



# Buxton House

## Fire Safety Strategy

*For AHR Architects Limited*

*RIBA Stage 3*

*Revision 02*

*For Comment*

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*Date: 12 January 2024*

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## EXECUTIVE SUMMARY

<b>Building Description</b>	<p>The project comprises the refurbishment of an existing building into a residential development. Buxton House is a 13-storey block, located on Albion Street, Huddersfield. The block is accessible at ground floor via an under-croft area off Albion Street, and at first floor, via an external car park.</p> <p>The block will comprise a resident's lounge at ground floor, plant room at first floor, and residential units at all upper floors. The building is served by two stairs; one serving all floors, and one serving first floor upwards.</p>
<b>Design Guidance and Legislation</b>	<p>The development is generally to be designed in accordance with BS 9991:2015 for all areas. All deviations from this guidance will require agreement with the approving authority and local Fire Service.</p>
<b>Fire Detection &amp; Alarm Systems</b>	<p>It is recommended that the residential units are provided with a Grade D Category LD1 detection and alarm system. Fire detection and alarm systems within the residential units are to be designed, installed, and commissioned in accordance with BS 5839-6:2019.</p> <p>The common residential areas (lobbies, corridors and stairs) are to be provided with a Category L5 fire detection system design to activate the relevant smoke ventilation systems only (no sounders to be provided in these areas). This fire detection system is to be design and installed in accordance with BS 5839-1:2017.</p> <p>The non-residential areas are to be provided with at least an L2 fire detection and alarm system designed in accordance with BS 5839-1:2017.</p> <p>An evacuation alert system should be designed and installed in accordance with BS8629:2019.</p>
<b>Evacuation Strategy</b>	<p>The evacuation strategy for the residential units is based on a 'stay-put' evacuation strategy where only the occupants within the unit of fire origin are to be alerted/evacuate and all other occupants within the building are to remain in place. Any additional evacuation is at the discretion of building management and the local Fire Service.</p> <p>The evacuation strategy for the non-residential areas is based on a single-stage simultaneous evacuation strategy where all occupants within these areas are to be alerted/evacuate immediately on fire detection.</p>
<b>Structural Fire Protection</b>	<p>Elements of structure throughout the building are to achieve at least 120 minutes fire resistance, with regard to load-bearing capacity – see Section 5.2 for further information.</p>

<b>Smoke Ventilation</b>	<p>Both stairs are to be provided with means of smoke ventilation, via an AOV located at the head of each stair, with minimum free area of 1.0m<sup>2</sup>.</p> <p>The common corridors are to be provided with mechanical smoke ventilation. CFD analysis will be required in order to demonstrate the suitability of the proposed mechanical smoke systems.</p>
<b>Automatic Water Fire Suppression System (AWFSS)</b>	<p>The building should be provided with a Category 4 sprinkler system in accordance with BS 9251:2021. Any non-residential areas that fall outside the scope of BS 9251 should be provided with commercial sprinkler coverage in accordance with BS EN 12845:2019.</p>
<b>Fire Service Access</b>	<p>The fire service are to access the building via Albion Street, accessing Stair 1 via the under-croft area.</p> <p>As the building exceeds 18m in height, a firefighting shaft is required. Stair 1 and the single passenger lift are to serve as part of the firefighting shaft of the building. A dry rising fire main is to be provided to the firefighting shaft.</p> <p>Hydrants should be located within 90m of the dry riser inlet position.</p>
<b>Alternative Approaches</b>	<p>The following areas deviate from the requirements of the relevant guidance. However, the proposed strategy is considered acceptable, subject to agreement with the approving authorities and local Fire Service:</p> <ul style="list-style-type: none"> <li>• Omitting the enclosure of kitchens in studio/2-bed apartments – see Section 3.4.1.4;</li> <li>• Stair 1 discharge to under-croft area – see Section 3.5.2;</li> <li>• Clear width of Stair 1 (firefighting stair) – see Section 3.5.3/7.2.1;</li> <li>• Firefighting lift opening into the firefighting stair enclosure – see Section 7.2.2;</li> <li>• Dual-entry firefighting lift at ground floor – see Section 7.2.2.1;</li> <li>• Protection to firefighting shaft from external fires – see Section 7.2.5.</li> </ul>

## 1. INTRODUCTION

Hydrock Fire have been engaged by AHR Architects Limited (hereafter, respectfully referred to as 'AHR') to provide fire engineering services for the proposed refurbishment of Buxton House, Huddersfield.

### 1.1 Purpose of Report

The purpose of this report is to demonstrate to the approving authorities that the proposed Buxton House, Huddersfield, satisfies all functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulations 2010 (as amended) and to outline the Fire Safety Strategy to the design team.

### 1.2 Basis of Report

This Fire Safety Strategy has been developed based on the information and drawings provided by AHR as outlined in Table 1.

Table 1 Information on which the Fire Safety Strategy is based

Description	Drawing No.	Revision	Date
Level B1 – Basement Plan	BXT-AHR-B1-B1-DR-A-202B1	P1 - DRAFT	21.12.2023 <sup>[1]</sup>
Level 00 – Ground Floor Plan	BXT-AHR-B1-00-DR-A-20200	DRAFT	19.12.2023 <sup>[1]</sup>
Level 01 – First Floor Plan	BXT-AHR-B1-01-DR-A-20201	S1 - DRAFT	19.12.2023 <sup>[1]</sup>
Level 02 – Second Floor Plan	BXT-AHR-B1-02-DR-A-20202	S1 - DRAFT	19.12.2023 <sup>[1]</sup>
Level 03 – Third Floor Plan	BXT-AHR-B1-03-DR-A-20203	S1 - DRAFT	19.12.2023 <sup>[1]</sup>
Level 04 – Fourth Floor Plan	BXT-AHR-B1-04-DR-A-20204	S1 - DRAFT	19.12.2023 <sup>[1]</sup>
Level 05 – Fifth Floor Plan	BXT-AHR-B1-05-DR-A-20205	DRAFT	19.12.2023 <sup>[1]</sup>
Level 06 – Sixth Floor Plan	BXT-AHR-B1-06-DR-A-20206	DRAFT	19.12.2023 <sup>[1]</sup>
Level 07 – Seventh Floor Plan	BXT-AHR-B1-07-DR-A-20207	DRAFT	19.12.2023 <sup>[1]</sup>
Level 08 – Eighth Floor Plan	BXT-AHR-B1-08-DR-A-20208	DRAFT	19.12.2023 <sup>[1]</sup>
Level 09 – Ninth Floor Plan	BXT-AHR-B1-09-DR-A-20209	DRAFT	19.12.2023 <sup>[1]</sup>
Level 10 – Tenth Floor Plan	BXT-AHR-B1-10-DR-A-20210	DRAFT	19.12.2023 <sup>[1]</sup>
Level 11 – Eleventh Floor Plan	BXT-AHR-B1-11-DR-A-20211	DRAFT	19.12.2023 <sup>[1]</sup>
Proposed Elevations	BXT-AHR-B1-XX-DR-A-20400	DRAFT	19.12.2023 <sup>[1]</sup>
Proposed Elevations	BXT-AHR-B1-XX-DR-A-20401	DRAFT	12.10.2023 <sup>[1]</sup>
Long Elevation	BXT-AHR-B1-XX-DR-A-20402	DRAFT	12.10.2023 <sup>[1]</sup>
Email from AHR outlining services locations, subject 'RE: [Hydrock: 22176-FENG] KC – Buxton – Leaseholders/Purchases'	-	-	12.10.2023

Existing Section Through Lift Shaft	BXT-AHR-XX-XX-RP-A-05-002	P01	20.06.2023
Buxton – 1-7_68-118 Boundary Existing	-	-	-

Notes:

1. Date received.

### 1.3 Limitations of Report

#### 1.3.1 Information Provided by Others

The Fire Safety Strategy represents only the best judgement of the consultants involved in its preparation, and is based, in part, on information provided by others. Under no circumstances is liability accepted for the accuracy of such information provided by others.

#### 1.3.2 Alternative Methods of Compliance

Where the Fire Safety Strategy proposes alternative methods of compliance, that have been based on accepted codes of practice, to satisfy the functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulations 2010 (as amended), they will be subject to the agreement of the approving authorities and local Fire and Rescue Service.

#### 1.3.3 Minimum Requirements

This report outlines the minimum requirements to satisfy the functional requirements of Part B (Fire Safety) of Schedule 1 to the Building Regulation 2010 (as amended). However, whilst these satisfy the statutory imperatives, Hydrock advise consideration of additional fire safety measures.

## 1.4 Building Overview

The project comprises the refurbishment of an existing building residential building consisting of 58 residential units (mainly studio and one-bedroomed units) into a residential development comprising of 44 residential units (mainly one and two-bedroomed units). Buxton House is a 13-storey block (basement, ground plus eleven above ground levels), located on Albion Street, Huddersfield, as illustrated in Figure 1. The block is accessible at ground floor via an undercroft area off Albion Street, and at first floor, via an external car park. The refurbished block will comprise plant at basement level, residential units, plant and a resident's lounge at ground floor, plant room and residential units at first floor, and residential units at all upper floors.

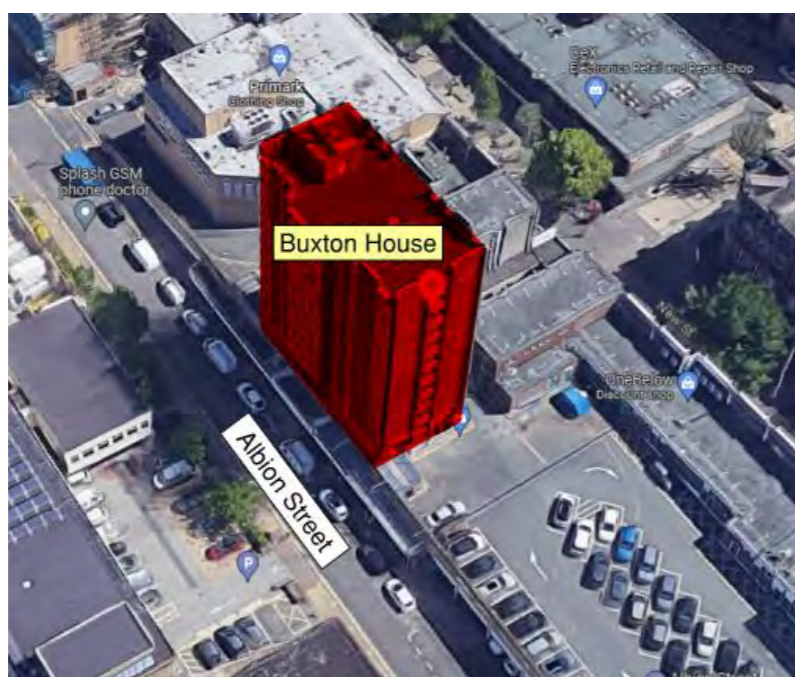


Figure 1 Site location

### 1.4.1 General Arrangements

#### Basement Floor

The basement is assumed to comprise plant space, as illustrated in Figure 2. The use and layout should be confirmed at RIBA Stage 4.

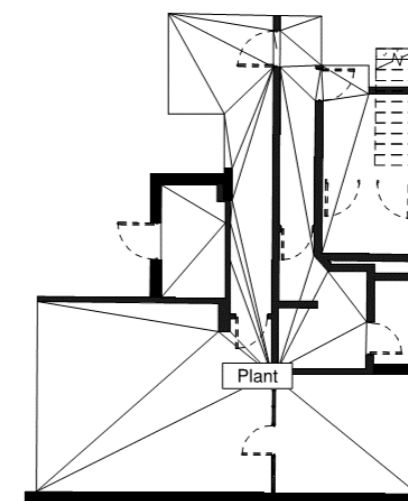


Figure 2 Basement floor general arrangement

#### Ground Floor

The ground floor is to comprise plant areas accessed direct from external, as well as a bike store, communal lounge, and two residential units, as illustrated in Figure 2. Stair 1 discharges at ground floor, leading to an under-croft walkway between the two halves of the development.

It is understood that there is potential for the ground-floor bike store and first-floor refuse stores to swap locations; however, on the basis that these are all to be accessed solely from external, the change would not have adverse impacts on the fire strategy.

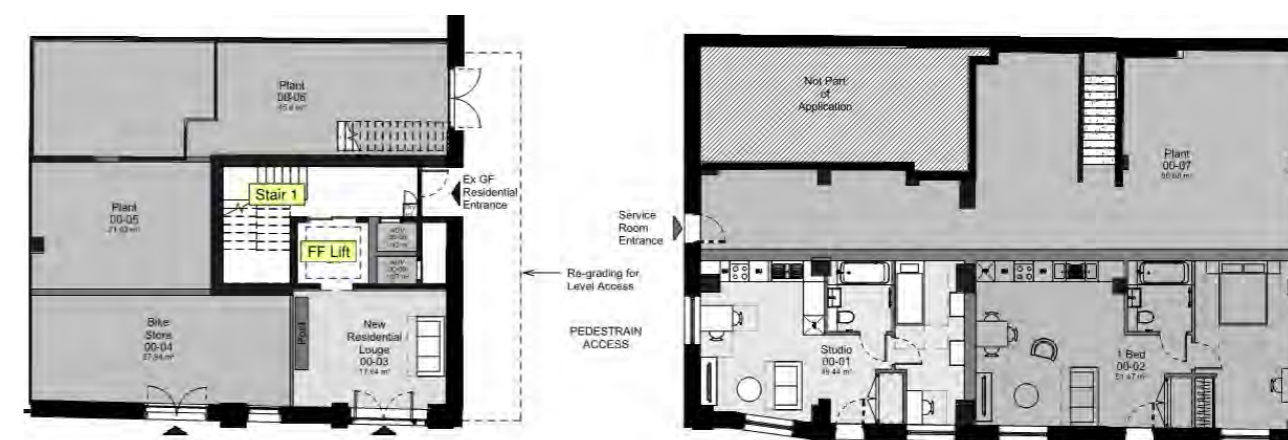


Figure 3 Ground floor general arrangement

### First Floor

The first floor is to comprise a plant room, accessed internally from a ground floor stair, and externally from the first-floor car park, and two refuse stores which are accessed externally. The first floor also comprises two residential units, and is served by Stair 1. Whilst it does not serve the first floor, Stair 2 is understood to discharge at this level, directly to external to the first-floor car park.

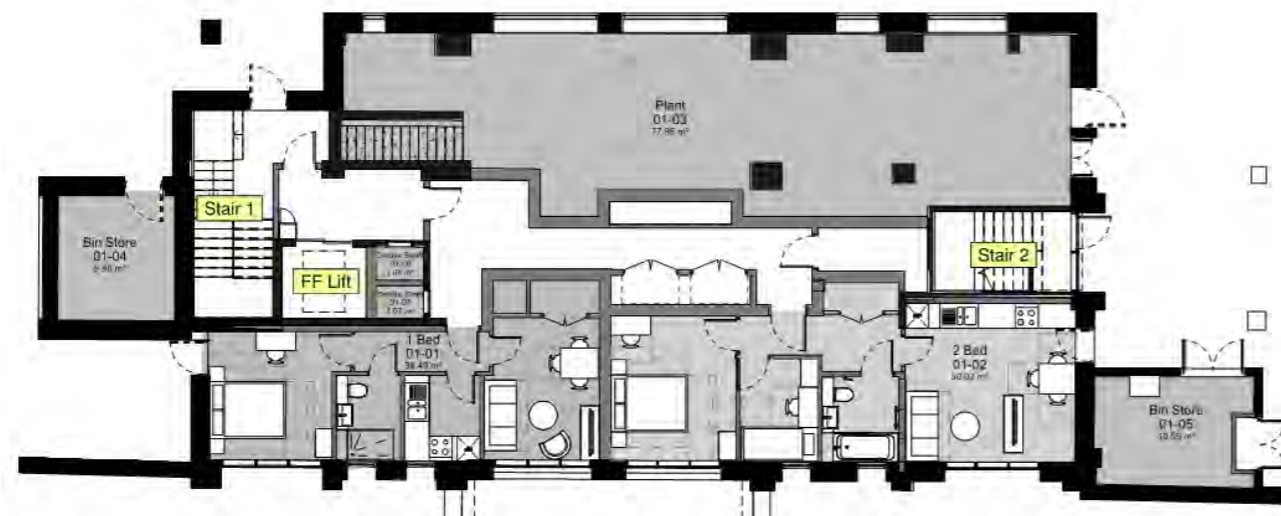


Figure 4 First floor general arrangement

### Second Floor

The second floor is to comprise five residential units, including two studios, two one-bed apartments and one two-bed apartment. The second floor is served by both stairs.



Figure 5 Second floor general arrangement

### Third Floor

The third floor is to comprise five residential units, including two studios, two one-bed apartments and one two-bed apartment. The third floor is served by both stairs.

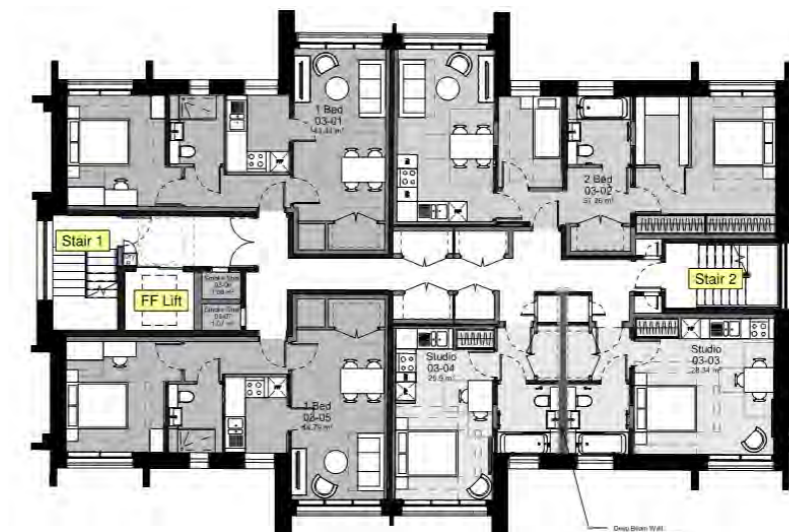


Figure 6 Third floor general arrangement

### Fourth-Eleventh Floors

The fourth-eleventh floors are to comprise four residential units, including two one-bed and two two-bedroomed apartments. These floors are served by both stairs.

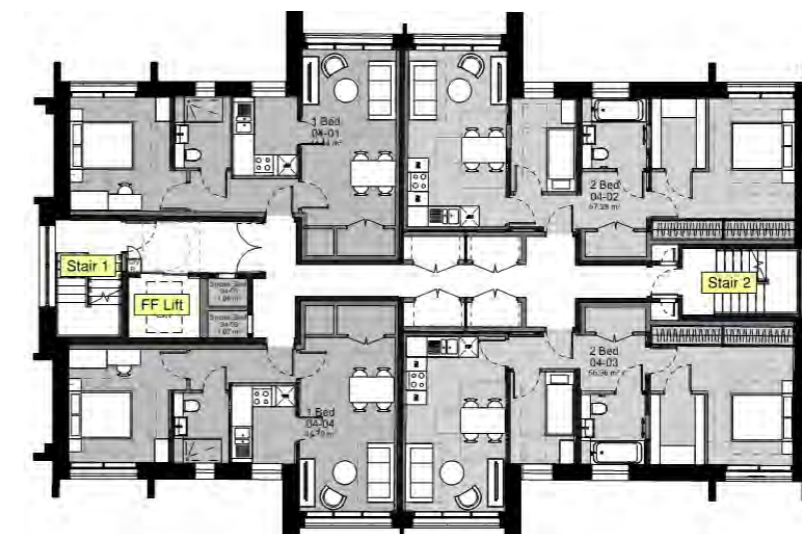


Figure 7 Fourth-eleventh floor general arrangement

Roof

The roof is to comprise the lift overrun and PV panels. Access is to be confirmed at RIBA Stage 4.

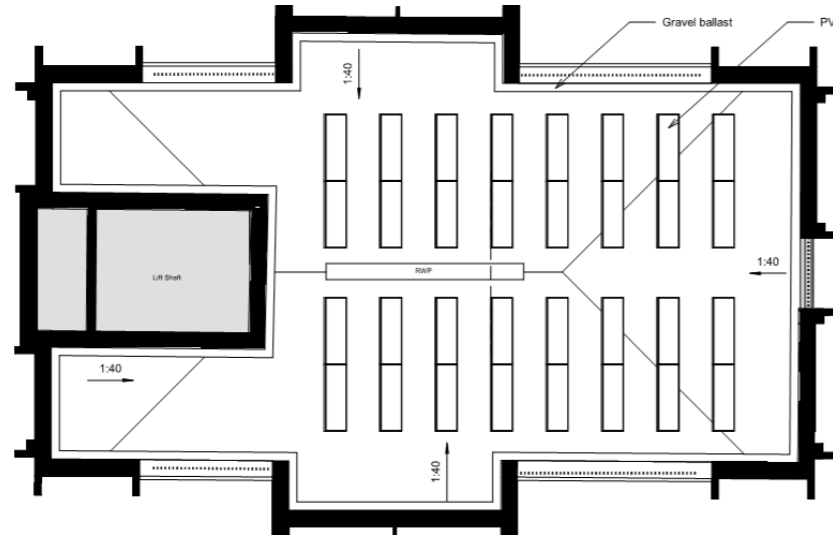


Figure 8 Third floor general arrangement

1.4.2 Building Height

For the purposes of the Fire Safety Strategy, it should be noted that the top occupied storey of the proposed building is approximately 30.67m above ground level, as illustrated in Figure 9.



Figure 9 Elevation illustrating building height

## 2. LEGISLATION

The following sections provide an outline of the regulations and guidelines on which the Fire Safety Strategy is based.

### 2.1 The Building Regulations 2010

The building work will be subject to control under the restrictions of the Building Regulations 2010 (as amended). The Building Regulations are concerned with the life safety of persons in and around a building. The development will be designed and constructed to satisfy the functional requirements of Part B (Fire Safety) to Schedule 1 of the Building Regulations 2010 (as amended), which includes the following:

- 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

Clause 5 of the Building Regulations 2010 defines a “material change of use” and notes that where:

*“the building, which contains at least one dwelling, contains a greater or lesser number of dwellings than it did previously”*

the work should be carried out such that the building following the work complies with paragraphs B1-B5 of Schedule 1 of the Building Regulations 2010 (as amended).

As the refurbishment works proposed at Buxton House qualify as a material change of use Clause 5 applies to the refurbishment works proposed.

### 2.2 Guidance Documents

Guidance referred to in this report includes, but is not limited to the following:

- BS9991:2015 ‘Fire safety in the design, management and use of residential buildings (dwellings) – Code of practice’;
- BS9999:2017 ‘Fire safety in the design, management and use of buildings – Code of practice’;
- BS5839-1:2017 ‘Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in non-domestic premises’;

- BS5839-6:2019 ‘Code of practice for the design, installation, commissioning and maintenance of fire detection and fire alarm systems in domestic premises’; BS8629:2019 (including Annex 1:2023) ‘Design, installation, commissioning and maintenance of evacuation alert systems for use by fire and rescue services in buildings containing flats – Code of practice’;
- BS81-72:2015 ‘Safety rules for the construction and installation of lifts. Particular applications for passenger and goods passenger lifts. Firefighters lifts’;
- BS5499-4:2013 ‘Code of practice for escape route signing’;
- BR187:2014 ‘External Fire Spread – Building separation and boundary distances’;
- BS5266-1:2016 ‘Emergency lighting. Code of practice for the emergency lighting of premises’;
- BS9990:2015 ‘Non-automatic firefighting systems in buildings’;
- BS EN 13501-1:2018 ‘Fire classification of construction products and building elements. Classification using data from reaction to fire tests’;

Guidance for the fire precautions will generally follow the recommendations contained within BS9991:2015. Any deviations from these standards are to be provided with justification demonstrating that the functional requirements of the Building Regulations are met however these will be subject to approval from the approving authority and local Fire Service. Where no specific provision is mentioned in this document regarding any particular aspect, reference should be made to BS9991:2015. Consideration is also to be given to insurers and other stakeholders requirements.

The Fire Safety Strategy is to be read in conjunction with the Fire Strategy Drawings in Appendix A.

### 2.3 Other Applicable Legislation

#### 2.3.1 The Regulatory Reform (Fire Safety) Order 2005

The Regulatory Reform (Fire Safety) Order (RRFSO) regulations shall apply to this development and are the landlord’s responsibility. The RRFSO came into force in 2006 with the aim of resolving the overlap caused by a number of previous legislations. Therefore, a large number of legislations were rationalised and consolidated into the RRFSO with the result that it also rationalised the number of enforcement authorities involved in fire safety matters.

The RRFSO applies to all workplaces and other non-domestic areas and premises, requiring the ‘Responsible Person’ to undertake an assessment of the fire risk in their premises and to keep this assessment under review. It requires that where the ‘Responsible Person’ does not have the relevant training and experience to

undertake such an assessment they must appoint a suitable ‘Competent Person’ to undertake the Risk Assessment.

The main focus of the Risk Assessment is to ensure that the premises is safe for the occupants to use and that all fire safety measures are adequate and appropriately maintained. In new buildings, the Fire Risk Assessment ensures that the fire safety provisions required under the Building Regulations 2010 are maintained, whereas in existing buildings it ensures that despite any modifications undertaken throughout the building’s history, it is still safe for use. It is therefore important that the Fire Safety Strategy for more complex buildings (regardless of age) is clear and well documented.

### 2.3.2 Fire Safety Act (2021)

The Fire Safety Act 2021 (enacted on 16.05.2022) has amended the applicability of the RRFSO to residential buildings as follows:

- ‘Where a building contains two or more sets of domestic premises, the things to which this order applies include—
  - (a) the building’s structure and external walls and any common parts;*
  - (b) all doors between the domestic premises and common parts (so far as not falling within sub-paragraph (a)).*
- The reference to external walls includes—
  - (a) doors or windows in those walls, and*
  - (b) anything attached to the exterior of those walls (including balconies).’*

This clarification empowers fire and rescue services to take enforcement action and hold building owners to account if they are not compliant.

## 2.4 Building Safety Act 2022

The Building Safety Bill received Royal Assent on 28.04.2022 to become the Building Safety Act 2022. It creates a Building Safety Regulator responsible for overseeing the safety of all buildings, with a primary focus on leading the implementation of a new regulatory framework for higher-risk buildings. A higher-risk building is defined as a building with 7 or more storeys or is above 18m in height, and either:

- contains at least 2 residential units;
- are care homes and hospitals (during design and construction)

The definition of building height as defined in Approved Document B – Volume 1 (2020) is the “height of top storey measured from upper floor surface of top floor to ground level on lowest side of building.”

Due to the building height and occupancy, this building is to be subject to the obligations under the Act.

### 2.4.1 Regulation 38

In conjunction with the RRFSO, Regulation 38 requires that information relating to the fire safety provisions within a building is provided to the ‘Responsible Person’ so that they (or an appointed ‘Competent Person’) can undertake the Fire Risk Assessment required under the RRFSO. It is therefore of paramount importance that the fire safety information for a building that falls under the requirements of the Building Regulations 2010 is kept up to date and a true reflection of the completed building.

This report does not form the Risk Assessment required under the RRFSO, nor does it absolve the client from exercising their duties under Regulation 38. However, the aim of this Fire Safety Strategy is to demonstrate how the project complies with the requirements of the Building Regulations 2010 (as amended) and therefore should form part of the information provided to the ‘Responsible Person’ in order for them to undertake and maintain the Fire Risk Assessment for the project.

## 2.5 Additional Information on Guidance

In light of the current climate there have been a number of changes to guidance to satisfying the functional requirements of the Building Regulations 2010 (as amended) and the RRFSO.

### 2.5.1 EWS1 Certificate

The Royal Institution of Chartered Surveyors (RICS), The Building Societies Association (BSA), and UK Finance have introduced an industry-wide valuation designed to help building owners to confirm to valuers and lenders that an external wall system or attachments, such as a balcony, on buildings containing flats has been assessed by a suitable expert.

The standardised External Wall Fire Review process requires a fire safety assessment to be conducted by a suitably qualified and competent professional. This is aimed at delivering assurance for lenders, valuers, residents, buyers and sellers and assist in the valuation of high-rise properties, with actual or potential combustible materials in external wall systems and balconies.

### 2.5.2 PAS 9980:2022

In the wake of the Grenfell Tower fire, The Ministry of Housing, Communities and Local Government (MHCLG) published a series of Advice Notes intended to manage the ongoing concern of fire safety with regard to external walls. In January 2020, the Consolidated Advice Note was published which brought together the

guidance contained within all of the published Advice Notes. This Consolidated Advice Note outlined the MHCLG's (now the Department for Levelling Up, Housing and Communities [DLUHC]) position on the actions that building owners should take to reduce the risk of fire spread from unsafe external wall systems.

On 10th of January 2022, the DLUHC withdrew the Consolidated Advice Note and replaced it with the Publicly Available Specification (PAS) 9980 with the intent of addressing inconsistencies in the appraisal of risks associated with external wall systems.

The Fire Safety Act 2021 amends the applicability of the Regulatory Reform (Fire Safety) Order (RRO) to include external wall construction as part of the periodic Fire Risk Assessment (FRA). Qualified assessors are required to give consideration to the potential spread of fire via the external walls of the building. Where a risk to life safety is identified, or where the risk to life safety is unclear, a Fire Risk Appraisal of External Walls (FRAEW) should be recommended as part of the FRA action plan. The FRAEW is intended specifically to inform the FRA of the risks associated with the external wall construction and to present, if any, the remedial action that is required.

The FRAEW is not solely influenced by the benchmarks given in the regulations and guidance, both current and that were applicable at the time of construction. Instead, the FRAEW considers the external wall construction in relation to Building Regulation Functional Requirement B4. Hence, the PAS 9980:2022 presents a risk-based methodology which is intended to provide consistency to the appraisal of risks associated with fire spread over the external walls in the FRAEW process. The tool considers three factors:

1. Fire performance: The likely speed and extent of fire spread as a result of fundamental material properties and their installation.
2. Façade configuration: The likely speed and extent of fire spread as a result of the quantity, location and arrangement of combustible material; the presence of extensive cavities, and the potential routes for fire re-entry to the inside of the building.
3. Fire strategy: All factors influencing the means of escape for occupants and the accessibility of the site and external walls for the fire and rescue service.

The outcome of the FRAEW is presented as part of the FRA (required under the RRO) to routinely consider the matters relating to fire safety.

The Royal Institute for Chartered Surveyors (RICS) published the EWS1 form as a standardised means of informing lenders and valuers that the external wall systems (and any attachments) have been reviewed and assessed by a qualified expert. The form itself is not an assessment methodology. Therefore, the means for

assessing the external wall systems in any building is left open to the assessor and their best judgement. However, with limited guidance on external wall fire risk assessments, the ongoing concern regarding fire spread via external walls has been met with inconsistencies in the appraisal of risk. The PAS 9980:2022 has been published with the intent of addressing this inconsistency and to restore a standardized methodology for risk appraisal. RICS, as the author of the EWS1 form, has publicly recommended the use of the PAS 9980:2022 when preparing the EWS1 form. Therefore, the assessment methodology presented in the PAS 9980:2022 is considered to be an industry recognised standard for the purposes of the EWS1 form.

### 3. MEANS OF WARNING AND ESCAPE

**Functional 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.*

Means of escape provisions are generally to be in accordance with BS 9991:2015. Where the proposed means of escape strategy deviates from this guidance document it will require agreement with the approving authority and local Fire Service.

#### 3.1 Fire Detection and Alarm System

Fire detection and alarm systems are designed to give warning of fire at an early stage to enable all occupants to evacuate the building safely, before the escape routes are impassable owing to the presence of fire, smoke or toxic gases.

##### 3.1.1 Residential Apartments

It is recommended that a Category LD1 detection and alarm system is provided. Fire detection and alarm systems within the residential units are to be designed, installed, and commissioned in accordance with BS 5839-6:2019.

##### 3.1.2 Communal Residential Areas

The communal residential areas (lobbies, corridors and stairs) are to be provided with a Category L5 fire detection system design to activate the relevant smoke ventilation systems only (no sounders to be provided in these areas). This fire detection system is to be design and installed in accordance with BS 5839-1:2017.

##### 3.1.3 Non-Residential Areas

The non-residential areas (communal lounge, plant rooms etc) are to be provided with at least a Category L2 fire detection and alarm system designed in accordance with BS5839-1:2017.

##### 3.1.4 Evacuation Alert System

As the building has a top storey over 18m above ground level, an evacuation alert system is to be provided throughout the building, designed and installed in accordance with BS 8629:2019.

##### 3.1.5 Fire Alarm System Interfaces

An automatic fire alarm system will have interfaces and links as necessary to operate equipment/devices and a number of examples are indicated below; for more information see BS5839-1:2017:

- Electromagnetic hold-open devices on fire doors – released to closed position;
- Security systems on exit doors – released as required;
- Gas supply valves (plant areas) – isolate;
- Smoke ventilation systems – relevant system activates depending on location of detection;
- Heating, ventilation and air conditioning systems – shut down to restrict spread of smoke and hot gases.

#### 3.2 Evacuation Strategy

The evacuation strategy for the residential units is based on a ‘stay-put’ evacuation strategy where only the occupants within the unit of fire origin are to be alerted/evacuate and all other occupants within the building are to remain in place, unless they are directly affected by smoke/fire. This does not preclude the event that occupants may wish to self-evacuate at any time. Any additional evacuation is at the discretion of the Fire Service if they decide it is necessary to do so during operational procedures.

The evacuation strategy for the non-residential areas is based on a single-stage simultaneous evacuation strategy where all occupants within these areas are to be alerted/evacuate immediately on fire detection.

#### 3.3 Maximum Expected Occupancy Levels

For the purposes of the Fire Safety Strategy the maximum expected occupancy within each of the non-residential areas building is outlined in Table 2.

Table 2 Maximum expected occupancy levels

Area	Maximum Expected Occupancy
Basement – plant room	[1]
Ground floor – communal lounge	17 [2]
Ground floor – bike store	[1]
Ground floor – plant room	[1]
First floor – plant room	[1]
First floor – refuse stores	[1]

Notes:

1. Area considered to be transiently occupied.
2. Based on floor space factor 1m<sup>2</sup> per person.

## 3.4 Horizontal Means of Escape

### 3.4.1 Internal Unit Layouts

#### 3.4.1.1 Ground-Floor Apartments

The two ground-floor apartments (1x studio and 1x 1-bed) are considered to be open-plan.

In accordance with Clause 9.7 of BS 9991:2015, open-plan flats should meet the following conditions:

- The size of the open-plan flat should not exceed 16m x 12m;
- Open-plan flats should be situated at a single level only;
- The ceilings of open-plan flats should have a minimum height of 2.25m; and,
- The kitchen should be enclosed if the open-plan flat exceeds 8m x 4m in size. Otherwise, the cooking appliances should not be adjacent to the entrance of the flat.

In line with the section drawings provided to Hydrock, it is noted that the ceiling height measures to be between 2.18-2.2m. Whilst it is acknowledged that the measured ceiling height is below the minimum threshold for open-plan flats, the ceiling heights of the block the ceiling heights are limited by the existing construction. Nevertheless, the impact of the ceiling height on the means of escape will be assessed in the RIBA Stage 4 Fire Safety Strategy.

It is considered reasonable to omit the enclosure of the kitchens within the open-plan apartments on the following basis, subject to agreement with the approving authorities:

- Research commissioned by the NHBC Foundation on open-plan arrangement (Report NF19 – Open Plan Assessment), on which BS 9991:2015 open-plan recommendations are based, has concluded the following:
  - Flat size/travel distance does not seem to be a significant factor;
  - The risk of death presented by an open-plan apartment with only enhanced detection is similar to that of code-compliant layout with a protected entrance hall;
  - Where open-plan apartments are served by suppression and enhanced detection, the level of safety is at least as good as a code-compliant design.
- Consequent to updated guidance within BS 9991:2015, as a result of studies commissioned by the NHBC in 2009 (NF19) and carried out by the Building Research Establishment (BRE), further investigation has been made into the effects of open kitchens and concealed sprinkler heads within apartments, in regard to Case 3c, which was reviewed by the original NF19 document. Case 3c was 3-

bedroom apartments measuring 16m x 12m with enclosed kitchens and fast response sprinkler coverage. This additional work is referenced within the International Fire Professional November 2016 Issue No. 18 “Open plan apartments – revisiting the risks in light of contemporary demands”, and was also carried out by the BRE. It is noted that the requirement to enclose kitchens in open-plan flat layouts greater than 16m x 12m has since been omitted from the updated draft BS 9991 guidance published for consultation in 2021.

The results of the additional study demonstrated that 16m x 12m, 3-bedroom open-plan apartments designed with open kitchens posed a lower risk when compared with the NF19 Case 3c arrangement, where the kitchen was enclosed, and including where concealed sprinkler heads were considered.

- Therefore, deviations from the BS 9991:2015 requirements in terms of the size of the unenclosed kitchen and the flat can be considered reasonable, on the basis that the kitchen is located sufficiently away from the entrance and means of escape;

In addition to the above research, in accordance with Clause 9.7 of BS 9991:2015, the cooking appliances should be located remote from the entrance to the apartment. It is considered that the hobs are located sufficiently remote from the apartment front doors in all open-plan apartments.

#### 3.4.1.2 First-Floor Apartments

In line with Section 9.3 of BS 9991:2015, apartments situated not more than 4.5m above ground level should meet the following conditions.

Any habitable room should not be an inner room, unless the room is provided with:

- An escape window/door;
- A Grade D LD1 detection system in line with BS 5839-6, and the building is provided with an automatic water fire suppression system (AWFSS) throughout.

Given the proposed layouts of the first-floor apartments, there are no habitable rooms serving as inner rooms; therefore, the above is considered to be met. Notwithstanding, on the basis that Stair 2 does not serve the first floor, in order to provide all occupants at every floor with an alternative means of escape, it is proposed to provide the two apartments with escape windows, as indicated in Figure 10. Escape windows should conform to the requirements of Section 3.4.2.

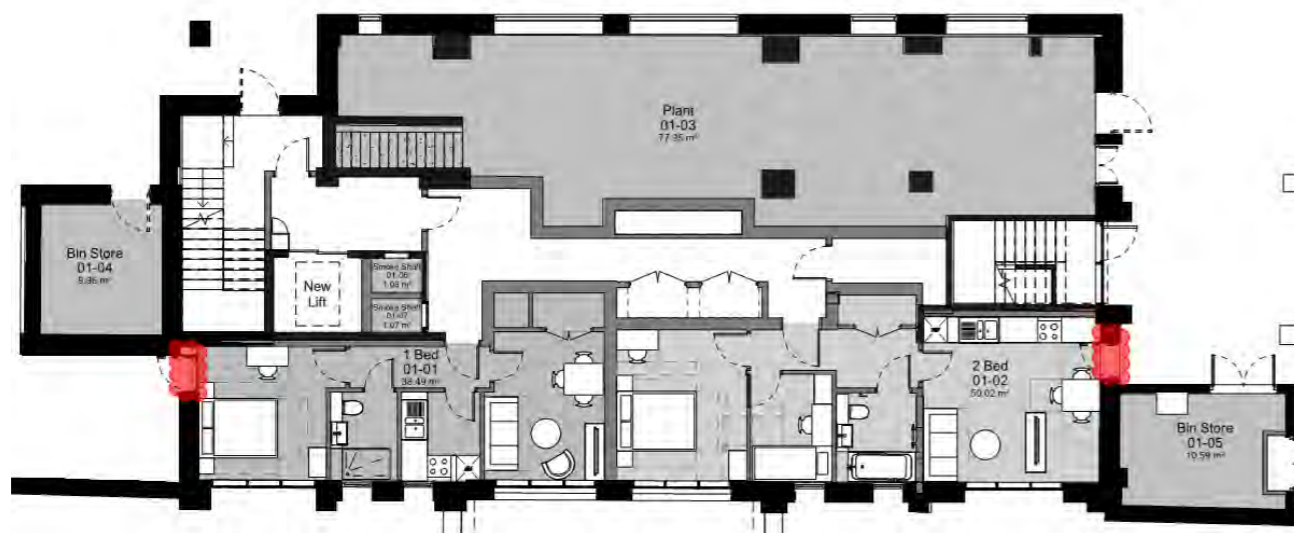


Figure 10 Proposed locations of escape windows

It is recommended that cooking facilities in the flats should be located remote from escape routes, and remote from the flat entrance door (e.g. 1.8m radius, with an additional 0.9m for egress).

### 3.4.1.3 Second-Eleventh Floor Apartments

Clause 9.4.2 of BS 9991:2015 outlines requirements for apartments situated more than 4.5m above ground level. On the basis that LD1 detection and sprinklers are provided to the building, travel distances within flats may be up to 20m, and therefore there is no requirement to provide fire-rated protected entrance halls to the flats.

It is recommended that cooking facilities in all flats should be located remote from escape routes, and remote from the flat entrance door (e.g. 1.8m radius, with an additional 0.9m for egress).

### 3.4.1.4 All Upper Floor Apartments (First-Eleventh Floors)

BS 9991:2015 defines open-plan arrangements to be those with open-spatial planning, where the main living space is not separated from the dwelling entrance door. (Note: the main living space refers to the lounge or living rooms, and bedrooms may or may not be separated from the main living space.)

Based on the above definition, it is not considered that the proposed upper-floor apartments constitute open-plan arrangements, on the basis that internal entrance halls are incorporated into the design (note: these need not be designed as protected entrance halls – as per Section 3.4.1.3). Subsequently, the apartments would not need to meet the conditions required for open-plan apartments as per Section 9.7 of BS 9991:2015.

### 1-Bed Apartments

It is noted that the 1-bed apartment designs incorporate enclosed kitchens, which are, in some cases, inner rooms to the living areas. However, this arrangement is in accordance with Figure 10.b of BS 9991:2015, and therefore is considered reasonable.

### Studios and 2-Bed Apartments

Studio apartments and 2-bed apartments are designed to have a kitchen open to the living area. Whilst it is acknowledged that the apartments are not strictly defined as open-plan apartments (given the provision of internal entrance halls), escape from the living/sleeping area requires passage through an open kitchen area, and BS 9991:2015 recommends that kitchens be enclosed in open-plan apartments exceeding 8m x 4m.

It is considered reasonable to omit the enclosure of the kitchens within the studios and 2-bed apartments on the same basis as provided for open-plan apartments – please see Section 3.4.1.1 for justification. Further to this, the requirements of open-plan apartments are driven by the inner room bedrooms which are considered to be the primary fire safety risk (to sleeping occupants), whereas in this design, the kitchen and living areas are fully open to each other (providing full visual access), and the bedrooms (sleeping risk) are accessed from an entrance hall, providing a separating partition which would delay the spread of smoke, this design is considered to meet the requirements of the guidance in BS 9991:2015 and also the functional requirements of the Building Regulations.

### 3.4.2 Escape Windows

Where escape windows are provided, they should comply with all of the following:

- Windows should have an unobstructed openable area complying with:
  - A minimum area of 0.33m<sup>2</sup>;
  - A minimum height and width of 450mm; and,
  - The bottom of the openable area is a maximum of 1100mm above the floor;
- People escaping should be able to reach a place free from danger of fire (courtyards or inaccessible back gardens should comply with Diagram 2.5 of ADB1:2022);
- Locks and opening stays may be fitted to escape windows; and,
- Windows should be capable of remaining open without being held.

### 3.4.3 Common Corridors / Layouts

#### 3.4.3.1 First Floor

Stair 2 does not serve the first floor; therefore, the first floor is considered to have a single-stair design, and thus the guidance of Figure 6, BS 9991:2015, has been applied.

Where there is only a single stair, travel within the common corridor should be limited to 15m (where the corridor is ventilated, and the building is provided with sprinklers).

This travel distance limit is met, measuring from the furthest apartment door to the first-floor final exit of Stair 1, as illustrated in Appendix A.

#### 3.4.3.2 Second-Eleventh Floors

The remaining upper floors are served by both Stair 1 and Stair 2. Therefore, the guidance of Figure 7, BS 9991:2015 has been applied.

Figure 7.a., BS 9991:2015, where there are no dead-ends in the design, requires that the two stairs are separated by a central fire door, such that the risk of simultaneous loss of both stairs due to the effects of fire/smoke is mitigated. It is considered that sufficient stair separation is to be provided by the provision of a protected (firefighting) lobby to Stair 1.

In line with Figure 7, BS 9991:2015, the travel distance from an apartment entrance door to the protected stair should not exceed 60m where alternative directions of escape are available (where the common corridor is provided with smoke ventilation, and the building is provided with sprinklers).

The travel distances within the common corridors of Buxton House are compliant with this limit, as illustrated in Appendix A.

### 3.4.4 Ancillary Accommodation

#### 3.4.4.1 Travel Distances

Travel distance is the actual distance a person needs to travel from any point within a building to the nearest storey/final exit.

In accordance with BS 9991:2015, the maximum travel distances within each ancillary residential area of the building are outlined in Table 3.

Table 3 Maximum permitted travel distances

Area	Maximum Permitted Travel Distance (m)			
	With Only One Escape Route Available		With Alternative Escape Routes Available	
	Layout Known	Layout Unknown	Layout Known	Layout Unknown
Communal lounge	18	12	45	30
Plant rooms	9	6	18	12
Bike store	18	12	45	30
Refuse store	9	6	18	12

Notes:

1. Travel distances to the nearest storey exit also apply

As illustrated in the Fire Strategy Drawings in Appendix A, all ancillary residential areas of the building are considered acceptable with regard to maximum permitted travel distances in accordance with BS 9991:2015.

#### 3.4.4.2 Number of Escape Routes

In the event of a fire within the non-residential parts of the building, occupants should be provided with a sufficient number of exits to ensure a prompt evacuation of the building prior to escape routes becoming blocked by the effects of fire and smoke. The minimum number of escape routes required from each area is determined based on the maximum expected occupancy of the area as outlined in Table 2.

Table 4 Minimum number of escape routes

Maximum Expected Occupancy	Minimum Number of Routes / Exits
Up To 60	1
61-600	2
More Than 600	3

There are no areas expected to exceed 60 persons therefore the number of exits is in accordance with BS 9991:2017.

#### 3.4.4.3 Inner Rooms

It is understood that the ancillary spaces may be subject to change/reconfiguration. Should the reconfiguration introduce any areas which are considered as 'inner rooms', where the only escape from a room is through another room (the "access room"), then the following conditions of Clause 16.3.4, BS 9999:2017, should be followed.

- The occupant capacity of the inner room is not to exceed 60 (30 where the occupants may require assistance escaping);
- The inner room is to be entered directly off the access room;
- The escape route from the inner room is not to pass through more than one access room;
- The one-way travel distance from any point in the inner room should not exceed the appropriate given limit;
- The access room is not to be a place of special fire hazard; and
- One of the following arrangements should be provided:
  - The enclosures (walls or partitions) of the inner room should be stopped at least 500mm below the ceiling; or
  - a suitably sited vision panel not less than 0.1m<sup>2</sup> should be located in the door or walls of the inner room; or
  - the access room should be fitted with a suitable automatic fire detection and alarm system.

### 3.4.5 Door Opening Directions

Where an exit may be expected to be required to serve more than 60 persons for escape in a fire scenario it should be arranged to open in the direction of escape.

## 3.5 Vertical Means of Escape

### 3.5.1 Protected Stairways

A protected stairway needs to be relatively free of potential sources of fire. In accordance with Clause 21.1 of BS 9991:2015, access hatches for service shafts should not be situated within a means of escape stair unless providing smoke control or pressurisation for that staircase.

Buxton House is served by two protected stairs. Stair 1 (as labelled in Appendix A) is accessible from the under-croft area off Albion St, as well as the first-floor car park, serving all storeys from ground upwards. Stair 2 (as labelled in Appendix A) is accessible from the first-floor external car park, and serves all storeys from first floor upwards.

Stairs providing access to a car park should be provided with a protected ventilated lobby as per Section 32 of BS 9991:2017. However, as the level 1 car park is an open-air car park, and there are no proposals to enclose any parts of the car park, this is not considered necessary.

If a stair connects the ground or upper storeys with a basement storey(s) or serves only basement storeys, there should be a protected lobby or protected corridor at every basement level. The layout of the basement is currently unconfirmed however the basement access to Stair 1 should be provided with a protected lobby. Additional requirements due to the requirement for a firefighting stair are addressed in Section 7.2.1.

### 3.5.2 Stair Discharge

In accordance with Clause 34.a of BS 9991:2015, residential stairs are to discharge to external directly or via a protected route which is lobby protected from any adjacent accommodation.

It is understood that Stair 1 discharges direct to external at first floor, leading to the car park, as well as at ground floor via a protected corridor leading to the under-croft area accessed from Albion St.

The discharge route leading to the under-croft area is considered reasonable on the following basis, subject to agreement with the approving authorities:

- The walkway of the under-croft area is sufficiently wide that escaping persons can pass at greater than 1800mm from any wall when making their escape;
- The under-croft area is open to air at Albion St;
- It is proposed to fire rate the external façade up to 1.1m above ground level along the under-croft escape route, including provision of fire doors.

It is noted that Stair 2 is to discharge direct to external at first floor, leading to the open-air car park.

Both of the car park level escape routes should meet the requirements of Section 34, BS 9991:2015, and provide a clear safe route across the car park and to a ramp or stair which discharges to ground level.

### 3.5.3 Required Stair Widths

Protected stairs should achieve an absolute minimum clear width of 750mm. Firefighting stairs should achieve a clear width of 1100mm.

It is noted that Stair 2 has a clear width of approximately 1010mm, and thus meets the above requirement for a protected stair.

Stair 1 is proposed to serve as the firefighting stair for the development (see Section 7) has a clear width of approximately 970mm, which does not achieve the minimum required width for a firefighting stair. Notwithstanding, Stair 1 is considered reasonable for use as a firefighting stair on the following basis, subject to agreement with the approving authorities:

- The building is existing, and the proposed remedial works are not worsening the existing clear width of the stairs;
- The clear width of Stair 1 is less than 12% below the required 1100mm. This reduction in width is not considered to be a significant risk due to the low “per floor” occupancy numbers. A typical floor layout is expected to have 11 occupants, over 11 storeys this gives a total of 121 occupants. A typical 750mm stair used for simultaneous evacuation has capacity for 500 escaping persons<sup>1</sup>;
- The purpose of achieving 1100mm clear width is to facilitate the contraflow of occupants escaping and firefighters. It is considered likely that occupants escaping the building will have evacuated prior to the arrival of the fire service, additionally the downward flow of escaping persons is low;
- There is an alternative stair available for occupants to use for escape, Stair 2, further reducing the flow of escaping persons down the fire-fighting stair. .
- Each level is provided with a separate ventilated fire-fighting lobby which does not provide access to any other accommodation. This exceeds the requirements for firefighting shafts in residential buildings and provides a protected ventilated floor area at each level for the fire service to use as a bridgehead for mounting their interventions.

### 3.6 Existing Commercial Units

It is understood that there are existing commercial units at ground floor adjacent to/underneath the Buxton House demise. A number of these commercial units are being acquired as part of the Buxton House project, whilst remaining commercial units are yet to be acquired.

The acquired commercial units are proposed to be refurbished as part of the project to become plant space/new residential units. Recommendations outlined within this report should be applied when designing the new plant/residential units. Note: the recommendations herein are not exhaustive and each unit should be considered on a case-by-case basis.

### 3.7 Escape Signage

Escape signage is to be provided within the common escape routes. Escape signage is to be designed and installed in accordance with BS 5499-4:2013. Signage utilised throughout the building is to be consistent and in accordance with BS ISO 3864-1:2011. Note where escape routes continue externally escape signage should mark the route until a final exit at street level has been reached.

#### 3.7.1 Wayfinding Signage for the Fire Service

In addition to escape signage, it is now a requirement to provide way-finding signage for the Fire Service, see Section 7.4 for further information.

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<sup>1</sup> Calculated using 1.5mm/person for a C1 occupancy as per Table 13 of BS 9999:2017.

## 4. INTERNAL FIRE SPREAD (LININGS)

### Functional Requirement B2:

1. To inhibit the spread of fire within the building, the internal linings shall—
  - a. adequately resist the spread of flame over their surfaces; and
  - b. have, if ignited, either a rate of heat release or a rate of fire growth, which is reasonable in the circumstances.
2. In this paragraph “internal linings” means the materials or products used in lining any partition, wall, ceiling or other internal structure.

### 4.1 Internal Fire Spread (Linings)

The interior wall and ceiling surfaces in a building may have a significant influence on how fast a fire may develop. The Building Regulations require that internal linings shall adequately resist the spread of flame over their surfaces and, if ignited, have either a heat release rate or a rate of fire growth which is reasonable in the circumstances.

It is particularly important that in circulation spaces, where the rapid spread of fire is most likely to prevent occupants from escaping, the surface linings are restricted by making provision for them to have low rates of heat release and surface spread of flame.

The internal surface linings are to be in accordance with Table 5 throughout the building.

Table 5 Internal lining requirements

Location	British Standard Performance Class <sup>[1]</sup>	European Performance Class <sup>[2]</sup>
Non-residential rooms having an area not more than 30m <sup>2</sup>	3	D-s3, d2
Residential rooms having an area not more than 4m <sup>2</sup>	3	D-s3, d2
All other rooms	1	C-s3, d2
Circulation spaces within dwellings	1	C-s3, d2
Other circulation spaces	0	B-s3, d2

Notes

1. Relates to performance measures in BS476 Parts 6 & 7 criteria
2. Relates to performance determined in accordance with BSEN13501-1:2018

The surface linings of the walls and ceilings should generally conform to the classifications outlined in Table 5. However, parts of walls in rooms may be of a lower class but not lower than Class 3 (national class) or Class D-

s3, d2 (European class) provided that the total of those parts in any one room does not exceed 50% of the floor area of the room (subject to a maximum of 60m<sup>2</sup> in non-residential areas and 20m<sup>2</sup> in residential areas).

For the purposes of internal surface lining requirements, the following definitions should be noted:

<b>Room</b>	An enclosed space within a building that is not used solely as a circulation space. The term includes not only conventional rooms, but also cupboards that are not fittings and large spaces such as warehouses and auditoria. The term does not include voids such as ducts, ceiling voids and roof spaces;
<b>Circulation space</b>	A space (including a protected stairway) mainly used as a means of access between a room and an exit from the building or compartment.

Table 6 outlines the inclusions/exclusions regarding the definitions for walls and ceilings for the purposes of internal surface spread of flame requirements.

Table 6 Internal lining inclusions/exclusions

	Walls	Ceilings
Definition includes	<ul style="list-style-type: none"> <li>• The surface of glazing (except glazing in doors)</li> <li>• Any part of a ceiling which slopes at an angle of more than 70° to the horizontal</li> </ul>	<ul style="list-style-type: none"> <li>• The surface of glazing</li> <li>• Any part of a wall which slopes at an angle of 70° or less to the horizontal</li> <li>• The underside of a mezzanine or gallery</li> <li>• The underside of a roof exposed to the room below</li> </ul>
Definition excludes	<ul style="list-style-type: none"> <li>• Doors and door frames</li> <li>• Window frames and frames in which glazing is fitted</li> <li>• Architraves, cover moulds, picture rails, skirtings and similar narrow members</li> <li>• Fireplace surrounds, mantle shelves and fitted furniture</li> </ul>	<ul style="list-style-type: none"> <li>• Trap doors and trap door frames</li> <li>• The frames of windows or rooflights and frames in which glazing is fitted</li> <li>• Architraves, cover moulds, picture rails, exposed beams and similar narrow members</li> </ul>

## 5. INTERNAL FIRE SPREAD (STRUCTURE)

Functional 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—*
  - a. *sub-division of the building with fire-resisting construction;*
  - b. *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.*

### 5.1 Elements of Structure

For the purposes of the Fire Safety Strategy, the top occupied storey of the building (i.e. excluding levels consisting of plant only) is 30.47m above ground level. Therefore, the required fire resistance for the elements of structure is 120 minutes (with regard to load-bearing capacity) in accordance with Table 4 of BS9991:2015.

#### 5.1.1 Roof

The structure of the roof and the structure that supports only the roof need not to be fire rated unless the roof:

- Forms part of an escape route; or
- Function as a floor; or
- Is part of a portal frame structure where the roof and the supporting stanchions form a single element of structure; or
- Is integral to the stability of a fire-resisting external wall.

### 5.2 Compartmentation

In accordance with Clause 17 of BS 9991:2015:

- All floors containing residential units are to be designed as compartment floors achieving the same level of fire resistance as required for elements of structure;
- All residential units are to be separated from all other areas of the building by at least 60-minute fire rated construction (FD30S fire doors on to common corridors).

### 5.3 Additional Fire Resistance Requirements

Fire resistance to achieve the required compartmentation and protection to escape routes is to be provided in accordance with BS 9991:2015 as outlined in Table 7.

Table 7 Fire resistance requirements

Space	Minimum Fire Resistance <sup>[1]</sup> (minutes)			Method of Exposure	
	Load-bearing Capacity (R)	Integrity (E)	Insulation (I)		
Structural Frames, Beams and Columns	[2]	-	-	Exposed faces	
Load-bearing Wall Elements	[2]	-	-	Each side separately	
Floors	[2]	[2]	[2]	From underside	
Compartment Floors	[2]	[2]	[2]	From underside	
Compartment Walls	Enclosing Residential Units	60	60	60	Each side separately
	Other Compartment Walls	[2]	[2]	[2]	Each side separately
Roofs	Any part forming part of an escape route	30	30	30	From underside
	Any part forming the function of a floor	[2]	[2]	[2]	From underside
External Walls	Any part within 1m of a relevant boundary	[2]	[2]	[2]	Each side separately
	Any part more than 1m from a relevant boundary	[2]	[2]	15	From inside building
	Any part within 1.8m of an external escape route	30	30	-	From inside building
Firefighting Shafts	Between firefighting stair, lift and lobby	60	60	60	Each side separately
	Between firefighting shaft and other accommodation	120	120	120	From outside of shaft
	Between firefighting shaft and other accommodation	60	60	60	From inside of shaft
Protected Shafts	Between shaft and protected lobby or corridor	30	30	30	Each side separately
	Between shaft any other accommodation	[2]	[2]	[2]	Each side separately
Protected Lobbies and Corridors	30	30	30	Each side separately	
Ancillary Accommodation	[4]	[4]	[4]	Each side separately	

Notes

1. When tested in accordance with the relevant parts of BS476 or equivalent European standard
2. Equivalent to that required for elements of structure as defined in Section 5.1
3. This does not apply to allowable unprotected openings calculated within in 6.1
4. Refer to Section 5.4

### 5.3.1 Under-croft Area

Stair 1 discharges into an under-croft area. Due to this, it is recommended that the external walls within the under-croft area should be fire-rated up to at least 1.1m above ground level, achieving no less than 30 minutes' fire resistance.

## 5.4 Ancillary Accommodation

The required fire rated enclosures to areas of ancillary accommodation are outlined in Table 8.

Table 8 Ancillary accommodation fire resistance requirements

Space	Minimum Fire Resistance <sup>[1]</sup> (minutes)
Communal lounge	30
Plant rooms	60
Bike store	30
Refuse store	60

Notes

1. When tested in accordance with the relevant parts of BS476 or equivalent European standard

## 5.5 Fire Doors

Fire doors are to be provided in all fire rated partitions noted in Section 5.3. The fire resistance requirements for the doors are outlined in Table 9.

Table 9 Fire door fire resistance requirements

Location	Minimum Fire Resistance <sup>[1]</sup> (minutes)	
Compartment Wall	Between residential unit and common space	FD30S
	Enclosing a protected shaft forming a protected stair wholly or partly above ground level	FD30S
	Enclosing a protected shaft forming a protected stair below ground level	[2]
	Enclosing a protected shaft forming a lift well or service shaft	[3]
	All other compartment walls	[3] [4]
Compartment Floor	[5]	
Within Protected Stairway (separating upward and downward flights or a basement stair)	FD30S	
Common Protected Lobby / Corridor	FD30S	
Protected External Escape Route	FD30	
Ancillary Accommodation	[6]	

Notes

1. When tested in accordance with the relevant parts of BS476 or equivalent European standard
2. At least half the period of fire resistance required of the wall in which it is fitted but not less than FD30 and with a smoke seal (S)
3. At least half the period of fire resistance required of the wall in which it is fitted but not less than FD30
4. Smoke seal only required where compartment wall is utilised for progressive horizontal evacuation
5. As for the wall or floor in which it is fitted
6. As for the wall or floor in which it is fitted and with a smoke seal (S)

A fire door that is required to resist the passage of smoke at ambient temperature conditions (i.e. with suffix 'S') should either:

- a. have a leakage rate not exceeding 3m<sup>3</sup>/h/m, when testing in accordance with BS 476-31.1 with a threshold taped and subjected to a pressure of 25Pa; or
- b. meet the classification requirement of Sa when tested in accordance with BS EN 1634-3.

#### *Fire Strategy Drawings*

Notional fire resistance (including fire doors) layouts are illustrated within the Fire Strategy Drawings in Appendix A.

### 5.6 Limitations on Non-Insulating Glazing

For information on non-insulation fire resisting glazing, see Section 22.2 of BS 9991:2015.

### 5.7 Ductwork

Where air handling ducts pass through compartmentation / fire-resisting construction, the integrity of these compartments should be maintained. There are four basic methods in order to prevent smoke and flame spread through the building / compartment.

For more information see Clause 21 of BS 9991:2015.

The requirements for each option are as follows:

#### *Method 1 – Thermally actuated fire dampers*

- Fire dampers that are thermally operated can be provided where ductwork penetrates through fire resisting construction.
- Fire dampers only actuated by fusible links are not suitable for protected escape routes or sleeping risk.

*Note:* Fire dampers should be tested to BS EN 15650:2010. They should have an E classification equal to or greater than 60 minutes.

*Note:* Method 1 is not suitable for ductwork serving kitchen extracts or sleeping risk.

#### *Method 2 - Fire resisting enclosures*

- The fire-resisting enclosures should achieve the same fire resistance as the wall the ductwork penetrates which forms a compartment known as a protected shaft. This allows a multiplicity of services to be transferred together with the duct to traverse a number of compartments within the building, without the need for further sub divisions. Fire dampers (thermally or actuated by an

automated fire detector, AFD) will only be required where the ductwork enters or leaves the protected shaft.

*Note:* Method 2 can only be used on ductwork that passes through an escape route, providing the ductwork does not serve the escape route it passes through.

#### *Method 3 - Protection using fire resisting ductwork*

- The ductwork itself forms a protected shaft. The ductwork should achieve the same fire resistance as the wall the ductwork penetrates. The fire resistance can be achieved by the ductwork material itself, or through the application of a protective material.

*Note:* Method 3 can only be used on ductwork that passes through an escape route, providing the ductwork does not serve the escape route it passes through.

*Note:* the supporting hangers should be capable of supporting the ductwork for not less than the period of fire resistance of the ductwork.

Air transfer grilles should be in accordance with BS 9991:2015. Generally, air transfer grilles should not be installed in:

- Elements of construction enclosing compartments or protected shafts;
- Enclosures to protected stairways, protected lobbies, protected corridors, firefighting stairs or firefighting lobbies.

#### *Method 4 – Automatically actuated fire and smoke dampers triggered by smoke detectors*

- Method 4 may be used for extract ductwork passing through the enclosures of protected escape routes, both where the ductwork does and does not serve the escape route.

*Note:* Method 4 is not suitable for ductwork serving kitchen extracts.

*Note:* Fire and smoke dampers should be tested to BS EN 15650:2010. They should have an ES classification equal to, or greater than, 60 minutes.

## 5.8 Fire Stopping

If the fire separating element is to be successful, every joint or imperfection of fit, or opening to allow services to pass through the element, should be adequately protected by sealing or fire stopping so that the fire resistance of the element is not impaired. Fire stopping is to be provided at the following locations:

- In line with fire rated walls and floors where there is a penetration of the wall/floor in order to maintain the fire resistance integrity of the wall/floor;
- Between fire rated walls/floors and an external wall to ensure the fire resistance integrity of the wall/floor is maintained to the external wall.

Where fire stopping is provided, it is to achieve the same level of fire resistance as required for the wall/floor it replaces. For more information see Clause 24.4 from BS 9991:2015.

## 5.9 Cavity Barriers

In accordance with BS 9991:2015 cavity barriers are to be provided in the cavity of:

- an external wall at all cavity edges and around all openings in the external wall (i.e. windows);
- an external wall in line with a compartment floor where it meets the external wall;
- an external wall in line with a compartment wall where it meets the external wall;
- an internal cavity wall at the junction with a fire rated wall/floor.

It should be noted that cavity barriers need not be provided within internal or external cavity walls where the following conditions are met:

- Cavity barriers are provided around all edges and openings in the cavity wall; and
- The cavity is enclosed within two leaves (one either side) of either concrete or masonry each at least 75mm thick.

Cavity barriers should also be provided in cavities to prevent the excessive spread of unseen fire and smoke. Cavity barriers are to be provided to ensure the maximum dimensions of undivided concealed spaces do not exceed the requirements outlined in Table 10.

Table 10 Maximum dimensions of concealed spaces

Location of Cavity	Class of Surface/Product Exposed in Cavity		Maximum Distance In Any Direction
	National Class <sup>[1]</sup>	European Class <sup>[2]</sup>	
Between Roof and Ceiling	Any	Any	20m
Any Other Cavity	Class 0 or Class 1	Class A1, Class A2, Class B or Class C	20m
	Any Other Class	Any Other Class	10m

Notes

1. Relates to performance measures in BS476 Parts 6 & 7 criteria
2. Relates to performance determined in accordance with BSEN13501-1:2018

Cavity barriers in a stud wall or partition, or provided around openings, may be formed of the following;

- Steel at least 0.5mm thick;
- Timber at least 38mm thick;
- Polyethylene sleeved mineral wool or mineral wool slab (both require to be under compression when used in cavity barrier construction); or
- Calcium silicate, cement based or gypsum plaster boards at least 12mm thick.

Where provided, cavity barriers are to achieve at least 30 minutes fire resistance for integrity and 15 minutes fire resistance for insulation (E30 I15). Refer to Clause 19.1 of BS 9991:2015 for further information with regard to cavity barrier provisions, construction and fixing requirements.

## 6. EXTERNAL FIRE SPREAD

### Functional 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.*

### 6.1 Fire Spread to Adjacent Properties

In order to prevent fire spread between properties it should be ensured sufficient separation distance is provided between fire compartments within the building and the relevant boundaries based on the extent of unprotected area to the fire compartments.

External fire spread analysis has been conducted based on the enclosing rectangle method as described in BR187:2014.

#### 6.1.1 Enclosing Rectangle Method

The enclosing rectangle method considers each fire compartment within the building separately. The methodology for this analysis is summarised as follows:

- A plane of reference is defined which ‘touches’ the elevation under consideration at least once but does not pass through it;
- A rectangle is constructed enclosing all unprotected areas on the elevation. The dimensions of this rectangle are then rounded up to the nearest dimensions defined in the tables of BR187:2014;
- The unprotected area on the elevation projecting on to the plane of reference is taken as a percentage of the area of the ‘enclosing rectangle’;
- The tables in BR187:2014 are then used to determine the required minimum distance between the plane of reference and the relevant boundary based on the dimensions of the enclosing rectangle and the percentage of unprotected area;
- The methodology of the enclosing rectangle analysis may also be carried out in ‘reverse’ based on a known boundary distance to determine the maximum percentage unprotected area on the elevation.

#### 6.1.2 Enclosing Rectangle Analysis Assumptions

External fire spread analysis in accordance with BR187:2014 is based on the following assumptions:

- All parts on the elevation to the fire compartment are considered ‘unprotected’ except the following:

- All parts of the elevation that meet the fire resistance requirements for elements of structure with regard to integrity (i.e. 120 minutes) and 15 minutes for insulation;
- Small unprotected areas (less than 1m<sup>2</sup>) and groups of unprotected areas (within an area not exceeding 1m<sup>2</sup>) that are separated from all other unprotected areas on the compartment elevation by at least 4m (reduced to 1.5m where one of the unprotected areas does not exceed 0.1m<sup>2</sup>);
- Unprotected areas to protected shaft that is enclosed within at least 60-minute fire rated construction;
- The relevant boundary distance is taken from the plane of reference to the adjacent site boundary except where the adjacent boundary is to a public roadway or river etc. In the case the adjacent boundary is a public roadway or river the relevant boundary distance may be taken to the middle of the road or river etc;
- Analysis for each fire compartment is to be conducted based on the relevant occupancy characteristic of the compartment (i.e. residential, etc.);
- The analysis will consider the ‘worst-case’ scenario for each elevation (i.e. compartment with greatest extent of unprotected area closest to the relevant boundary). Providing the analysis for the worst case demonstrates compliance it is considered acceptable to assume all other compartments on the elevation are also acceptable with regard to external fire spread.

#### 6.1.3 External Fire Spread Analysis

##### *Relevant Boundary Distances*

An up-to-date site boundary plan should be provided to Hydrock in order to assess compliance with the minimum required boundary distances as outlined in the following sections. This will be addressed at RIBA Stage 4.

### North Elevation

The ‘worst-case’ compartment on this elevation is considered to be either of the top-floor apartments, based on the extent of the unprotected area and proximity to the relevant boundary. The extent of unprotected area is illustrated in Figure 11.



Figure 11 North elevation analysis

The plane of reference for this analysis is taken parallel to the elevation. The unprotected area of this compartment elevation has been taken as the entire compartment and is approximately 14.85m<sup>2</sup> within an enclosing rectangle of 3m (2.48m) high x 6m (5.86m) wide (total enclosing rectangle of 18m<sup>2</sup>). Therefore, the percentage of unprotected area within the enclosing rectangle is 82.5%, resulting in a minimum required boundary distance of 2.5m.

In line with Section 1.2.4 of BR 187:2014, where sprinklers are provided, the required boundary distance may be halved (up to 1m); therefore, the resulting final required boundary distance is 1.25m. Compliance with this minimum boundary distance can be confirmed upon receipt of an up-to-date site plan.

### East Elevation

There are two ‘worst-case’ compartments on this elevation, based on the fire load within the compartments, the extent of the unprotected area and proximity to the relevant boundary. These compartments are a top floor apartment (reduced fire load), and the first-floor plant room (high fire load). The extent of unprotected area for each worst-case is illustrated in Figure 12.

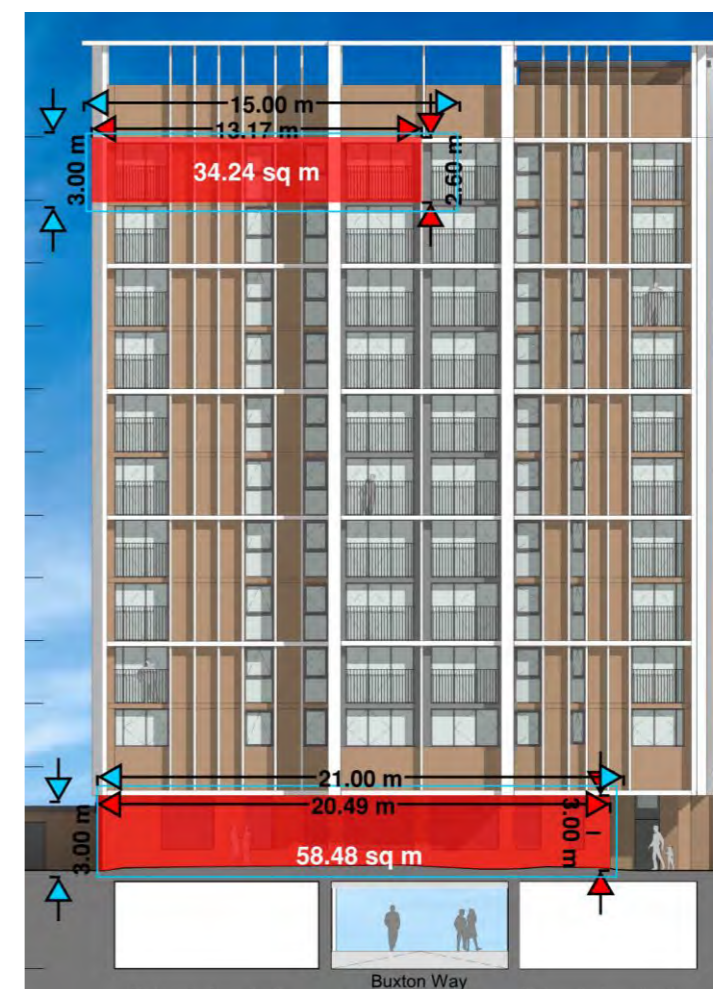


Figure 12 East elevation analysis

The plane of reference for this analysis is taken parallel to the elevation. Each compartment has been assumed to be fully unprotected as a “worst-case” scenario.

The unprotected area of the apartment is approximately 34.24m<sup>2</sup> within an enclosing rectangle of 3m (2.50m) high x 15m (13.17m) wide (total enclosing rectangle of 45m<sup>2</sup>). Therefore, the percentage of unprotected area within the enclosing rectangle is 76.0%, resulting in a minimum required boundary distance of 3.3m.

In line with Section 1.2.4 of BR 187:2014, where sprinklers are provided, the required boundary distance may be halved (up to 1m); therefore, the resulting final required boundary distance is 1.65m. Compliance with this minimum boundary distance can be confirmed upon receipt of an up-to-date site plan.

The unprotected area of the plant room is approximately 58.48m<sup>2</sup> within an enclosing rectangle of 3m (3.0m) high x 21m (20.49m) wide (total enclosing rectangle of 63m<sup>2</sup>). Therefore, the percentage of unprotected area within the enclosing rectangle is 92.48%, resulting in a minimum required boundary distance of 6.64m.

In line with Section 1.2.4 of BR 187:2014, where sprinklers are provided, the required boundary distance may be halved (up to 1m); therefore, the resulting final required boundary distance is 3.32m. Compliance with this minimum boundary distance can be confirmed upon receipt of an up-to-date site plan.

#### South Elevation

The ‘worst-case’ compartment on this elevation is considered to be either of the top-floor apartments, based on the extent of the unprotected area and proximity to the relevant boundary. The extent of unprotected area is illustrated in Figure 13.

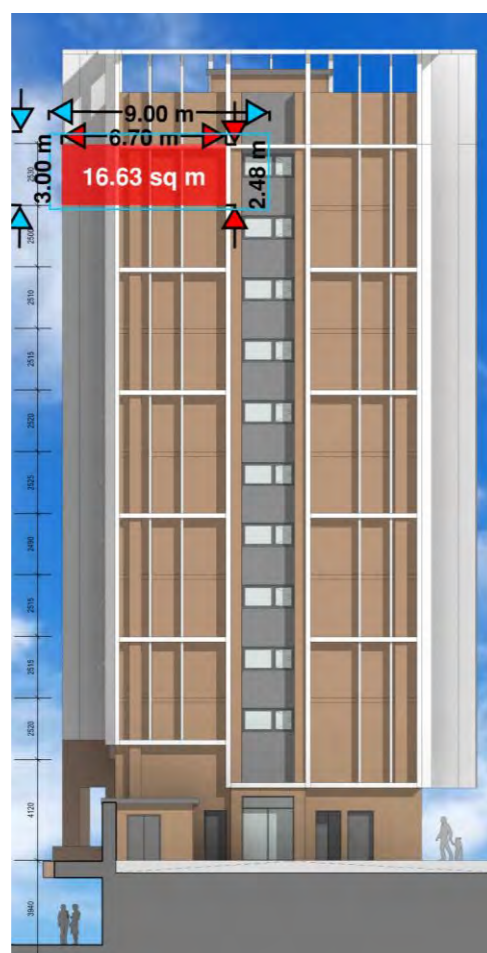


Figure 13 South elevation analysis

The plane of reference for this analysis is taken parallel to the elevation. The unprotected area of this compartment elevation is approximately 16.63m<sup>2</sup> within an enclosing rectangle of 3m (2.48m) high x 9m (6.7m) wide (total enclosing rectangle of 27m<sup>2</sup>). Therefore, the percentage of unprotected area within the enclosing rectangle is 61.6%, resulting in a minimum required boundary distance of 2.5m.

In line with Section 1.2.4 of BR 187:2014, where sprinklers are provided, the required boundary distance may be halved (up to 1m); therefore, the resulting final required boundary distance is 1.25m. Compliance with this minimum boundary distance can be confirmed upon receipt of an up-to-date site plan.

#### West Elevation

The ‘worst-case’ compartment on this elevation is considered to be either of the top-floor apartments, based on the extent of the unprotected area and proximity to the relevant boundary. The extent of unprotected area is illustrated in Figure 14.



Figure 14 West elevation analysis

The plane of reference for this analysis is taken parallel to the elevation. The unprotected area of this compartment elevation is approximately 29.45m<sup>2</sup> within an enclosing rectangle of 3m (2.53m) high x 12m (11.65m) wide (total enclosing rectangle of 36m<sup>2</sup>). Therefore, the percentage of unprotected area within the enclosing rectangle is 81.8%, resulting in a minimum required boundary distance of 3.1m.

In line with Section 1.2.4 of BR 187:2014, where sprinklers are provided, the required boundary distance may be halved (up to 1m); therefore, the resulting final required boundary distance is 1.55m. Compliance with this minimum boundary distance can be confirmed upon receipt of an up-to-date site plan.

## 6.2 Re-Entrant Corners

The building design should prevent fire spread from occurring around walls/floors required to be fire rated via an external corner in the façade (i.e. re-entrant corners). Therefore, where the internal angle of a corner in the façade is less than 135°, unprotected areas to areas of separate sides of a fire rated wall/floor are to be separated by at least 1800mm as illustrated in Figure 15. Re-entrant corners have been marked on the Fire Safety Strategy Drawings included in Appendix A.

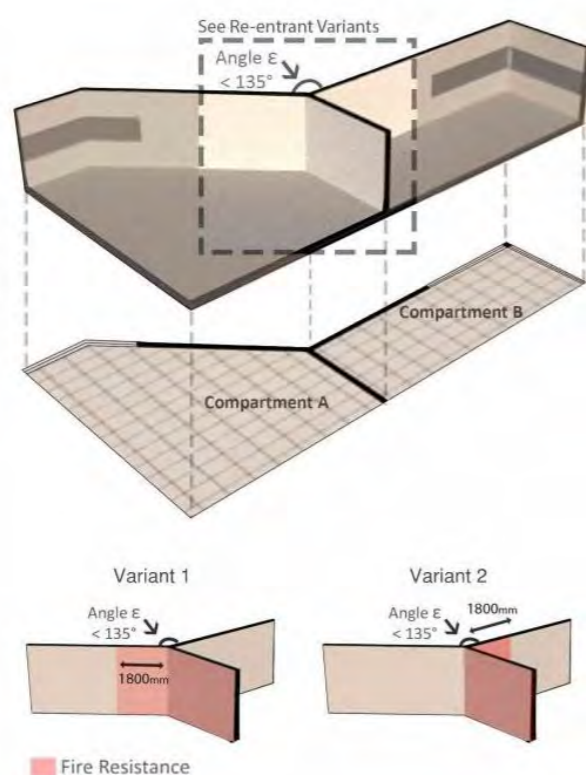


Figure 15 Re-entrant corner requirements

## 6.3 Building Façade

External walls should be constructed using a material that does not support fire spread and therefore endanger people in or around the building. Flame spread over or within an external wall construction should be controlled to avoid creating a route for rapid fire spread bypassing compartment floors or wall. It should also be ensured external walls close to relevant boundaries are not readily ignitable to avoid fire spread between buildings.

In accordance with BS 9991:2015 external walls should either meet the performance criteria of BR135 when testing accordance with BS 8414-1 or BS 8414-2 or should meet the following requirements:

- Where the external wall is within 1m of a relevant boundary the external surface is to achieve the following requirement:
  - Class B-S3, d2 or better (European class). Profiled or flat steel sheet at least 0.5mm thick with an organic coating of no more than 0.2mm thickness is also acceptable;
- Where a part of the building is considered assembly or recreation all external wall surfaces up to 10m above ground level and up to 10m above a roof any part of the building to which the public have access to are to achieve the following requirement:
  - Class B-S3, d2 or better (European class). Profiled or flat steel sheet at least 0.5mm thick with an organic coating of no more than 0.2mm thickness is also acceptable;
- Cavity barriers are to be provided as outlined in Section 19;
- External balconies that are enclosed should be constructed and separated from other enclosed balconies by at least 60-minute fire rated construction.

Where the top storey of a residential building is not more than 18m above ground level there are no explicit restrictions on the combustibility of the external wall construction noted within BS 9991:2015. However, Requirement B4 of Schedule 1 to the Building Regulations 2010 (as amended) requires that “...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 location of the building.”

In accordance with Clause 10.1 of ADB1:2022, the external wall of a building should not provide a medium for fire spread if that is likely to be a risk to health and safety. Additionally, Clause 10.4 of ADB1:2022 states that in relation to buildings of any height or use, consideration should be given to the choice of materials (including their extent and arrangement) used for the external wall, or attachments to the wall, to reduce the risk of fire spread over the wall. Therefore, even where prescriptive guidance for the combustibility of external wall construction on residential buildings is less specific for buildings with no storey more than 18m above ground

level, consideration should be given to whether the provision of any combustible material within the external wall construction presents a risk to health and safety and satisfies the functional requirement B4 of Schedule 1 to the Building Regulations.

Hydrock advise that all primary materials in the external walls are to achieve Class A2-s1,d0 or better. Permitted exemptions to this requirement are to follow those outlined within the Building (Amendment) Regulations 2018 [S.I. 2018/1230]. These can also be found in the Regulation 7(2) section within ADB1:2022 (pages 76-77).

It is to be noted that Approved Document B June 2022 Amendments requires the outermost external material and any insulation product used in the external wall to achieve Class A2-s1, d0 or A1 (for buildings with a top storey more than 11m above ground level).

### 6.3.1 The Building (Amendment) Regulations 2018

The Building (Amendment) Regulations 2018 was released on 28.11.2018 and came into force on 21.12.2018. This amendment to the Building Regulations describes the requirements for external wall construction for high-rise relevant buildings (including residential buildings).

In accordance with the Building (Amendment) Regulations 2018 all materials which become part of an external wall, or specified attached, of a residential building are to be of Class A2-s1, d0 or Class A1 classified in accordance with BS EN 13501-1:2007+A1:2009 (this has now been superseded by BS EN 13501-1:2018). Refer to The Building (Amendment) Regulations 2018 for further information with regard to:

- Components included within definition of ‘external wall’;
- Components included within definition of ‘specified attachments’;
- Components of external wall and specified attachment considered exempt from this requirement.

These requirements are applicable to all ‘building work’ except where initial notice or building notice has been given to, or full plans have been deposited with the local authority before 21.12.2018 and the building work has started before 21.12.2018 or within the period of 2 months starting from 21.12.2018.

## 6.4 Roof Coverings

The term roof covering describes constructions which may consist of one or more layers of material but does not refer to the roof structure as a whole. The requirements refer to the coverings with regards to the performance of the roof when exposed to fire from outside.

The performance of roof coverings is designated by reference to the test methods specified in BS 476-3:2004 or determined in accordance with BS EN 13501-5:2005. Construction is classified within the national system by 2 letters in the range A to D, with an AA designation considered the highest performance. The first letter indicates the time to penetration; the second letter measures the distance of surface spread of flame. Construction classified under the European system is BROOF(t4) – FROOF(t4), with the prior representing the best performance. BS EN 13501-1 refers to four tests, with the suffix indicating Test 4 is to be applied for the purposes of Part B of the building regulations.

Limitations are also applicable to glass, wood shingles and plastic rooflights within recommendations provided under the relevant section of ADB.

The following roof classification is to be achieved based on the separation distance provided from the relevant boundary.

Table 11 Performance of Roof Coverings

Requirements for Roof Covering Performance					
Designation of covering of roof		Minimum distance from any point on relevant boundary			
National Class	European Class	Less than 6m	At least 6m	At least 12m	At least 20m
AA, AB or AC	B <sub>ROOF</sub> (t4)	ACCEPTABLE	ACCEPTABLE	ACCEPTABLE	ACCEPTABLE
BA, BB or BC	C <sub>ROOF</sub> (t4)	-	ACCEPTABLE	ACCEPTABLE	ACCEPTABLE
CA, CB or CC	D <sub>ROOF</sub> (t4)	-	[1] [2]	[1]	ACCEPTABLE
AD, BD or CD	E <sub>ROOF</sub> (t4)	-	[1] [2]	[1]	[1]

Notes

1. Not acceptable on any of the following buildings:
  - Houses in terraces of three or more buildings;
  - Industrial, storage or other non-residential purpose group buildings;
  - Any other building with a cubic capacity of more than 1500m<sup>3</sup>
2. Acceptable on buildings not listed in note 1, if part of the roof is no more than 3m<sup>2</sup> in area and is at least 1500mm from any similar part, with the roof between the parts covered with a material of limited combustibility.

Where the roof covering passes over a compartment wall, the roof covering should be situated on top of a deck of material of Class A2-s3, d2 or better, for at least 1500mm either side of the compartment wall. It should be noted that this requirement is not considered necessary where the roof achieves a fire resistance (from the underside) equivalent to that of the compartment wall (e.g. where the roof is a concrete slab).

Compartment walls should be fire-stopped up to the roof construction. It is noted that additional recommendations are made in Section 7.6 due to the inclusion of Photovoltaic (PV) Panels.

## 7. FACILITIES FOR FIREFIGHTING

Functional Requirement B5:

1. The building shall be designed and constructed so as to provide reasonable facilities to assist firefighters 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.

The following section describes the arrangements for firefighting provisions in the event of a fire in order to comply with B5 of Schedule 1 to the Building Regulations 2010 (as amended).

### 7.1 Firefighting Access

It is considered that the fire service will gain access to the building via Albion Street; access to the first-floor car park is not considered suitable for a fire appliance.



Figure 16 Access point from Albion Street

Access is to be made to the building via the under-croft area to the Stair 1 entrance. Whilst it is acknowledged that the building is existing, it is recommended that consultation is had with the fire service at an early a stage as possible, to communicate and agree upon the proposed access via the under-croft area.

#### 7.1.1 Appliance Access Routes

Measurements for a typical vehicle access route for a pump appliance are as follows:

- Minimum width of road between kerbs: 3.7m;
- Minimum width of gateways: 3.1m;
- Minimum turning circle between kerbs: 16.8m;
- Minimum turning circle between walls: 19.2m;
- Minimum clearance height: 3.7m;
- Minimum carrying capacity: 12.5t.

### 7.2 Firefighting Shaft

As the building is greater than 18m in height, a firefighting shaft is required, designed in accordance with Section 20 of BS 9999:2017. The firefighting shaft should contain:

- Firefighting stairs;
- A firefighting lift;
- A firefighting lobby; and,
- Fire mains.

As no floor area exceeds 900m<sup>2</sup> a single fire-fighting shaft is acceptable. As the building is to be fitted throughout with a sprinkler system in accordance with BS 9251:2021, fire-fighting shafts are to be provided such that every part of every storey is no more than 60 m from a fire main outlet in a fire-fighting shaft, as measured on a route suitable for laying hose.

#### 7.2.1 Firefighting Stairs

It is proposed that Stair 1 serves as the firefighting stair for the building, due to the availability of fire service access, and its proximity to the lift.

Firefighting stairs should be provided with means of ventilation to ensure they remain relatively smoke-free. It is recommended that an automatic opening vent (AOV) is provided at the head of the stair, in accordance with BS EN 12101-2, with a free area no less than 1m<sup>2</sup>.

Firefighting stairs should achieve a clear width of 1100mm. Stair 1 has a clear width of approximately 970mm, which does not achieve the minimum required width as per BS 9999:2017. However, subject to agreement

with the approving authorities, it is considered reasonable that Stair 1 serves as the firefighting stair on the following basis:

- The building is existing, and the proposed remedial works are not worsening the existing clear width of the stairs;
- The clear width of Stair 1 is less than 12% below the required 1100mm. This reduction in width is not considered to be a significant risk due to the low “per floor” occupancy numbers. A typical floor layout is expected to have 11 occupants, over 11 storeys this gives a total of 121 occupants. A typical 750mm stair used for simultaneous evacuation has capacity for 500 escaping persons<sup>2</sup>;
- The purpose of achieving 1100mm clear width is to facilitate the contraflow of occupants escaping and firefighters. It is considered likely that occupants escaping the building will have evacuated prior to the arrival of the fire service, additionally the downward flow of escaping persons is low;
- There is an alternative stair available for occupants to use for escape, Stair 2, further reducing the flow of escaping persons down the fire-fighting stair.
- Each level is provided with a separate, ventilated fire-fighting lobby which does not provide access to any other accommodation. This exceeds the requirements for firefighting shafts in residential buildings and provides a protected ventilated floor area at each level for the fire service to use as a bridgehead for mounting their interventions.

To prevent smoke from basement storeys penetrating the stair enclosure above ground level, firefighting stairs serving floors both above and below ground level should be separated at ground floor level by a fire door (Section 50.3.2.1 of BS 9991:2015).

## 7.2.2 Firefighting Lift

The firefighting lift should be installed in accordance with BS EN 81-20 and BS EN 81-72.

Firefighting lifts should be located within 7.5m of the firefighting stair. On the basis that Stair 1 serves as the firefighting stair, this requirement is considered to be met.

Typically, firefighting lifts should not open directly into the firefighting stair enclosure. However, it is noted that at ground floor, this arrangement is unavoidable due to the existing construction of the building. It is considered that this is reasonable on the following basis, subject to agreement with the approving authorities:

- The building is existing, and the existing location of the lift in relation to Stair 1 is not being worsened by the refurbishment works;
- The firefighting lift will only open directly into the firefighting stair enclosure at one out of 13 storeys;
- There is an alternative stair available (Stair 2). Therefore, it is considered that the firefighting lift and firefighting lobby (i.e. the common corridor) are sited such that the movement of the fire service between the lift and lobby would not impede the use of Stair 2 by occupants during an evacuation;
- If the lift entrance were relocated out of the stair enclosure the access would be an additional travel distance 16m from the fire-fighting stair entrance point;
- It is recommended that the firefighting lift well should be inspected monthly and any combustible materials should be removed and if the machinery spaces cannot be sited above or within the top of the lift well, they should be located outside, or should be separated from, the stairway (to avoid smoke spread into the stairway from a fire in a machinery space).

### 7.2.2.1 Dual-Entry Lift

It is understood that, at ground floor, it is proposed that the lift is dual-entry, allowing for occupants to enter the lift via the main entrance on Albion St, as well as being accessible from the firefighting stair side. The use of dual-entry firefighting lifts is not typically recommended within residential buildings; therefore, the inclusion of a dual-entry firefighting lift is subject to agreement with approving authorities.

Dual-entry firefighting lifts should meet all of the conditions of Clause 20.4.3, BS 9999:2017, which includes, but is not limited to, the following:

- Additional facilities need to be provided by the lift control system in accordance with BS EN 81-71;
- The lift doors should be no less than FD60;
- The accommodation into which the dual-entry lift opens should be enclosed in no less than 30 minutes fire resistance and should consist only of passenger lifts or sanitary accommodation.

As it is not possible in the current arrangement of the building to meet all of the requirements of Section 20.4.3 of BS 9999:2017, it is proposed to provide a 120-minute fire and smoke curtain in line with the dual-entry doors at ground floor. Therefore, on activation of a detector in any communal space will activate the fire and smoke curtain providing the required compartmentation to the fire-fighting lift shaft. Fire curtains should be designed,

<sup>2</sup> Calculated using 1.5mm/person for a C1 occupancy as per Table 13 of BS 9999:2017.

installed and commissioned in accordance with BS 8524-1:2013 and meet all of the requirements of Section 23 of BS 9991:2015.

### 7.2.3 Firefighting Lobby

In line with Note 3 of Clause 50.2.2, BS 9991:2015, in residential buildings, it may be assumed that the protected common corridor is to serve as the firefighting lobby, and it is thus not required to provide an additional firefighting lobby between the firefighting stair and common corridor. Notwithstanding, a protected, ventilated fire-fighting lobby to Stair 1 has been introduced into the design, and therefore the lobby is to be designed as the firefighting lobby.

The firefighting lobby should be ventilated. Please see Section 8.2 for further discussion.

### 7.2.4 Fire Mains

A dry rising fire main is to be provided to the firefighting shaft. Dry fire mains should be designed, installed and commissioned in accordance with BS 9990:2015.

A landing valve should be provided at every floor level, including ground floor, and each landing valve should be sited either:

- Within a ventilated stair lobby;
- In a stairway enclosure; or,
- In any other position agreed within the approving authorities.

A landing valve should also be provided at roof level for test purposes, if practicable.

It should be ensured that the fire service have access to a parking position within 18m of the dry riser inlet position, measured along a route suitable for laying a hose. The inlet should be clearly visible from the parking position.

All areas of the floor plate should be accessible within 60m from the dry riser outlet, measured along a route suitable for laying a hose. It has been demonstrated in Appendix A that all areas of the floor plates can be reached within 60m of the outlet position.

### 7.2.5 Protection from External Fire

In line with Figure 23, BS 9999:2017, where one or more walls enclosing a firefighting shaft are external walls, and the distance between the firefighting shaft and the accommodation is less than 5m, one of the following recommendations should be met:

- Either the side nearest the accommodation of any external wall facing or adjacent to the firefighting shaft should have a fire resistance of 2 hours; or,
- The side internal to the firefighting shaft of any external wall facing or adjacent to the accommodation should have a fire resistance of 2 hours.

It is acknowledged that, at first floor, the firefighting shaft abuts the external walls at angles less than 110°, and there are openings into residential accommodation (escape window) and the bin store within 5m of these internal angles. It is considered that reasonable protection to the firefighting shaft is provided by the proposed re-entrant corner protection, as detailed in Section 6.2 and illustrated in Appendix A. This is subject to agreement with the approving authorities.

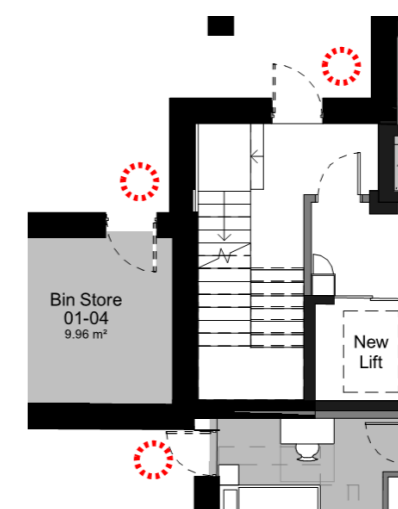


Figure 17 Re-entrant corners of the firefighting shaft (level 01)

## 7.3 Fire Hydrants

In accordance with BS 9991:2015 and BS 9999:2017 it should be ensured a fire hydrant is provided within 90m of the dry riser inlets serving the development.

AHR attended site on 02.08.2023 to determine the location of existing hydrants at the Buxton House development. It was confirmed that an existing hydrant is located as approximately indicated below.

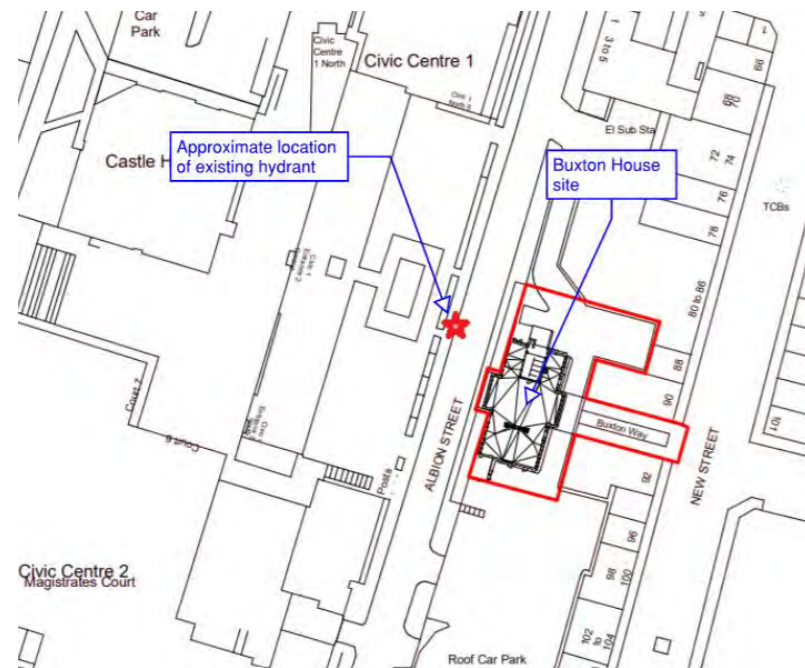


Figure 18 Existing hydrant location

Based on the above, it is considered that the existing hydrant is within 90m of both the proposed firefighting entrance to the Buxton House and the expected location of the dry riser inlet (dry riser inlet position yet to be confirmed). Notwithstanding, it is recommended that a survey is undertaken in order to confirm the suitability of the existing hydrant in accordance with BS 9990:2015.

#### 7.4 Wayfinding Signage

To assist the Fire Service in identifying each floor in a core with a top storey more than 11 m above ground level, floor identification signs and flat indicator signs should be provided within the building on all floors. Information on wayfinding signage is not currently included in BS 9991:2015, but full details on the specifications of wayfinding signage is provided in Clauses 15.13–15.16 of Approved Document B – Volume 1 (2022).

#### 7.5 Premises Information Box (PIB)

The provision of a PIB was a recommendation from the Dame Judith Hackitt review following the Grenfell Tower tragedy. PIB's offer a recognised focal point for the provision of premises plans and information to attending fire crews in the event of an incident.

PIB's should be strategically located, be simple, easily accessible and contain key information needed by operational fire crews at the time of an incident. It is proposed to provide a PIB at the main entrance to each core of the blocks (this can be located internally or externally). The following are the essential items:

- Operational Contingency Plans;
- Simple plans and or schematic representations of the building and any relevant information relating to equipment/fixed installations design and operation provided for means of escape or fire-fighting operations;
- Basic operating instructions for fire protection and fixed fire-fighting equipment (isolation switch locations etc.).

Simple single line plans should be provided of typical floor plan layouts and any relevant fire resistance, access, fire-fighting facilities, equipment, services and hazards etc. should be shown.

Further information can be found in the 'FIA Code of Practice for the Provision of Premises Information Boxes in Residential Buildings' [December 2020].

#### 7.6 PV Panels

New rooftop PV installations should not lower the fire performance/classification of the roof. PV arrays should not traverse fire barriers, or fire compartment walls, and all cabling should be sealed, or contained in order to prevent the spread of fire across fire barriers.

Due to the PV panels located at roof level, it is also recommended that within the PIB, information be provided for the fire and rescue service to include:

- The layout of the site, including plans of large buildings showing the locations of the PV panels and control equipment;
- The location of isolation switches for PV panels;
- The location of the main electrical intake(s) and consumer units;
- The location of the indicator panel for the automatic fire detection and alarm installation;
- Details of any automatic fire suppression system(s) and the location of their controls or valves;
- Details of ventilation systems;
- The nature and location of any hazardous substances on the premises;
- Contact details for staff who may need to be consulted; and
- The location of hydrants, rising mains or other sources of water on site or nearby for firefighting purposes.

The presence of a PV system on a building is not always obvious from ground level, thus a sign that indicates the presence of a PV system on a building or structure should be prominently displayed for the information of the fire and rescue service. The sign, measuring at least 100mm x 100mm shown in Figure 19, should be displayed at the consumer units or supplier's cut-out.

In order to effectively reduce the spread of fire via PV system components, the following should be achieved:

- The PV arrays should not traverse fire barriers or fire walls, and all cabling should be sealed or contained in order to prevent the spread of fire across fire barriers.
- Additional fire protection measures will be needed if the roofing material is not PV arc resistant;
- New rooftop PV installations, including panels and fixing systems, should not lower the fire performance/classification of the roof. In-roof systems should have the correct fire qualification to satisfy the requirements of the Building Regulations. If installation on a combustible or partly-combustible roof is unavoidable, then a fire resistant covering should be applied.
- On roofs, there should be a minimum distance of 2.5m between the PV modules on each side of the compartment/fire walls. A reduced distance may be permitted, if the potential for a fire to spread across a compartment boundary is considered low.

Further information can be found in the 'RC62: Recommendations for fire safety with photovoltaic panel installations'.

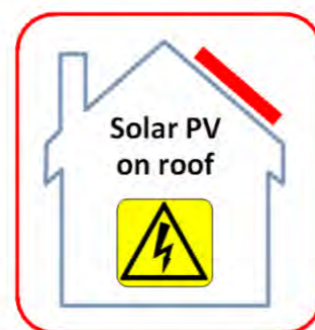


Figure 19 Sign indicating presence of PV panel installation (image taken from RC62: Recommendations for fire safety with photovoltaic panel installations)

## 8. FIRE PROTECTION SYSTEMS

This section describes the fire protection systems to be provided with the development in order to ensure the safety of occupants and Fire Service personnel in the event of a fire.

### 8.1 Emergency Lighting

Emergency lighting is to be provided throughout the development designed, installed and commissioned in accordance with BS 5266-1:2016.

### 8.2 Smoke Ventilation

#### 8.2.1 Stairs

Both stairs should be provided with means of ventilation. An automatic opening vent (AOV) should be provided at the head of each stair, with a free area of no less than 1m<sup>2</sup>.

#### 8.2.2 Common Corridor/Firefighting Lobby

The firefighting lobby and common corridor at each floor level should be provided with means of ventilation. It is understood that the existing/previous lift shaft is to be split to facilitate two smoke shafts, each capable of individually serving the firefighting lobby or common corridor at each level, respectively, as indicatively illustrated in Figure 20.



Figure 20 Smoke shafts serving the firefighting lobby and the common corridor

It is understood that the two smoke shafts are to be designed as mechanical smoke systems.

If the system(s) is to be mechanical, the smoke shaft(s) should meet the following requirements:

- The smoke shaft should be fully open to the external air at the top and closed at the base;
- The top of the lobby or corridor vent should be located as close to the top ceiling of the lobby or corridor as is practicable, and should be at least as high as the top of the door connecting the lobby or corridor to the stairwell;
- The lobby or corridor vents, in the closed position, should have a minimum fire and smoke resistance performance of 30 minutes, and integrity no greater than 360m<sup>3</sup>/h/m<sup>2</sup> when tested in accordance with BS EN 1366-2;
- No services other than those relating to the smoke shaft should be contained within the smoke shaft; and,
- The smoke shaft should be located at the remoted end of the corridor away from the staircase.

Further details on the mechanical smoke ventilation system can be found in Clause 14.2.4 of BS 9991:2015.

If mechanical ventilation is to be provided, computational fluid dynamics (CFD) analysis is required for the proposed mechanical ventilation system, in order to demonstrate that the system is capable of maintaining tenable conditions within the common corridor. The acceptance of this CFD analysis is to be subject to agreement with the approving authorities.

Any smoke shaft penetrating a fire compartment should, as a minimum, maintain the same level of fire compartmentation as that which has been breached.

The draft 2021 edition of BS 9991 includes the following additional commentary on mechanical smoke shafts (note: this guidance has not yet been formally issued, however the following has been included for consideration):

- The cross-sectional (free) area of the smoke shaft should be sized according to the requirements of the mechanical smoke ventilation system, with a minimum dimension of 0.85m in any direction;
- The cross-sectional area can vary between 0.6m<sup>2</sup> and 1.0m<sup>2</sup>, depending on the height of the shaft and the potential for resistance to flow;
- Vents or AOVs opening to the outside should be natural smoke ventilators;
- AOVs opening into shafts or ducts should be smoke control dampers.

### 8.3 Automatic Water Fire Suppression Systems (AWFSS)

The building height is greater than 18m; therefore, the development is to be provided with a Category 4 sprinkler system in accordance with BS 9251:2021. A Category 4 sprinkler system requires a minimum discharge density of 2.8mm/min, and a minimum duration of supply of 60 minutes. Additional requirements or alterations to minimum discharge duration may apply based on the finalised use of each space at RIBA Stage 4.

Where non-residential areas fall outside the scope of the BS 9251 system, such areas will require a commercial sprinkler system in accordance with BS EN 12845:2019.

### 8.4 Secondary Power Supply

To ensure the operation of all life safety systems during a fire, a secondary power supply should be provided. Secondary power supplies are to be provided for the following primary life safety systems; however, this list is not exhaustive:

- Sprinkler pumps;
- Wet riser pumps;
- Firefighting shaft equipment (including firefighting lifts) and lighting;
- Smoke ventilation systems (mechanical and natural);
- Passenger lifts used for evacuation;
- Fire detection and alarm systems;
- Emergency lighting and illuminated escape signage.

All power supplies, electrical wiring, and control equipment should be protected against fire for an appropriate period of time where the effects of fire are likely to result in the failure or incorrect operation of the life safety system. Power and control cables should be installed in accordance with BS 8519:2020.

## 9. PROVISIONS FOR DISABLED OCCUPANTS

The Equality Act became law in October 2010. It replaced previous legislation (Disability Discrimination Act 1995) and provides employers and employees information on what they need to do to make their workplaces a fair environment and comply with the law.

With regard to fire safety, it is generally assumed that disabled occupants will be able to escape to a place away from danger without assistance from the Fire Service. However, there will be a certain proportion of building occupants, such as those who are non-ambulant disabled, i.e. wheelchair users, who will not be able to negotiate stairs unaided; therefore, an evacuation management procedure for disabled occupants will need to be incorporated into the Fire Safety Management Strategy. This is the responsibility of the end user of the building or 'The Responsible Person'.

Fire safety procedures will therefore, where appropriate, make provision for occupants who might need assistance to make their way to a place of ultimate safety in a fire. If there is a need to make specific arrangements, then it is assumed that consultation with the individual(s) or representative organisations should take place at the earliest opportunity.

### 9.1 Disabled Refuge Areas

As the building is being developed as residential apartments with a stay-put evacuation strategy in place, disabled refuges are not required on the upper levels.

The communal lounge and main entrance at ground floor should be provided with level thresholds, and, where this is not possible, ramps should be provided.

#### 9.1.1 Evacuation Lift

In line with BS 9991:2015, it is not a minimum requirement to provide an evacuation lift. However, in accordance with Annex G of BS 9999:2017, although firefighting lifts are provided principally for the use of the fire service, they may be utilised to augment the evacuation strategy for disabled persons. The use of the firefighting lift may be used by trained management personnel, in the initial phases of evacuation prior to the attendance of the fire service. It is recommended the use of the evacuation lift and operating procedure is agreed with the building management and incorporated into Personal Emergency Evacuation plans (PEEPs). The management and operation of the evacuation lifts will be developed further in RIBA Stage 4. This should be effectively communicated and agreed with the approving authorities.

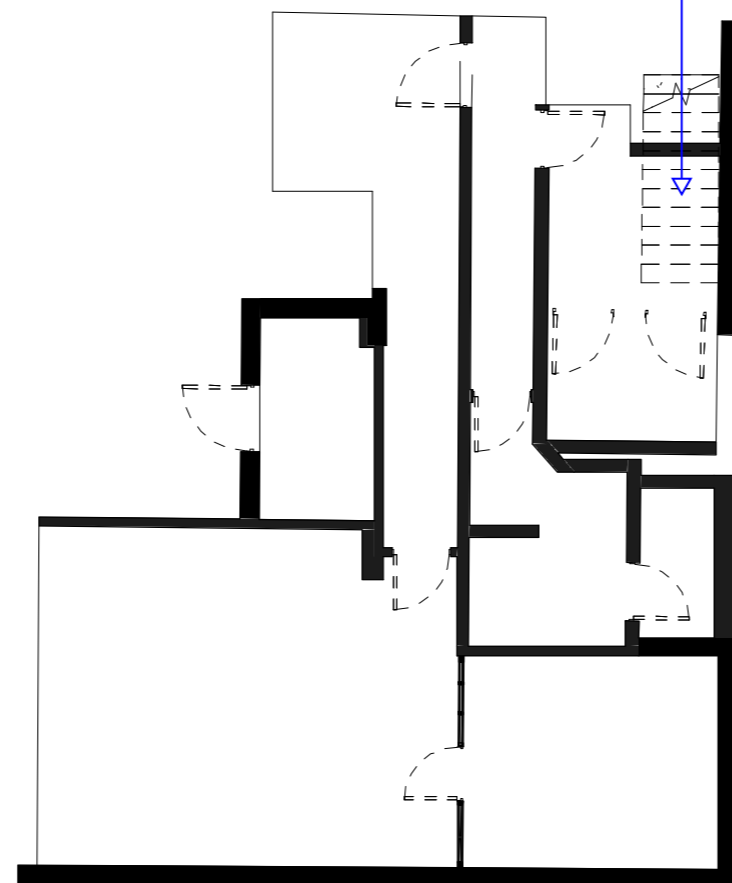
APPENDIX A – FIRE STRATEGY DRAWINGS

**Notes:**












1. This drawing is the property of Hydrock.
2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reports to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Layout of basement to be clarified.

Single-direction travel distances limited to 9m within the plant room.



**Legend:**

-  FD30 fire door
-  FD60 fire door
-  FD30S fire door
-  FD60S fire door
-  30 minute fire rated construction
-  60 minute fire rated construction
-  120 minute fire rated construction
-  Single travel distance
-  Total travel distance
-  Re-entrant corner
-  Hose distance
-  120 minute fire rated drop-down fire curtain/shutter

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
**AHR Architects Ltd**



Hydrock Consultants Ltd  
Merchant House  
Wapping Road  
Stratford  
B51 4RW  
T +44 (0)117 945 8225  
south@hydrock.com  
[www.hydrock.com](http://www.hydrock.com)

Client :  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Basement Level  
Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

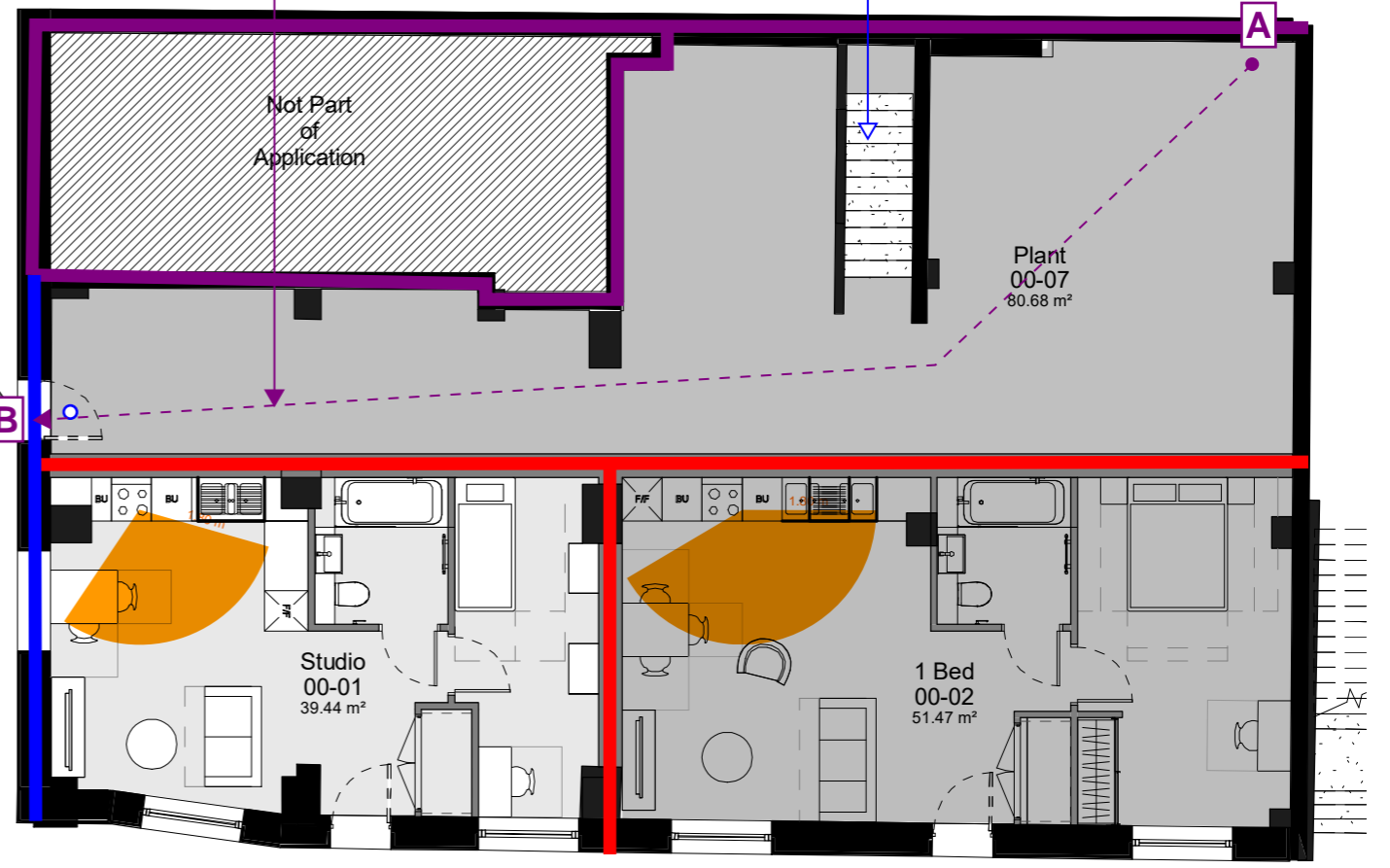
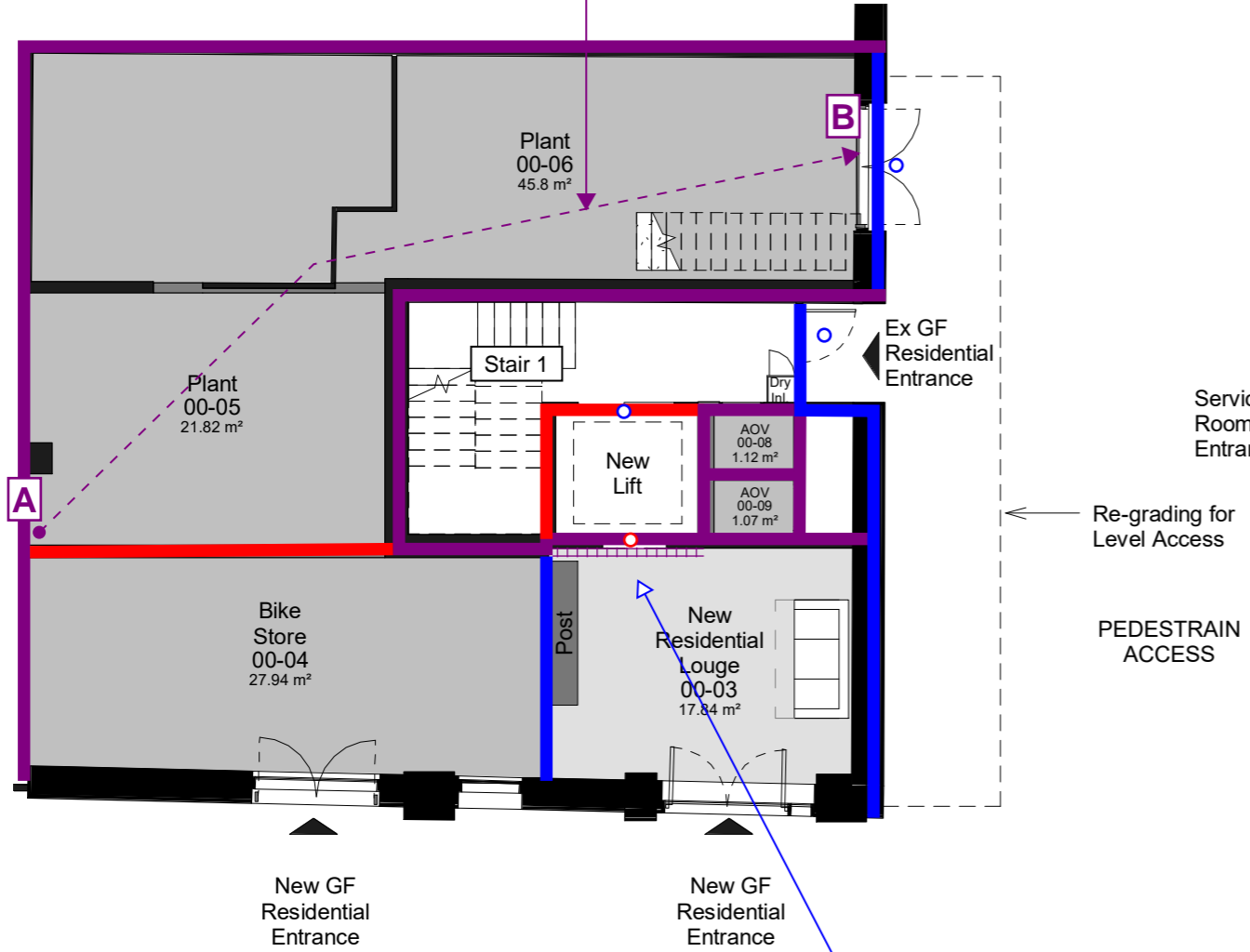
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AF	DA	1:100	12.01.24	12.01.24
Drawing Number				Revision
22176-HYD-XX-B1-DR-FE-1001				02

Single Travel Distance A-B = 13.37m  
 Maximum A-B = 6.0m (2/3 x 9m, layout unknown)  
**EXTENDED SINGLE-DIRECTION TRAVEL**  
 (Table 14, BS 9991:2015)

Single Travel Distance A-B = 18.23m  
 Maximum A-B = 6.0m (2/3 x 9m, layout unknown)  
**EXTENDED SINGLE-DIRECTION TRAVEL**  
 (Table 14, BS 9991:2015)

Clarification required as to where this stair leads/serves.

- Notes:**
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  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.



Re-grading for Level Access  
 PEDESTRAIN ACCESS

ALBION STREET

Please see Section 7.2.2.1 of the Fire Safety Strategy report for commentary on the dual-entry firefighting lift.

- Legend:**
- FD30 fire door
  - FD60 fire door
  - FD30S fire door
  - FD60S fire door
  - 30 minute fire rated construction
  - 60 minute fire rated construction
  - 120 minute fire rated construction
  - A - - - B Single travel distance
  - A - B - C Total travel distance
  - Re-entrant corner
  - - - - - Hose distance
  - 120 minute fire rated drop-down fire curtain/shutter

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
**AHR Architects Ltd**



Client :  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 00 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

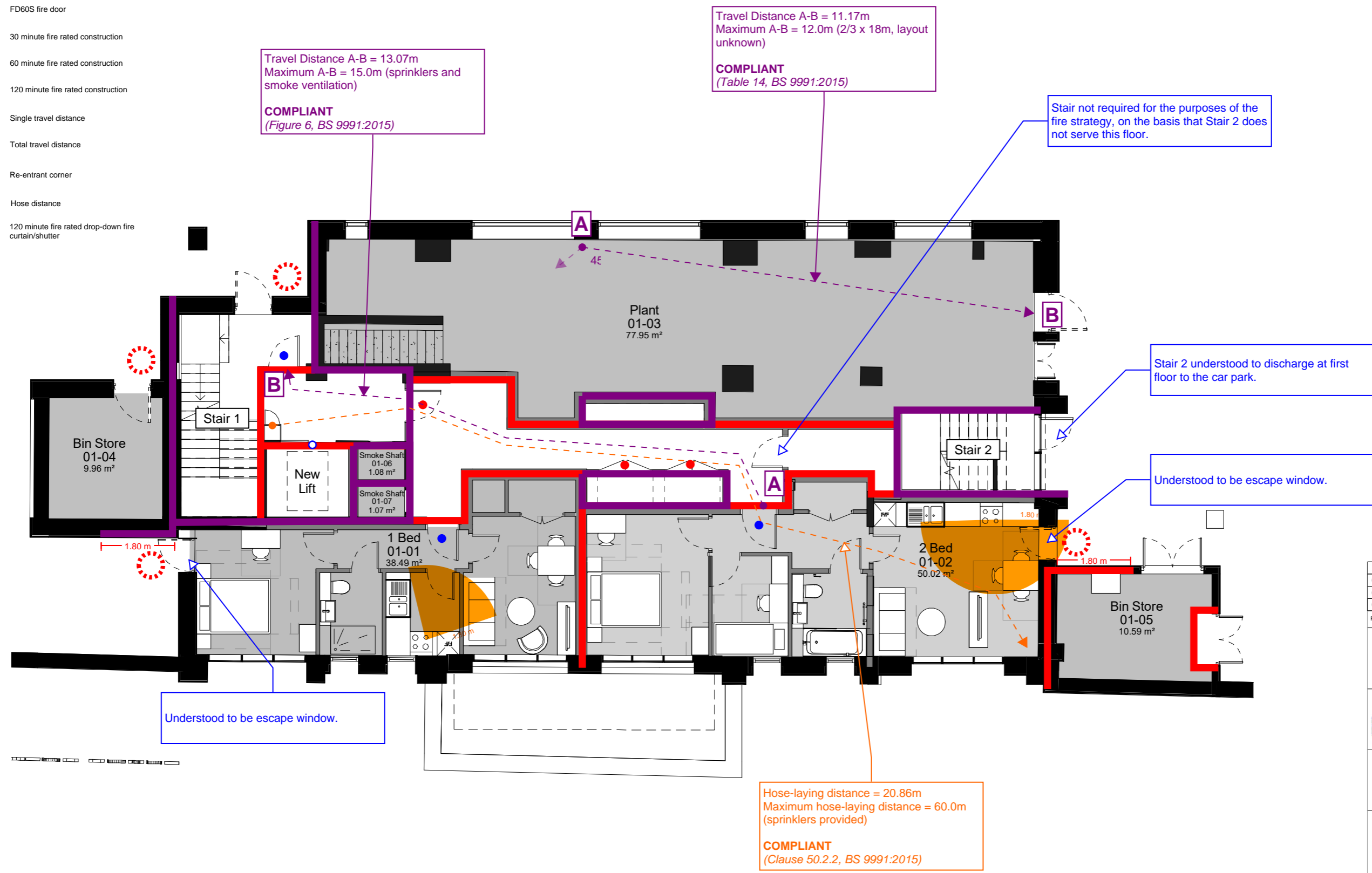
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AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-00-DR-FE-1001**      Revision: **02**

**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- A — B Single travel distance
- A — B — C Total travel distance
- ⊙ Re-entrant corner
- Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
1. This drawing is the property of Hydrock.
  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.



Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
AHR Architects Ltd



Client :  
AHR Architects Ltd

Project Title:  
Buxton House

Drawing Title:  
Level 01  
Fire Strategy Drawing

Drawing Status:  
Stage 3  
Hydrock Job No:  
22176-FENG

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number: 22176-HYD-XX-01-DR-FE-1001  
Revision: 02

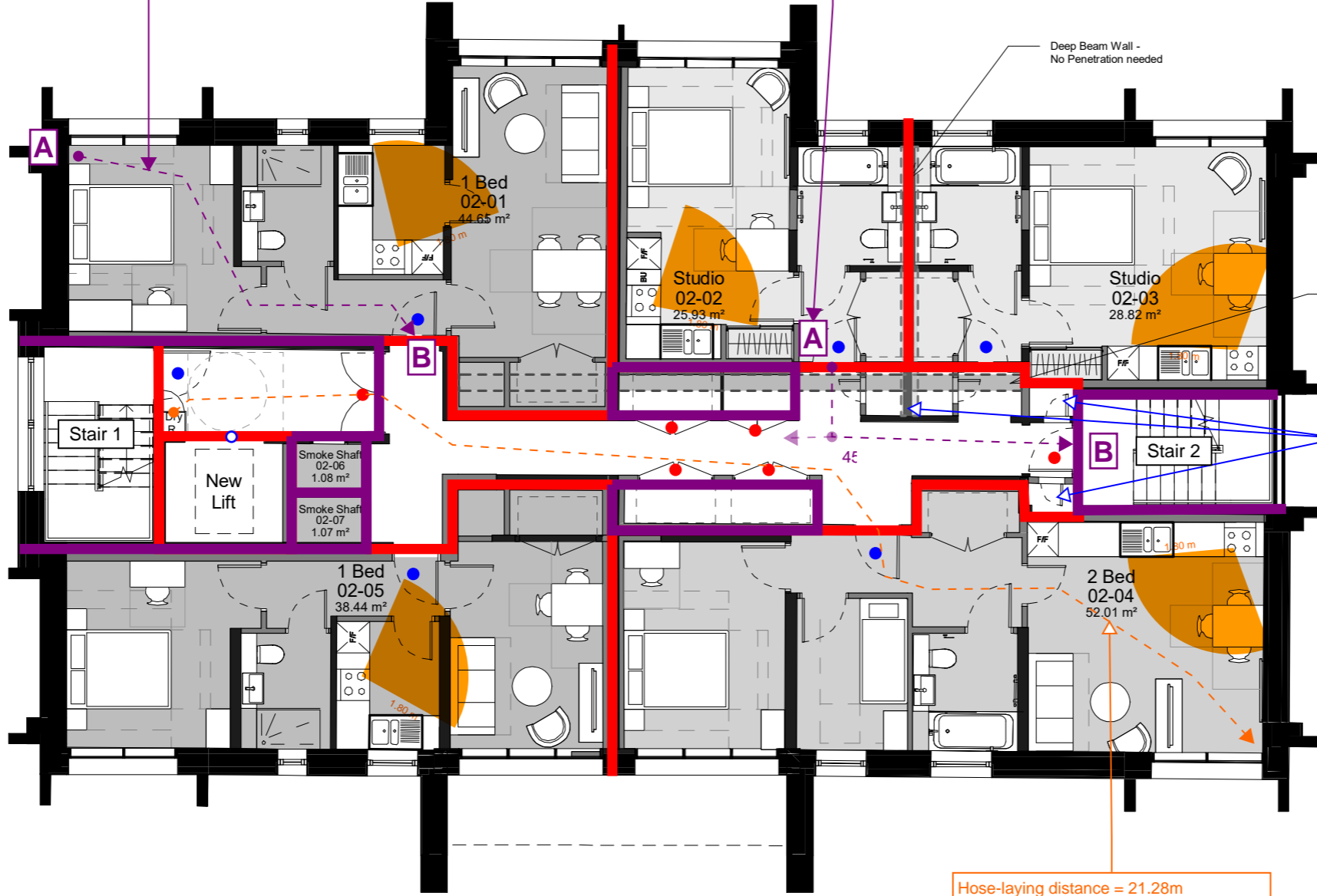
**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- Single travel distance
- Total travel distance
- Re-entrant corner
- Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
1. This drawing is the property of Hydrock.
  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Single Travel Distance A-B = 7.43m  
Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
(Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 5.34m  
Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
(Figure 7, BS 9991:2015)



Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 21.28m  
Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
(Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
**AHR Architects Ltd**



Client :  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 02  
Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-02-DR-FE-1001**      Revision: **02**

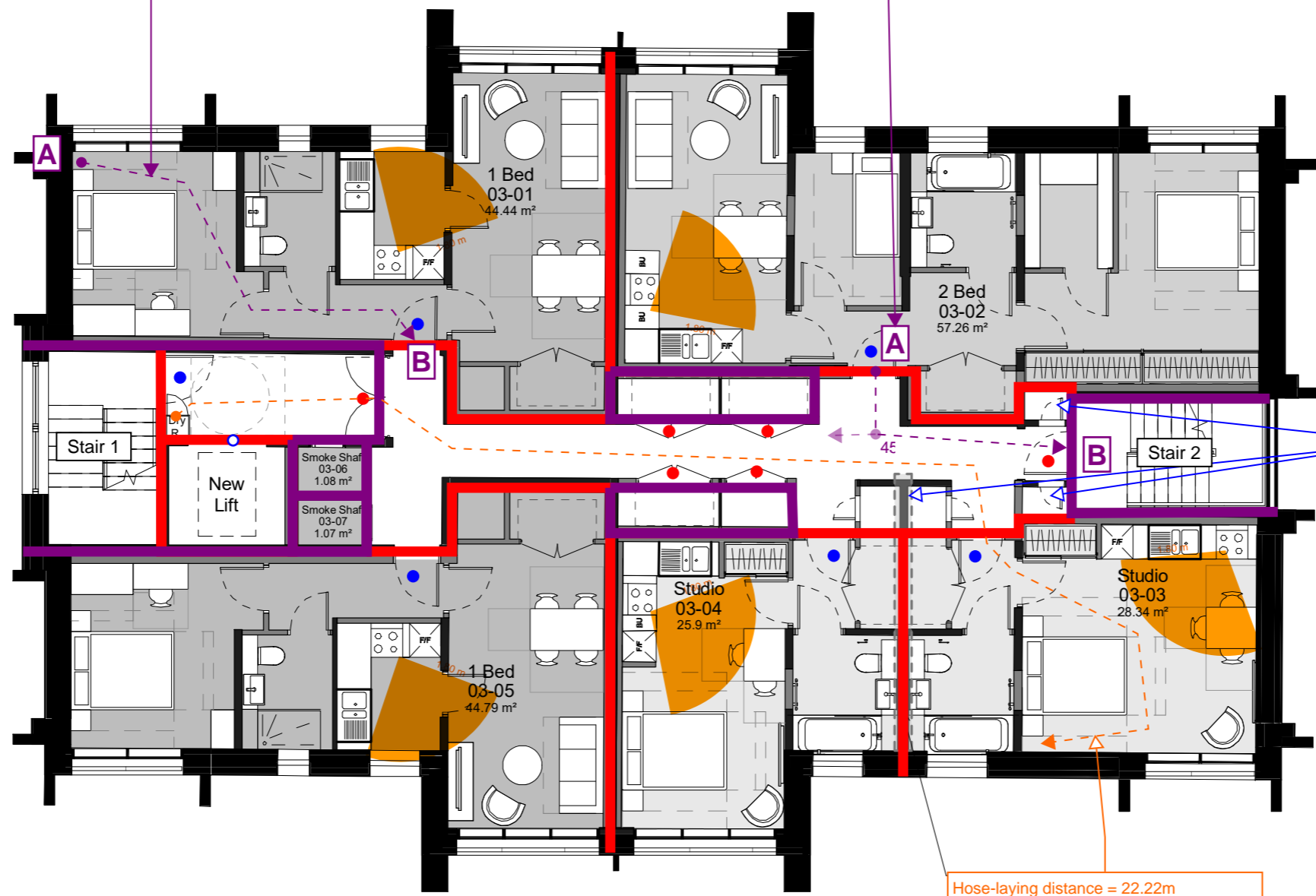
**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- Single travel distance
- Total travel distance
- Re-entrant corner
- Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
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  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)



Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.22m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 03  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

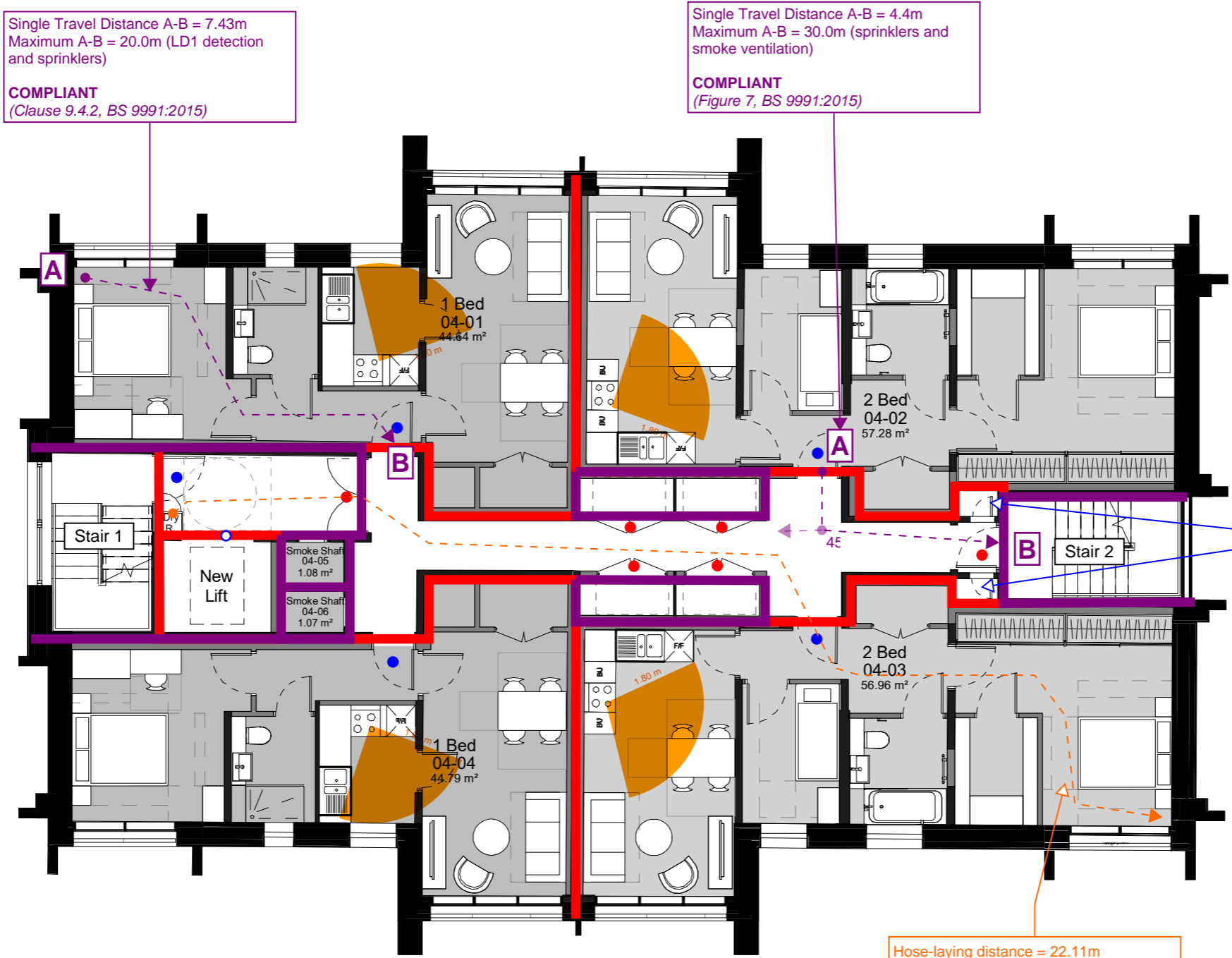
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AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-03-DR-FE-1001**      Revision: **02**

**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- ▤ 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
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  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reports to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
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  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.



Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)

Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.11m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 04  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

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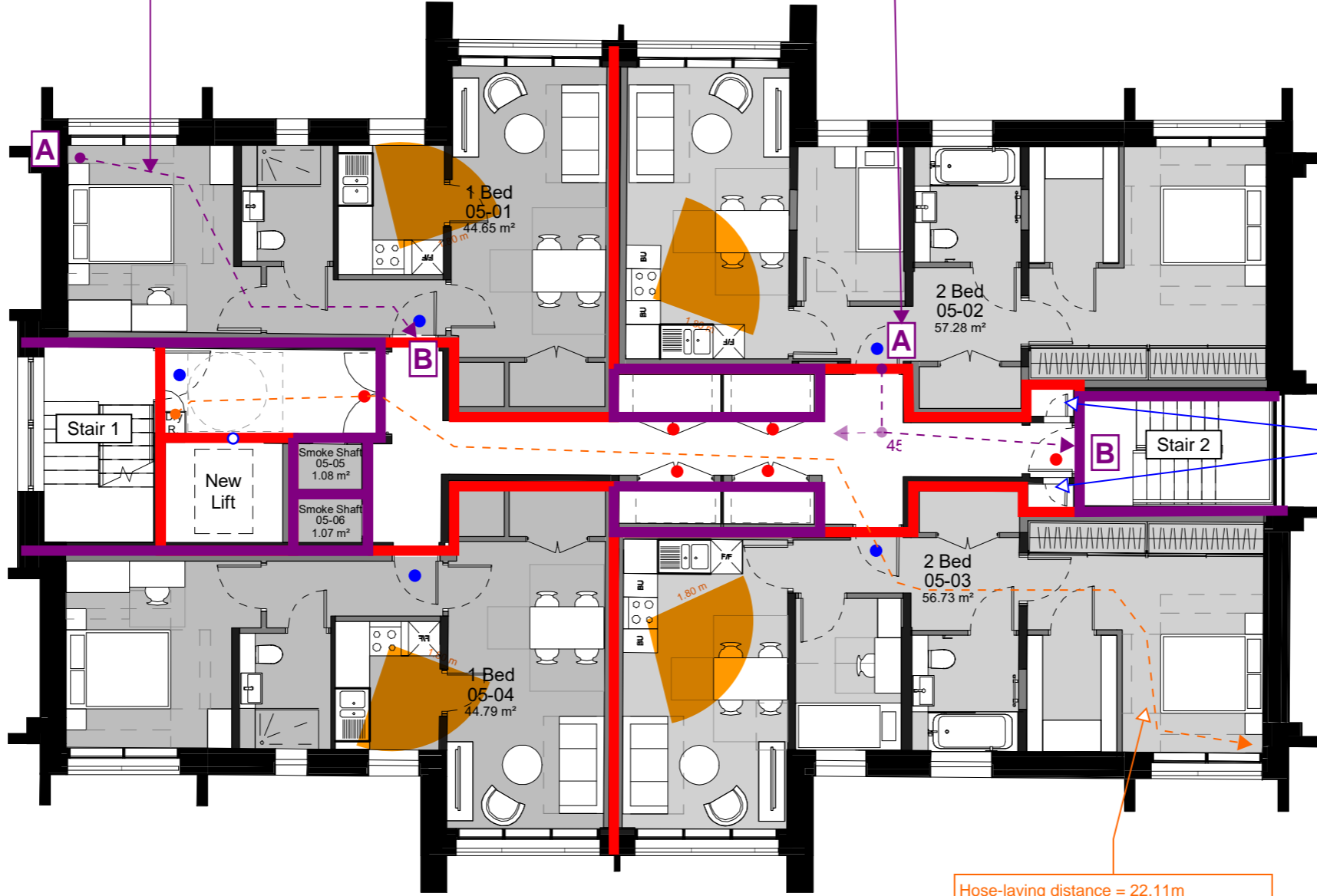
Drawing Number: **22176-HYD-XX-04-DR-FE-1001**      Revision: **02**

**Legend:**

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- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)



Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.11m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

- Notes:**
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  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 05  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

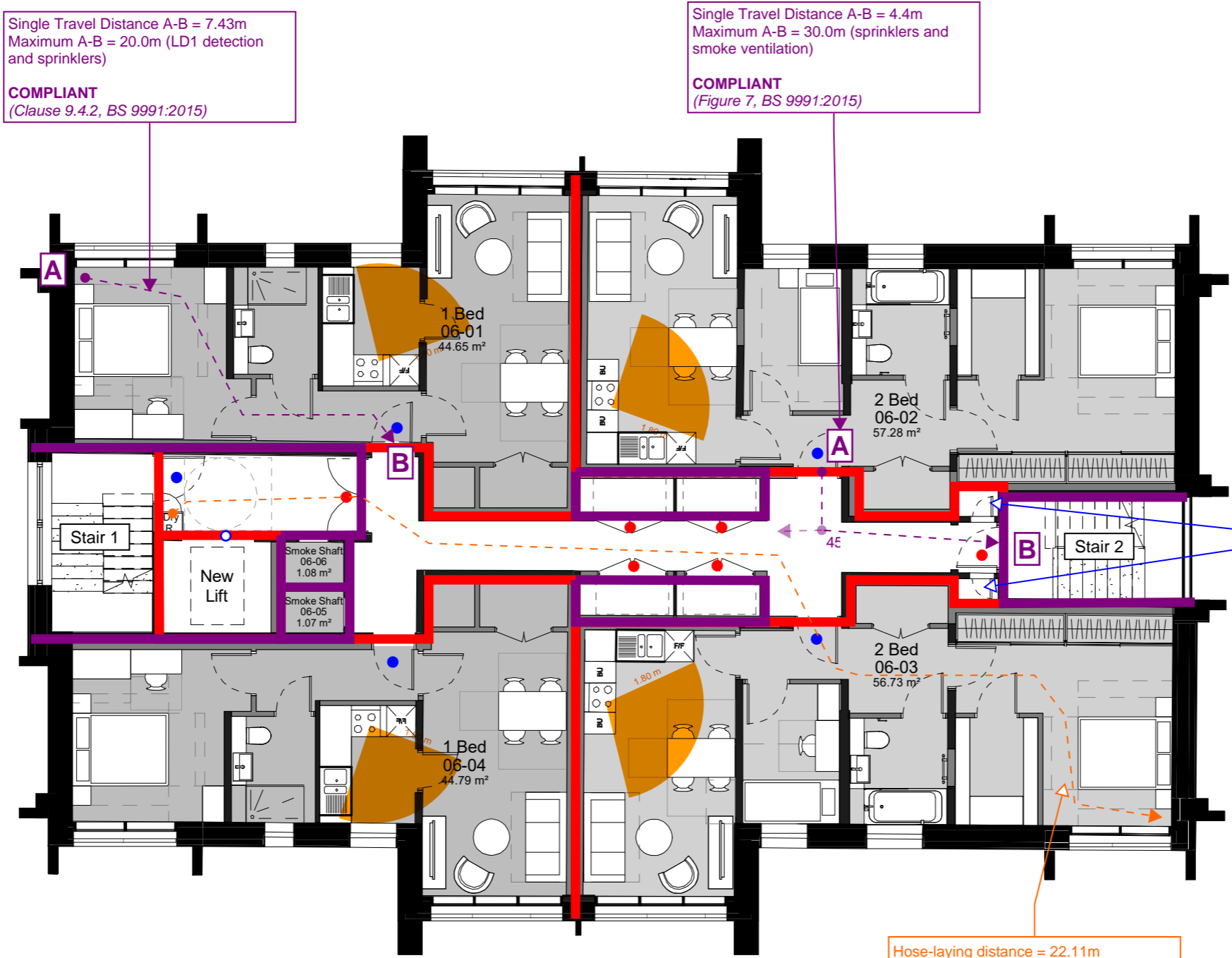
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AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-05-DR-FE-1001**      Revision: **02**

**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
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  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.



Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)

Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.11m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 06  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-06-DR-FE-1001**      Revision: **02**

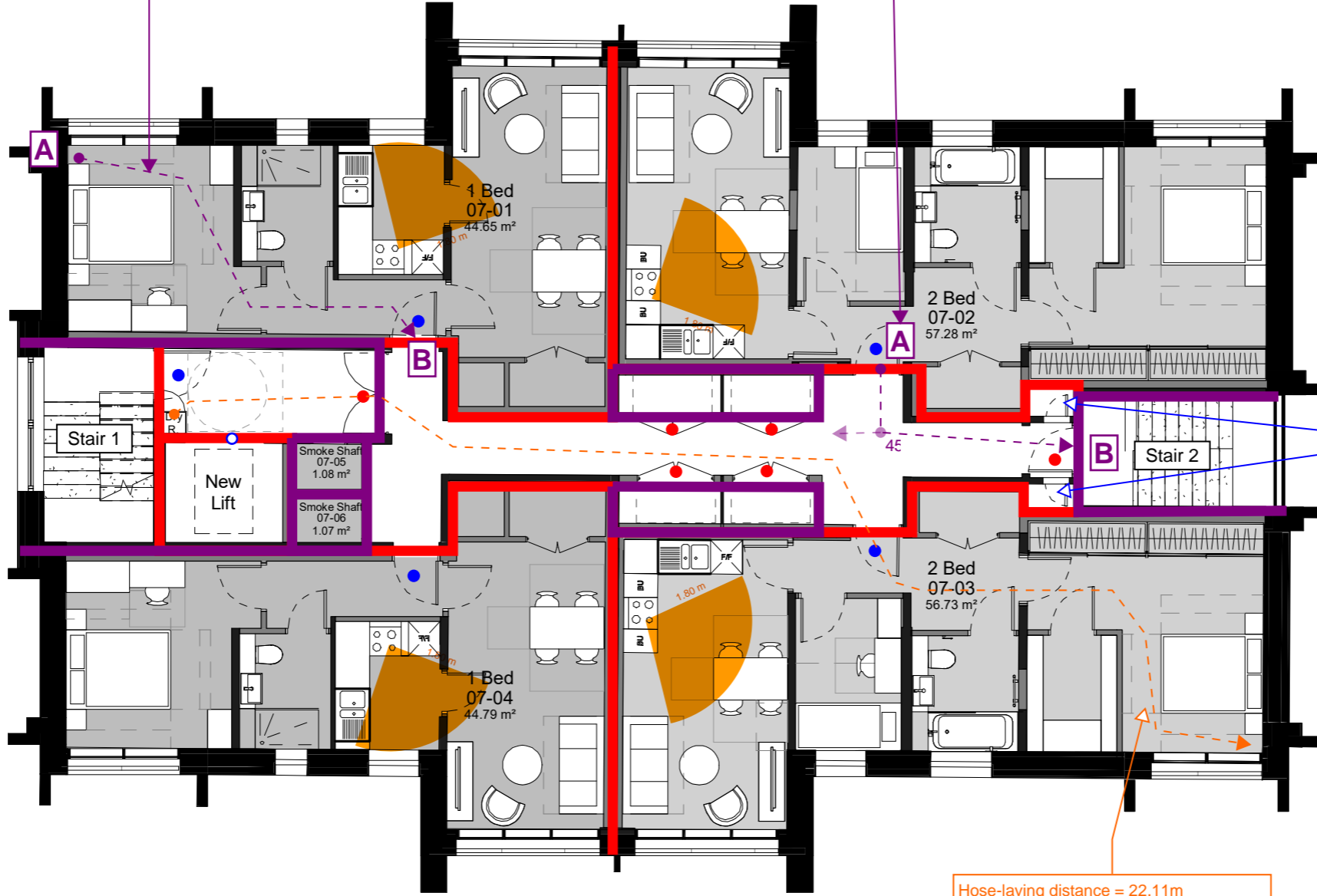
**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- ▤ 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
1. This drawing is the property of Hydrock.
  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)



Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.11m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 07  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-07-DR-FE-1001**      Revision: **02**

**Legend:**

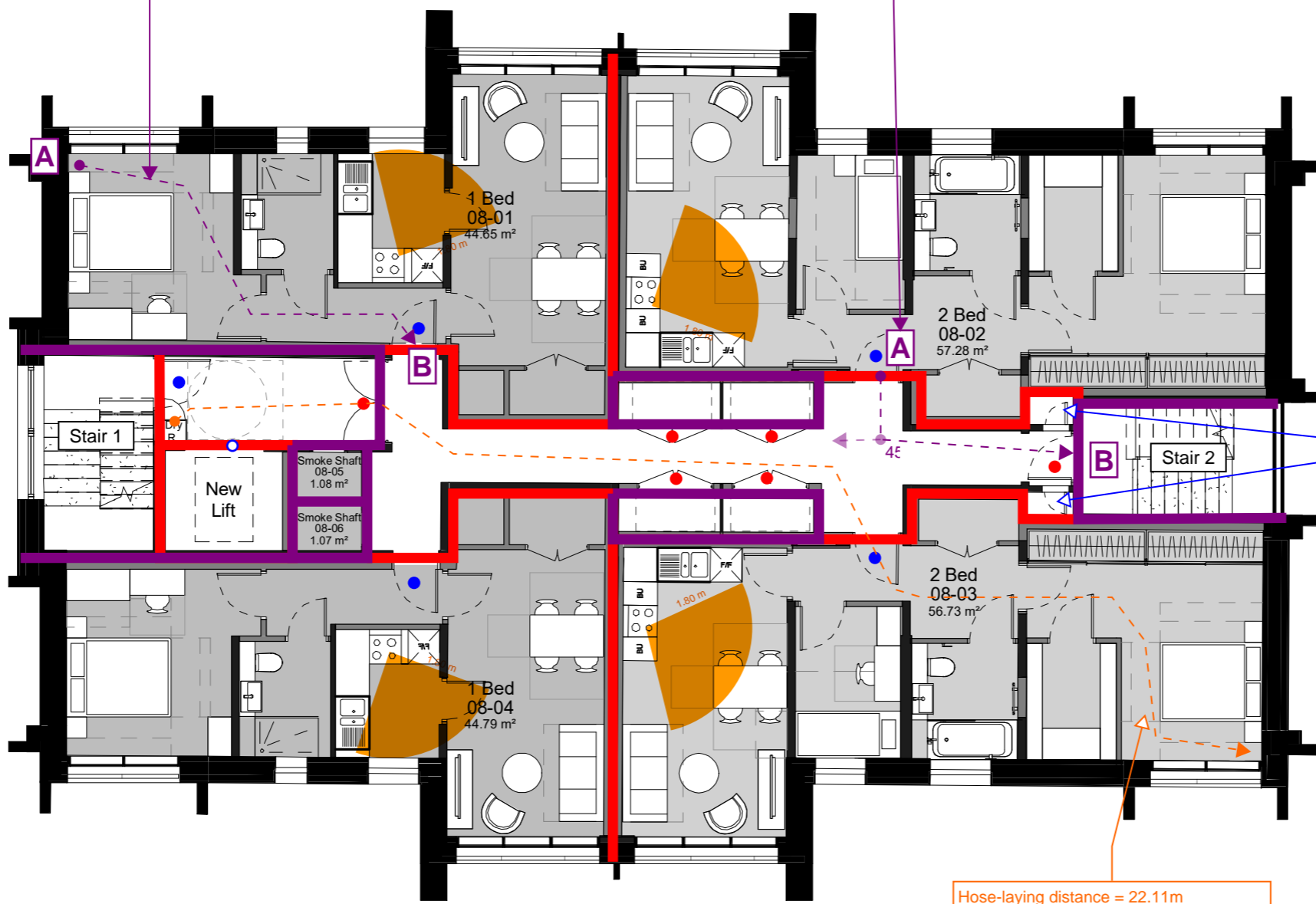
- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- ▤ 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
1. This drawing is the property of Hydrock.
  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)

Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.



Hose-laying distance = 22.11m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 08  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

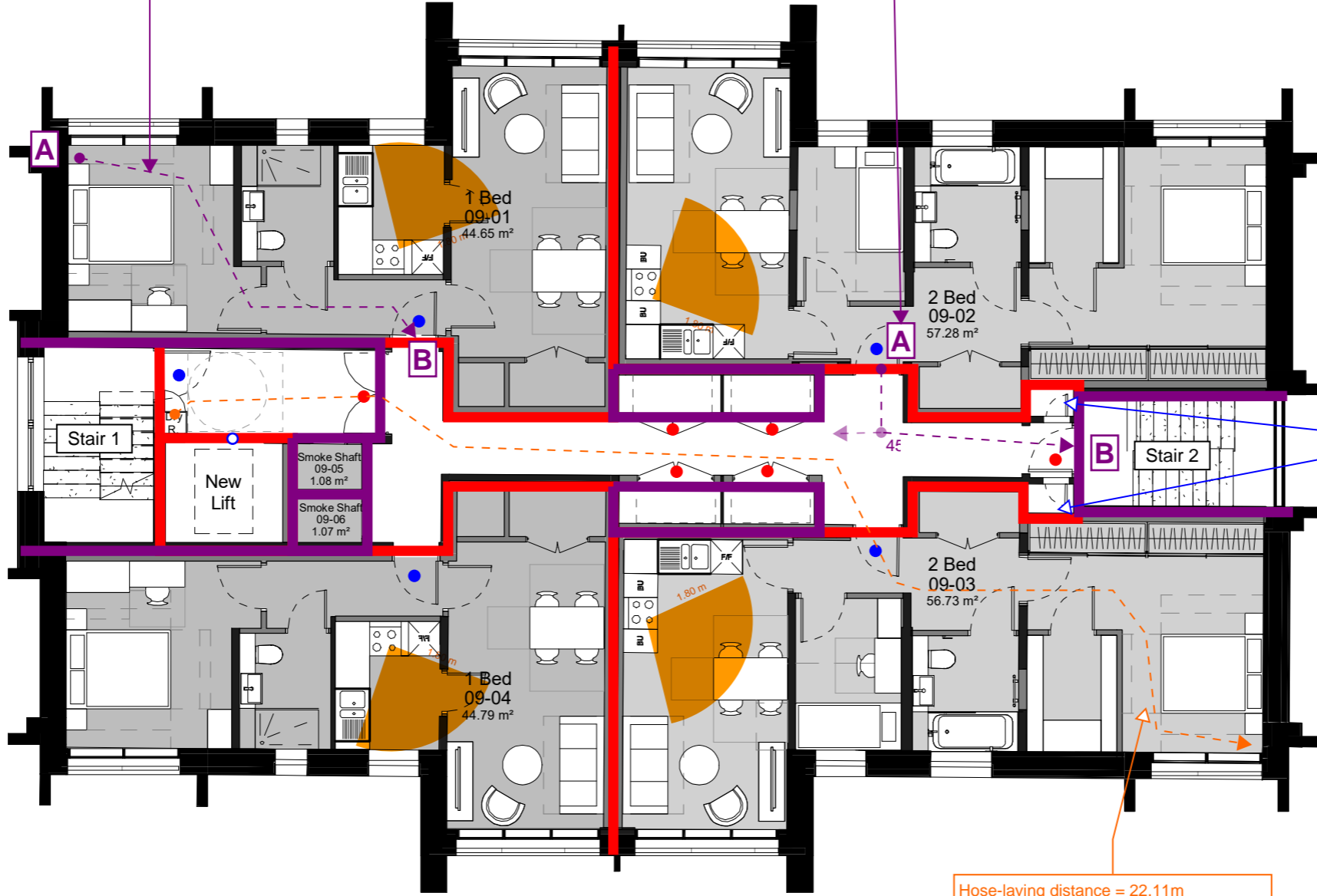
Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24
Drawing Number				Revision
22176-HYD-XX-08-DR-FE-1001				02

**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

Single Travel Distance A-B = 7.43m  
 Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
 (Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
 Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
 (Figure 7, BS 9991:2015)



Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.11m  
 Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
 (Clause 50.2.2, BS 9991:2015)

**Notes:**

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2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
**AHR Architects Ltd**



Client :  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 09  
 Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-09-DR-FE-1001**      Revision: **02**

**Legend:**

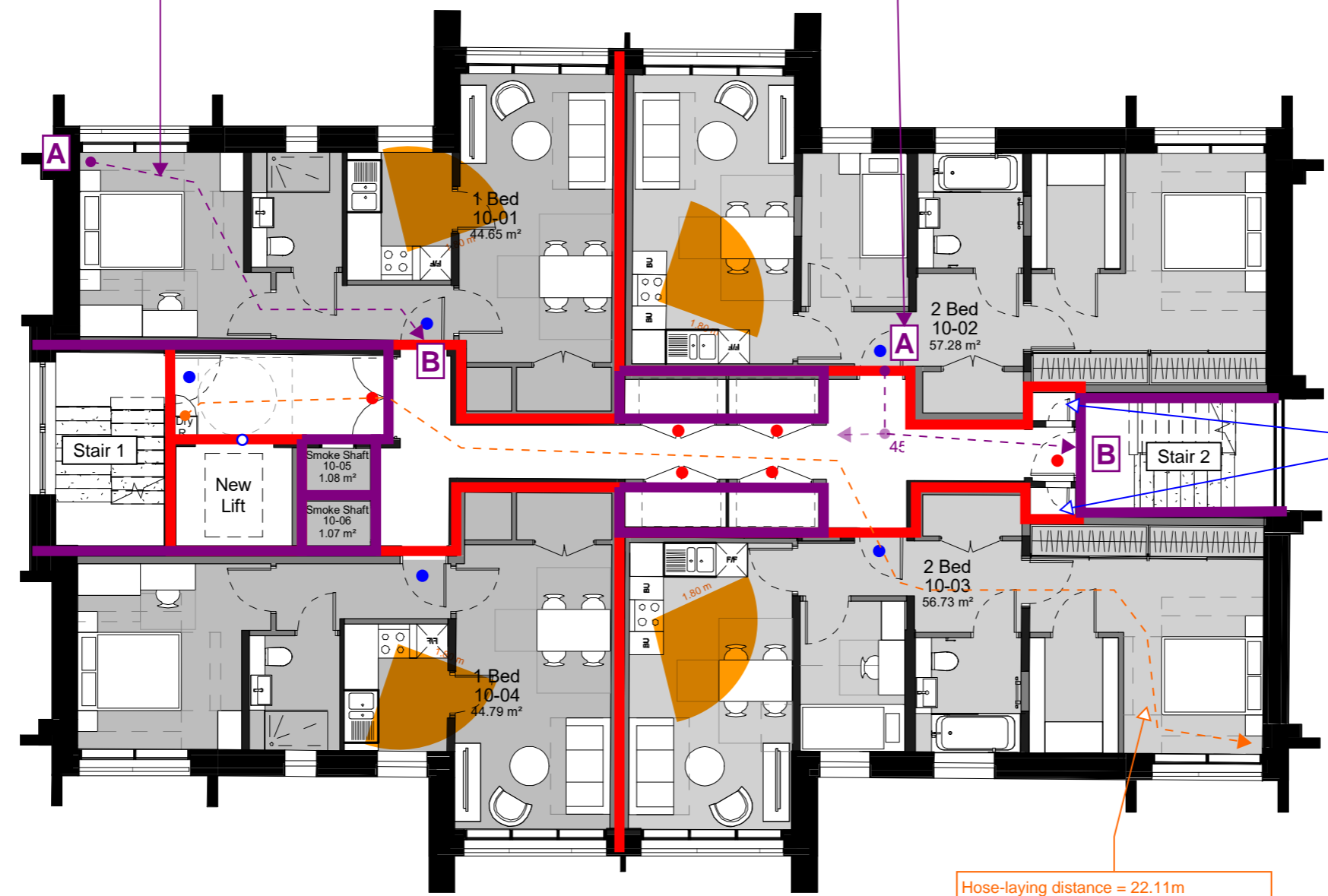
- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

- Notes:**
1. This drawing is the property of Hydrock.
  2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
  3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
  4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Single Travel Distance A-B = 7.43m  
Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
(Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
(Figure 7, BS 9991:2015)

Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.



Hose-laying distance = 22.11m  
Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
(Clause 50.2.2, BS 9991:2015)

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
**AHR Architects Ltd**

Hydrock Consultants Ltd  
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Wapping Road  
Stratford  
B51 4RW  
T: +44 (0)117 945 8225  
south@hydrock.com  
[www.hydrock.com](http://www.hydrock.com)

Client :  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 10  
Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number:  
**22176-HYD-XX-10-DR-FE-1001**

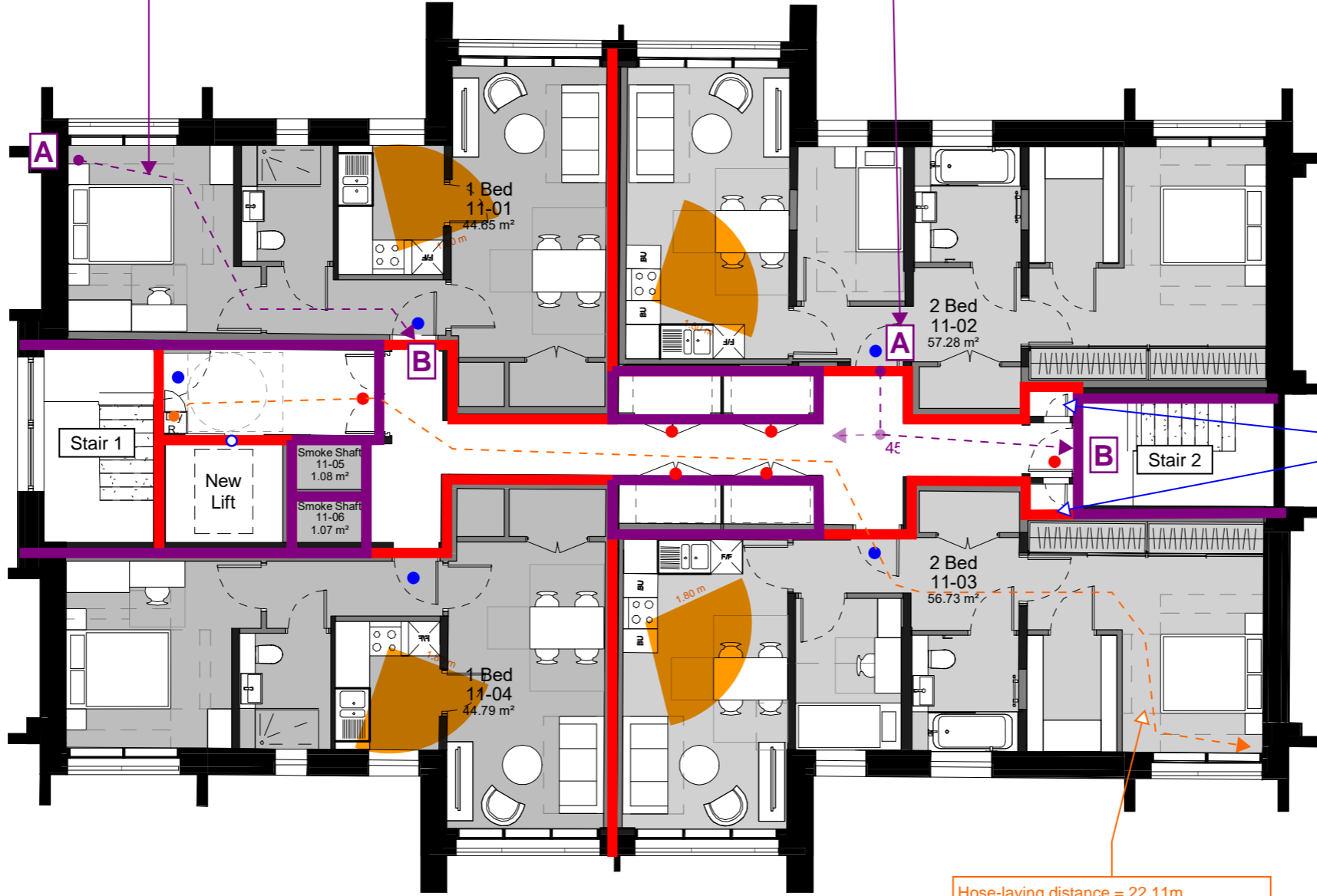
Revision:  
**02**

**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- 30 minute fire rated construction
- 60 minute fire rated construction
- 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- 120 minute fire rated drop-down fire curtain/shutter

Single Travel Distance A-B = 7.43m  
Maximum A-B = 20.0m (LD1 detection and sprinklers)  
**COMPLIANT**  
(Clause 9.4.2, BS 9991:2015)

Single Travel Distance A-B = 4.4m  
Maximum A-B = 30.0m (sprinklers and smoke ventilation)  
**COMPLIANT**  
(Figure 7, BS 9991:2015)



Clarification required as to the purpose/service of these areas. If these are riser shafts, they should be in accordance with Section 5 of the Fire Safety Strategy.

Hose-laying distance = 22.11m  
Maximum hose-laying distance = 60.0m (sprinklers provided)  
**COMPLIANT**  
(Clause 50.2.2, BS 9991:2015)

**Notes:**

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2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect:  
**AHR Architects Ltd**



Client:  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Level 11  
Fire Strategy Drawing**

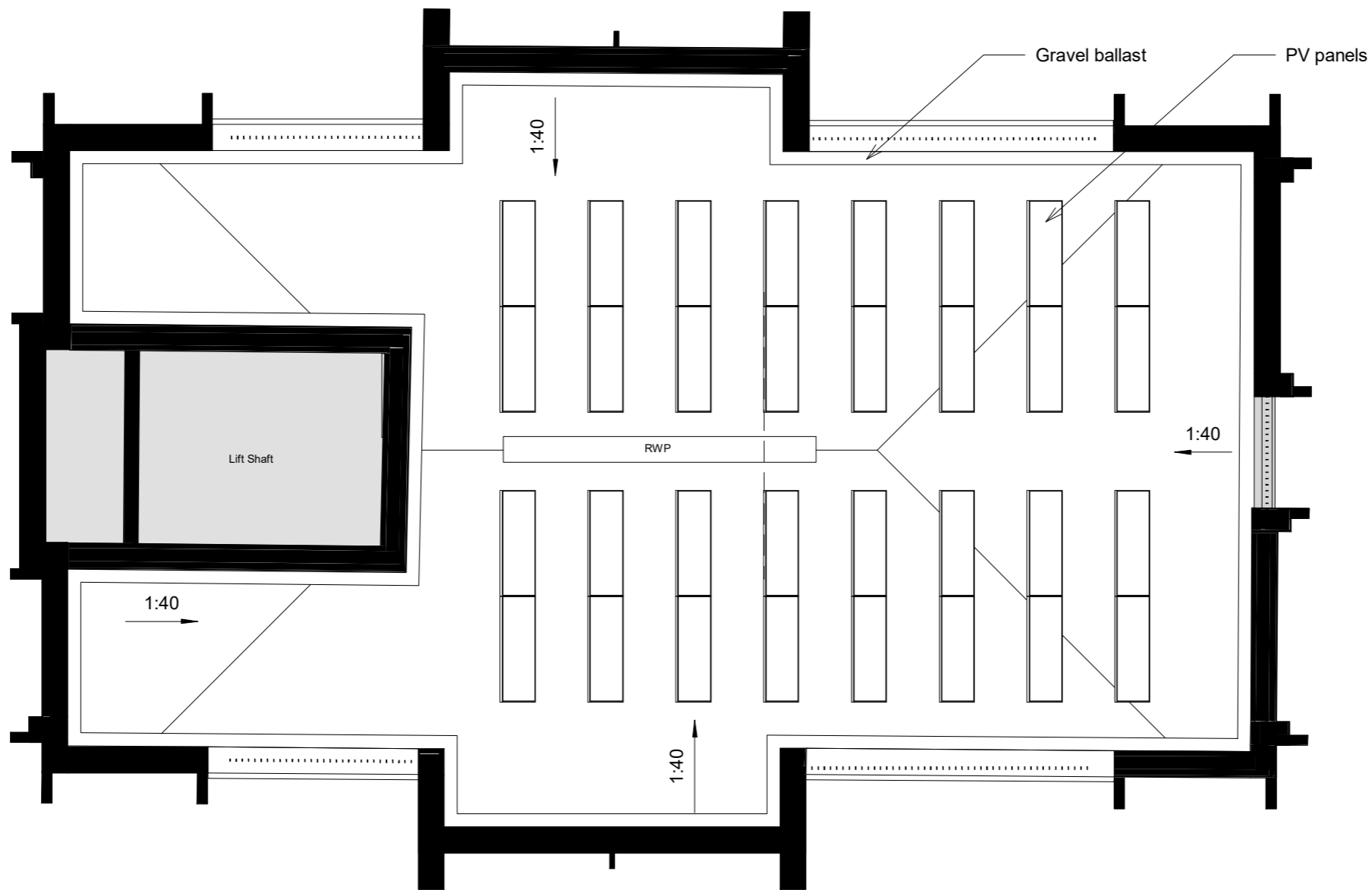
Drawing Status:  
**Stage 3**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24

Drawing Number: **22176-HYD-XX-11-DR-FE-1001**      Revision: **02**

**Legend:**

- FD30 fire door
- FD60 fire door
- FD30S fire door
- FD60S fire door
- ▬ 30 minute fire rated construction
- ▬ 60 minute fire rated construction
- ▬ 120 minute fire rated construction
- - - Single travel distance
- - - Total travel distance
- ⊙ Re-entrant corner
- - - Hose distance
- ▬ 120 minute fire rated drop-down fire curtain/shutter



**Notes:**

1. This drawing is the property of Hydrock.
2. All dimensions are to be checked on site before the commencement of works. Any discrepancies are to be reported to the Architect & Engineer for verification. Figured dimensions only are to be taken from this drawing.
3. This drawing is to be read in conjunction with the Fire Safety Strategy Report.
4. Fire Strategy Drawings will require agreement with the local approving authorities and insurers.

Rev	Date	Description	By	Ckd
02	12.01.24	Stage 3 update	AF	DA
01	17.10.23	Stage 3 Issue	AF	DA
00	05.07.23	Stage 2 Issue	AF	DA

Architect :  
**AHR Architects Ltd**

**Hydrock** Hydrock Consultants Ltd  
Merchant House  
Wapping Road  
Stratford  
B51 4RW  
T +44 (0)117 945 8225  
south@hydrock.com  
[www.hydrock.com](http://www.hydrock.com)

Client :  
**AHR Architects Ltd**

Project Title:  
**Buxton House**

Drawing Title:  
**Roof Level Fire Strategy Drawing**

Drawing Status:  
**Stage 3**

Hydrock Job No:  
**22176-FENG**

Drawn	Checked	Scale @ A3	Date	Issue Date
AF	DA	1:100	12.01.24	12.01.24
Drawing Number:				Revision:
<b>22176-HYD-XX-RE-DR-FE-1001</b>				<b>02</b>