



Withington Community Hospital: Community Diagnostics Centre RIBA Stage 3 Fire Strategy



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Quality Management

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1 INTRODUCTION

1.1 Appointment

OFR Consultants Ltd (OFR) have been appointed by Manchester University Hospital NHS Foundation Trust to develop a detailed fire strategy for the new building at Withington Community Hospital. The development will be a two-storey building comprising a Community Diagnostics Centre (CDC, use class E(e)), with associated external landscaping, patient and delivery drop off area and 6 no. accessible parking spaces.

The purpose of this fire strategy document is to inform the design by detailing the key fire safety provisions necessary within this new building to comply with the Building Regulations 2010 (as amended 2018) [1]. This detailed document can be used in consultations with Building Control, the Trust Fire Officer, and the Fire Service (Greater Manchester Fire and Rescue Service) during the approvals process to demonstrate the design intent. This fire strategy is subject to Building Control and Trust Fire Officer approval. As the project is constructed, this strategy is to be updated to form part of the building information as required in line with Regulation 38.

1.2 Applicable Legislation and Guidance

Building Regulations 2010 (as amended), Part B, Fire Safety applies to building design, whilst for fire safety provisions and management in occupied buildings, compliance with the Regulatory Reform (Fire Safety) Order 2005 (FSO) [2] is needed.

The strategy has been developed and laid out in a manner that is deemed most suitable to achieve its main purposes. In doing so, it is structured to align with the requirements of the Building Regulations, 2010 (as amended 2018), Part B namely:

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

The fire safety strategy primarily addresses life safety under the Building Regulations and has not been developed to address property protection. However, the features that are included for life safety, as required by the Building Regulations, will contribute in some extent to business and property protection. The Trust should advise if any additional measures are required specifically for property protection.

1.3 Basis of Design and Guidance

The fire safety design is based on the guidance given in the Health Technical Memoranda (HTM) suite of documents, and in particular HTM 05-02 Fire safety in the design of healthcare premises 2015 [3].

HTM 05-02 should allow the current statutory regulations to be applied sensibly within a framework of understanding and if applied correctly, will satisfy all the requirements of Part B of Schedule 1 of the Building Regulations.

It is acknowledged within the guidance that HTM 05-02 may not be appropriate for all types of building and that judgement should be exercised based on a full understanding of the problem taking into account such issues as:

- The type of care being provided;
- The mobility of the patients;
- The planned staffing levels;
- The age of the patients; and
- The size of the premises

In accordance with clause 2.21 and 2.22 of HTM 05-02, in most cases for areas containing independent patients or occupants who can escape from a fire unaided it will be sufficient to follow the recommendations in Approved Document B Volume 2 (2019 edition incorporating amendments to 2022) (ADB) [4]. HTM 05-02 is generally applied for the building rather than ADB, but in instances where HTM 05-02 does not provide sufficient guidance, recommendations from ADB have been applied in addition to the minimum recommendations of HTM 05-02. Specifically, the guidance in ADB is referenced when defining refuges in stairs for persons with reduced mobility.

This fire strategy is based on the first floor of the new CDC being only accessed by patients who are independent. The first floor of the building, therefore, may not be suitable for patients who are dependent – future changes to the building should take cognisance of this.

1.4 Reference Information

This document is based upon the following drawings provided by the project architects (DAY). Revised mark-ups are provided for the fire plans, FF&E plans and the site plan in Appendix A – Fire strategy markups on plans, FF&E and site plan.

Table 1: Reference Drawings

Drawing No.	Title	Revision	Date	Author
DAY-XX-00-DR-A-02-0101	Hospital Site Plan	P6	12.05.2023	DAY
DAY-XX-00-DR-A-67-0101	Proposed Ground Floor Fire Compartmentation Plan	P3	12.05.2023	DAY
DAY-XX-01-DR-A-67-0102	Proposed First Floor Fire Compartmentation Plan	P2	12.05.2023	DAY
DAY-XX-XX_DR-A-20-0110	Proposed North & East Elevations	P2	12.05.2023	DAY
DAY-XX-XX_DR-A-20-0111	Proposed South & West Elevations	P2	12.05.2023	DAY
DAY-XX-00-DR-A-70-0101	Proposed Ground Floor FF&E Loaded Plan	P2	12.05.2023	DAY
DAY-XX-01-DR-A-70-0102	Proposed First Floor FF&E Loaded Plan	P2	12.05.2023	DAY

1.5 Items requiring design development or approval

HTM 05-02 describes a way of achieving an acceptable standard of fire safety within new and modified healthcare buildings, but it also recognises that there may be other ways to satisfy the functional requirements of the Building Regulations by adopting a fire engineering approach. It is acknowledged that a fire safety engineering approach that considers the total fire safety package can provide an alternative approach to fire safety.

The following table highlights those areas of the design where development is still needed to confirm acceptability along with relevant actions on the design team, or where it is intended to provide alternative approaches from the guidance in HTM 05-02. These are alternative approaches in line with clauses 1.20 and 1.21 of HTM 05-02. Alternative approaches are subject to approval by Building Control and the Trust Fire Officer. Where an alternative approach is not recommended and instead an action is placed on the designer to amend the design, this is noted explicitly.

Table 2: Areas requiring design development, or proposed alternative approaches from HTM 05-02

Item	HTM relevant item	Comment or Proposed Solution	Section	Action on project team
1	HTM recommends atria have smoke clearance vents not less than 10% plan area.	As the building contains a double height space which can technically be defined as an atrium, smoke clearance would typically be recommended by HTM 05-03 Part M. The guidance recommends this should comprise a natural vent at roof level having an area not less than 10% of the plan floor area of the atrium i.e., a vent not less than 1.45m² in this instance. It is proposed that the fire strategy for this space does not include smoke clearance for the following reasons: • The space is a small circulation space (14.5m² plan area) with very limited fire load; • The space is only connected to the building at GF, is directly connected to the main entrance, and is fully enclosed in 60REI construction at 1F with no access.; and • The space is not located on a through route.	3.6	No action – item for approval.
2	HTM states that compartments should have three exits, one to either storey exit, final exit; and a further two to neighbouring (but different) compartments.	Based on the proposed fire plans, the building is split into three compartments at ground floor (CG1.1, CG1.2, CG2, CG3) with one patient-access compartment comprising two sub-compartments, and three compartments at first floor (C11.1, C11.2, C12, C13) with one patient-access compartment comprising two sub-compartments. At 1F, C13 is a plant room and has two exits. This is considered reasonable on the basis that the compartment is only one room therefore fire should be detected easily by anyone in the room, and otherwise can meet all relevant spatial recommendations (travel distance and escape widths) and should only be occupied by maintenance personnel as required, with no patient access provided. Compartment C12 has three possible exits but two of these enter into the same compartment (although different sub-compartments). While this does not fully meet the recommendations of HTM 05-02, it is considered reasonable on the basis that compartment C12 is an office area occupied by staff who should be independent and therefore the reliance on PHE is not pertinent and staff could easily evacuate to a final exit if required. In addition, considering the first floor is proposed to be occupied only by independent persons who will be awake, the provision of L1 automatic fire detection means that all occupants will be aware of fire at the earliest possible time. It is noted that L1 detection is expected in HTM, but this provision of automatic detection would exceed the minimum requirement for a comparable assembly and recreation building which presents a comparable risk to this building given patients are independent.	4.3	No action – item for approval.
3	External fire spread	The distance to the relevant boundary is greater than 12.5m on 3 out of 4 elevations, therefore these elevations may be 100% unprotected in accordance with HTM 05-02. For the elevation facing the existing hospital building, a notional boundary is taken at the halfway point between the two buildings c. 5.5m from the new CDC building. The recommended degree of protection is therefore 57%, meaning a 43% unprotected area is allowed. It is noted that this may increase if it is determined the existing building has insufficient external wall fire resistance e.g., if the boundary was previously taken at the site boundary. OFR should be provided with the existing building fire strategy to confirm.	6.2	Action on project team to provide OFR with existing building fire strategy.

Item	HTM relevant item	Comment or Proposed Solution	Section	Action on project team
4	Firefighting for existing building	The Fire Service access provisions for the existing building are not covered within this fire strategy. However, it is presumed that site access is already catered for on account of the existing building fire-fighting strategy. OFR should be provided with the existing building fire strategy to confirm fire-fighting needs for that building and to ensure clashes are avoided with the new building.	7	Action on project team to provide OFR with existing building fire strategy.

2 PROJECT DESCRIPTION

The proposed building will be a two-storey Community Diagnostics Centre (CDC, use class E(e)) adjacent to the existing Withington Hospital building (refer to Figure 1), with associated external landscaping, patient and delivery drop off area and 6 no. accessible parking spaces. The CDC will be an outpatient facility provided with two escape stairs and will contain the following:

- Reception and waiting areas;
- Consultation, preparation, examination and screening rooms;
- Recovery rooms (male and female);
- Procedure rooms;
- Offices and meeting rooms;
- Staff preparation areas (changing rooms, showers and clean rooms);
- Storage rooms; and
- Plant.

The new building will have a footprint of approximately 1,150 m². The proposed layouts are shown in Figure 2.

The patients in the CDC building are expected to be mostly independent, with a small number of dependent patients being present in treatment, procedure and recovery rooms. The fire strategy is based on there being only independent patients at first floor, and no patients of very high dependency anywhere in the building.

The CDC building is expected to be closed at night and no patients are expected to stay overnight, therefore the building purpose group as per ADB is designated as Purpose Group 5 Assembly and Recreation.

2.1 Patient Numbers per Compartment

Expected patient numbers have not been provided for the CDC building to date. However, the FF&E drawings indicate seating arrangements which have allowed for approximate calculations of occupant numbers at each floor (see Table 3). Compartment designations are clarified in section 4.3 of this report.

In terms of estimated patient numbers per compartment, the building meets the HTM 05-02 recommendations for buildings up to 12m with floor area greater than 1,000m² (see section 4.3 of this report).

Table 3: Compartment patient numbers

Compartment designation	Number of seats/beds	Of which are patients
CG1.1	21	17
CG1.2	26	21
CG2.1	33	26
CG2.2	4	3
CG3	8	0
C11.1	27	19
C11.2	23	20
C12	33	0
C13	0	0



Figure 1: Site plan



Figure 2: Proposed new building GF (left) and 1F (right)

3 FIRE SAFETY SYSTEMS

3.1 Fire Detection and Alarm System

A fully addressable analogue type L1 category system meeting the recommendations of HTM 05-03 Part B [5], BS 5839-1 [6] and the relevant parts of BS EN 54 is expected to be provided throughout the area in the scope of the refurbishment to facilitate the Progressive Horizontal Evacuation (PHE) strategy. Fire alarm panels should be provided at locations accessible by the fire service. Additionally, repeater panels will be distributed across the floor plates at suitable locations (potentially at staff bases) to comply with BS 5839-1. This will be detailed as the design progresses.

The means of warning should be discussed with hospital personnel, a conventional alarm system may not be appropriate depending on the patient characteristics. Standard practice is for a continuous alarm within the compartment or sub-compartment of fire origin, with an intermittent alarm in the adjacent compartments. A detailed cause and effect matrix will be developed by the M&E designer to ensure that all necessary elements are coordinated, such as dampers, lifts, door hold opens, break glass units, detection systems etc.

Break-glass call points should be provided where there is not a high risk of malicious activation by patients. Options for call point types are to be considered with regard to security and risk of inappropriate usage.

3.1.1 Atrium

Automatic detection should be provided in the atrium. Fire detection and alarm in the atrium should be configured as part of the ground floor fire detection.

3.2 Hold Open Devices

Where fire doors in the closed position are considered a hindrance to the day-to-day operations of the building, hold open devices should be installed such that upon activation of the detection system they will release and close in accordance with BS 7273-4 [7] and BS 5839-3 [8]. HTM 05-02 recommends that these are not installed on staircase doors.

The door hold open devices, if provided, should:

- Conform to BS 5839-3 and BS 7273-4 and be fail-safe (that is, in the event of a fault or loss of power, the release mechanism should be triggered automatically);
- Linked to the fire detection and alarm system;
- Be checked regularly to ensure they close correctly on activation of the fire alarm
- Be provided with a ready means of manual operation from a position at the door; and
- Be closed at a predetermined time each night and remain closed throughout quiet hours. If for reasons of management this is impracticable, it should be the specific responsibility of the fire warden (or other nominated member of staff) to operate the release mechanism at least once a week to ensure that:
 - o the mechanism is working effectively
 - o the doors close effectively onto their frames.

3.3 Emergency Lighting

Emergency lighting will be provided in accordance with the recommendations of BS 5266: Parts 1-7 [9] and HTM 06-01 'Electrical services: supply and distribution' [10] and the CIBSE guide – 'Lighting guide LG2: hospitals and healthcare buildings'.

Emergency lighting will illuminate all occupied areas, common evacuation routes (internal and external as necessary) and essential areas including plant areas. It will also illuminate a safe exit route including fire exits, fire alarm call points, changes in level or direction, external assembly points and firefighting equipment.

3.4 Emergency Exit Signage

All escape routes are to be distinctively and conspicuously marked by emergency exit signs following the recommendations of BS ISO 3864-1 [11] and BS 5499-4 [12]. Escape route signage should be provided to include directions outside the building to the nominated assembly point.

3.5 Emergency Voice Communication

Refuges should be provided with emergency voice communication points in accordance with BS 5839-9 [13]. See section 4.8 of this report for refuge locations.

3.6 Smoke clearance ventilation

As the building contains a double height space which can technically be defined as an atrium, smoke clearance would typically be recommended by HTM 05-03 Part M. The guidance recommends this should comprise a natural vent at roof level having area not less than 10% of the plan floor area of the atrium i.e., a vent not less than 1.45m². It is proposed that the fire strategy for this space does not include smoke clearance for the following reasons:

- The space is a small circulation space with very limited fire load (14.5m² plan area);
- The space is only connected to the building at GF, is directly connected to the main entrance, and is fully enclosed in 60REI construction at 1F with no access; and
- The space is not located on a through route.

3.7 Stair ventilation

Each stair should be provided with a 1.0m² free area Opening Vent (OV) at high level on the top storey.

3.8 Emergency Power

Emergency power will be provided to all essential life safety equipment as part of the full hospital back up system. Emergency power should be provided to the following systems:

- Fire detection and alarm system;
- Emergency lighting system; and
- Emergency Voice Communication Systems.

4 MEANS OF WARNING AND ESCAPE

4.1 Means of Warning

The fire safety guidance in HTM states that evacuation of an entire healthcare building may not be practical and would likely pose a risk to patients due to trauma or their medical condition, there are three fire conditions identified which could lead to evacuation. These are shown in Figure 3.

This strategy assumes that staffing levels will be maintained in accordance with HTM to ensure that the emergency plan can be implemented at any time. The required staffing levels should be included in a fire safety management strategy to be produced by the building operators.

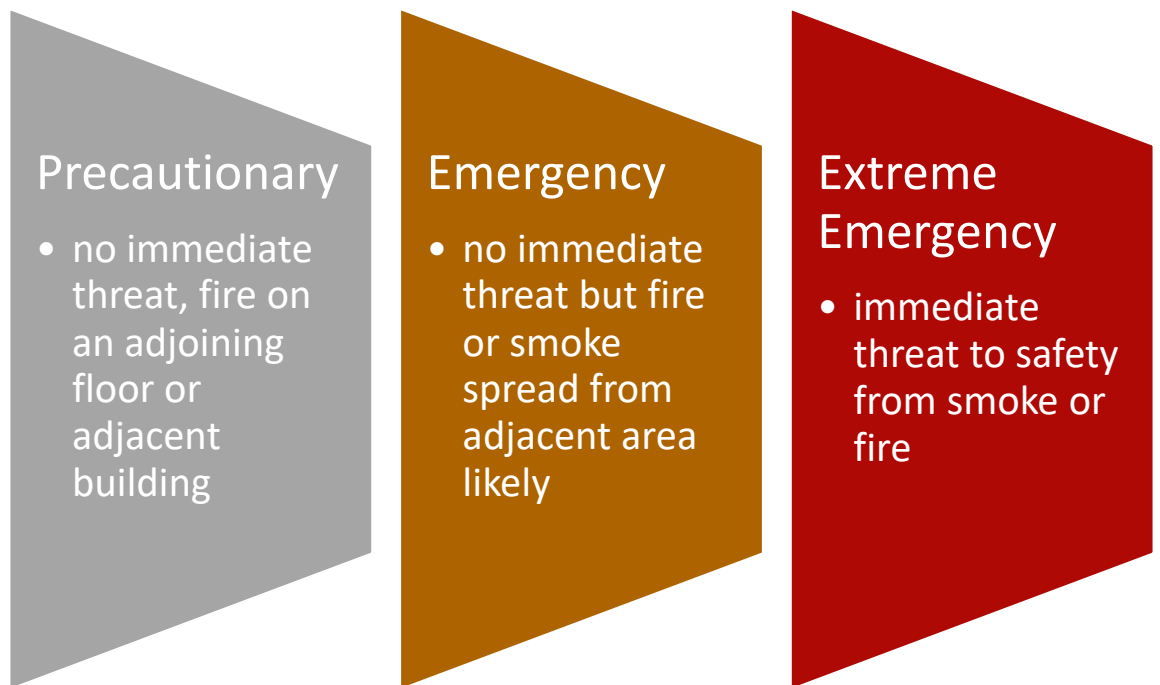


Figure 3: Fire conditions

In buildings where the occupants are unable to evacuate without assistance, a PHE strategy is used. The principle of PHE is to move occupants from any area affected by fire to an adjacent area on the same level separated by a fire and smoke resisting barrier designed to protect occupants from fire and smoke. Occupants may remain in the adjacent compartment until the fire is dealt with or await further assistance for onward evacuation if required. Each level will be divided into fire compartments.

This procedure is heavily reliant on ensuring there is sufficient numbers of trained staff available to assist in moving the occupants as discussed earlier. The RR(FS)O requires the responsible person to produce an evacuation procedure, have sufficient staff to implement it and ensure that members of staff are adequately trained. The PHE stages are shown in Figure 4.

In the event of an extreme emergency the sequence of evacuation is expected to be as shown in Figure 5. As there are expected to be a high proportion of independent patients compared to dependent patients in the building, these individuals may choose to evacuate the building entirely, and so the ultimate reliance on PHE should be limited to assisting dependent patients.

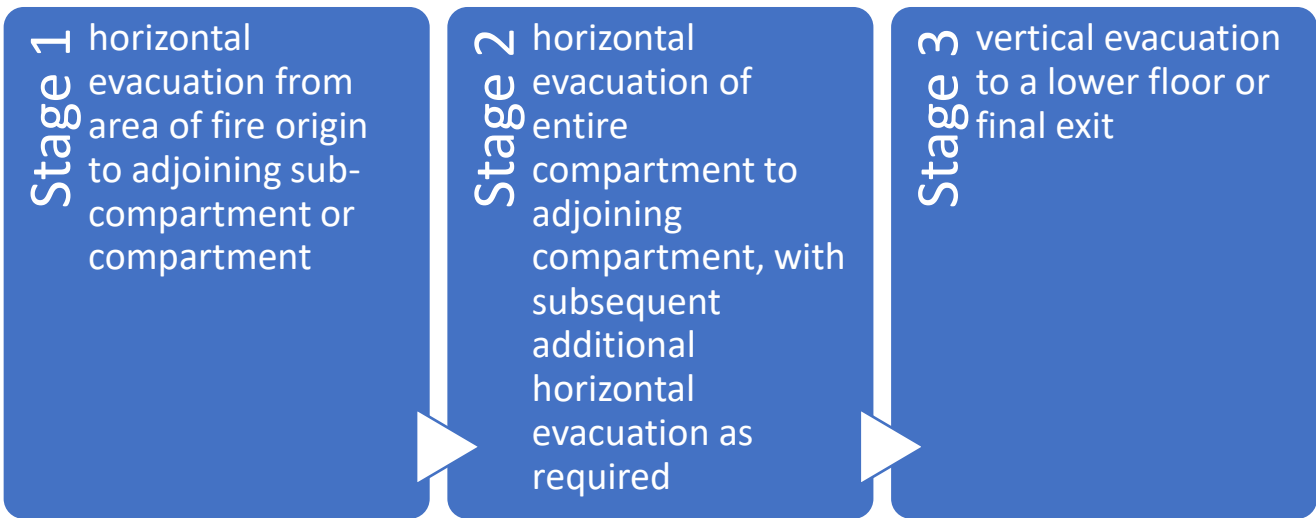


Figure 4: Stages of Progressive Horizontal Evacuation

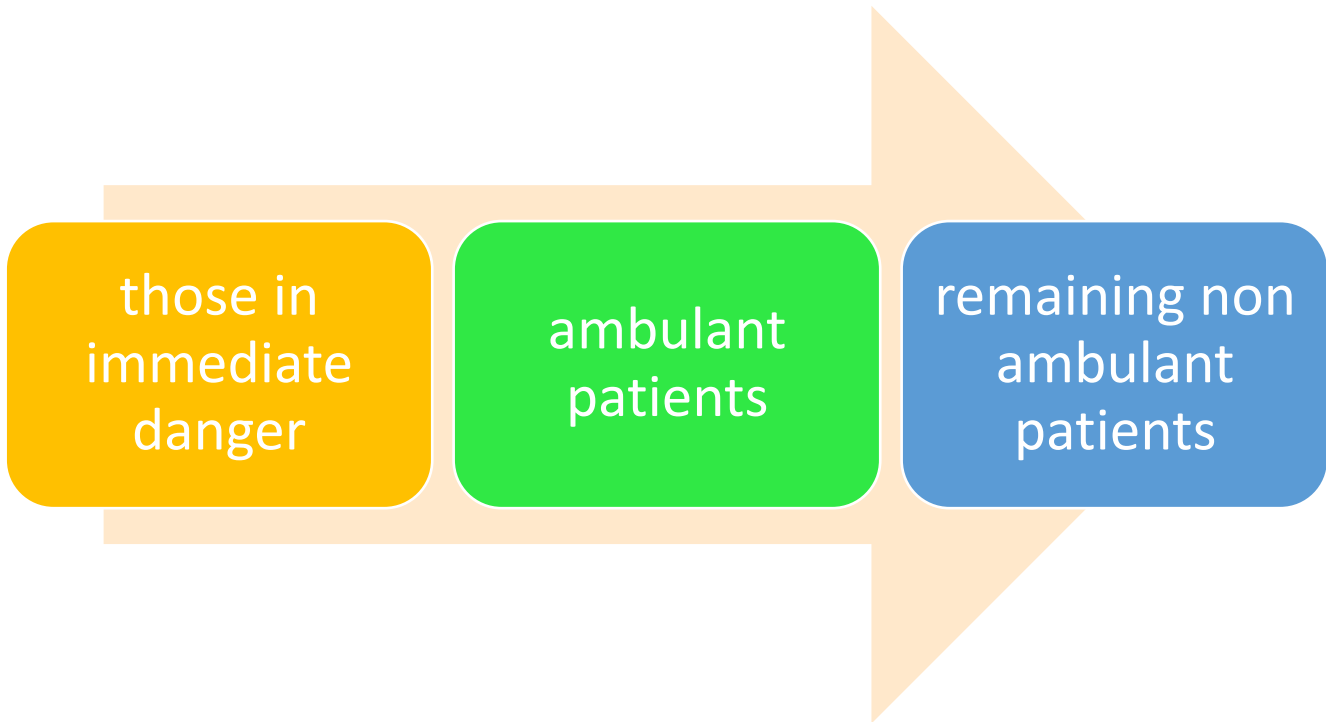


Figure 5: Evacuation sequence

4.2 Adjacencies

To minimise the potential for a fire in non-patient-access areas affecting the patient-access areas, patient-access areas should always be in different compartments from non-patient-access areas.

The patients accessing the CDC building are expected to be predominantly outpatients who are independent and therefore less likely to require assistance in an evacuation. However, outpatients undergoing minor procedures who then use recovery rooms are considered likely to have some dependency on staff. There are no areas in the building expected to contain very high dependency patients. Compartmentation is planned to support the patient access strategy as shown in Figure 6.

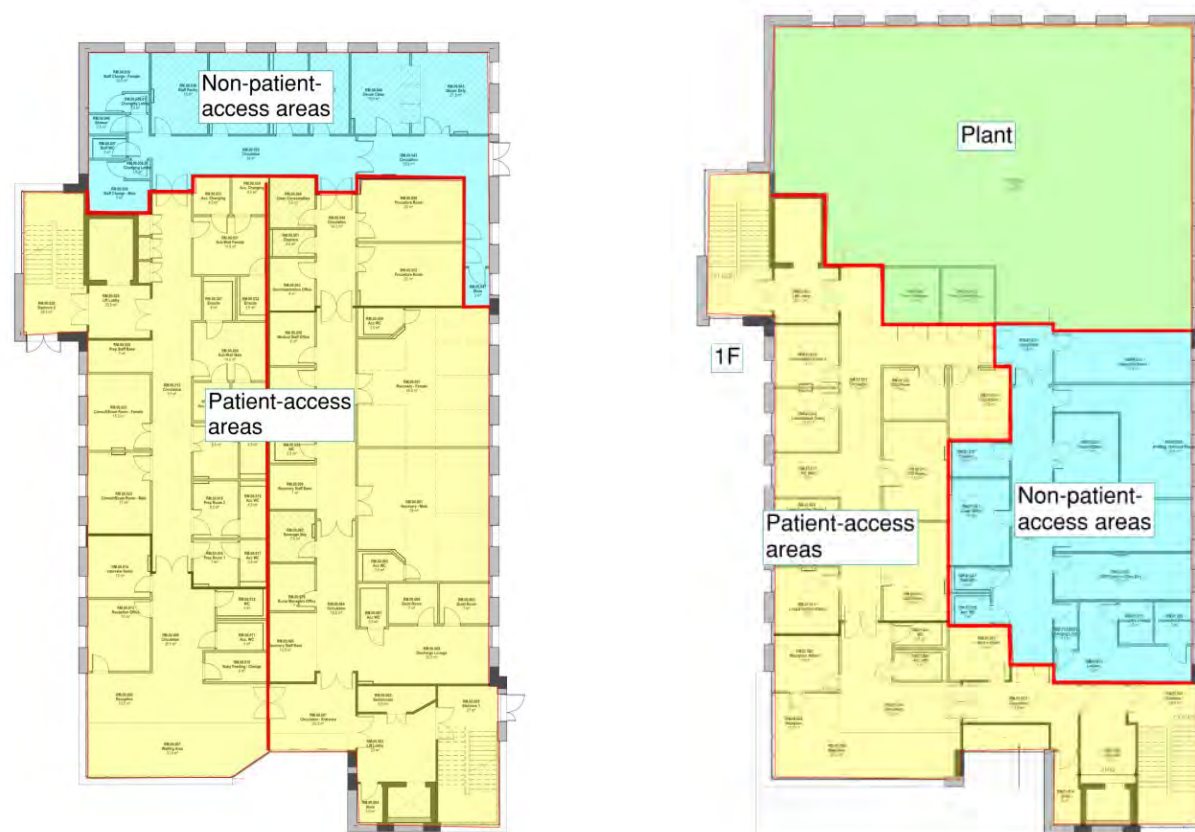


Figure 6: Patient access separation GF (left) and 1F (right)

4.3 Horizontal Means of Escape

To implement a PHE strategy the building is divided into fire compartments and sub-compartments, each compartment should be capable of accommodating the designed occupancy of the most highly occupied adjoining compartment as well as its own normal occupancy including space for medical equipment for continuity of care and space for beds.

The building footprint is 1150m². Levels up to 12 m above ground level greater than 1000 m² in area and containing patient access should be divided into compartments such that:

- At least three compartments should be provided per floor;
- Occupants have at least three exits that provide horizontal escape to adjoining but separate compartments or to a stair or final exit;
- There are no more than 30 patients per sub-compartment; and
- Compartments should be divided into sub-compartments (where there is patient access) if:
 - o They contain departments to which more than 30 patients will have access at the same time,
 - o They contain sleeping accommodation for more than 30 patients (not relevant as no sleeping accommodation provided in CDC building).

Based on the proposed fire plans, the building is split into three compartments at ground floor with one patient-access compartment comprising two sub-compartments, and three compartments at first floor with one patient-access compartment comprising two sub-compartments. It is to be confirmed with the Trust how many occupants per compartment are considered to be patients.

4.3.1 Exits from Compartments and Sub-Compartments

Each compartment should be provided with three exits by way of a circulation space to two adjoining compartments as well as one exit providing access to a stairway (again by way of circulation space), or a final exit.

The compartment exits in each storey of the building are as shown on Figure 7 as well as the compartment designations (CG1.1, CG1.2, CG2.1 CG2.2, CG3, C11.1, C11.2, C12 and C13). The arrows indicate the exits which should be used when evacuating i.e., patients and staff should not wait in a circulation space and should continue to the adjacent compartment or storey/final exit. When in staff areas, patients will need to wait in circulation spaces within the compartment.

At GF, each compartment is proposed to have three exits as described above. The four sub-compartments each have at least two exits as needed. All exits have level access internally and externally.

At 1F, C13 is a plant room and has two exits. This is considered reasonable on the basis that the compartment is only one room therefore fire should be detected easily by anyone in the room, and otherwise can meet all relevant spatial recommendations (travel distance and escape widths) and should only be occupied by maintenance personnel as required.

Compartment C12 has three possible exits but two of these enter into the same compartment (different sub-compartments). While this does not fully meet the recommendations of HTM 05-02, it is considered reasonable on the basis that compartment C12 is an office area occupied by staff who should be independent and therefore the reliance on PHE is not pertinent and staff could easily evacuate to a final exit if required. In addition, considering the first floor is proposed to be occupied only by independent persons who will be awake, the provision of L1 automatic fire detection means that all occupants will be aware of fire at the earliest possible time.

It is noted that L1 detection is expected in HTM, but this provision of automatic detection would exceed the minimum requirement for a comparable assembly and recreation building which presents a comparable risk to this building given patients are independent.

C11 is proposed to have three exits as described above. The two sub-compartments each have at least two exits as needed.



Figure 7: Compartment exits and compartment designs

4.3.2 Direction of Escape

HTM recommends that all fire doors across escape routes should open in the direction of escape, where these doors provide escape routes in both directions, the door must swing in both directions. It is recommended that doors noted as exits in two directions in Figure 7 should be configured to swing in both directions. Doors to the plant room may open as shown currently given this is not a patient access area and has a low occupancy.

4.3.3 Travel Distances

Travel distances to adjacent compartments, sub-compartments, and final exits should be limited in accordance with HTM, noted in Table 4. All areas of the CDC building align with this guidance.

Table 4: Travel distance limits

	Travel in one direction	Travel in more than one direction
Within a sub-compartment to an adjoining compartment, sub-compartment or stairway/ final exit	18m (outpatient)	30m
Within a compartment to each adjoining compartment or stairway/ final exit	18m	60m
Within plant room	12m*	25m

*12m until travel in more than one direction is possible i.e. two routes which are at an angle of at least 45 degrees from each other. If the plant room is low risk such as air handling units, the limits become 25m and 35m.

4.3.4 Dimensions of Escape Routes

It is understood that while beds are provided in recovery rooms, these are not expected to be moved around the building regularly and primarily the traffic within corridors will comprise ambulant persons and non-ambulant persons with mobility aids (wheelchair or crutches). As such the recommended dimensions of corridors should be as noted in HBN 00-04 [14]:

- 2150 mm minimum clear corridor width;
- Doors should be configured to not encroach on escape widths by either opening inwards or being recessed from escape routes;
- For bed access along corridors, a minimum clear width for doors of 1740mm is recommended with both door leaves open as per Figure 15 in HBN 00-04 – this is recommended at ground floor only;
- For bed access off corridors (90 degrees), a minimum clear width for doors of 1550mm is recommended as per Figure 16 in HBN 00-04 (and Figure 1 in HTM 05-02 – this is recommended at ground floor only; and
- Consideration should be given for turning circles along routes where beds are likely to be moved if this is to form part of the evacuation strategy.

Where no bed movement is required (i.e. at first floor), the minimum clear width of escape routes should be 1200mm (where the occupancy is not greater than 200 people).

4.3.5 Horizontal exit capacity

In general, the escape widths provided in support of bed movements will provide more than adequate capacity for the number of occupants predicted, even when considering that the estimations above are likely to be under the total occupancy (including staff).

4.4 Vertical Escape

4.4.1 Staircases

There are two staircases in the building in accordance with the recommendations of HTM 05-02. Each stair is separated from neighbouring occupied areas by a protected lobby and a refuge is proposed for each. Stair dimensions are shown in Figure 8.

Each stair has clear width 1500mm with landing depth c. 1520mm and landing width c. 3250mm. As such, the stairs may not be suitable for assisted patient evacuation as HTM recommends having landing depth 1550mm. Assisted evacuation is not required for 1F under the present design.

4.4.2 Stair Lobbies

HTM 05-02 states that staircases and lifts (not accessed from hospital streets) should be provided with protected lobbies. Lobbies are provided to both stairs at each floor as a means of separating stairs from neighbouring accommodation.

Further to the above, protected lobbies should not be located so that they form a through route where the corridor continues beyond the lobby. The constant use of the doors can damage them more easily.

Both stair lobbies are configured such that they are not located on a through route but it is recommended that the door accessing the south stair lobby from the reception is provided with hold open devices in accordance with section 3.2 of this report to reduce damage to the lobby door from regular use by staff accessing the store.

4.5 Dead end corridors

It is good practice for dead end corridors to be avoided wherever possible. HTM 05-02 recommends that any part of an enclosed escape route which has single direction of escape only and exceeds 4.5m should be a protected corridor. Travel distances for single direction of escape should also be maintained. Currently there are no dead-end corridors in the design.

4.6 Final Exits

Final exits should not be provided with a step and should open to a level area for a distance of at least 1m.

4.7 External Escape Routes

In the event it becomes necessary to evacuate patients to outside, adequate routes and assembly points are required.

4.8 Persons with Reduced Mobility (PRMs)

As an outpatient department it is expected that some occupants may have mobility issues, all escape routes should be designed to accommodate wheelchair users. Refuges should be provided in stairs as shown in Figure 8. The refuge points should have a clear space of at least 1400mm x 900mm which does not impact the flow of escaping occupants and should be provided with an emergency voice communication system in accordance with BS 5839-9 [15]. The communication response for this should align with Trust procedures.

Mobility impaired members of staff using this building should have a Personal Emergency Evacuation Plan (PEEP) as part of the Trust management procedures. It is assumed that all existing final exits from the building are suitable for use by occupants with mobility impairments.

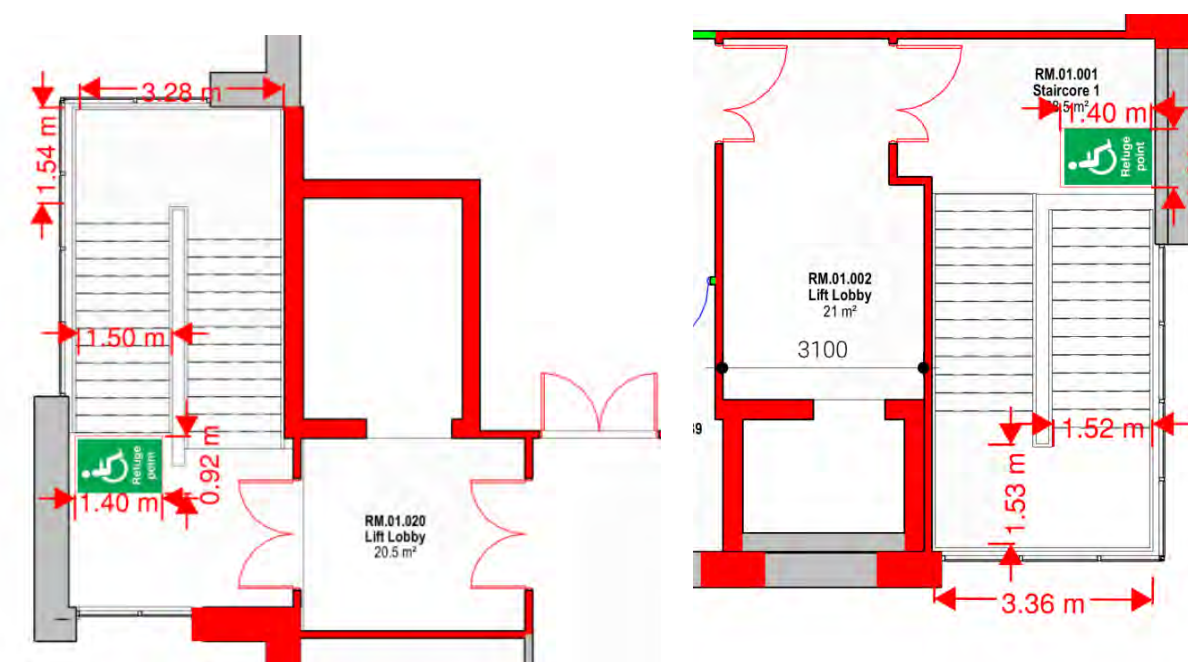


Figure 8: Refuge and stair dimensions

5 INTERNAL FIRE SPREAD

5.1 Internal Linings

Surfaces applied to walls and ceilings can contribute to the spread of fire, in order to limit the potential for fire spread across the walls and ceilings, HTM states the minimum recommendations as shown in Table 5. The National classification is listed here as HTM refers to this, but European Class in accordance with BS EN 13501-1 [16] would be expected to take precedence as National Class has been removed from recent updates to other fire safety guidance documents.

Table 5: Recommendations for linings

Location	National classification	European class
Small rooms (less than 4 m²)	1	C-s3, d2
Circulation spaces	0	B-s3, d2
Other rooms	0	B-s3, d2

5.2 Load Bearing Elements of Structure

The CDC building is two storeys and does not possess sprinklers. The structural fire resistance rating should therefore be 60 minutes classified in accordance with BS EN 13501-2 [17].

5.3 Compartmentation and Fire Resisting Construction

The building should be divided into compartments and sub-compartments in order to observe maximum compartment size limits specified in HTM 05-02 and in support of the PHE strategy. It is proposed to separate patient-access and non-patient-access areas.

Additional fire resisting construction is recommended in HTM as follows:

- All floors should be compartment floors (including ground floor to separate a basement);
- All stairs, lifts and risers should be constructed as protected shafts;
- Hazard departments should be separated from patient areas, or should not be adjacent to patient areas (based on patient dependency); and
- Hazard rooms (as defined in Table 7) should be enclosed with a minimum of 30 minutes fire resistance.

Table 6: Fire resisting construction

Location	Fire Resistance	Fire door rating
Compartment floors	60 minutes	N/a
Protected shafts (risers)	60 minutes	FD60S
Protected shafts (stair)	60 minutes	FD30S
Protected lobbies	60 minutes	FD30S
Atria + lobbies to atria	60 minutes	FD60S
Compartment wall	60 minutes	FD60S
Sub-compartment wall	30 minutes	FD30S
External wall (refer to Section 6.2 of this report)	30 minutes	N/a
Junctions of compartment and sub-compartment walls with external wall should have a storey-height 1 m wide strip of fire resisting construction	60/30 minutes	FD60/30*
Fire Hazard rooms (refer to Section 5.3.2 of this report)	30 minutes	FD30

*Where the 1m strip is impacted by door, window or service penetrations.

5.3.1 Atrium

For atria, the guidance in HTM 05-03 Part M is relevant [5]. There is an atrium in the main entrance to the building at GF, shown in Figure 9. This should be enclosed in fire resisting construction achieving the performance stated in Table 6 (REI). As the atrium is not connected to any areas above ground level, no protected lobby is needed at ground floor.

As the atrium is effectively an entrance circulation space and contains no furniture, it has a very limited fire load. As a result, no smoke clearance system is recommended as per 3.6 of this report.

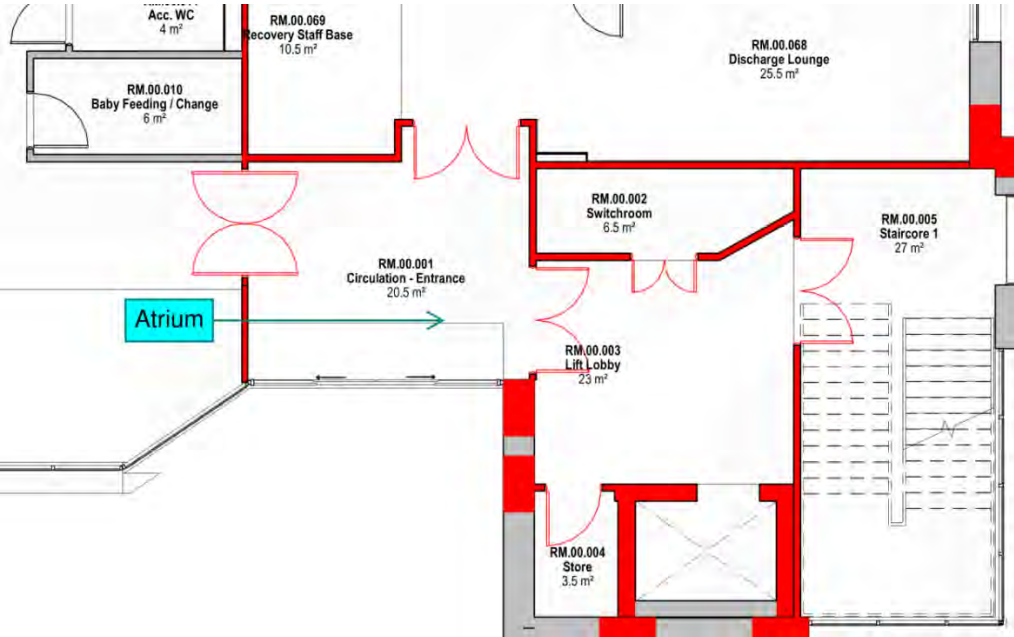


Figure 9: Atrium

5.3.2 Hazard Rooms

Fire hazard rooms (as defined in Table 7) should each be enclosed with a minimum of 30 minutes fire resisting construction. These are shown on the fire strategy drawings. In addition to the below, staff rest rooms and small locker rooms are also considered to be hazard rooms for the purposes of this fire strategy.

Table 7: Fire hazard rooms

Fire Hazard Rooms	
Chemical stores	Store rooms (including dirty and clean utility)
Clothes storage	Relatives' overnight stay room
Disposal rooms	Ward kitchens
Cleaners' room	Communal bathrooms in mental health premises
Hub rooms	Linen stores
Lift motor rooms	Staff on-call rooms
Main staff changing and locker rooms	Patient bedrooms provided specifically for: • People with mental health needs • People with learning disabilities

5.4 Openings

All openings in fire resisting construction should be protected to provide a minimum of the same period of fire resistance as the structure through which it passes.

5.5 Cavity Barriers

Cavity barriers should be provided in buildings to prevent the spread of fire through concealed spaces, cavity barriers should be provided throughout the building in accordance with HTM 05-02.

Cavity barriers will be provided to ensure that the maximum length of a void is no more than 20 m, each barrier should achieve a minimum of 30 minutes fire resistance.

Cavity barriers should also be provided:

- To prevent the interconnection of vertical and horizontal cavities;
- At the intersection of fire-resisting construction and elements containing a concealed space;
- Within the void behind the external face of rain-screen cladding, at every floor level and on the line of compartment walls abutting the external wall; and
- Around openings such as windows and doors.

5.6 Ventilation Ducts and Flues

Ventilation ducts should maintain the period of fire resistance of the construction through which they pass. The requirements vary based on the duct location i.e., depending on the purpose of the fire resisting element they penetrate. Table 8 provides suitable options based on the location of the ventilation penetration. Fire dampers shall be provided, classified in accordance with BS EN 13501-3 [18]. Fire resisting ductwork/ fire resisting ductwork enclosures are also suitable.

Table 8: Permissible locations of transfer grilles, fire dampers and fire and smoke dampers

Location	Damper Type	Activation
Compartment floor, wall, sub-compartment, protected shaft and protected escape routes (e.g., protected lobbies)	Fire and smoke damper	Activated by automatic fire detection
Cavity barrier	Fire damper or fire and smoke damper	Can be thermal activation or activated by automatic fire detection
Fire hazard room ¹	Fire and smoke damper or air transfer grille (note, not permitted in doors) ²	Dampers can be thermal activation or activated by automatic fire detection, air transfer grille automatic fire detection activation only
(1) Ducts should not pass through the hazard room if the duct serves the fire hazard room and other rooms beyond the fire hazard room. (2) Fire and smoke dampers are a preference by the Trust for Fire Hazard rooms over and above the minimum provisions allowed for in HTM.		

5.7 Junction of Compartment/ Sub-compartment Walls and External Walls

HTM 05-02 states that where a compartment wall (or sub-compartment wall) meets an external wall, or a protected shaft meets an external wall a 1 m wide storey-height strip of external wall that has a similar period of fire resistance should be provided to prevent lateral fire spread. These are currently indicated on the fire plans.

6 EXTERNAL FIRE SPREAD

6.1 External Wall Construction

HTM 05-02 recommends that the external wall surface of all healthcare buildings to provide a surface spread of flame classification of Class 0 (European Class B-s3, d2).

6.2 Space Separation

Buildings should be constructed such that the risk of fire spread to neighbouring buildings is low. For buildings less than 12m in height to the topmost occupied floor, HTM05-02 Figure 20 provides representative values for the allowable unprotected area on external walls based on the distance to the relevant boundary. The height to the topmost occupied floor is 4.35m above ground level, and therefore Figure 20 in HTM 05-02 may be used. Also, any area of the external wall which requires protection may be protected by walls having fire resistance of 30 minutes (Loadbearing R (if loadbearing), and Integrity E, 15 minutes Insulation I).

The distance to the relevant boundary is greater than 12.5m on 3 out of 4 elevations, therefore these elevations may be 100% unprotected in accordance with HTM 05-02. For the elevation facing the existing hospital building, a notional boundary is taken at the halfway point between the two buildings c. 5.3m from the CDC building. The recommended degree of protection is therefore 57%, meaning a 43% unprotected area is allowed. It is noted that this may increase if it is determined the existing building has insufficient external wall fire resistance e.g. if the boundary was previously taken at the site boundary. OFR should be provided with the existing building fire strategy to confirm.

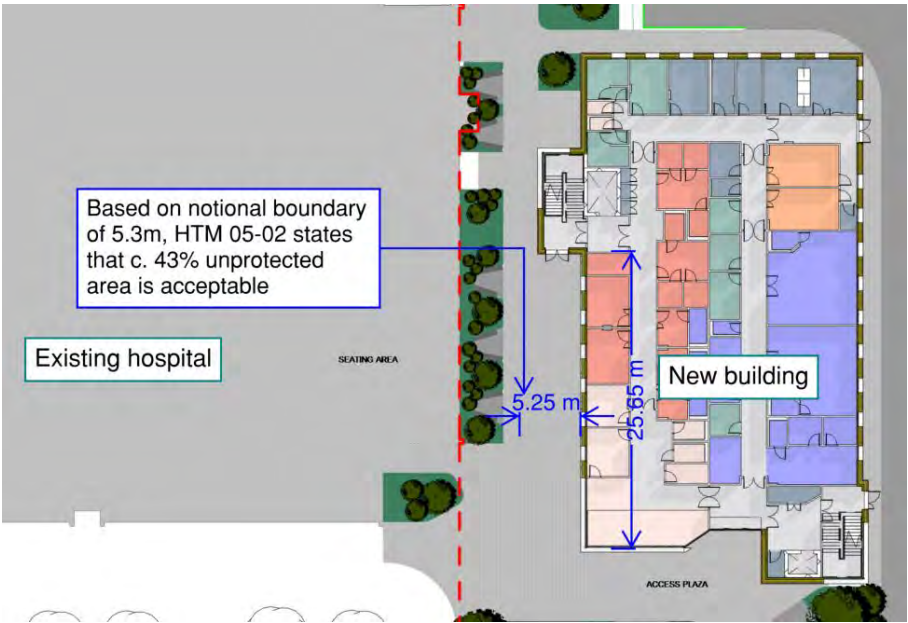


Figure 10: Space separation

7 ACCESS AND FACILITIES FOR THE FIRE SERVICE

The Fire Service access provisions for the existing building are not covered within this fire strategy. However, it is presumed that site access is already catered for on account of the existing building fire-fighting strategy. OFR should be provided with the existing building fire strategy to confirm fire-fighting needs for that building and to ensure clashes are avoided with the new building.

As the height to the topmost occupied floor is less than 9m and the building has an aggregate floor area between 2000-8000m², HTM 05-02 Table 9 recommends that 15% perimeter access is provided to the building. The total perimeter is c. 154m and 15% of this is 23.1m.

Roadways accessing the building should meet the recommendations of Table 9. Perimeter access is provided via the pedestrian access plaza which will be suitable for fire tender access. Figure 11 shows the current arrangement. Fire service vehicles should not need to reverse for more than 20m down an access road without turning circles being provided.

Table 9: Typical vehicle access route specification from HTM 05-02 Table 10

Appliance type	Minimum width of road between kerbs / m	Minimum width of gateways / m	Minimum turning circle between kerbs / m	Minimum turning circle between walls / m	Minimum clearance height / m	Minimum carrying capacity / tonnes
Pump	3.7	3.1	16.8	19.2	3.7	12.5
High reach	3.7	3.1	26.0	29.0	4.0	17.0

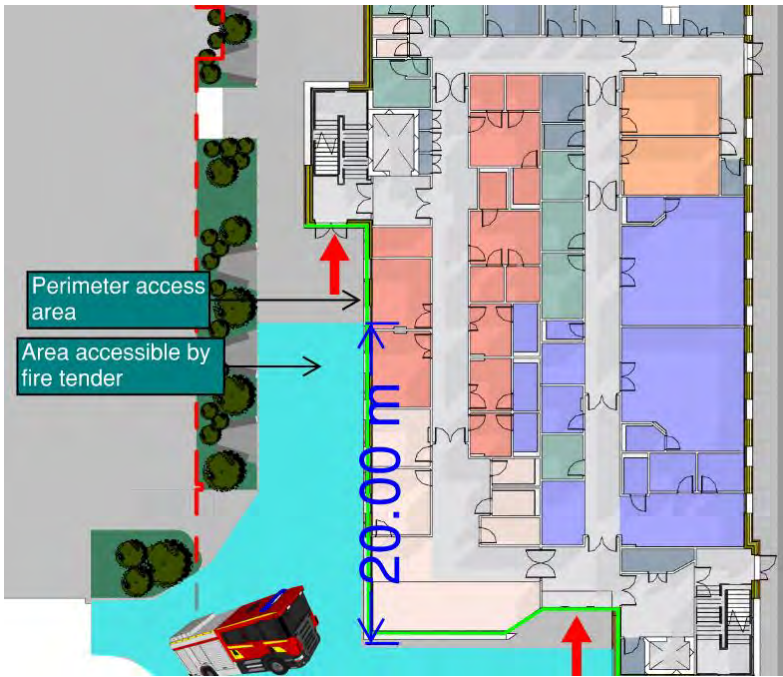


Figure 11: Fire-fighting access

8 FIRE SAFETY MANAGEMENT

8.1 Overview

Management procedures have a pivotal role to play in fire prevention, control and evacuation of occupants should a fire occur. In all non-residential buildings the Regulatory Reform (Fire Safety) Order 2005 (FSO) places legal obligations on management of premises.

This section is intended to introduce the FSO, its obligations and provide initial guidance on fulfilling these duties.

It is important that the building management are aware of their responsibilities detailed in this document and agree that they are capable of adequately performing them.

HTM 05-01 [19] provides guidance for the management of fire safety within healthcare facilities.

8.2 Regulatory Reform (Fire Safety) Order 2005

The Order applies to all non-domestic premises in England and Wales, including the common parts of blocks of flats or houses in multiple occupation. The Order removed the legal status of fire certificates, which are no longer enforceable by the Fire Authorities. The 'responsible person' has a duty to make the premises safe and must undertake regular fire risk assessments. It is the responsible person who will be held accountable under the new legislation for any breaches in fire safety.

In workplaces, the responsible person is the employer. In other cases, the owner or person in control of the premises is the responsible person.

Under the Order, the responsible person must carry out a fire safety risk assessment and implement and maintain a fire management plan. The assessment should be kept under regular review and reassessed if the use of the building has been varied or a material alteration is made. The significant findings must then be recorded, along with the measures taken to address the risks. A competent person should carry out the fire risk assessment.

The act also extends the duties and obligations of the responsible person to anyone who has any extent of control over the premises. This would be the building owner, or the facilities management company, if appointed to do so.

8.3 General Management Responsibilities in Support of the Fire Strategy

Management of fire safety must be integrated with all other management systems. If this management is lacking, then there is a danger that all the other areas such as security measures and alarm systems will be ineffective. To ensure there is no doubt as to where the responsibility for fire safety rests, and to enable consistency of approach, it is important that each establishment appoints a designated Fire Safety Manager. It may be possible to appoint a professional to take on this role but that will depend on the size of the premises, costs, etc.

The appointed person should have the necessary authority and powers of sanction to ensure that standards of fire safety are maintained. HTM 05-01 lists the following as the main duties of the Fire Safety Manager:

- An awareness of all fire safety features and their purpose
- Fire safety risks particular to that organisation
- Requirements for disabled staff and patients (related to fire procedures)

- Ensuring appropriate levels of management are always available to ensure decisions can be made regardless of the time of day
- Compliance with legislation
- Development and implementation of the organisations fire safety policy
- Development of the organisations fire safety strategy
- Development of an effective training programme
- Cooperation between other employees where two or more share the premises
- The reporting of fire incidents in accordance with current practice
- Monitoring and mitigation of unwanted fire incidents
- Liaison with enforcing authorities
- Liaison with other managers
- Monitoring of inspection and maintenance of fire safety systems

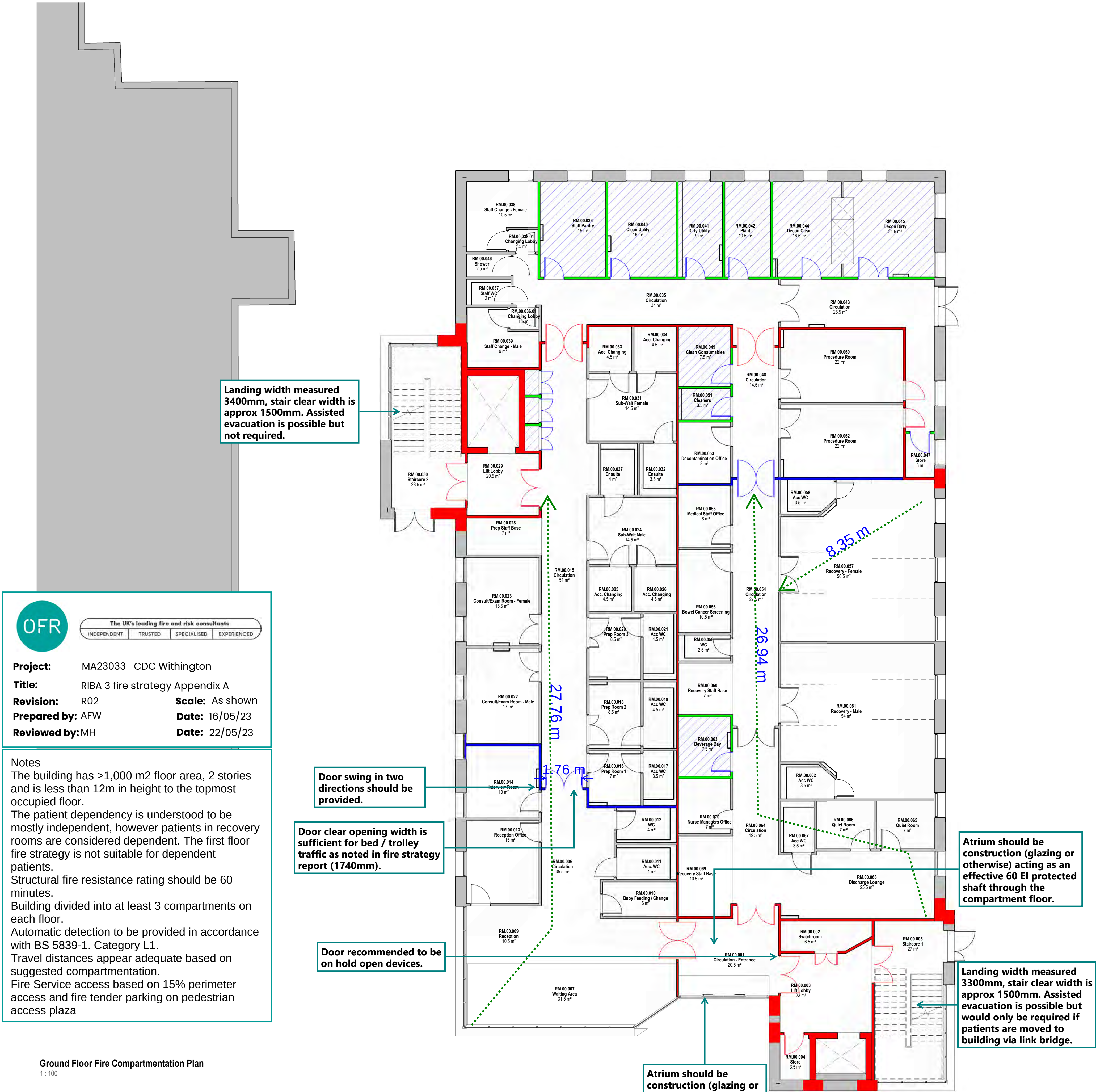
HTM 05-01 states that the main task in managing occupied buildings is to minimise the risk of fire occurring, and if a fire does occur, to prevent it escalating to a serious incident. Good housekeeping and the maintenance of furniture, furnishings and equipment is considered to be as important as maintaining fire safety equipment.

9 REFERENCES

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- [19] Department of Health, 'Health Technical Memorandum 05-01: Managing healthcare fire safety', Health Technical Memorandum HTM 05-01, Apr. 2013.



APPENDIX A – FIRE STRATEGY MARKUPS ON PLANS, FF&E AND SITE PLAN



Ground Floor Fire Compartmentation Plan
1 : 100

Fire Strategy Legend	
Doorsets:	
	NFR Doorset
	FD60s Doorset
	FD30s Doorset
Hazard Rooms:	
	30 Minute Hazard Room
	Existing Building
Walls:	
	30 Minute Compartment
	30 Minute Fire Rated Construction (Hazard Rooms)
	60 Minute Compartment

Fire Strategy

This drawing must be printed and read in colour.

This drawing is subject to Local Authority Building Regulations and Trust Fire Officer comments/approval and detailed design development and to be read in conjunction with separate Fire Strategy report.

Structure:
Supporting structure to be fire protected. See separate structural protection drawing for details. In general, all internal columns to be encased in a plasterboard encasement system. All internal beams to be encased in a plasterboard encasement system. Thickness, type & quantity of boards to be determined by manufacturer based on steel section sizes. Where acoustic performance is required, allowance to be made for additional boards and insulation.

Compartmentation:
Floor slabs are compartment floors.

All fire rated compartment & sub-compartment walls that abut the external wall to be appropriately fire stopped to maintain their specified performance including a 1m fire protected separation zone on the external face to avoid fire breakout re-entering the building. All fire rated partitions are to be installed full height to underside of soffit with the appropriate manufacturer's deflection head detail unless stated otherwise.

Rainscreen Cavities only: In addition to the above; all horizontal cavity barriers to be intumescent faced, with associated ventilated spacing as defined in the product test data.

Doorsets, Thresholds and Glazed Screens:
Contractor to ensure all thresholds to fire doors are surveyed and prepared/screeded as necessary to ensure maximum undercut size for the doors installed with floor finish completed is no greater than required in the fire test certificate for the doorset or maximum 3mm. Contractor is responsible for coordination of flooring and joinery sub-contractor to ensure this is achieved.

All doorsets / ironmongery to be installed by FIRAS approved party agreed with the Trust.

Service Penetrations:
All service penetrations for fire rated walls to be fire stopped to meet the minimum performance of the wall as designated by the Fire Strategy. All products must be installed into walls / floors strictly in accordance with the associated build ups in the fire test. All firestopping products where used together, to be from a single manufacturer to mitigate test performance incompatibilities.

Any proposed service penetrations to comply with HTM 05-02: Firecode 2015 Edition/Approved Document B of the Building Regulations.

Specification of walls penetrated by dampers to be checked against damper manufacturer test certificate to ensure correct construction/build-up before partition installation.

All fire stopping to be undertaken by FIRAS approved party agreed with the Trust.

Fire Detection and Signage:
Refer to M&E Engineers drawings for fire detection / alarm information and emergency / escape lighting.

Fire Extinguisher quantities and positions to be determined by Trust Fire Officer.

Fire Signage not covered by M&E drawings to be determined to suit local escape management plan by Trust Fire Officer.

GENERAL NOTES:

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- 5 For the purpose of coordination, all relevant parties must check this information prior to implementation and report any discrepancies to the Architect / Designer.

P3 STAGE 3 ISSUE
P2 Revised Fire Plans
P1 Issue for Information
REV DESCRIPTION

12.05.23
05.04.23
22.03.23
DATE

MA
MA
MA
REV BY

CLIENT
Manchester University Hospital NHS Foundation Trust

PROJECT
CDC - Endoscopy & Cardiorespiratory, Withington
Community Hospital

DRAWING
Proposed Fire Compartmentation Plan - Ground Floor

SCALE
1 : 100 @ A1

FIRST ISSUED
03/07/23

PROJECT
1342-22

CLIENT REF
WCHCDC

DRAWN BY
MA

CHECKED BY
CB

ORIGIN
DAY

VOLUME
V1

LEVEL
00

TYPE
DR

ROLE
A

NUMBER
670001

REVISION
P3

SUITABILITY
INFORMATION

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Project:

MA23033- CDC Withington

Title:

RIBA 3 fire strategy Appendix A

Revision:

R02

Scale:

As shown

Prepared by:

AFW

Date:

16/05/23

Reviewed by:

MH

Date:

22/05/23

Notes

The building has >1,000 m2 floor area, 2 stories and is less than 12m in height to the topmost occupied floor. The patient dependency is understood to be mostly independent, however patients in recovery rooms are considered dependent. The first floor fire strategy is not suitable for dependent patients. Structural fire resistance rating should be 60 minutes. Building divided into at least 3 compartments on each floor. Automatic detection to be provided in accordance with BS 5839-1. Category L1. Travel distances appear adequate based on suggested compartmentation. Fire Service access based on 15% perimeter access and fire tender parking on pedestrian access plaza

First Floor Fire Compartmentation Plan
1 : 100

Fire Strategy Legend

Doorsets:

NFR Doorset

FD60s Doorset

FD30s Doorset

Hazard Rooms:

30 Minute Hazard Room

Existing Building

Walls:

30 Minute Compartment

30 Minute Fire Rated Construction (Hazard Rooms)

60 Minute Compartment

Fire Strategy

This drawing must be printed and read in colour.

This drawing is subject to Local Authority Building Regulations and Trust Fire Officer comments/approval and detailed design development and to be read in conjunction with separate Fire Strategy report.

Structure:

Supporting structure to be fire protected. See separate structural protection drawing for details. In general, all internal columns to be encased in a plasterboard encasement system. All internal beams to be encased in a plasterboard encasement system. Thickness, type & quantity of boards to be determined by manufacturer based on steel section sizes. Where acoustic performance is required, allowance to be made for additional boards and insulation.

Compartmentation:

Floor slabs are compartment floors.

All fire rated compartment & sub-compartment walls that abut the external wall to be appropriately fire stopped to maintain their specified performance including a 1m fire protected separation zone on the external face to avoid fire breakout re-entering the building. All fire rated partitions are to be installed full height to underside of soffit with the appropriate manufacturer's deflection head detail unless stated otherwise.

Rainscreen Cavities only:

In addition to the above, all horizontal cavity barriers to be intumescent faced, with associated ventilated spacing as defined in the product test data.

Doorsets, Thresholds and Glazed Screens:

Contractor to ensure all thresholds to fire doors are surveyed and prepared/screeded as necessary to ensure maximum undercut size for the doors installed with floor finish completed is no greater than required in the fire test certificate for the doorset or maximum 3mm. Contractor is responsible for coordination of flooring and joinery sub-contractor to ensure this is achieved.

All doorsets / ironmongery to be installed by FIRAS approved party agreed with the Trust.

Service Penetrations:

All service penetrations for fire rated walls to be fire stopped to meet the minimum performance of the wall as designated by the Fire Strategy. All products must be installed into walls / floors strictly in accordance with the associated build ups in the fire test. All firestopping products where used together, to be from a single manufacturer to mitigate test performance incompatibilities.

Any proposed service penetrations to comply with HTM 05-02: Firecode 2015 Edition/Approved Document B of the Building Regulations.

Specification of walls penetrated by dampers to be checked against damper manufacturer test certificate to ensure correct construction/build-up before partition installation.

All fire stopping to be undertaken by FIRAS approved party agreed with the Trust.

Fire Detection and Signage:

Refer to M&E Engineers drawings for fire detection / alarm information and emergency / escape lighting.

Fire Extinguisher quantities and positions to be determined by Trust Fire Officer.

Fire Signage not covered by M&E drawings to be determined to suit local escape management plan by Trust Fire Officer.

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P3	STAGE 3 ISSUE	12.05.23	MA
P2	Revised Fire Plans	05.04.23	MA
P1	Issue for Information	22.03.23	MA
REV	DESCRIPTION	DATE	REV BY

CLIENT	Manchester University Hospital NHS Foundation Trust
PROJECT	CDC - Endoscopy & Cardiorespiratory, Withington Community Hospital

DRAWING	Proposed Fire Compartmentation Plan - First Floor
SCALE	1 : 100 @ A1
PROJECT	1342-22
VOLUME	V1
CLIENT REF	WCHCDC
DRAWN BY	MA
CHECKED BY	CB
ORIGIN	DAY
LEVEL	01
TYPE	DR
ROLE	A
NUMBER	670101
REVISION	P3
SUITABILITY	INFORMATION

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First Floor Loaded Plan - Component Schedule				
ADR/CODE	ADR/Description		ADR/Ref(s)	Count
HO1002	HOLDER, steel, 75 lbs, Black UL, Foot Operated, Fixed	1	3	2
BL0012	BLIND, vertical, draw back to one side, extended remote control		3	1
BL0013	BLIND, horizontal, draw back to one side, extended remote control	3	1	1
BL0014	BLIND, metal, 1/2" x 1/2" x 4 inches, 1800W 4200V 6000	3	6	1
BL0015	BLIND, cast, extruded aluminum	3	1	1
SH0002	2 phase gear shelling 1500W 3000	1	2	1
SH0003	2 phase gear shelling 1500W 3000	1	2	1
CA0012	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0013	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0014	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0015	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0016	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0017	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0018	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0019	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0020	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0021	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0022	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0023	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0024	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0025	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0026	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0027	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0028	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0029	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0030	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0031	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0032	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0033	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0034	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
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CA0036	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
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CA0206	CABINET, floor, 2 drawer, 210W 475W 6200	3	1	1
CA0207	CABINET, floor, 2 drawer, 210W 475W 6200	3	1</	



23 total number of
seats in
sub-compartment
20 patients

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INDEPENDENT	TRUSTED	SPECIALISED	EXPERIENCED

Notes

The building has >1,000 m² floor area, 2 stories and is less than 12m in height to the topmost occupied floor.

The patient dependency is understood to be mostly independent, however patients in recovery rooms are considered dependent. The first floor fire strategy is not suitable for dependent patients.

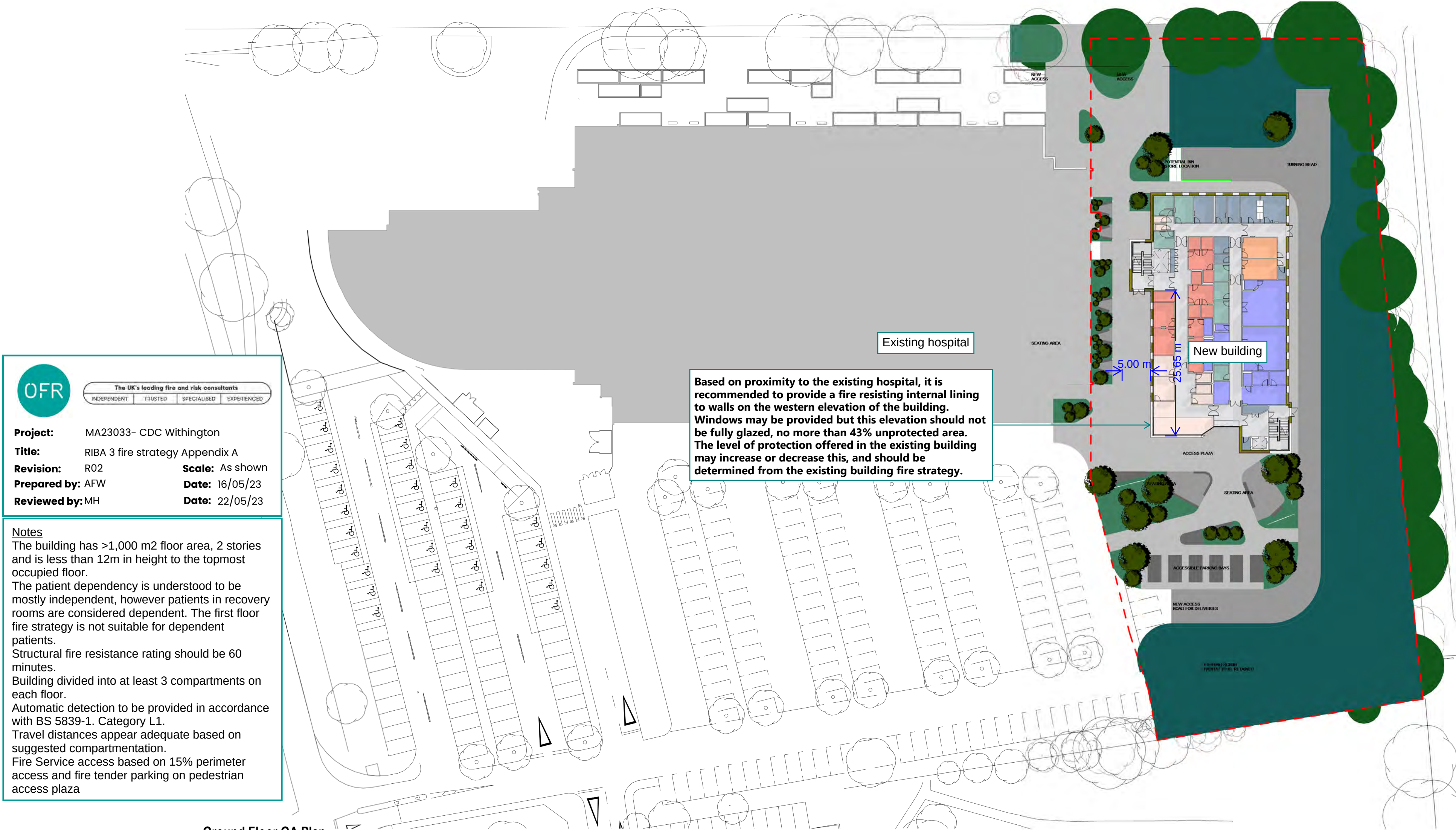
Structural fire resistance rating should be 60 minutes.

Building divided into at least 3 compartments on each floor.

Automatic detection to be provided in accordance with BS 5839-1. Category L1.

Travel distances appear adequate based on suggested compartmentation.

Fire Service access based on 15% perimeter access and fire tender parking on pedestrian access plaza



Ground Floor GA Plan
1 : 500

OFR

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Project:

MA23033- CDC Withington

Title:

RIBA 3 fire strategy Appendix A

Revision:

R02

Scale:

As shown

Prepared by:

AFW

Date:

16/05/23

Reviewed by:

MH

Date:

22/05/23

Notes

The building has >1,000 m2 floor area, 2 stories and is less than 12m in height to the topmost occupied floor.
The patient dependency is understood to be mostly independent, however patients in recovery rooms are considered dependent. The first floor fire strategy is not suitable for dependent patients.
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Fire Service access based on 15% perimeter access and fire tender parking on pedestrian access plaza

GENERAL NOTES:

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1 All boundaries, dimensions and levels are to be checked on site before construction and any discrepancies reported to the Architect / Designer.

2 Partial Service: Any discrepancies with site or other information is to be advised to the Architect / Designer and direction and / or approval is to be sought before the implementation of the detail.

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4 Do not scale this drawing.

5 For the purpose of coordination, all relevant parties must check this information prior to implementation and report any discrepancies to the Architect / Designer.

P6

STAGE 3 ISSUE

12.05.23

MA

P5

Revised Site Plan for Information

09.05.23

MA

P4

Issue for Information

03.05.23

MA

P3

Issued for Information

21.04.23

MA

P2

Red Line Boundary Drawings

24.02.23

MA

P1

Issue for Information

12.01.23

MA

REV

DESCRIPTION

DATE

REV BY

CLIENT

Manchester University Hospital NHS Foundation Trust

DRAWING

Hospital Site Plan

SCALE

1 : 500 @ A2

FIRST ISSUED

01/12/23

PROJECT

CDC - Endoscopy & Cardiorespiratory, Withington Community Hospital

PROJECT

1342-22

CLIENT REF

WCHCDC

DRAWN BY

MA

CHECKED BY

CB

ORIGIN

DAY

VOLUME

V1

LEVEL

00

TYPE

DR

ROLE

A

NUMBER

020001

REVISION

P6

SUITABILITY

INFORMATION

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