposed Second to Eighth floor plan	0226 - 105	P01
Proposed Ninth floor plan	0226 - 106	P02
Proposed roof plan	0226 - 107	P02
Proposed site plan	0226 - 102	P01
Proposed South-West elevation	0226 - 108	P01
Proposed North elevation	0226 - 109	P01

2. PROJECT OVERVIEW AND DESIGN BASIS

2.1 Introduction

2.1.1 The Partridge Way development in Wood Green, London is comprised of a single residential block. This report is solely concerned with the fire safety strategy covering this building.

2.2 Building descriptions

2.2.1 The development comprises the construction of a new residential block. The building will comprise solely of residential units and ancillary areas located on the ground floor. The approximate total height of the buildings is 30 m, whilst the height of the top-most-storey is 23.8 m.

2.2.2 Any reference to a storey level will be in accordance with the nomenclature utilised in the floor plans listed in Table 2.

2.2.3 The stair core shall be designed as a firefighting shaft, provided with a firefighting stair, firefighting lift and a dry rising main.

2.2.4 The building contains flats consisting of a mixture of one to three bedrooms accessed from the common residential corridor. A single means of escape is provided for the residential areas via the central core.

2.2.5 The residential ancillary areas are located at ground floor and consist of bike, bin and cleaner's stores, a plant room and a post room.

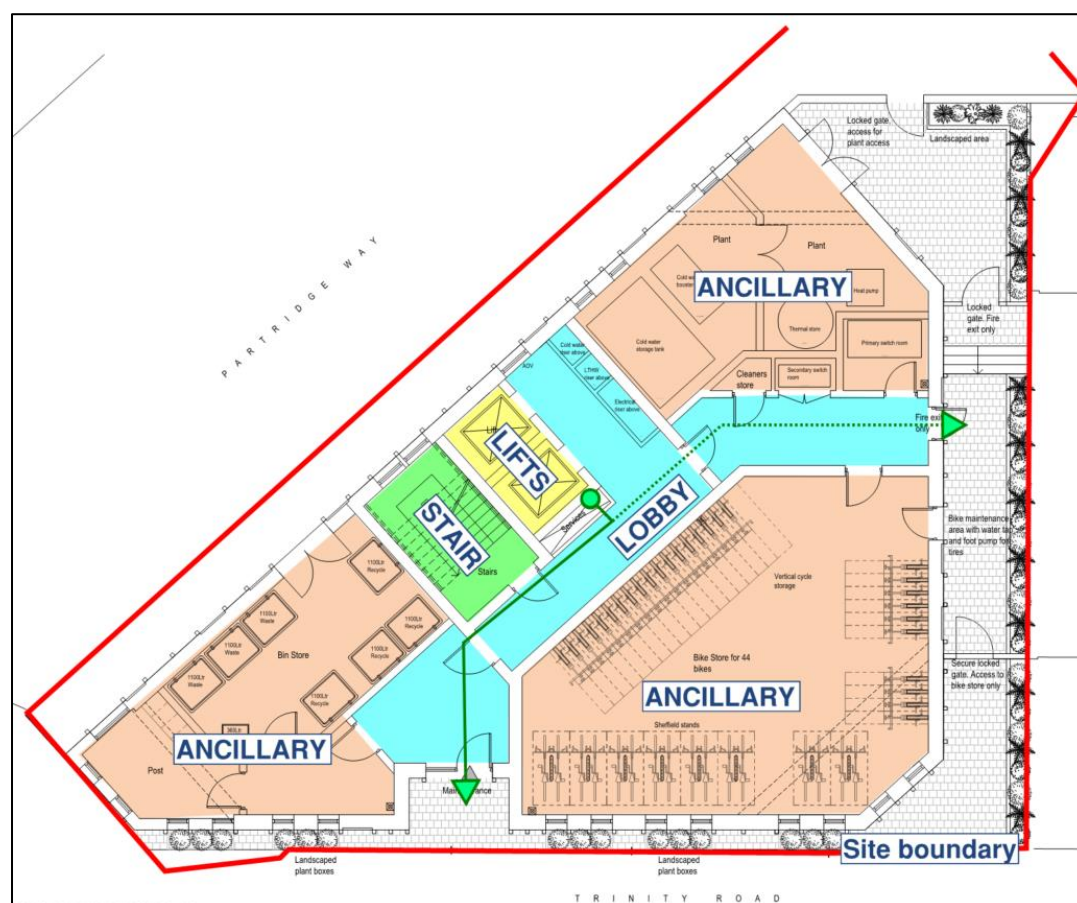


Figure 1 - Site plan of the Partridge Way development/ indicative ground floor arrangement

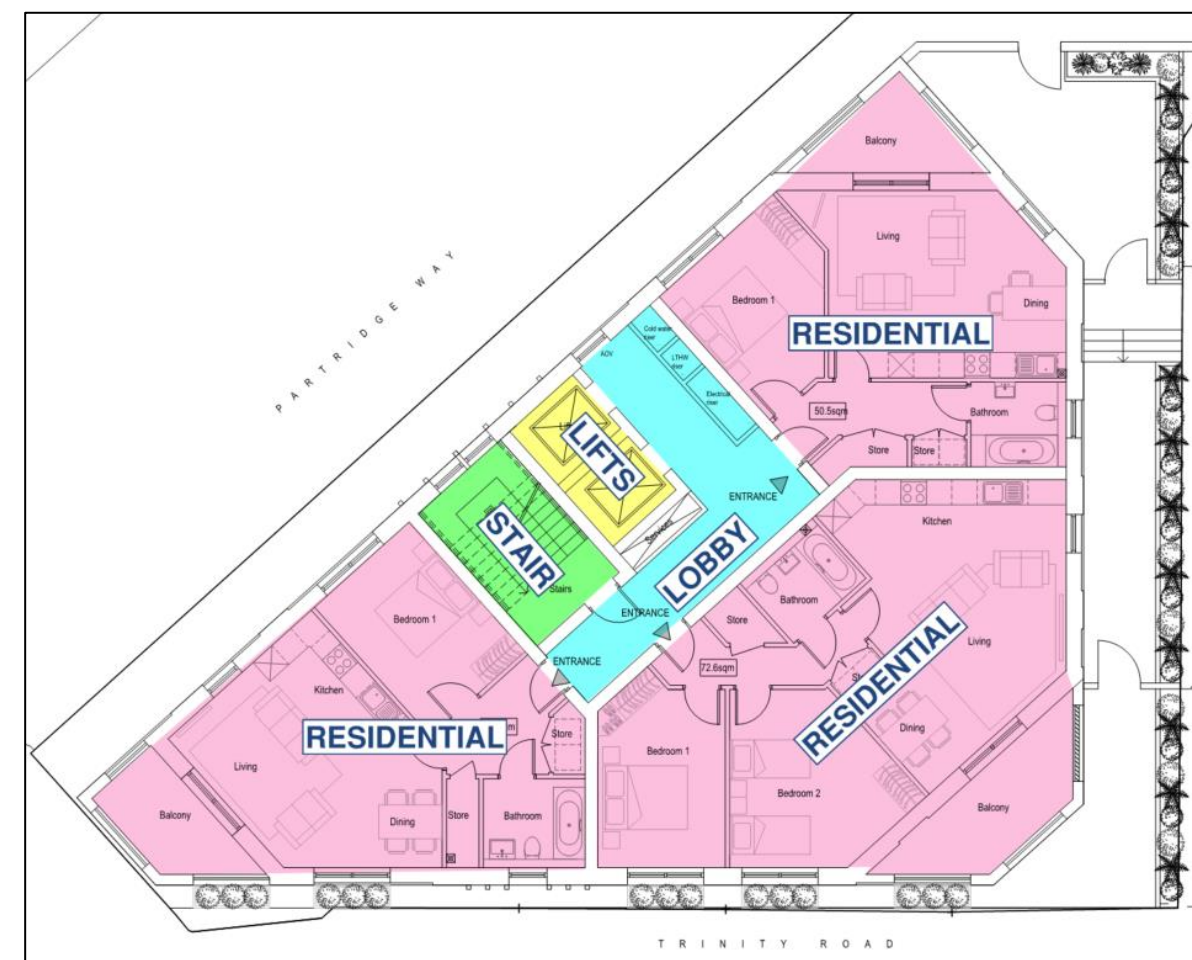


Figure 2 - Typical residential floor arrangement

2.3 Occupancy

2.3.1 The design of residential accommodations is not led by numbers of occupants for most of the building. The residential accommodation strategy is premised upon a defend-in-place procedure. Therefore, occupants in the residential flats (other than the flat of fire origin) may escape at their own pace.

2.3.2 It is expected that the distribution of elderly people and disabled people will be relatively typical for the residential occupancies, and no additional requirements above the minimum stated in BS 9991 are deemed to be necessary.

3. MEANS OF WARNING AND ESCAPE

Building Regulations requirement B1:

"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."

3.1 Evacuation regime

- 3.1.1 A 'stay-put' (also known as a 'defend in place') strategy will be implemented in all residential units, whereby only the unit of fire origin will be signalled to evacuate in the first instance upon activation of a fire alarm. Further evacuation of other units may be enacted by the fire and rescue service, as needed depending on the development of the fire.
- 3.1.2 Occupants are also free to leave the building of their own accord if they should feel the need to do so.

3.2 Means of detection and alarm

- 3.2.1 In support of the evacuation regime, all the residential units will have an automatic fire detection and alarm system designed in accordance with BS 5839-6 [7].
- 3.2.2 The flats shall be provided with a protected entrance hall whereby all habitable rooms can be accessed directly from. These flats should be provided with an automatic fire detection system designed and installed to a minimum of Grade D1, Category LD2 in accordance with BS 5839-6 [7].
- 3.2.3 It is recommended that heat detectors are installed central to the flat kitchen areas and smoke detection is provided centrally to the living area. This is intended to reduce the number of false alarms from cooking activities while still offering fast detection in the event of a fire in the flat.
- 3.2.4 Common corridors serving the flats and firefighting stair will typically be provided with category L5 coverage in accordance with BS 5839-1 [8], with smoke detection needed to activate the automatic elements of the smoke ventilation system (AOV) on the floor where detection occurred only. Alarm sounders should not be installed in the residential common areas, but detection in these areas could notify the building's Control and Indicating Equipment (CIE) at the entrance lobby as part of fire safety management procedures.
- 3.2.5 The apartment balconies should be considered as inner room throughout the development and the alarm within the flats should be an alarm that is audible from the balcony or gives a visual indication if the alarm is inaudible.
- 3.2.6 Other non-residential areas within the buildings, including the bin, bike and cleaner's stores, are recommended to be provided with smoke detection and alarm designed and installed in accordance with BS 5839-1 to category L5 (M). This would assist with providing an alert to any occupants located within the space. In these areas, the local sounding of the activated detector head (or heads) only would be recommended, to provide a warning to occupants within the immediate vicinity.
- 3.2.7 Rooftop areas are only accessible for maintenance, therefore a local management and / or permit system should be put in place to communicate with any maintenance persons on site and to notify them in case in case of a fire anywhere in the building.
- 3.2.8 The provision of Control and Indicating Equipment (CIE) – also referred to as the fire alarm panel – should be within the entrance foyer, placed in a location that is visible and accessible to the fire and rescue

service upon arrival at the building. The CIE locations should be shown on the relevant design team drawings, i.e. architect and other designers. Fire alarm panels will be provided in accordance with BS 5839-1.

- 3.2.9 Visual alarms should be provided where required in accordance with BS 5839-1 [8]. In addition, communal areas that could facilitate occupants with hearing difficulties shall also be provided with a visual alarm as well as areas with high ambient sound levels.
- 3.2.10 The fire alarm systems within flats are not required to be connected to a central alarm panel. However, the provision of monitoring at a central location (such as in the building's entrance lobby) would assist the fire service or building management in the event of an alarm activation within the building. Though not required to meet the minimum recommendations, the flat alarm systems may be connected to the central panel if considered beneficial for the client. Supporting the safety of disabled occupants within their flats would be a circumstance in which central monitoring of the fire alarm would be beneficial.

3.3 Means of escape overview

- 3.3.1 The general philosophy for means of escape is that the occupants of a building should be able to turn their back on a fire and escape via the nearest exit without additional assistance from other occupants or firefighters. In the first instance, this is achieved by limiting travel distances and providing sufficient exit width. If necessary, alternative escape routes and escape routes with a specified period of fire resistance are also provided.

3.4 Horizontal means of escape – Internal flat design

- 3.4.1 All apartments are to be provided with a protected entrance hall having a maximum travel distance of 9 m from the furthest point within the hallway to the flat access door. The flats within the buildings will be served by a single exit leading into the protected common corridor.

3.5 Horizontal means of escape - Residential common areas

- 3.5.1 Access and escape from all flats is provided via protected ventilated common corridor, which in turn provides means of escape to the firefighting stair.
- 3.5.2 The maximum recommended travel distance within the protected lobbies is 15 m in a single direction due to provision of sprinklers throughout the building and ventilated protected lobbies. The travel distance is measured from the furthest flat entrance door to the door enclosing the firefighting stair. The common corridors will be ventilated via an AOV on the external façade.
- 3.5.3 Each above-ground common corridor will be ventilated by a natural means via external AOVs, specified and sized in accordance with Section 14.1.3 of BS 9991, as follows:
- AOVs mounted on the exterior of the building with a free area of 1.5 m², in the lift lobby adjacent to the stair; and
 - an AOV located at as high a level as possible at the top storey of the stair, with a minimum free area of 1.0m². The AOVs opening to outside should conform to BS EN 12101-2 [9].
- 3.5.4 The common corridors will have self-closing FD30S door separation to all flats. These will require maintenance throughout the life of the building.

3.6 Horizontal means of escape – Ancillary areas

Within the ancillary areas located at ground floor level, means of escape should meet the recommendations of Table 14 of BS 9991. Single-direction of travel distances are limited to not more than 9 m, or 18 m for multi-directional means of escape within high risk rooms (i.e. plant room and bin store) whilst for normal risk rooms (i.e. post room, bike and cleaner's stores) the travel distances are limited to 18 m and 45 m for single and multiple-direction of travel respectively to final or storey exits.

3.7 Vertical means of escape

3.7.1 The escape stair within shall be designed as firefighting stair and shall therefore have a clear width at least 1,100 mm. This is in accordance with the recommendations contained in Section 50.3.2 of BS 9991.

3.7.2 Where the handrails intrude 100 mm or less, these can be ignored when assessing the clear width of the communal stairs.

3.7.3 The stair and landings should have clear headroom for a vertical distance of at least 2 m.

3.7.4 Where lifts have been proposed in a development, London Plan Policy D5(B5) requires a minimum of one lift per core to be an evacuation lift. Evacuation lifts should be provided in addition to Building Regulations requirements for firefighting shafts/ lifts to ensure they can be used for evacuation purposes when the firefighting lift is in use by fire and rescue service. The provision of evacuation lifts may be utilised to propose alternative evacuation methods to mitigate the risks involved with any failure of the 'stay-put' strategy.

3.8 Protection to ground floor final escape route

3.8.1 At the ground floor level, the stair will be provided with two alternative means of escape via protected corridors (see Figure 1). However, ancillary accommodation will be accessed from each of the escape route. Hence, it is proposed to provide lobby separation between the ancillary accommodation and the ground floor stair lobby.

3.8.2 In order to prevent smoke from entering the stair, which has been designated as firefighting stair a two-door separation is to be provided between the stair discharge route and any ancillary areas on the ground / final exit level. In accordance with Figure 34 of BS 9991, a single lobby separation shall be provided as follows:

- Separation from bin and post room – a single lobby separation shall be provided between the lift lobby and ancillary areas as a minimum. The bin store lobby should also be provided and have 0.2 m² permanently open natural ventilation.
- Separation from switch rooms and bike and cleaner's stores – a single lobby separation shall be provided between the lift lobby and ancillary areas as a minimum.

3.9 Means of escape for mobility-impaired persons (MIPs)

3.9.1 According to London Plan Policy D5, a minimum of one lift should be designed as an evacuation lift. Evacuation lift should be provided in addition to Building Regulations requirements for firefighting shafts / lifts to ensure they can be used for evacuation purposes when the firefighting lift is in use by fire and rescue service. The provision of evacuation lifts may be utilised to propose alternative evacuation methods to mitigate the risks involved with any failure of the 'stay-put' strategy.

3.9.2 The evacuation lift should be clearly signed at the final exit storey and relevant information should be available detailing the operation mode, rescue controls and machinery spaces.

3.9.3 The evacuation lift should always be available for evacuation purposes and it should be designed, installed and operated in accordance with BS EN 81-20 [10], BS EN 81-70 [11] and BS EN 81-76 [12].

3.9.4 According to BS EN 81-70, the car size should be at least type 2 in order to be used for evacuation of persons with disabilities.

3.9.5 Evacuation lifts can operate using one the following methods:

- Driver assisted evacuation;
- Automatic evacuation; or
- Remote assisted evacuation.

3.9.6 This is a residential development, hence a competent person allowing for a driver assisted evacuation might be absent. It is recommended to employ an automatic evacuation procedure in accordance with Section 5.4.3.2 of BS EN 81-76.

3.9.7 The ground floor will be defined as 'The Main Evacuation Exit Floor' (MEEF).

3.9.8 The first-floor flats are exclusively designed for disabled people, therefore the first-floor landing call shall have the highest priority when in automatic evacuation mode. The second highest priority shall be assigned to the furthest landing call from the MEEF.

3.9.9 The evacuation lift shall be provided with alternative power supplies as per Section G.2.2.2 of BS 9999 (see Section 3.14).

3.9.10 Disabled refuges are not required in the escape stairs in residential buildings, where a 'stay put' fire safety strategy is employed. Disabled occupants would be expected to wait within their flats during a fire incident elsewhere within the building. In the event of a fire within their flat, suitable space is available for waiting within the common parts of the building prior to exiting via the stairs.

3.10 Escape beyond final exits

3.10.1 Travel beyond the building final exits must be away from the building, towards a place of safety, and not be jeopardised by unprotected openings of the building. In general, the building is provided with escape routes, upon exiting the building that are either directly away from the building or alternate paths along the building façade, therefore, fire resisting construction is not be required to maintain means of escape.

3.10.2 Designated assembly areas are not required for residential buildings. In general, occupants are to be encouraged to retreat to a safe distance from the building, away from the access routes that would be used by the fire and rescue service.

3.10.3 Escape beyond the final exits, including to and from assembly points should be usable by all occupants, e.g. a need to cross grass may not be appropriate for all mobility aids. Egress routes should meet the accessibility recommendations of Approved Document M [13] or BS 8300 [14], as appropriate.

3.11 Emergency lighting

3.11.1 Emergency lighting will be installed to provide temporary illumination in the event of failure of the primary power supplies to the normal lighting system. As part of the emergency lighting system, escape lighting will be provided to ensure that escape routes are illuminated at all material times. Adequate artificial lighting will be provided in all common escape routes and will be of a sufficient standard to enable persons to see to escape.

3.11.2 Emergency lighting will be installed in accordance with the recommendations of BS 5266-1 [15] and the documents referenced therein. Emergency lighting will illuminate all common evacuation routes (internal and external as necessary) and essential areas including plant areas. It will also illuminate a safe exit route including fire exits, fire alarm call points, changes in level or direction and firefighting equipment. Lighting to escape stairs should be on a separate circuit from that supplying any other part of the escape route.

3.11.3 Primary and emergency lighting will be provided for external escape routes that are not suitably lit by surrounding street lighting.

3.11.4 Discharge lighting installations may operate at voltages that are a hazard to firefighters. An exterior discharge lighting installation, or an interior discharge lighting installation operating unattended, operating at a voltage exceeding low voltage (as defined in Statutory Instrument number 1018, part of the Building Regulations), should be controlled by a firefighter's emergency switch, installed and situated in accordance with BS 7671 [16] and the requirements of the fire authority.

3.12 Fire safety signage

3.12.1 Fire safety signs will be installed where necessary to provide clear identification of fire precautions, fire equipment and means of escape in the event of fire. All parts of the development will be fitted with appropriate fire safety signage to comply with The Health and Safety (Signs and Signals) Regulations 1996 i.e. signage to be specified in accordance with BS ISO 3864-1 [17] and following the principles of the Safety signs and Signals: Guidance on Regulations Publication [18].

3.12.2 The purpose of fire signs is to direct persons towards fire exits, or to provide specific information or warning about equipment, doors, rooms, or procedures. They should be recognisable, readable and informative, as they convey essential information to regular and infrequent users of the premises, and the Fire and Rescue Service.

3.12.3 In order to assist the fire service to identify each floor in a block of flats with a top storey more than 11 m above ground level, floor identification signs and flat indicator signs should be provided in accordance with the 'May 2020 - Amendments to the Approved Documents' [13].

3.12.4 All fire doors will be marked with the appropriate fire safety sign conforming to BS 5499-1 [19] (white on blue) according to whether the door is:

- to be kept closed when not in use ('FIRE DOOR - KEEP SHUT');
- to be kept locked when not in use ('FIRE DOOR - KEEP LOCKED'); or
- held open by an automatic release mechanism ('AUTOMATIC FIRE DOOR - KEEP CLEAR').

3.12.5 Fire doors to cupboards and to service ducts should be marked on the outside at about eye level. All other fire doors should be marked on both sides at about eye level.

3.13 Electromagnetic locking/hold open devices

3.13.1 Where doors are provided with electromagnetic locking or hold-open devices, these devices should be designed in accordance with BS 7273-4 [20] recommendations and are to operate (either release the door to close normally, or release the door to be opened) upon:

- Activation of smoke detectors located on either side of the door;
- Failure of the power supply;

- Operation of a hand operated switch located to the side of the door;
- Malfunction.

3.13.2 Doors on magnetic locks along the escape route shall need to be fail safe open.

3.14 Secondary Power Supplies

3.14.1 The following fire safety systems shall comply with their respective British Standards regarding secondary power supplies:

- i) Emergency lighting and signage;
- ii) Automatic fire detection and alarm system;
- iii) Evacuation lift;
- iv) Firefighting lift;
- v) Automatic water fire suppression system; and
- vi) Smoke ventilation system.

There must be minimal delay in change over if the main power fails and it must occur automatically. It was confirmed by 'Martin Arnold Associates' that the required secondary power supplies will be provided from a suitably sized UPS battery designed in accordance with Appendix A of BS 8519 [21].

3.14.2 To ensure that the evacuation lift will be available to assist with the evacuation of the disabled occupants, an alternative power supply should be provided which offers at least 60 minutes of run-time as per Section G.2.2 of BS 9999. The alternative power supply will be provided from a suitably sized UPS battery as stated in 3.14.2.

3.14.3 The diverse (primary and secondary) power cables should only come together in the fire compartment housing the control panel by means of an automatic change-over switch, unless the cable route is via a fire compartment which does not open onto areas requiring protection via the relevant life safety system.

4. INTERNAL FIRE SPREAD

Building Regulations requirement B2:

- “(1) To inhibit the spread of fire within the building, the internal lining shall:
- Adequately resist the spread of flame over their surfaces; and
 - Have, if ignited, a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.
- (2) In this paragraph ‘internal linings’ mean the materials or products used in lining any partition, wall, ceiling or other internal structure.”

Building Regulations requirement B3:

- “(1) The building shall be designed and constructed so that, in the event of fire, its stability will be maintained for a reasonable period.
- (2) A wall common to two or more buildings shall be designed and constructed so that it adequately resists the spread of fire between those buildings. For the purposes of this sub paragraph a house in a terrace and a semi-detached house are each to be treated as a separate building.
- (3) Where reasonably necessary to inhibit the spread of fire within the building, measures shall be taken, to an extent appropriate to the size and intended use of the building, comprising either or both of the following:
- sub-division of the building with fire resisting construction;
 - installation of suitable automatic fire suppression systems.
- (4) The building shall be designed and constructed so that the unseen spread of fire and smoke within concealed spaces in its structure and fabric is inhibited.”

4.1 Internal linings

- 4.1.1 In the early stages of a fire in a building, the choice of material for the lining of walls and ceilings can significantly affect the spread of fire and its rate of growth. Wall and ceiling linings should achieve the surface spread of flame and fire classifications specified in Table 3 as a minimum, which is based on recommendations within BS 9991, Section 20.1.

Table 3 – Minimum surface spread of flame classification requirements

Location	European Class ¹⁾
Circulation spaces within dwellings	C-s3, d2
Residential common circulation spaces	B-s3, d2
Small rooms ≤ 4m ² (Residential and ancillary areas)	D-s3, d2
1) when tested in accordance with BS EN 13501-1	

- 4.1.2 Parts of the wall area of an individual room are permitted to be of a poorer performance classification than those set out in Table 3, but no worse than European Class D-s3, d2. This variation is limited to an area not exceeding half the floor area of the room, 20 m² in residential / ancillary areas, whichever is less.

- 4.1.3 Where thermoplastic materials which do not comply with Table 3 are used (e.g. windows, roof-lights and lighting diffusers only), these are to comply with the recommendations given in Section 18.6 of BS 9991.

4.2 Automatic Fire Suppression System

- 4.2.1 The building will be fitted with an automatic sprinkler system coverage throughout, except for the fire-sterile common circulation areas (i.e. stairs, common corridors and lobbies). Provision of sprinklers in the electrical switch rooms is subject to specialist assessment (e.g. electrical engineer, sprinkler designer) based on the type/ voltage of the equipment fitted in those rooms. If sprinklers are not permitted, then other means of suppression should be employed (e.g. gaseous suppression).
- 4.2.2 The residential areas of the building should be provided with Category 2 system designed and installed in accordance with BS 9251 [1]. The system should be provided with a water supply capable of offering at least 60 minutes of supply at a rate of 2.8 mm/min for a maximum of two heads.
- 4.2.3 For the ancillary areas, Section 5.3 of BS EN 16925 [22] suggests that a residential sprinkler system may be used for ancillary areas provided these are of an area no greater than 100 m². The total area of the ancillary rooms is circa 150 m². However, as these are all non-commercial areas associated with the residential use and will be divided into several smaller compartments with a maximum floor area of 80 m² (bike store), it is considered that the use of the residential sprinkler system for the ground ancillary areas would also be appropriate.
- 4.2.4 The ground floor ancillary areas should be fitted with quick response type sprinkler in accordance with BS EN 12259-1 [23], and have a water supply sufficient to meet 5 mm/min over 72 m² for a duration of 60 minutes.
- 4.2.5 A fully tested and approved sprinkler design and installation should be undertaken by the certified system manufacturer / installer. System information should also be provided to the building operator / dwelling owners to ensure that the system is operated and maintained in accordance with the manufacturer’s specifications.
- 4.2.6 The sprinkler system should have annual inspections and be tested by a competent person (organisation). The system should be checked to determine if it is fully operational and all components and functions are working as designed. Valves should be checked to make sure they’re working correctly and in good condition.
- 4.2.7 The system should be checked for leaks and tested where materials, the fire load of the building, or the number of any vulnerable occupants in the building has changed.
- 4.2.8 Sprinkler heads and their cover plates should be checked to see whether they have been damaged or tampered with to ensure the water spray is unaffected. Alarms should be checked to ensure they are working correctly and in good condition.
- ### 4.3 Structural fire resistance
- 4.3.1 In accordance with BS 9991, the required structural fire resistance depends upon the height of the building and whether or not the building is sprinklered. The height of the building is measured from ground floor level to the finished floor level of the top storey excluding any roof top plant areas (infrequent use).

- 4.3.2 According to Table 4 of BS 9991, elements of structure should generally be designed and/or protected to achieve 60 minutes of fire resistance as the building is fitted with an AWFSS and is less than 30 m in height.
- 4.3.3 Elements of structure that only support a roof do not require fire resistance. The structure is considered to support more than only a roof if it supports a load other than the roof itself (e.g. rooftop plant) or is not essential to the stability of a fire-resisting element.
- 4.3.4 Spaces containing elements supporting life safety (e.g. sprinkler's room, ventilation system control room, switch rooms) should be enclosed in 120-minute fire-resisting construction.

Table 4 – Minimum periods of fire resistance

Building element	Fire resistance	Exposure
Structural elements (frame/ beam/ column/ wall)	60 L	Exposed faces
Walls separating flats	60 L/Int/Ins	Each side separately
Compartment floors	60 L/Int/Ins	From underside
Roof – forming part of an escape route	30 L/Int/Ins	From underside
Protected shafts (e.g. risers)	60 L/Int/Ins	Each side separately
External walls more than 1000mm from the relevant boundary	60 L/Int/ 15Ins	From inside
Protected entrance halls	30 L/Int/Ins	Each side separately
Stair protected lobbies	60 L/Int/Ins	Each side separately
Firefighting stair	120 L/Int/Ins	Each side separately
Firefighting lift	120 L/Int/Ins	Each side separately
Cavity barriers	30 Int / 15 Ins	Each side separately
Ancillary areas	See Section 4.5	

4.4 Compartmentation and fire-resisting separations

- 4.4.1 All flats are required to be constructed as a separate fire compartment with a minimum of 60 minutes fire resistance.
- 4.4.2 All floors separating residential areas from all other areas are required to be designed as compartment floors having the same standard of fire resistance as the structural elements of the building.
- 4.4.3 Any service riser penetrating a compartment floor should achieve the same fire rating as the floor (i.e. 90 minutes) or fire-stopping elements should be fitted in line with the floor.
- 4.4.4 Areas of ancillary accommodation are to be provided with fire resistance in accordance with Section 4.5.

- 4.4.5 Tables 3 and 15 in BS 9991 set out the minimum fire-resisting performance requirements (loadbearing, integrity and insulation) of parts of the building and enclosure to ancillary areas respectively. The relevant information has been summarised in Table 4 and is indicated in the fire strategy plans provided in Appendix B.
- 4.4.6 Compartment walls should include suitable head details to accommodate the predicted deflection head (40 mm recommended as a generic baseline) of any structure passing overhead.
- 4.4.7 The firefighting shaft is not provided with a direct discharge point to outside, therefore a continuation of its fire resisting construction up to the final discharge point will be required.

4.5 Ancillary accommodation

- 4.5.1 Ancillary accommodation rooms within the buildings are to be enclosed within fire-resisting construction in accordance with Table 15 of BS 9991, and separated by ventilated protected lobbies from escape routes as required by Sections 14.1.6 (areas of higher fire risk) and Table 13 of BS 9991. A summary of the ancillary areas requiring certain levels of separation are provided in Table 5.
- 4.5.2 The entrance lobby within all blocks should be kept sterile, as it forms part of the firefighting shaft. In addition, the post boxes will be made out of a non-combustible material and limited in size (i.e. letters and not large packages).

Table 5 – Summary of ancillary areas minimum fire protection requirements

Ancillary area	Fire resistance rating (minutes)
Bin, bike and cleaner's stores	90
Plant & post rooms	90
Primary & secondary switch rooms	120

4.6 Fire Doors

- 4.6.1 All doors on escape routes will either not be provided with a securing device or be provided with a securing device that is easily openable without the use of a key and without having to manipulate more than one mechanism. The escape provisions should be coordinated with the security / access design.
- 4.6.2 Doors on escape routes will generally be hung to open in the direction of exit (though this is not essential where doors will serve less than 60 people), will open not less than 90° and have a swing which is clear of any change in level, other than a threshold or single step on the line of a doorway.
- 4.6.3 Any fire doors fitted with hold-open devices, including cross-corridor doors should release on:
- Actuation of a local fire detector head or the local fire alarm system;
 - Manual operation or operation of a hand-operated switch fitted in a suitable position, if necessary; and
 - Failure of the electricity supplies.

- 4.6.4 Doors fitted with an electronic latch (e.g. operated by a swipe card reader) on the un-secure side (e.g. leading to plant areas, etc.) should have door latches operated by a handle on the secure side (so people inside the room will always be able to get out without the need for a key).
- 4.6.5 Doors opening onto stairways or corridors will be sited not to encroach on the effective width of any stairway, landing or corridor.
- 4.6.6 Vision panels will be provided in doors that swing in both directions and in doors sub-dividing corridors on escape routes. Other vision panels may be required as part of general accessibility or design requirements.
- 4.6.7 Fire doors will be specified in accordance with Section 5.5. Fire door assemblies will comply with:
- BS 476-22 [24] or BS EN 1634-2 [25] for fire resistance; and where applicable
 - BS 476-31 [26] or BS EN 1634-3 [27] for smoke leakage.
- 4.6.8 The required fire performance of the doors is shown in Table 6.
- 4.6.9 Where hold open devices are used, they should be installed in accordance with BS EN 1155 and BS 9999 Clause 33.1.6.2. Hold open devices can be either, fusible link (unless door is fitted on an escape route), an automatic release mechanism which is linked to the fire alarm or be a delayed closing device with a delay not exceeding 25 seconds.

Table 6 – Fire Doors

Position of Door	Tested to BS 476-22	Tested to BS EN 1634-1
Enclosing ancillary accommodation	As per the wall it is fitted in with smoke seals	As per the wall it is fitted in with smoke seals
Flat entrance doors	FD 30 S	E 30 Sa
Doors to internal protected entrance halls	FD 30	E 30
Enclosing a firefighting stair	FD 60 S	E 60 Sa
Enclosing a lift shaft	FD 60	E 60
Enclosing service risers	FD 60 S	E 60 Sa
i) Internal entrance hall doors are not required to be on self-closing devices. ii) All other fire doors should be self-closing except for doors into places of special fire hazards / plant rooms / risers that should be kept locked shut provided with appropriate signage. iii) The ratings shown above are for integrity only. iv) The suffix 'S' is required in all doors if they are located along a protected escape route.		

4.7 Cavity barriers and concealed spaces

- 4.7.1 Extensive concealed cavities (e.g. roof voids or the void between suspended ceilings and the soffit of the floor above) require cavity barriers to sub-divide them. If internal sub-divisions and all internal walls are proposed to extend up to soffit level (i.e. underside of the slab overhead), there will be limited extensive internal cavities.
- 4.7.2 Cavity barriers are to be installed in accordance with Figure 24 of BS 9991, apart from within any twin-leaf masonry cavity walls which are constructed in accordance with Figure 25 of BS 9991.
- 4.7.3 Where the external walls of the building will contain cavities, these are to be provided within the external wall, horizontally aligned to each compartment floor and vertically aligned with compartment walls or fire-resisting walls which separate flats, common corridors and protected stairs.
- 4.7.4 Cavity barriers are also required to close the edges of cavities, including cavity closers in openings (such as windows, doors or vents).
- 4.7.5 Cavity barriers should achieve a fire resistance rating of 30 minutes for integrity and 15 minutes for insulation. Cavity barriers within a stud wall or closing an opening may alternatively be constructed from:
- Steel at least 0.5 mm thick;
 - Timber at least 38 mm thick;
 - Polythene-sleeved mineral wool, or mineral wool slab, in either case under compression when installed in the cavity; or
 - Calcium silicate, cement-based or gypsum-based boards at least 12 mm thick.
- 4.7.6 Cavity barriers should be tightly fitted to a rigid construction and mechanically fixed in position. If this is not possible (e.g. where a cavity barrier joins to slates, tiles, corrugated sheeting or similar materials) the junction should be fire-stopped.
- 4.7.7 Cavity barriers should be well fixed, so their performance is unlikely to be affected by any of the following:
- any movement of the building due to subsidence, shrinkage or temperature change, and movement of the external envelope due to wind;
 - during a fire, collapse of services penetrating the cavity barriers, either by the failure of the supporting system or through degradation of the service itself (e.g. by melting or burning);
 - during a fire, failure of the cavity barrier fixings. (In roof spaces, where cavity barriers are fixed to roof members, there is no expectation of fire resistance from roof members provided for the purpose of support;
 - During a fire, failure of any material or construction to which cavity barriers abut. (For example, a suspended ceiling that continues over a fire resisting wall or partition collapses, and the cavity barrier fails prematurely because the ceiling was not designed to provide a minimum fire resistance of EI 30.)

4.8 Fire-stopping and penetrations through fire-resisting construction

- 4.8.1 Fire-stopping must be provided to maintain the fire resistance period of fire-separating walls or floors (see Table 4 and Table 5) at junctions with other construction, and thereby prevent a fire from travelling around the junction and back into the neighbouring unit or space. See Figure 3 for typical fire-stopping and penetration expectations / details.

4.8.2 All pipes, ductwork and services passing through fire-resisting barriers should be penetration-sealed with an appropriate system and / or fire damper which has been shown by test or assessment to maintain the period of the fire-resistance of the barrier. Certain small-diameter pipes require only fire-stopping around the pipe, dependent on pipe material and the type of fire-resisting barrier penetrated. Further information is available in Table 10 of BS 9991.

- 4.8.3 Pipes that pass through a fire separating element, should meet one of the following provisions;
- Proprietary seals - Provide a proprietary sealing system which has been shown by test to maintain the fire resistance of the wall, floor or cavity barrier
 - Restricted pipe diameter - Where a proprietary sealing system is not used, fire stopping may be used around the pipe, keeping the opening as small as possible. The nominal internal diameter of the pipe should not be more than the relevant dimension given in Table 7;
 - Sleeving - A pipe of lead, aluminium, aluminium alloy, fibre-cement or uPVC, with a maximum nominal internal diameter of 160mm, may be used with a sleeving of non-combustible pipe. The opening in the structure should be as small as possible and provide fire stopping between the pipe and structure. The sleeve should extend no less than 1000mm on either side of the structure.

Where ducts cross protected escape routes (e.g. protected stairs, protected common corridors or lobbies and flat entrance lobby), dampers on fusible links are not sufficient. Either combined fire-and-smoke dampers activated upon smoke detection (ES type dampers) are provided, or the duct should be fire-resisting / enclosed within a fire-resisting enclosure.

Table 7 – Maximum Diameter of Pipes

Situation	Pipe material and maximum internal diameter		
	Non-Combustible Material	Lead, Aluminium Alloy, uPVC, Fibre Cement	Any other material
Structure enclosing a protected shaft which is not a stairway or lift shaft	160mm	110mm	40mm
Any other situation	160mm	40mm	40mm
Any non-combustible material which, if exposed to a temperature of 800°C, will not soften or fracture to the extent that flame or hot gas will pass through the wall of the pipe.			

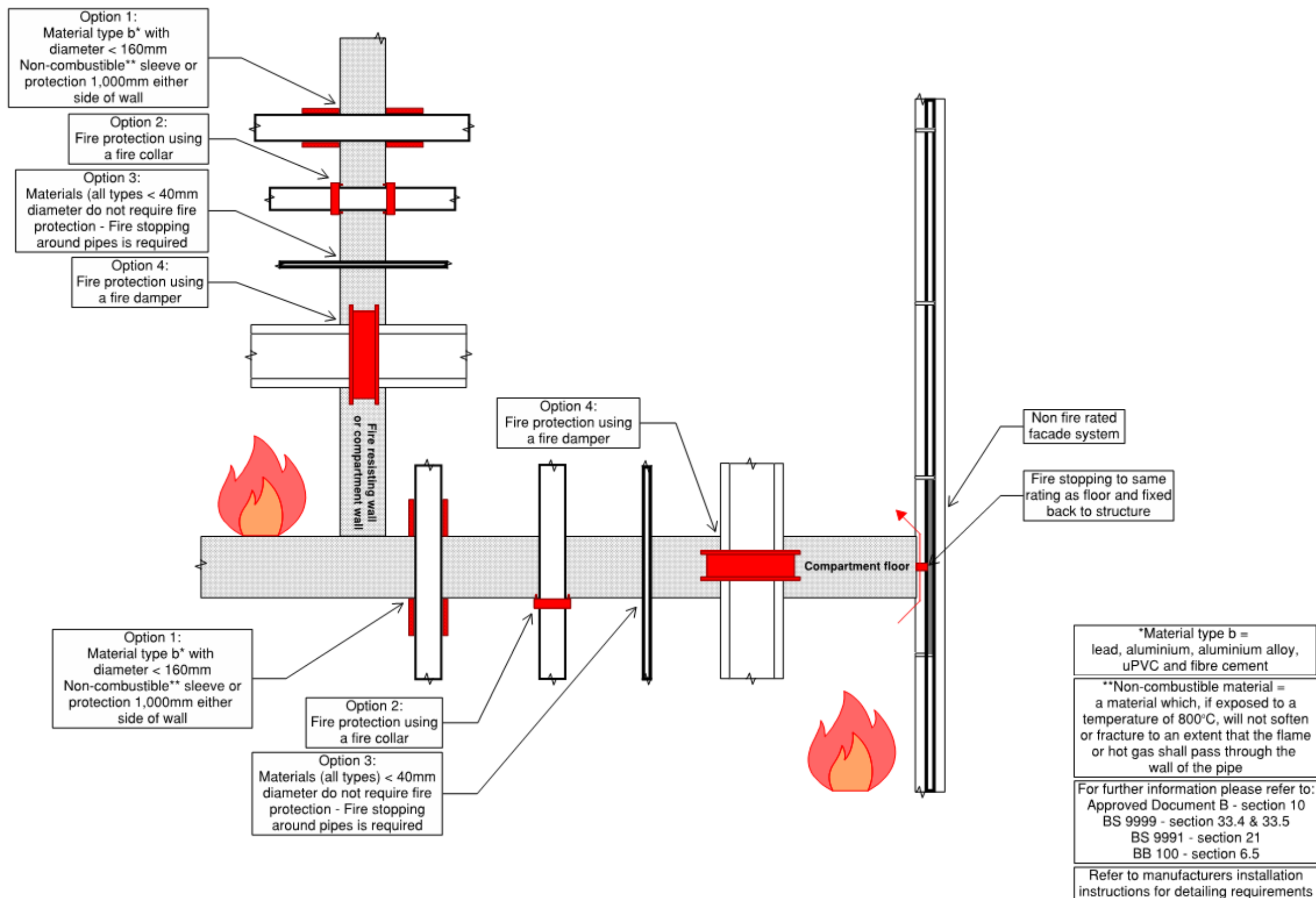


Figure 3 – Typical fire-stopping and penetration expectations

5. EXTERNAL FIRE SPREAD

Building Regulations requirement B4:

- “(1) The external walls of the building shall adequately resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building.
- (2) The roof of the building shall adequately resist the spread of fire over the roof and from one building to another, having regard to the use and position of the building.”

5.1 External surfaces of walls

- 5.1.1 External walls should be constructed such that they will not support fire spread at a speed that is likely to threaten people in or around the building.
- 5.1.2 External wall surfaces near other buildings should not be readily ignitable, to avoid fire spread between buildings.
- 5.1.3 As all buildings have a top storey more than 18 m above ground, in accordance with the November 2018 amendment to the Building Regulations (Regulation 7(2)), the façade linings and external wall construction of each block should achieve European Classification A2-s1, d0 or Class A1 (classified in accordance with BS EN 13501-1:2007+A1:2009 [28]) and be constructed on non-combustible materials (with permitted exceptions).
- 5.1.4 The recommendations in Section 5.1.3 apply to the following:
- anything located within any space forming part of the wall;
 - any decoration or other finish applied to any external (but not internal) surface which forms part of the wall;
 - any windows and doors in the wall;
 - any part of a roof pitched at an angle of more than 70 degrees to the horizontal if that part of the roof adjoins a space within the building to which persons have access, but not access only for the purpose of carrying out repairs or maintenance;
 - balconies, devices for reducing heat gain within a building by deflecting sunlight and solar panels that are attached to an external wall.

5.1.5 Membranes used as part of the external wall construction should achieve a minimum classification of European Class B-s3, d0.

5.1.6 Thermal breaks (thermal bridging elements) should not span two compartments. There is no minimum performance for the materials used, however, the minimum amount of material required to restrict thermal bridging should be used.

5.2 Roof coverings

- 5.2.1 Roof coverings will be designated in accordance with the prescriptive recommendations of BS 9991, as summarised in Table 8. No thermoplastic rooflights are proposed within the buildings.
- 5.2.2 Should photovoltaic panels or biodiversity areas be introduced to roofs in future, these should be in accordance with these recommendations, or be specified in accordance with suitable alternative

guidance. Where proposed, further review of the suitability of these is recommended to be undertaken during RIBA Stage 4.

Table 8 – Limitations on roof coverings

Distance from relevant boundary	Designation of roof covering*			
	National Class ^A	AA, AB, or AC	BA, BB, or BC	CA, CB or CC
	European Class ^B	B _{roof} (t4)	C _{roof} (t4)	D _{roof} (t4)
Less than 6m		✓	✗	✗
At least 6m		✓	✓	✗
At least 12m		✓	✓	✗
A. Class is determined by reference to BS 476-3 B. Class is in accordance with Commission Decision 2055/823/EC amending Decision 2001/671/EC in accordance with BS EN 13501-5 [29]. Test 4 within BS EN 13501-5 is to be used in determining the classification.				

5.3 Space separation and unprotected façade areas

- 5.3.1 Should a fire occur in a building, heat will radiate through non-fire resisting openings in the external walls. This heat can be enough to set fire to nearby buildings. To reduce the likelihood of this occurring, the Building Regulations place limits on the area of the external elevation with no fire resistance. This area is known as the unprotected area. The distance of the building from other buildings, the use of the building and the compartment size are all factors in determining the acceptable degree of unprotected area for each elevation.
- 5.3.2 Using the calculation process outlined in BR 187 [30] an analysis of the distance between the building and the adjacent site or notional boundaries has be undertaken. For areas likely to have a greater volume of combustibles, being the plant & post rooms, bin store, cleaner’s store and cycle store, the upper radiation intensity value of 168 kW/m² recommended by BR187 is utilised. For all other areas, the lower value of 84 kW/m² is used.
- 5.3.3 All flats and ancillary areas (e.g. bin store, bike store, plat etc.) shall be provided with a sprinkler system and as such, the radiant heat flux will be reduced by half, in accordance with the guidance of BS 9991.
- 5.3.4 As all floors are compartment floors, and compartmentation is provided within the ground floor of the building, fires may be assumed to be confined to a single compartment at a single storey. With regard to assessing fire spread from residential areas, it is assessed from the flat that offers the greatest

* Recommendations given in this table are not exhaustive as dispensations are provided in BS 9999, including for roof lights.

opportunity for external fire spread from a given elevation (i.e. the largest). As such, the fire spread calculations undertaken in Table 9 are for the most onerous compartments within the building only.

- 5.3.5 The relevant site boundaries are taken as indicated in
- 5.3.6 Figure 4, utilising the physical site boundaries (e.g. fence, wall, or hedge), centreline of the surrounding roads and public spaces, where each of these are suitably unlikely to be developed.
- 5.3.7 According to Table 5, none of the flat's external walls will require fire resistance for space separation purposes. Whilst the east elevation of the bike store will have to be protected as per Table 5.

Table 9 – Space separation calculations

Façade	Use	Distance to boundary (m)	Radiation intensity (kW/m ²)	Maximum enclosing rectangle (m)		Permitted unprotected façade (%)
				Height	Width	
North	Plant	6.6	168*	3.0	7.7	100
North	Bin store	6.6	168*	3.0	7.1	100
East	Bin store	2.3	168*	3.0	5.4	79
East	Switch room	2.3	168	3.0	2.2	84
East	Bike store	2.3	168*	3.0	9.6	58
East	Residential (1 st floor)	2.3	84*	3.0	16.5	100
South	Bike store	4.6	168*	3.0	11.2	100
West	Post room	7.0	168*	3.0	2.4	100

* All residential and ancillary areas are provided with an automatic suppression system, therefore the radiant heat flux will be reduced by half, in accordance with the guidance of BS 9991.

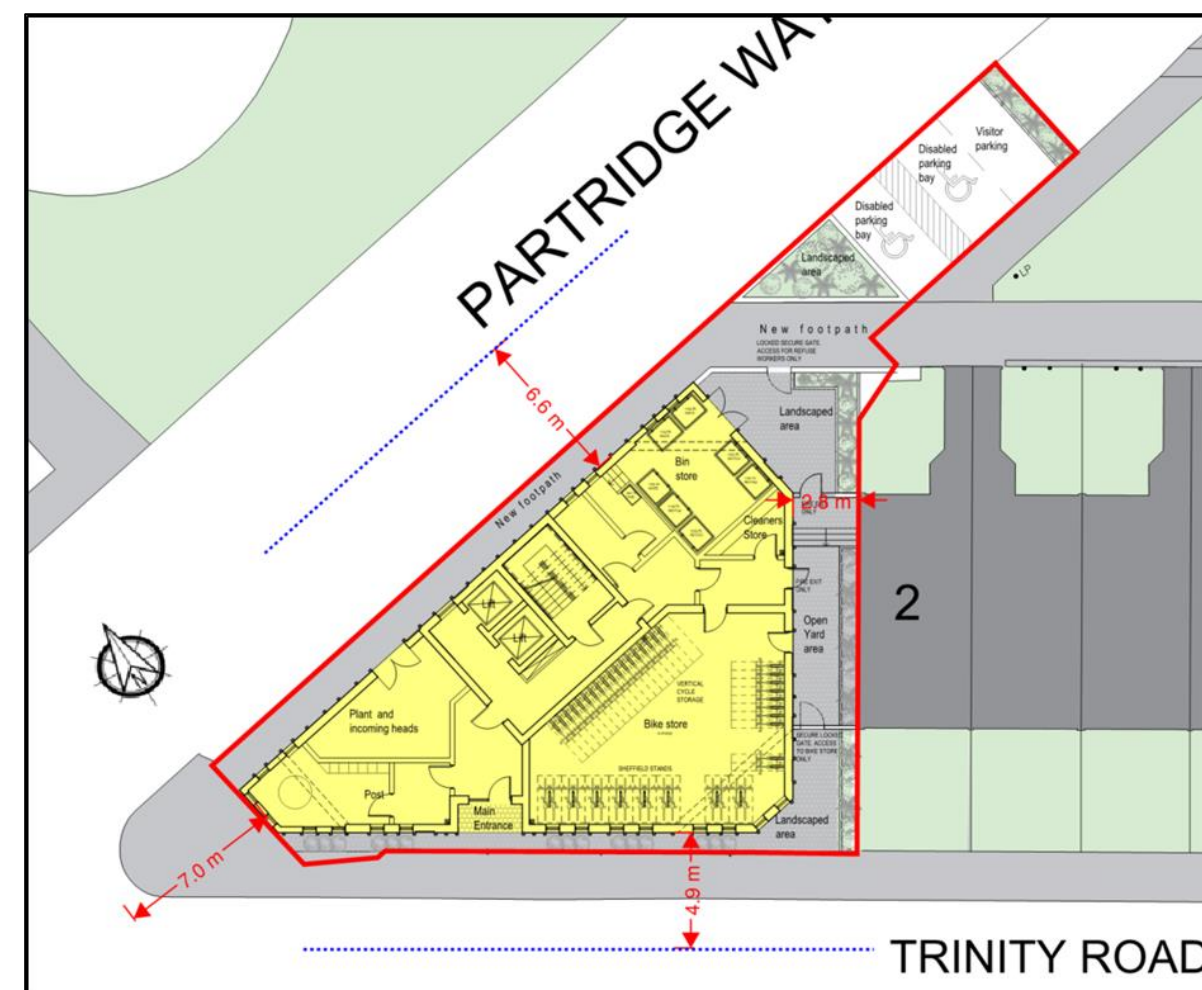


Figure 4 –Space separation

6. ACCESS AND FACILITIES FOR THE FIRE AND RESCUE SERVICE

Building Regulations requirement B5:

- (1) The building shall be designed and constructed so as to provide reasonable facilities to assist fire fighters in the protection of life.
- (2) Reasonable provision shall be made within the site of the building to enable fire appliances to gain access to the building."

6.1 Means of notifying the fire and rescue service

- 6.1.1 In the event of fire, the fire and rescue service will be notified by either a resident of the building or where applicable a member of building management. An automatic fire service notification system could be employed for common areas alarm system.

6.2 Access to and around the building

- 6.2.1 Fire and rescue service vehicle access around and into the building will be provided via Partridge way and Trinity Road. Figure 5 below presents the fire-fighting access around the buildings. Fire-fighting access points into the building are shown with red arrows.
- 6.2.2 Fire and rescue service access to and around the buildings will be as indicated in Figure 5. These provide access for a pumping appliance to within 18 m and clear line of sight of the dry riser inlets, as recommended by Section 50.1.3 of BS 9991, and are sized in accordance with the recommendations given in the LFB document GN29 [31], as noted in Table 10.
- 6.2.3 The firefighting shaft will be fitted with dry fire main whilst fire appliance access will be provided to within 18 m and within sight of a suitable entrance giving access to the fire main.

6.3 Firefighting facilities provided within the development

- 6.3.1 Access for fire-fighters to the residential areas will be directly via firefighting stair, which grants access to all flats throughout the block. Ancillary areas at ground level are accessed directly from outside, except for post room.
- 6.3.2 The firefighting stair and lift should be clearly signed for firefighters as specified in Section 3.12.3.
- 6.3.3 The dry riser in accordance with BS 9990 [32] will be provided within the firefighting stair. The dry riser inlet will be adjacent to the main entrance, being easily accessible to the fire pump appliance. Though the main will require a horizontal run within the building to reach the stair core, this is considered an acceptable arrangement for meeting the recommendations where of a distance no greater than the 18 m anticipated in Figure 20(b) of BS 9999.
- 6.3.4 All areas of the buildings are within the maximum hose laying distance of 60 m from the dry riser outlet within the firefighting stair, as recommended by BS 9991. As such, a second dry riser is not considered necessary.
- 6.3.5 The dry riser mains should be provided with landing valves on each floor including ground. Additionally, a roof landing valve is recommended for testing purposes. Dry risers will be specified and installed in accordance with BS 9990 [5].

- 6.3.6 Access to the firefighting shaft is done directly from the main entrance lobby.

- This area should be kept sterile at any time.
- Though BS 9999 (as referenced in BS 9991) recommends that the escape route from the firefighting stair to the final exit should be increased by 500mm to account for the contra flow of evacuating building occupants and firefighters entering, this is not considered relevant for residential buildings with a 'stay-put' policy and for which large numbers of occupants will not be escaping.

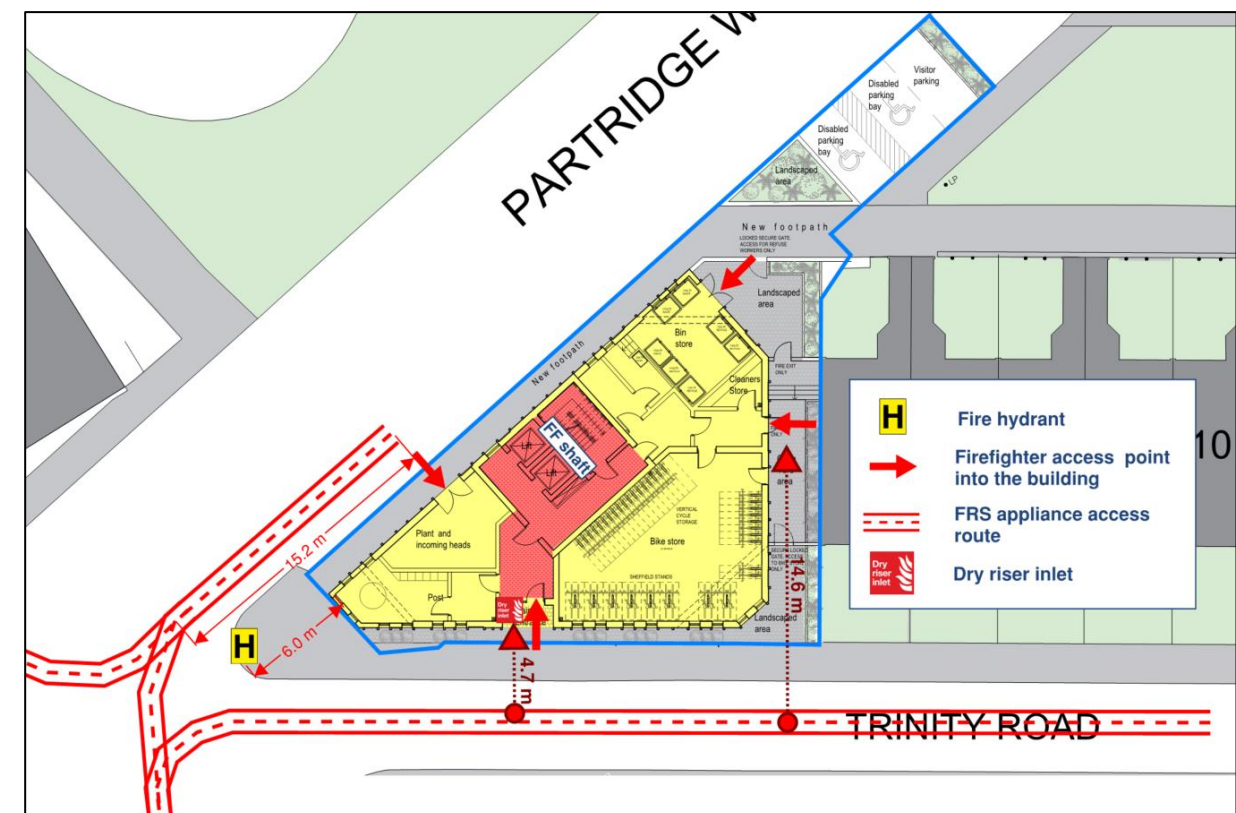


Figure 5 – Fire-fighting access around and to the buildings

6.4 Water supplies

- 6.4.1 Water will be supplied for firefighting use via the public hydrant system. The approximate location of each existing hydrant is shown in Figure 5. The current hydrant location is considered acceptable as it is located circa 7 m away from the building.
- 6.4.2 A water supply capable of providing a minimum 1,500 litres per minute at all times is recommended. Where existing hydrants are to be utilised, they should be confirmed as operational and capable of providing the necessary pressures and flows. Water supplies will be designed and installed in accordance with BS 9990 [32].

Table 10 – Pump type and high-reach (Aerial platform) fire-fighting appliance access requirements

Minimum access route specification	Pump appliance minimum dimensions	High-reach appliances
Width between kerbs	3.7m	3.7m
Width between gateways	3.1m	3.1m
Turning circle between kerbs	16.8m	26.0m
Turning circle between walls	19.2m	29.0m
Clearance height	3.7m	4.0m
Carrying capacity for entire truck	14 tonnes	23 tonnes

6.5 First-aid fire-fighting

- 6.5.1 First-aid fire-fighting provisions should be assessed and provided as part of the fire risk assessment for the building, including consideration for the day-to-day management of these provisions. Suitable first-aid firefighting provisions can help with the extinguishment of small fires, preventing these from growing into significant fires.
- 6.5.2 In general, fire points should be provided within common areas of the building and within specific areas presenting a significant fire ignition risk. It would be recommended that fire points be provided at storey exits (to common stairs and final exits). The fire risk assessment that should be undertaken upon occupation of the building may assist with the placement of suitable fire extinguishers.
- 6.5.3 The provision of suitable first-aid fire-fighting equipment (i.e. fire extinguishers and fire blankets) within flats is generally considered to be the responsibility of the flat occupier or landlord. However, it would be recommended that management of the wider building encourage first-aid fire-fighting equipment within each flat to assist in reducing the likelihood of flat fires developing, growing and posing a threat to the building occupants or property.
- 6.5.4 The type and size of extinguisher(s) at each fire point will be chosen in accordance with the guidance given in BS 5306 [33], as summarised by Table 11 and the classification of fire fuel hazards summarised as follows:
- Class A – fires involving solid materials, usually of an organic nature (general hazards);
 - Class B – fires involving liquid or liquefiable solids (such as liquid fuels, lubricants, paints, etc.);
 - Class C – fires involving gasses;
 - Class D – fire involving metals; and
 - Class F – fires involving cooking media (vegetable or animal oils or fats).
- 6.5.5 Fire blankets are typically provided for extinguishing cooking fires. Should suitable extinguishers for cooking or metal fires be required, it would be recommended that advice from a specialist be sought.

Table 11 – Fire extinguisher types and application guidance

Medium	Colour code	Application	Do NOT use for
Water	White	Class A fires	Liquid, electrical, metal or cooking fires
Powder	Blue	Class A, B or C fires	Metal or cooking fires
Foam	Cream	Class A or B fires	Electrical*, metal or cooking fires
CO ₂	Black	Class B fires	Metal or cooking fires
* AFFF Foam extinguishers may be used for electrical fires up to 35 kV (dielectric test) and where operated from a distance of at least 1 m.			

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APPENDIX A - FIRE SAFETY MAINTENANCE AND MANAGEMENT ISSUES

A.1 Fire safety management documentation

- A.1.1 Under Regulation 38 of the Building Regulations, this fire safety strategy report should form part of the information handed over to the management company to enable them to enact fire safety management in the building.
- A.1.2 Under the FSO, the landlord or building management company is responsible for developing a fire safety plan. To achieve the required level of information dissemination and availability, a fire safety manual should be produced specific to the site. Annex H of BS 9999 provides guidance on the preparation of fire safety manuals.
- A.1.3 It is recommended that adequate premises information for the fire and rescue service is provided on site in a suitable manner, e.g. premises information box or similar. Further guidance relating to the format of this information can be obtained from the London Fire Brigade Fire Safety Team.
- A.1.4 The responsible person(s) for the premises should ensure that all fire safety arrangements being maintained are accounted for as part of their fire risk assessment(s).
- A.1.5 The remainder of this section provides guidance regarding management issues identified during the strategic development of the fire safety strategy for this building. This may be utilised to inform the ongoing fire risk assessment for the building, which should monitor the degree to which these items are being upheld in practice.

A.2 Maintenance of fire safety systems

- A.2.1 The fire safety systems provided within the building will require ongoing maintenance in accordance with the manufacturer's specification for each of the systems. These may include, but are not limited to:
- Alarm and detection systems;
 - Fire doors, including door closers and smoke seals;
 - Emergency lighting and any illuminated signage;
 - Evacuation lift;
 - Firefighting lift;
 - Sprinkler system;
 - Elements of smoke control systems serving common corridors and ancillary area lobbies;
 - Dry riser systems;
 - Fire dampers, whether automatic or intumescent;
 - Back-up power supply system; and
 - Fire extinguishers provided in common areas.

- A.2.2 It is recommended that an inspection and maintenance schedule be developed for the fire safety systems within the building, and the records of this be available as required when undertaking a fire risk assessment, or at the request of the local fire and rescue service.

A.3 Management of fire safety

- A.3.1 Within the common areas, building management will be responsible for ensuring that fire safety provisions and assumptions for these areas are maintained and enforced. These include, but are not limited to:
- Ensuring that the resident's lobby, common corridors, lobbies and stairs remain suitably fire sterile (no stored combustible goods or refuse) and are free obstacles which may hinder escape.
 - Ensuring that fire doors within the common areas may operate effectively and are not propped open using door stops or fire-extinguishers. Should it become apparent that common fire doors are regularly being propped open, management should consider installing suitable hold-open devices which would release automatically upon activation of the fire alarm.
 - Management should ensure that service risers and storage cupboards accessed from common corridors are locked shut whenever these are not in use.

A.4 Access, monitoring and maintenance within flats

- A.4.1 To suitably maintain the common fire safety provisions within the building, management will require the ability to access and intervene with certain elements of the dwellings within the building. As such, it is recommended that contracts between building management and occupants (i.e. tenancy agreements, leaseholds, freeholds, building management agreements, etc.) include the ability from management to be able to inspect, repair or enforce repairs, such as regarding the following non-exhaustive list of items:
- Fire doors provided between the flat and the common areas are critical to the success of the means of escape strategy. These should be regularly reviewed by building management to ensure that these have not been damaged or altered, and that the self-closing device is operating correctly. Building management should retain the ability to enforce repairs or install new doors where flat entrance doors are found to be sub-standard.
 - Fire-resisting construction provided to separate flats or common areas is required to be maintained throughout the life of the building. Management should ensure that occupants within flats are not able to lower the fire-resistance ratings of separating walls or soffits through informal or unapproved alterations.
 - If dampers are utilised within flats, where ductwork crosses fire-resisting construction between flats or common areas, management should be able to access, inspect, repair or reset dampers.
 - Fire spread between balconies presents a route via which fire may simultaneously affect flats at multiple levels, putting the wider occupancy of the building at risk. Resident's private balconies, especially where these are vertically aligned with balconies above, should not be used for storing substantial amounts of combustible items. Management would be recommended to be able intervene should excessive fire load become apparent on flat balconies.

A.5 Hoarding

- A.5.1 'Compulsive hoarding' or 'Hoarding' is a mental health issue characterised by the accumulation of great quantities of good within an occupant's home or flat. Amongst the number of health and safety issues associated with hoarding, this also poses a challenge with regards to fire safety.
- A.5.2 The fire safety provisions provided within a building assume certain characteristics, including fire load and the effectiveness of the sprinkler system. Hoarding may significantly increase the fire load above that which is typically assumed within a residential unit and present a greater likelihood of sheltered or deep-seated fires occurring where accumulated goods shelter the fire from the AWFSS spray arc.
- A.5.3 As such, hoarding increased the likelihood of the fire safety systems being overwhelmed by a fire occurring within the unit and posing a life safety risk for the wider occupants of the building and firefighters.
- A.5.4 Should building management have cause to believe an occupant is hoarding goods within their flat, it is recommended that their suspicions are reported to the local health or mental health service provider, as well as to the local fire and rescue service.

APPENDIX B – FIRE SAFETY MARK-UPS

Project: Patridge Way, London
Title: Fire Resistance & Fire Safety Mark-ups
Revision: v4.0
Prepared by: Mihail Celan
Checked by: Andy Ballantyne

Scale: As shown
Date: 19/05/21
Date: 20/05/21

Socotec Fire Engineering- Mark-up Legend

120 minutes fire resistance

90 minutes fire resistance

60 minutes fire resistance

30 minutes fire resistance

Storey/ final exit

Dry riser inlet

FD90S Fire door

FD60S Fire door

FD60 Fire door

FD30S Fire door

FD30 Fire door

Dry riser outlet

Notes:

- flats should be provided with an LD2 alarm and detection system;
- all floor should be designed as compartment floors
- structural fire resistance period - 60 minutes
- materials which are part of the external wall should achieve European Class A1-s1, d0 or Class A1.

Fire-fighting stairs should be designed in accordance with BS 5395-1, with a width between the walls or balustrades of not less than 1.1 m. This width should be kept clear for a vertical distance of 2.0 m, as measured from the pitch line or landing floor level.

Fire-fighting (FF) shaft should be provided with:

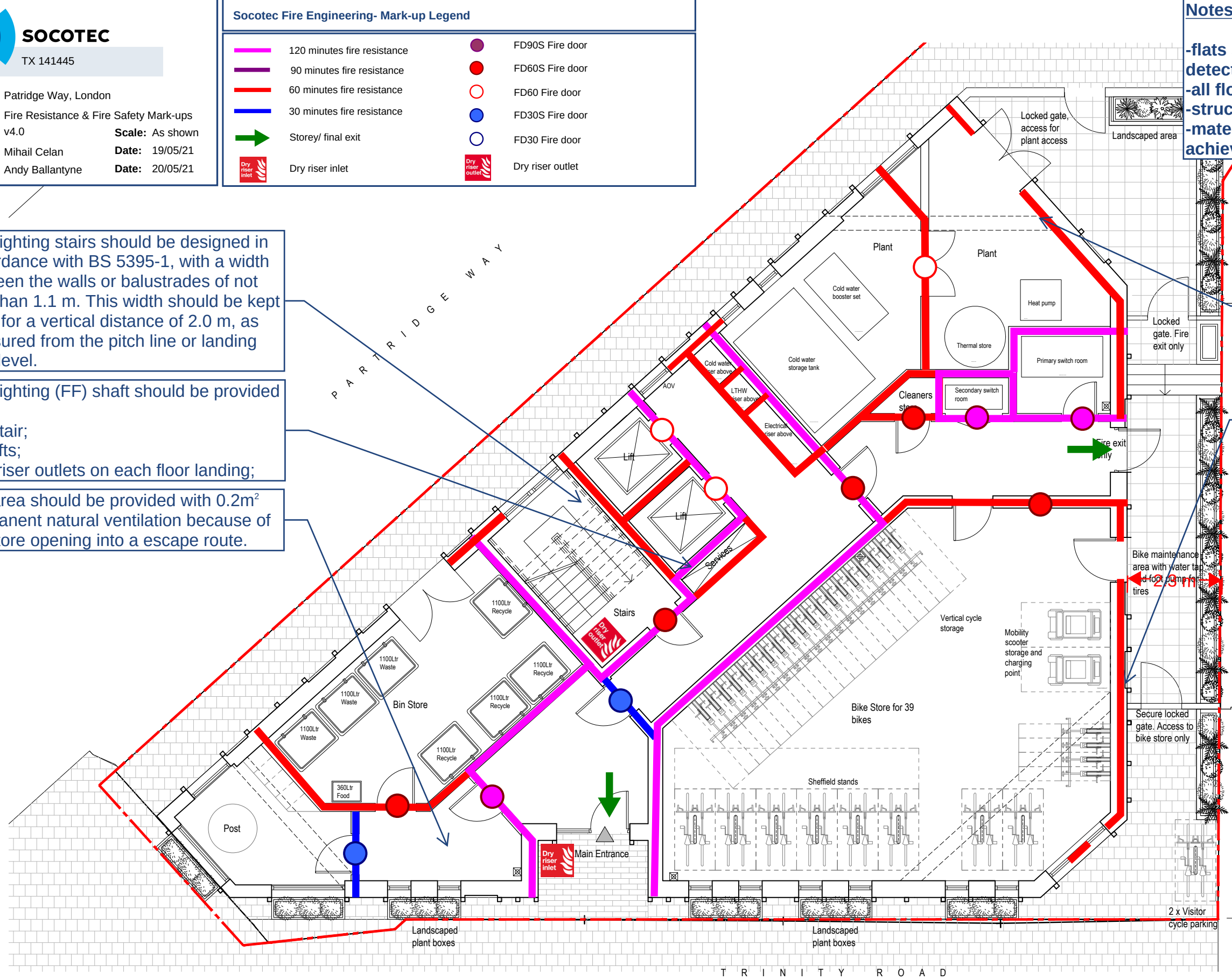
- FF stair;
- FF lifts;
- Dry riser outlets on each floor landing;

this area should be provided with 0.2m² permanent natural ventilation because of bin store opening into a escape route.

External fire spread - Plant -East elevation
boundary distance = 2.3m (site boundary)
width = 5.4m; height =3m; heat flux = 84kW/m2 (reduced by 1/2 due to AWFSS)
Allowed unprotected area = **79%**

External fire spread - Bike store
East elevation
boundary distance = 2.3m (site boundary)
width = 9.5m; height =3m; heat flux = 84kW/m2 (reduced by 1/2 due to AWFSS)
Allowed unprotected area = **58%**

2



SCHEDULE

Unit Number	Unit Type	Size
1	2B3P	82.02sqm
2	2B4P	96.81sqm
3	1B2P	51.92sqm
4	2B4P	72.61sqm
5	1B2P	51.08sqm
6	1B2P	51.92sqm
7	2B4P	72.61sqm
8	1B2P	51.08sqm
9	1B2P	51.92sqm
10	2B4P	72.61sqm
11	1B2P	51.08sqm
12	1B2P	51.92sqm
13	2B4P	72.61sqm
14	1B2P	51.08sqm

Notes

This drawing should be read in conjunction with the building fire safety report and supporting detailed information.

The fire resistance illustrated on this drawing are for separating or enclosing areas of the building. The performance of the loadbearing structure, external walls and floors should be in accordance with the building fire safety report.

Unless otherwise shown, fire resistance provisions and method of exposure should be in accordance with the fire strategy and associated references.

Unless otherwise shown, fire doors should be in accordance with the fire strategy and associated references

01 PROPOSED GROUND FLOOR PLAN
103 1:100

Project:

Patridge Way, London

Title:

Fire Resistance & Fire Safety Mark-ups

Revision:

v4.0

Prepared by:

Mihail Celan

Checked by:

Andy Ballantyne

Scale:

As shown

Date:

19/05/21

Date:

20/05/21

Socotec Fire Engineering- Mark-up Legend

120 minutes fire resistance

90 minutes fire resistance

60 minutes fire resistance

30 minutes fire resistance

Storey/ final exit

Dry riser inlet

FD90S Fire door

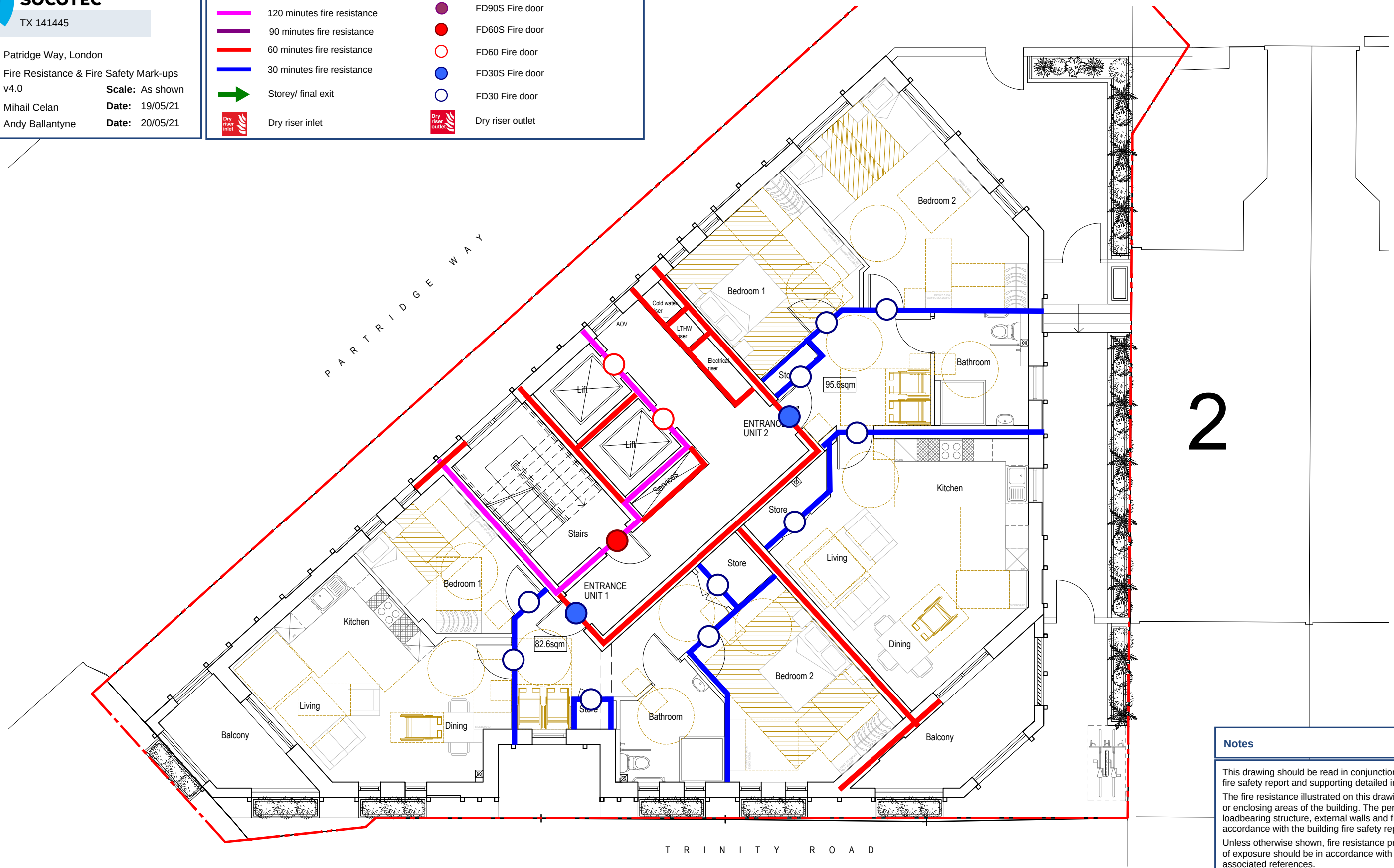
FD60S Fire door

FD60 Fire door

FD30S Fire door

FD30 Fire door

Dry riser outlet



2

Notes

This drawing should be read in conjunction with the building fire safety report and supporting detailed information.

The fire resistance illustrated on this drawing are for separating or enclosing areas of the building. The performance of the loadbearing structure, external walls and floors should be in accordance with the building fire safety report.

Unless otherwise shown, fire resistance provisions and method of exposure should be in accordance with the fire strategy and associated references.

Unless otherwise shown, fire doors should be in accordance with the fire strategy and associated references

01104

PROPOSED FIRST FLOOR PLAN

1:100

Project:

Patridge Way, London

Title:

Fire Resistance & Fire Safety Mark-ups

Revision:

v4.0

Prepared by:

Mihail Celan

Checked by:

Andy Ballantyne

Scale:

As shown

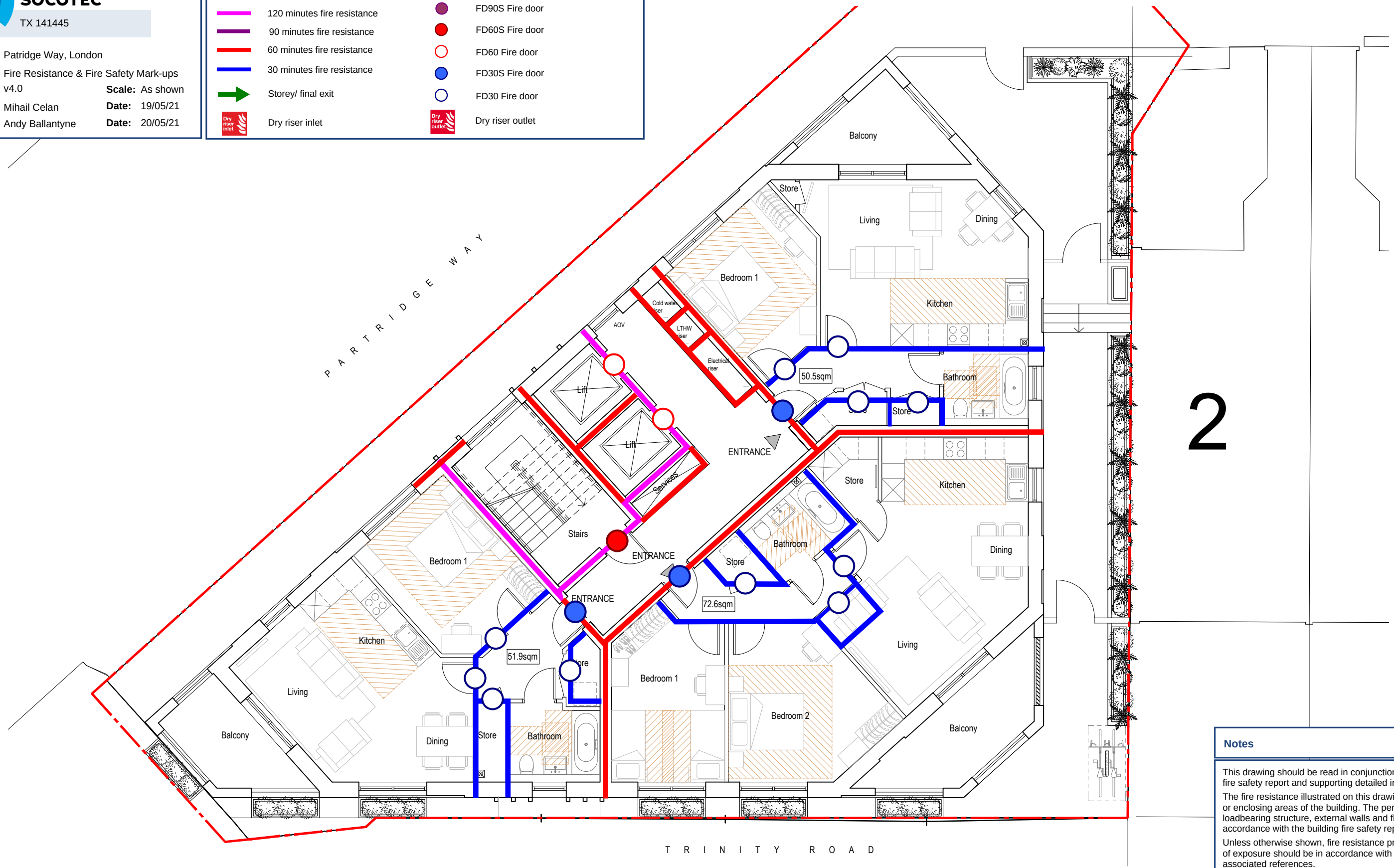
Date:

19/05/21

Date:

20/05/21

Socotec Fire Engineering- Mark-up Legend			
	120 minutes fire resistance		FD90S Fire door
	90 minutes fire resistance		FD60S Fire door
	60 minutes fire resistance		FD60 Fire door
	30 minutes fire resistance		FD30S Fire door
	Storey/ final exit		FD30 Fire door
	Dry riser inlet		Dry riser outlet



Notes

This drawing should be read in conjunction with the building fire safety report and supporting detailed information.

The fire resistance illustrated on this drawing are for separating or enclosing areas of the building. The performance of the loadbearing structure, external walls and floors should be in accordance with the building fire safety report.

Unless otherwise shown, fire resistance provisions and method of exposure should be in accordance with the fire strategy and associated references.

Unless otherwise shown, fire doors should be in accordance with the fire strategy and associated references

01105

PROPOSED SECOND TO EIGHTH FLOOR PLAN

1:100

Project:

Patridge Way, London

Title:

Fire Resistance & Fire Safety Mark-ups

Revision:

v4.0

Prepared by:

Mihail Celan

Checked by:

Andy Ballantyne

Scale:

As shown

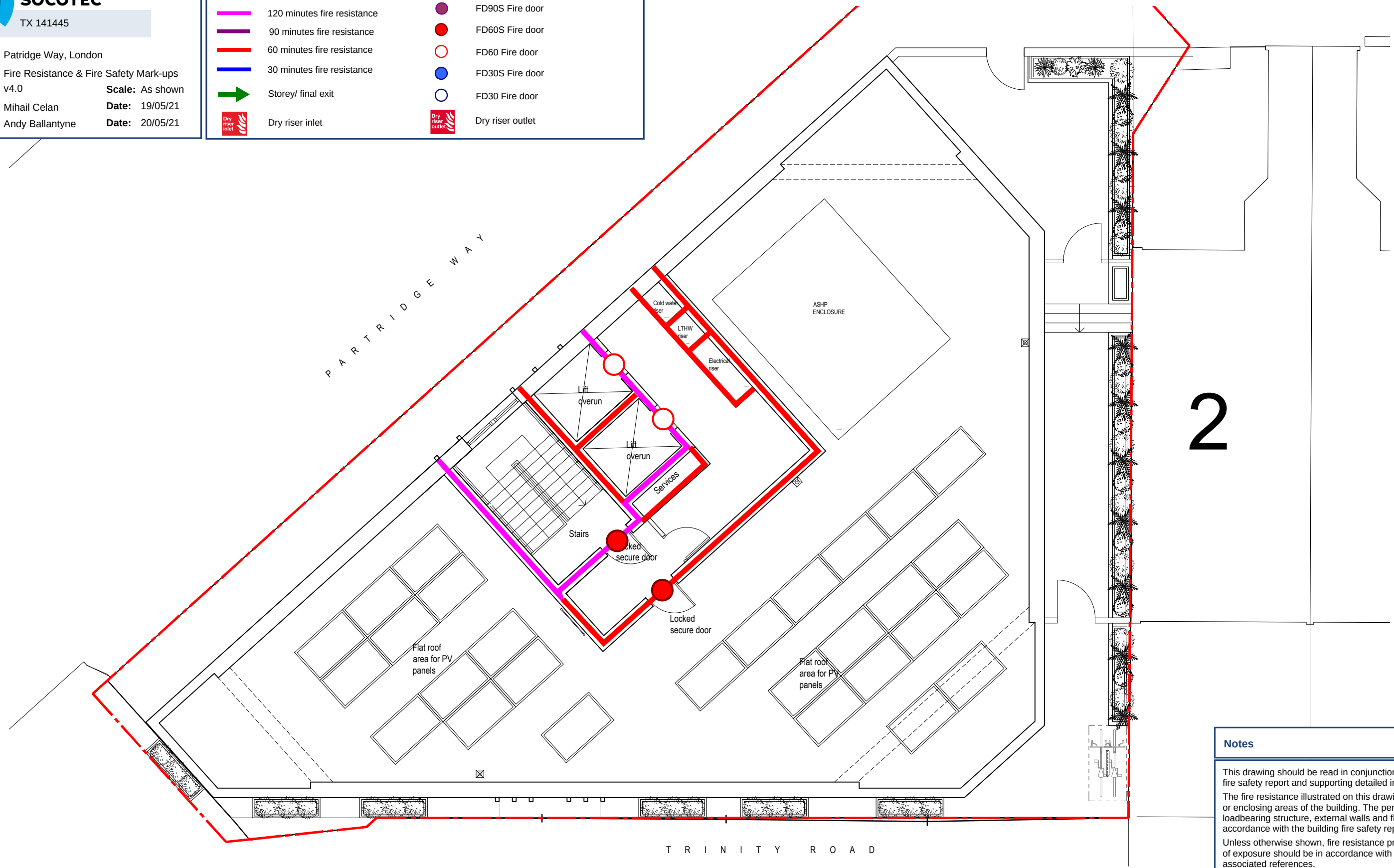
Date:

19/05/21

Date:

20/05/21

Socotec Fire Engineering- Mark-up Legend			
	120 minutes fire resistance		FD90S Fire door
	90 minutes fire resistance		FD60S Fire door
	60 minutes fire resistance		FD60 Fire door
	30 minutes fire resistance		FD30S Fire door
	Storey/ final exit		FD30 Fire door
	Dry riser inlet		Dry riser outlet



01

106

PROPOSED NINTH FLOOR PLAN

1:100

Notes

This drawing should be read in conjunction with the building fire safety report and supporting detailed information.

The fire resistance illustrated on this drawing are for separating or enclosing areas of the building. The performance of the loadbearing structure, external walls and floors should be in accordance with the building fire safety report.

Unless otherwise shown, fire resistance provisions and method of exposure should be in accordance with the fire strategy and associated references.

Unless otherwise shown, fire doors should be in accordance with the fire strategy and associated references

CONTRACTORS ARE NOT TO SCALE OFF THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE
INFORM THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION
PLOT SIZE: A3

NOTES:

SCALE: 1:100 @ A3

0

1

2



P02	25.06.2021	ADDITIONAL PV PANELS ADDED	VL	CP
P01	08.04.2021	SCHEME FREEZE FOR PLANNING	VL	CP
REV	DATE	DESCRIPTION	DRN	CHK
REVISION HISTORY				

PROJECT:

PARTRIDGE WAY
HARINGEY

CLIENT:

HARINGEY COUNCIL

DRAWING NO:

0226 - 106

DRAWING TITLE:

PROPOSED
NINTH FLOOR PLAN

SCALE @ A3:

1:100

REV:

P02



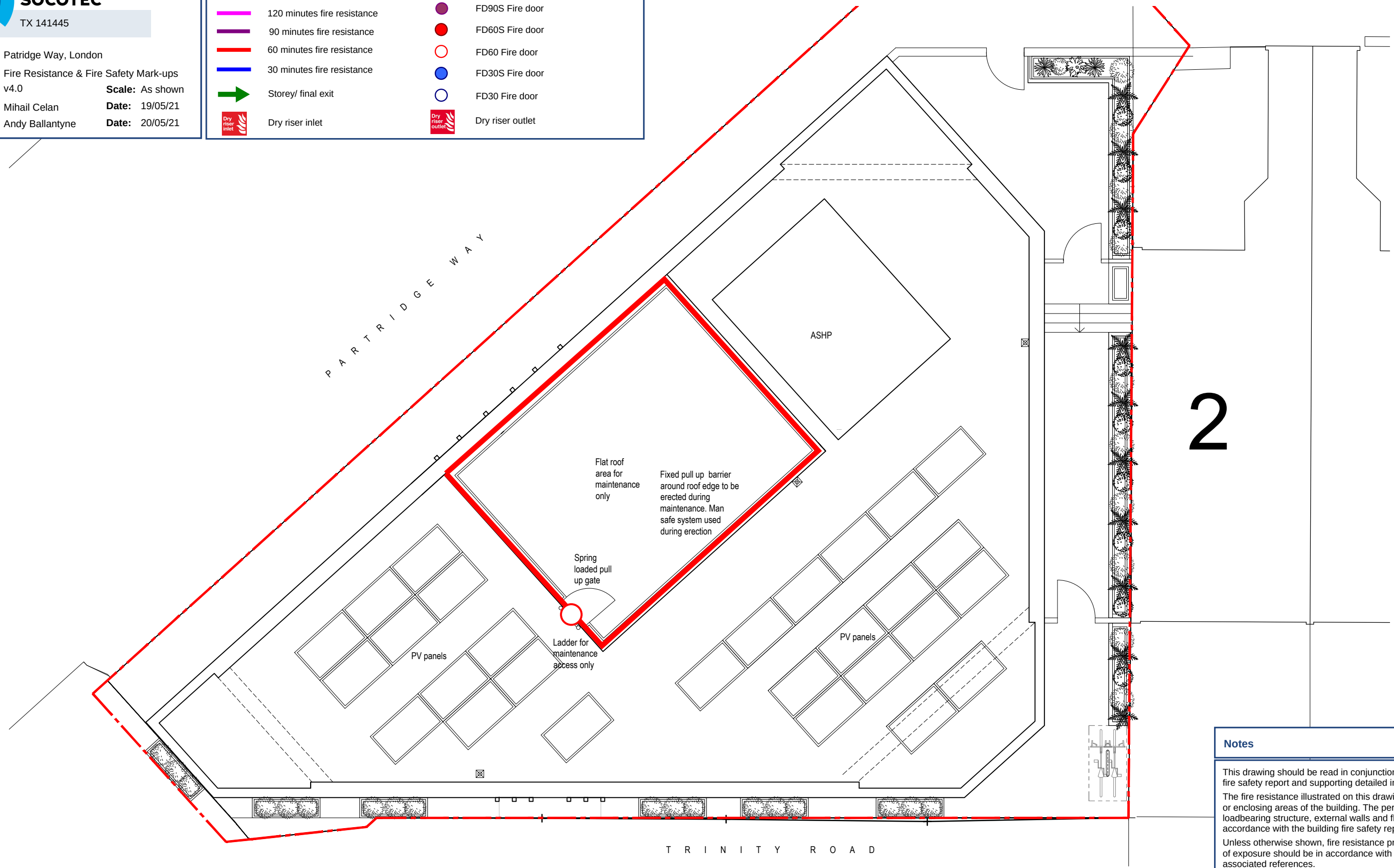
Unit One Architects Ltd

The Junction, Station Road, Watford, WD17 1EU
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Project: Patridge Way, London
Title: Fire Resistance & Fire Safety Mark-ups
Revision: v4.0
Prepared by: Mihail Celan
Checked by: Andy Ballantyne

Scale: As shown
Date: 19/05/21
Date: 20/05/21

Socotec Fire Engineering- Mark-up Legend			
	120 minutes fire resistance		FD90S Fire door
	90 minutes fire resistance		FD60S Fire door
	60 minutes fire resistance		FD60 Fire door
	30 minutes fire resistance		FD30S Fire door
	Storey/ final exit		FD30 Fire door
	Dry riser inlet		Dry riser outlet



Notes

This drawing should be read in conjunction with the building fire safety report and supporting detailed information.

The fire resistance illustrated on this drawing are for separating or enclosing areas of the building. The performance of the loadbearing structure, external walls and floors should be in accordance with the building fire safety report.

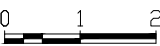
Unless otherwise shown, fire resistance provisions and method of exposure should be in accordance with the fire strategy and associated references.

Unless otherwise shown, fire doors should be in accordance with the fire strategy and associated references

01
107 **PROPOSED ROOF PLAN**
1:100

CONTRACTORS ARE NOT TO SCALE OFF THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE
INFORM THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION
PLOT SIZE: A3

NOTES:
SCALE: 1:100 @ A3



P02	25.06.2021	ADDITIONAL PV PANELS ADDED	VL	CP
P01	12.05.2021	SCHEME FREEZE FOR PLANNING	VL	CP
REV	DATE	DESCRIPTION	DRN	CHK
REVISION HISTORY				

PROJECT:
**PARTRIDGE WAY
HARINGEY**

CLIENT:
HARINGEY COUNCIL

DRAWING NO:
0226 - 107

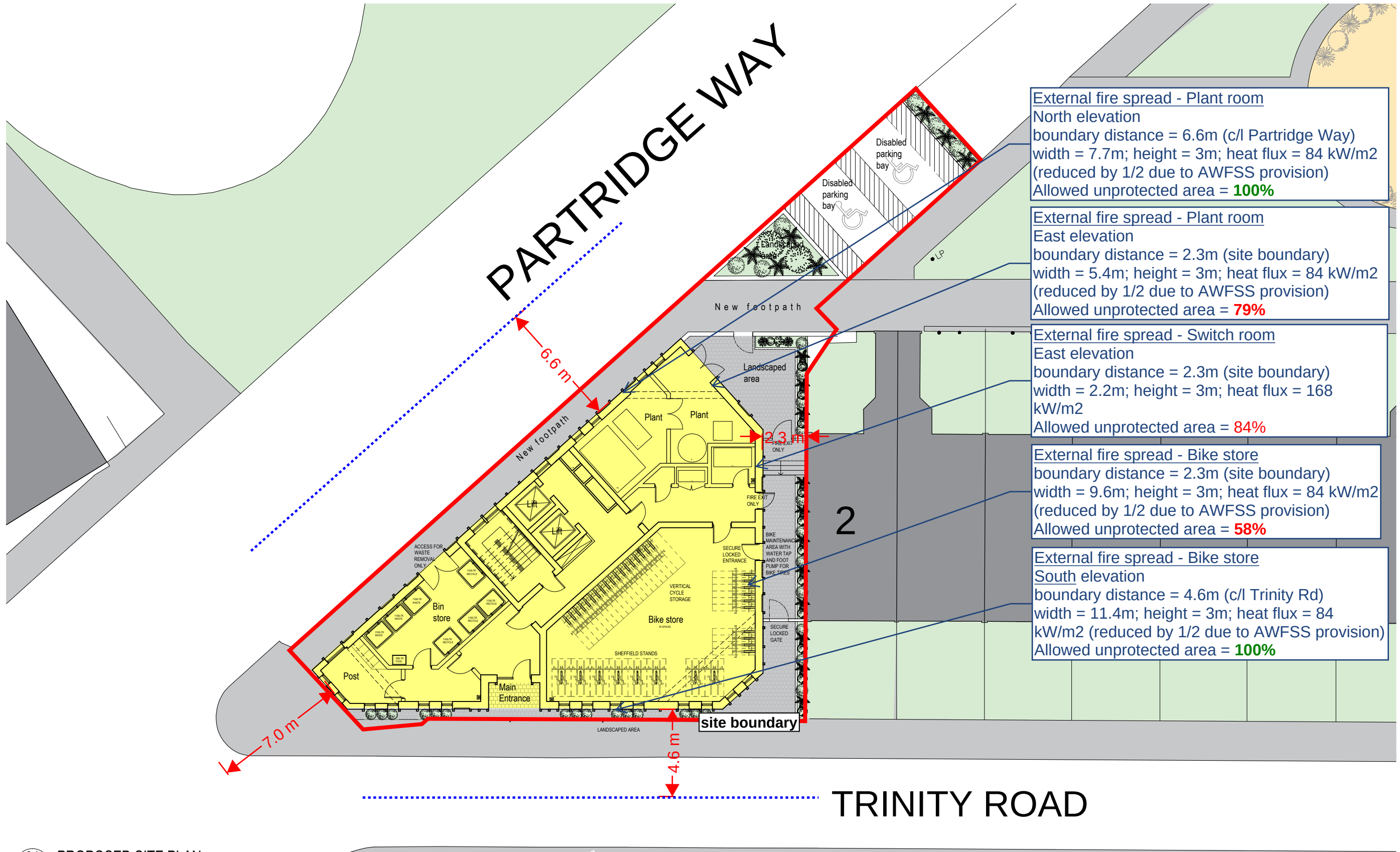
DRAWING TITLE:
**PROPOSED
ROOF PLAN**

SCALE @ A3: 1:100

REV:
P02



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External fire spread - Plant room
North elevation
boundary distance = 6.6m (c/l Partridge Way)
width = 7.7m; height = 3m; heat flux = 84 kW/m2
(reduced by 1/2 due to AWFSS provision)
Allowed unprotected area = **100%**

External fire spread - Plant room
East elevation
boundary distance = 2.3m (site boundary)
width = 5.4m; height = 3m; heat flux = 84 kW/m2
(reduced by 1/2 due to AWFSS provision)
Allowed unprotected area = **79%**

External fire spread - Switch room
East elevation
boundary distance = 2.3m (site boundary)
width = 2.2m; height = 3m; heat flux = 168 kW/m2
Allowed unprotected area = **84%**

External fire spread - Bike store
boundary distance = 2.3m (site boundary)
width = 9.6m; height = 3m; heat flux = 84 kW/m2
(reduced by 1/2 due to AWFSS provision)
Allowed unprotected area = **58%**

External fire spread - Bike store
South elevation
boundary distance = 4.6m (c/l Trinity Rd)
width = 11.4m; height = 3m; heat flux = 84 kW/m2 (reduced by 1/2 due to AWFSS provision)
Allowed unprotected area = **100%**

01 PROPOSED SITE PLAN
102 1:200

CONTRACTORS ARE NOT TO SCALE OFF THIS DRAWING
ALL DIMENSIONS MUST BE CHECKED ON SITE
INFORM THE ARCHITECT OF ANY DISCREPANCIES PRIOR TO CONSTRUCTION
PLOT SIZE: A3

NOTES:
SCALE: 1:200 @ A3

0 2 4

A07	27.11.2020	AMENDED TO CONSULTANTS COMMENTS	VL	CP
A06	25.11.2020	AMENDED TO CONSULTANTS COMMENTS	VL	CP
A05	22.10.2020	AMENDED TO FIRE CONSULTANTS COMMENTS	VL	CP
A04	18.09.2020	ISSUED FOR PUBLIC ENGAGEMENT	VL	CP
A03	09.09.2020	ISSUED FOR INFORMATION	VL	CP
A02	24.07.2020	ISSUED FOR PRE APP	VL	CP
A01	15.07.2020	ISSUED FOR COMMENT	VL	CP
REV	DATE	DESCRIPTION	DRN	CHK

REVISION HISTORY

PROJECT:
PARTRIDGE WAY
HARINGEY

CLIENT:
HARINGEY COUNCIL

DRAWING NO:
0226 - 102

DRAWING TITLE:
PROPOSED
SITE PLAN

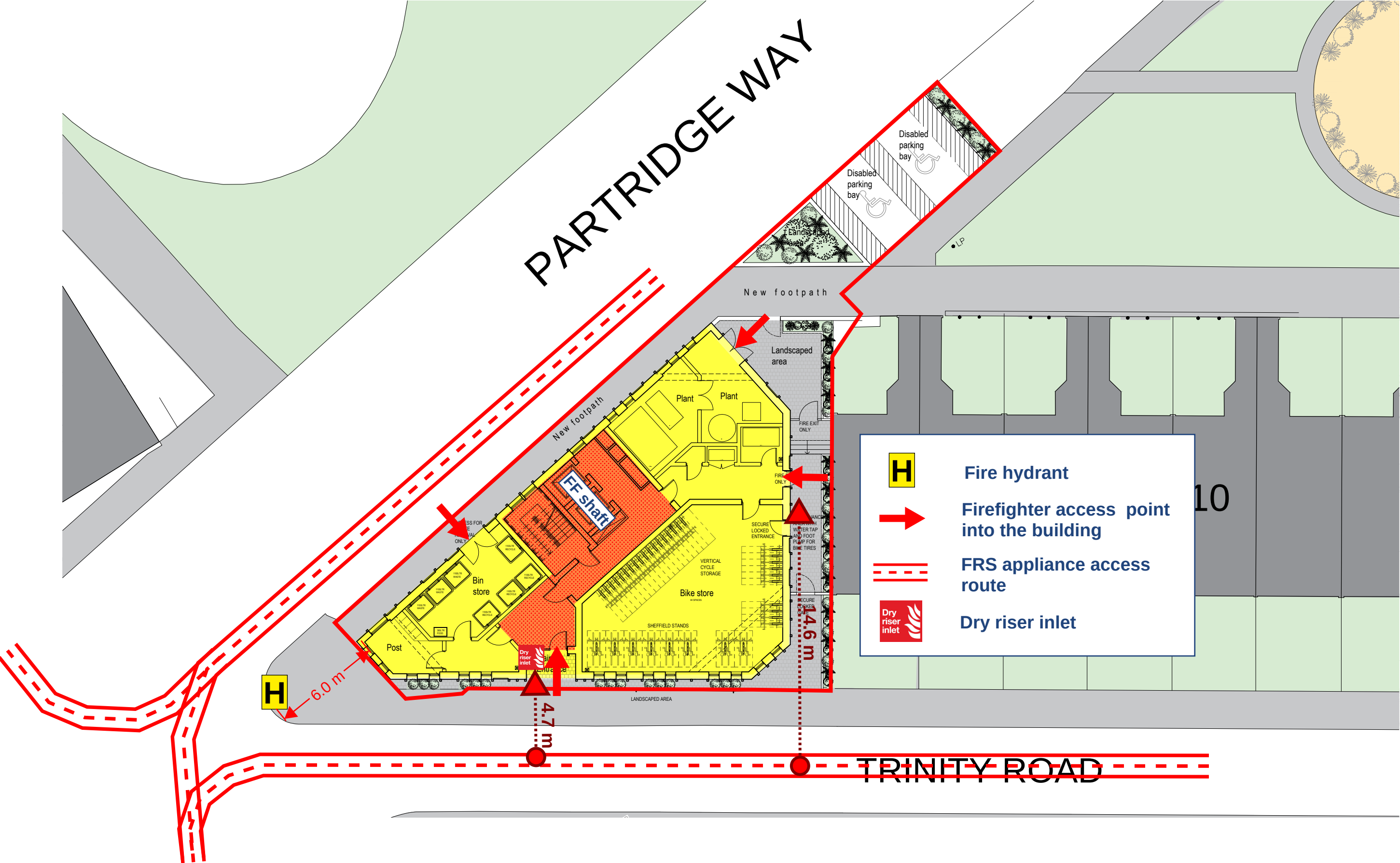
SCALE @ A3: 1:200

REV:
A07

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INFORM THE ARCHITECT OF ANY
DISCREPANCIES PRIOR TO CONSTRUCTION
PLOT SIZE: A3

NOTES:
SCALE: 1:200 @ A3

A07	27.11.2020	AMENDED TO CONSULTANTS COMMENTS	VL	CP
A06	25.11.2020	AMENDED TO CONSULTANTS COMMENTS	VL	CP
A05	22.10.2020	AMENDED TO FIRE CONSULTANTS COMMENTS	VL	CP
A04	18.09.2020	ISSUED FOR PUBLIC ENGAGEMENT	VL	CP
A03	09.09.2020	ISSUED FOR INFORMATION	VL	CP
A02	24.07.2020	ISSUED FOR PRE APP	VL	CP
A01	15.07.2020	ISSUED FOR COMMENT	VL	CP

REV	DATE	DESCRIPTION	DRN	CHK
REVISION HISTORY				

PROJECT:
PARTRIDGE WAY
HARINGEY

CLIENT:
HARINGEY COUNCIL

DRAWING NO:
0226 - 102

DRAWING TITLE:
PROPOSED
SITE PLAN

SCALE @ A3: 1:200

REV:
A07

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