

Drawing Review

Logan Construction (SE) Response- External Fire Doors

Architectural

Across the scheme there are multiple escape doors that are required to be wider than indicated on the previously submitted drawings to comply with minimum exit widths.

1. West Elevation

The Planning consent indicates the external escape door to ramp, as identified in *Figure 1.1 in red*.

The proposal is to increase the door width to satisfy the minimum required clear exit width. An updated Architectural proposal is shown in *Figure 1.2 in red*.



Figure 1.1 - Extract from Approved Planning Drawings showing West Elevation

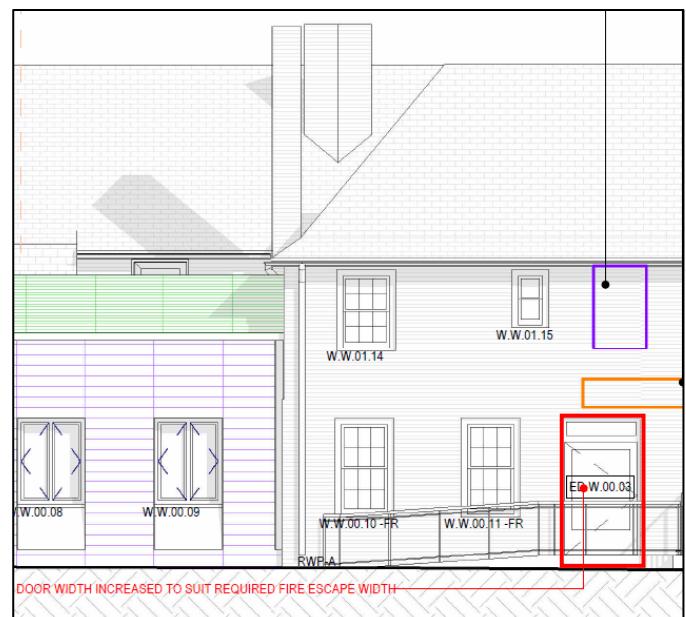


Figure 2.2 – Architectural Proposal

2. Courtyard Elevation

The Planning consent indicates the external escape door, as identified in *Figure 2.1* in red.

The proposal is to increase the door width to satisfy the minimum required clear exit width. An updated Architectural proposal is shown in *Figure 2.2* in red.



Figure 2.1 - Extract from Approved Planning Drawings showing the East Elevation of the Courtyard



Figure 2.2 – Architectural Proposal

3. Reason of change

The External Fire Door width is required to change to conform with HTM 05-02:2015 guidance and as per the latest project Fire Strategy, clause “3.5.4”. An extract of the Fire Strategy can be found in *Figure 3*, and Section 3 “Means Of Warning and Escape” can be found in *Appendix A*.

3.5.4 Minimum Required Clear Exit Widths

Where deemed necessary, the escape route will be sufficiently wide to accommodate beds/trolleys. It is not permissible to evacuate any non-clinical area through a clinical area unless the route through the clinical area is via a circulation route only.

There are no in-patient areas located within Northwood and Pinner Health Centre.

In accordance with Clause 3.42 of HTM 05-02:2015, departments and areas where beds or patient trolleys will not be used, the minimum escape route will be 1200mm for up to 200 people, or 1200mm plus an additional 275mm for every additional 50 people over 200.

For the purposes of this report, the width of a doorway is the clear width of the opening between the door leaf and frame (or projecting building hardware or the width between two opening door leaves in the case of double doors) assuming that the door leaf is free to open 90° or more. The width of an escape route is the width at 1500mm above the pitch line when defined by the walls or the minimum width of passage available between any fixed obstruction (hand rails fixed to the wall are ignored if less than 100mm).

Table 4 below documents the minimum widths of the circulation spaces and the permitted occupancy per circulation space.

Table 4 Width of circulation spaces considering occupancy capacities

Level	Minimum corridor width	Maximum occupants	Acceptable?
Ground	1200mm	147	Yes
First	1200mm	70	Yes

All widths are considered acceptable for the number of occupants expected in the building as per Table 3.

Figure 3 – Extract of 3.5.4 from project Fire Strategy “33406-HYD-ZZ-ZZ-RP-Y-0001”



Appendix A

Section 3 of the project Fire Strategy.

3. MEANS OF WARNING AND ESCAPE

Means of escape are to be in accordance with HTM 05-02:2015 for all areas of the redeveloped building. Where the proposed means of escape strategy deviates from these guidance documents, provisions will require agreement with the approving authority and local Fire Service.

3.1 Occupancy Dependency

It has been confirmed by *NHS Property Services Ltd* (email dated: 05 August 2021) that the patients located within the development are likely be considered as independent patients. Patients are considered independent if:

- Patients' mobility is not impaired in any way and they are able to physically leave the premises without staff assistance; or
- Patients experience some mobility impairment and rely on another person to offer minimal assistance. This would include being sufficiently able to negotiate stairs unaided or with minimal assistance, as well as being able to comprehend the emergency wayfinding signage around the facility.

3.2 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.

In accordance with Clause 4.6 of HTM 05-03-Part B, a Category L2 fire detection and alarm system will be provided throughout the healthcare premises. The fire detection and alarm system will be designed and installed in accordance with recommendations from BS5839-1:2017. The following areas should always be protected:

- All patient access areas;
- Fire hazard rooms and areas;
- Rooms or departments below patient access areas from which fire can spread vertically to affect patient access areas;
- Hazard departments;
- Stairways, lobbies, and corridors used as means of escape when not in frequent use;
- Mechanical and electrical services plantrooms (other than water tank rooms);
- Toilets intended for use by the public.

No detection is normally required in the following areas:

- Voids and roof spaces of any depth which contain only:
 - » Mineral-insulated copper-clad cable (MICC) or wiring clipped to a metal tray or within metal conduit or trunking;
 - » Non-combustible pipework and ducts;
 - » Metal or plastic pipes used for water supply or drainage;
- Bath/shower rooms;
- Toilets in staff areas;
- Small cupboards (less than 1m²);

The omission of detectors should be subject to a risk assessment and consultation with the approving authorities.

3.3 Evacuation Strategy

The evacuation strategy for redeveloped areas of Northwood and Pinner Health Centre is based on a simultaneous evacuation procedure. This evacuation strategy is characterised as when an entire building is evacuated immediately on receiving an evacuation signal or instruction. This is the default approach where it is unreasonable to expect the occupants to remain in the building for a prolonged time when there is a fire.

3.4 Occupancy numbers

Occupancy levels for the majority of the staff rooms have been previously provided by Allies & Morrison LLP in their General Arrangement Plan Drawings (see Table 1). The occupancy of every room is indicated on the Fire Strategy Drawings in Appendix A and the total occupancy is shown in Table 2.

Table 2 Expected occupancy

Level	Expected maximum occupancy level
Ground	147
First	70

3.5 Horizontal Means of Escape

3.5.1 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 (place of relative or ultimate safety).

Travel distances within the scheme are to be in accordance with Clause 3.29 – 3.36 of HTM 05-02:2015 based on the relevant use of the area. The maximum permitted travel distances for each relevant area of the development are as follows:

Table 3 Maximum permitted travel distances

Area	Maximum Permitted Travel Distance (m)		
	With Only One Escape Route Available	With alternatives available	
		To nearest sub-compartment/stair	To each adjacent compartment/stair
Plant room	12	25	
All other parts of the healthcare building	18	30	60

It is to be noted that in all cases the single direction of escape distance is an element of maximum travel distance.

Travel distances within the proposed redevelopment areas of the Northwood and Pinner Health Centre are considered acceptable; this is further illustrated within Appendix A – Fire Strategy Drawings.

3.5.2 Inner Rooms

In accordance with Clause 3.33 of HTM 05-02:2015, escape from an inner room via an access room is permitted provided the access room is not a fire hazard room. Travel distances from the inner rooms will need to comply with the stated travel distances in Section 3.5.1 above.

It is proposed that the furniture in the 'General Waiting' area (on the Ground Level) and the 'GP Admin' areas (on the First Floor) are of limited combustibility and therefore of limited fire load. The two reception desks are not fully partitioned from the general waiting area and are therefore not considered inner rooms. All the rooms within Northwood and Pinner Health Centre are accessed from the circulation spaces and do not qualify as inner rooms.

3.5.3 Minimum Number of Exits

In accordance with Clause 5.11 in HTM 05-02:2015, the maximum area of a compartment should not exceed 2000m² for a multi-storey building. Furthermore clause 3.25 of HTM 05-02:2015 states that for out-patient

departments in hospitals, the floor area may be increased to 1000 m² before sub-compartmentation becomes necessary. Hydrock consider that this advice extends to health care centres which utilise the guidance within Health Technical Memorandums, given that their overarching risk is considerably lower.

The floor areas of the Ground and First Floors are approximately 900m² and 580m², respectively. As both floors are less than 1000m², the scheme does not require sub-division into two different sub-compartments (see information in Section 4.2.3). There will be a minimum of two exits from each compartment into either:

- An adjoining compartment, or
- An escape stair, or
- A final exit.

In accordance with Clause 3.45 of HTM 05-02:2015, the building will have a minimum of two stairways. In Health Centres not provided with hospital streets, each compartment should have access to a stairway by a circulation space.

In addition to the exits provided direct to the exterior via Stair 01 and Stair 02, the Ground Floor has multiple exits direct to outside.

As for the First Floor, this level includes two protected stairs for occupants to use. An accommodation stair is also present but stair is not envisaged to be utilised by the occupants (i.e., stair not accounted for as a fire exit route) – see Section 3.7.

All areas of the proposed building have a suitable number of exits.

3.5.4 Minimum Required Clear Exit Widths

Where deemed necessary, the escape route will be sufficiently wide to accommodate beds/trolleys. It is not permissible to evacuate any non-clinical area through a clinical area unless the route through the clinical area is via a circulation route only.

There are no in-patient areas located within Northwood and Pinner Health Centre.

In accordance with Clause 3.42 of HTM 05-02:2015, departments and areas where beds or patient trolleys will not be used, the minimum escape route will be 1200mm for up to 200 people, or 1200mm plus an additional 275mm for every additional 50 people over 200.

For the purposes of this report, the width of a doorway is the clear width of the opening between the door leaf and frame (or projecting building hardware or the width between two opening door leaves in the case of double doors) assuming that the door leaf is free to open 90° or more. The width of an escape route is the width at 1500mm above the pitch line when defined by the walls or the minimum width of passage available between any fixed obstruction (hand rails fixed to the wall are ignored if less than 100mm).

Table 4 below documents the minimum widths of the circulation spaces and the permitted occupancy per circulation space.

Table 4 Width of circulation spaces considering occupancy capacities

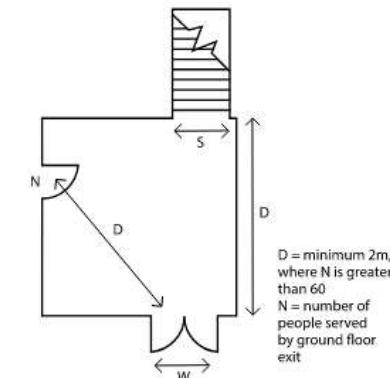
Level	Minimum corridor width	Maximum occupants	Acceptable?
Ground	1200mm	147	Yes
First	1200mm	70	Yes

All widths are considered acceptable for the number of occupants expected in the building as per Table 3.

3.5.5 Merging Flow

Since the standard evacuation strategy utilised within HTM 05-02:2015 is a progressive horizontal strategy, the Firecode does outline any need to consider merging flows towards a final exit within a staircase.

Salus AI outlined the potential need to demonstrate that the Healthcare Centre can meet the requirements for merging flow given that the evacuation strategy is simultaneous. ADBV2:2022 uses the below diagram and equation outlined within Figure 8 to determine merging flow issues and required exit widths.



$$W = ((N/2.5) + (60S))/80$$

where:

W is the width of final exit in metres

N is the number of people served by ground floor storey exit

S is the stair width in metres.

Figure 8 Merging Flow Calculation

For both stairs, according to Tables 3.1 and 3.2 within ADBV2:2022 (as amended), the minimum required stair size to suitably serve 217 occupants is 1100mm. Both merging flows have been considered for each protected stair within Figure 9 *Merging Flow*. For the North stair it is expected that no more 19 people will use the ground floor storey exit (based on reasonable floor space factors of 7m²/person – Table D1 of ADBV2:2022). The South stair is not expected to have a negligible merging flow due to the independent exit directly adjacent.

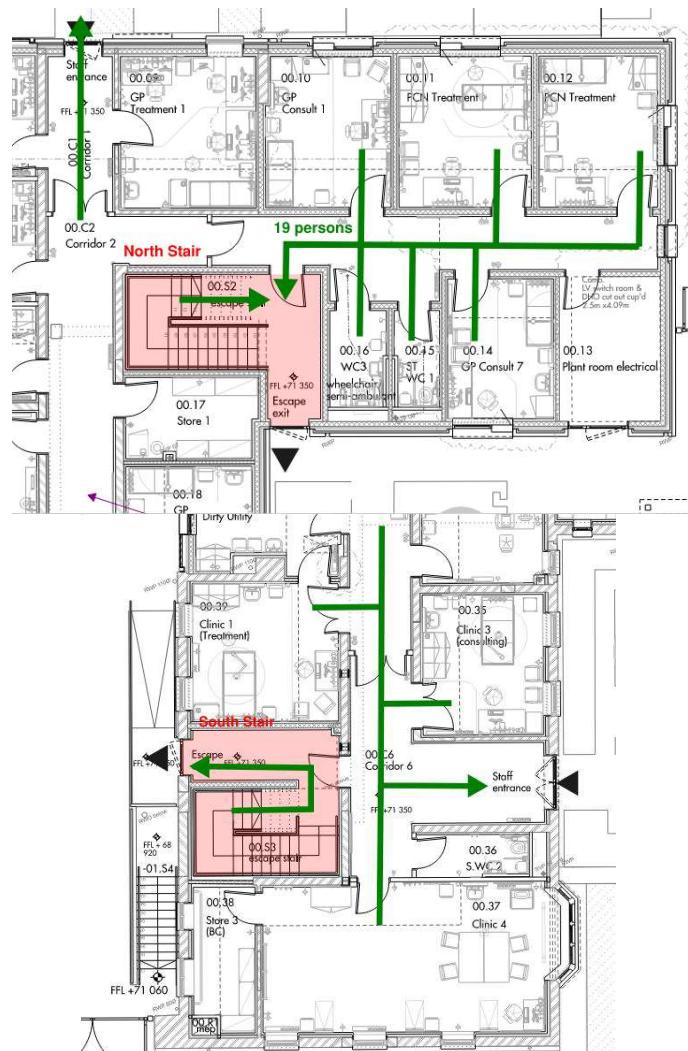


Figure 9 Merging Flow Sketch (North and South stair respectively)

Therefore, the maximum width of the final exit is:

$$W = \frac{\frac{N}{2.5} + 60S}{80} = \frac{\frac{19}{2.5} + 60 * 1100}{80} = 825\text{mm}$$

The final exit width appears to have been met on the current drawings provided to Hydrock. Given the low quantity of people using the storey exit (rather than taking a more direct final exit), there is no need to re-assess the final exit widths of development based on the simultaneous evacuation use.

3.6 Vertical Means of Escape

As stated in Section 3.5.3, every building providing healthcare should be provided with a minimum of two stairways. The stairs should be located so alternative means of escape is always available and be remote enough from each other so that in the event of fire at least one is available for evacuation purposes.

Where stairways provide escape for independent patients only, the minimum width of the stair should be 1200mm for up to 200 people, or 1200mm plus an additional 275mm for every additional 50 people over 200. The stairs are measured as 1200mm each. In the event of a fire, one of the stairways may be discounted and all of the occupants on the First Floor will be required to escape via the alternative stair. At 1200mm, the stairs can each hold 200 occupants. Table 3 states that a likely number of occupants on the First Floor would be 70, therefore the stair widths are acceptable.

3.6.1 Accommodation Stair

There is a third stairway (accommodation stair) located centrally within the building.

In accordance with Clause 2.17 of HTM 05-02:2015, in healthcare premises, the practice of designating certain stairways as escape stairways and others as accommodation stairways only is not acceptable, since in an emergency any stairway will be used if necessary. Therefore, all stairways should be designed as escape stairways other than those contained wholly within and only serving an atrium.

The accommodation stair arrangement may be considered acceptable due to the subsequent reasons:

- Compartmentation to 60 minutes is proposed to enhance protection to each zone. This provision exceeds the minimum requirements of HTM 05-02:2015 as upper level does not exceed 1000m². Therefore, no trigger requirement for compartmentation is required for meeting the recommendations of HTM 05-02:2015.
- Each protected stair core situated at either end of the scheme. Although occupants may be expected to pass the open stair arrangement, they can travel within a single travel distance (i.e., 18m) to the adjacent zone (see Figure 10)
- An L2 Fire Alarm and Detection System is provided which offers early means of warning and escape with coverage present in all rooms;
- The accommodation stair is not required for means of escape:

- » The occupancy within the upper level is limited to 70 people, thus the provision of two protected stairs is regarded as sufficient.
- » Each compartment (noted as Zones A and B in Figure 10) serves less than 60 people.
- » It should be made clear through the use of signage that in the event of a fire, occupants escaping the first floor should continue their escape via one of the escape stairs
- Approved Document B allows for the use of accommodation stairs within the scheme provided sufficient alternative means of escape is provided. Under the guidance of HTM 05-02:2015, it is permitted to use ADBV2:2022 as a guidance document as per Clause 2.21 for independent patients, which states:

'In most cases, the use of Approved Document B will be sufficient'
- Whilst patients may utilise 4 treatment rooms with the latest design iterations, the patients shall be accompanied at all times with members of staff (whether it be doctors or nurses).

The aforementioned justification has been agreed Building Control (email dated: Thu 04/11/2021).

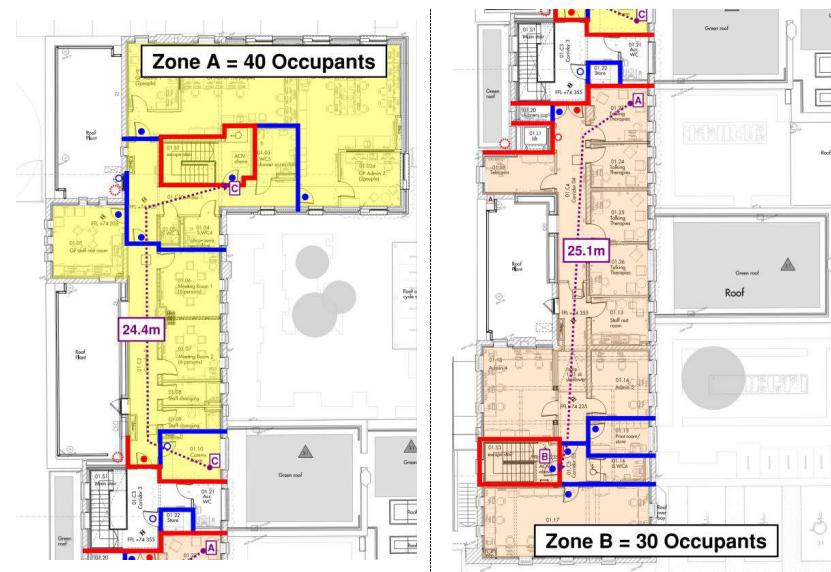


Figure 10 First floor – Compartmentation Strategy/Zones

The arrangement was discussed with Building Control and agreed in principle (meeting date 30.09.2021).

3.6.2 Basement Stair – External Escape Stair

An external stair is located on the west facing elevation that serves the basement. The basement is approximately 40m² and is solely dedicated to plant equipment.

HTM 05-02:2015 guidance does not specify requirements for external stairs, as they are not permitted to be used by patient-only areas. Given that the stair is serving an area which contains no patient facilities or patients, it is considered acceptable to utilise guidance from ADBV2:2022. An external escape stair is permitted when;

- There is at least one internal escape stair from every part of each storey (excluding plant areas).
- In the case of an 'assembly and recreation' (purpose group 5) building, the route is not intended for use by the public.

The layout of an escape stair should be in line with Figure 11. In general, doors to the stair should be fire resisting (minimum E 30) and be fitted with a self-closing device. Fire resisting construction (minimum RE 30) is required for the building envelope within the zones highlighted within Figure 11.

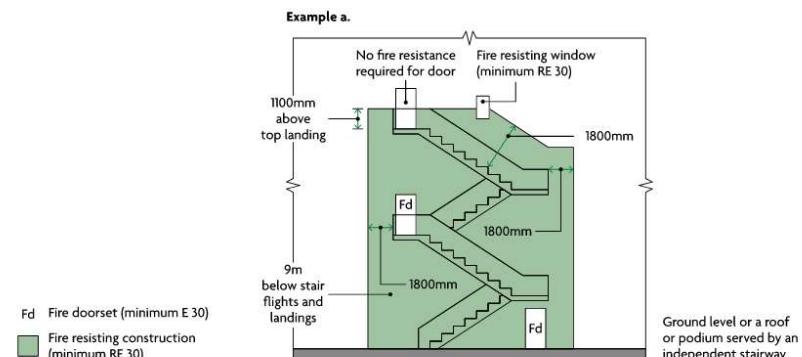


Figure 11 Fire resistance of areas near to external stairs

3.6.3 Protected lobbies

In accordance with Clause 5.34 in HTM05-02:2015, protected shafts for stairways and lifts should be provided with protected lobbies except where they are accessed from a hospital street.

Protected Stair 01, Protected Stair 02 and the accommodation stair are all provided with protected lobbies.

3.6.4 Stair Discharge

In accordance with Clause 3.56 of HTM 05-02:2015, all stairways should terminate at final exit or escape level and:

- Provide access to the outside; or

- Discharge to a route from the base of the stairway to the outside, which provides the same period of fire resistance as the protected shaft and which contains no accommodation except that permitted for a protected shaft; or
- Discharge to a hospital street.

Both protected stairs discharge directly to outside and therefore are acceptable.

In accordance with Clause 5.33 of HTM 05-02:2015, the protected shafts containing a stairway will be provided with an opening window or similar, providing a clear ventilation area of 1m².

3.7 General (Doors)

Doors on common corridor escape routes (whether or not the doors are fire doors) will either not be fitted with lock, latch or bolt fastenings, or be fitted only with simple fastenings that can be readily operated from the side approached by all people (including disabled and elderly) making an escape. The operation of these fastenings should be readily apparent and be available without the use of a key or having to manipulate more than one mechanism. Green break glasses are considered acceptable for this project.

Fire doors across escape routes providing alternative means of escape must be double-swing, and those across escape routes providing single direction of escape should open in the direction of escape.

On activation of the fire alarm, all electronic locks on means of escape doors from the evacuation zone in alarm are to fail-safe open. All escape doors to be provided with an electronic lock are also to be provided with a green break glass.

Automatic final exit doors should be freely openable by hand under any condition, including power failure; otherwise, adjacent non-automatic outward-opening doors must be provided. Final exits should not be provided with a step and should open onto an area which is level for a distance of at least 1 metre.

As gates are utilised on external escape routes away from the healthcare centre, these must also be readily operated for those choosing to escape past the building. The advice outlined within this section is also considered applicable to the external gates on the development.

3.8 External Escape Routes

Comparatively to ADBV2:2022, HTM 05-02:2015 does not have requirements on the use of fire-resistant construction upon the external wall where they are within 1.8m of an external escape route. Clause 3.62 of HTM 05-02:2015 states that the following points should be considered when designing external escape routes:

- the location of assembly positions to permit access for ambulances, while maintaining adequate circulation space for other emergency vehicles;
- the provision of adequate artificial lighting;
- the provision of adequate paved footpaths and dropped kerbs to the assembly points;
- the gradients of external escape routes;
- the proximity of external escape routes
- to the external wall of the building;
- The need to maintain segregation of patients if required by the emergency evacuation strategy

Given that the external escape route on the Western elevation provide two alternative directions of travel, it is not considered necessary to ensure that the external wall achieves a fire-resistance for escape purposes. The location of a suitable assembly point in the responsibility of the end-client, however, it is recommended that the design team consider the aforementioned criteria.

3.9 Escape Signage

Guidance on emergency escape lighting is contained within BS5266:2016. Additional guidance is provided in Health Technical Memorandum 06-01. All escape lighting should have a minimum duration of three hours and should incorporate fully automatic network testing facilities.