

9 NESTLES AVENUE, HAYES INITIAL FIRE ENGINEERING REVIEW

EL7233/nh/06th
30 July 2020

THE SCHEME

The scheme is a new residential building on a former factory site in Hayes. The building will be divided into two cores, with residents each having access to a single core. Residential apartments will be provided up to tenth floor above ground in the north core (top floor height approximately 30.1m), and ground plus five floors in the south core (top floor approximately 15.3m above ground). Access to communal terraces will be provided to each core.

This technical note describes the results of an initial fire engineering review of the scheme based on the Draft Plans dated 20 June 2020. The report is intended for design team information to identify the key fire strategy issues at this stage. It is not intended for submission to Building Control.

ACTIVE FIRE SAFETY MEASURES

Sprinklers

Both cores are more than 11m in height, so all residential accommodation will need to be sprinklered to comply with the latest fire code guidance released in May 2020. Sprinklers should also be provided in the duplex units, as well as any ancillary accommodation accessed from within the building.

Smoke Detection

Every apartment will be provided with a minimum LD3 standard of smoke detection. Where open plan apartments are proposed, detection will be to an LD1 standard.

Smoke detection will be provided in the common areas to an L5.

MEANS OF ESCAPE

Apartments

The drawings don't currently show internal layouts. However, as the apartments will be sprinklered there is flexibility for them to be designed as open-plan, with bedrooms that are accessed direct from the living areas.

Evacuation Strategy

The residential element will operate a 'defend in place' fire strategy, where only the apartment on fire evacuates initially. Wheelchair refuges are not needed to comply with Building Regulations guidance.

However, if the building is subject to the requirements of the Intend to Publish London Plan, then provisions to provide a dignified means of escape for all occupants of the building will be a requirement. The document notes that at least one lift in each core should be designed as a suitable evacuation lift. However, our experience is that fire fighting lifts will also be deemed as acceptable for use in an evacuation.

A fire fighting lift will be needed in the north core in any case due to its height. However, provision should be made for the lift in the south core to be designed as either a fire fighting or evacuation lift.

Common Areas

South Core

The drawings show escape distances of less than 15m in the South core at each level. This is fine. A single mechanical smoke extract shaft in the corridor will be sufficient.

The specialist supplier will need to confirm, but the shaft would typically be $0.66 - 0.8\text{m}^2$ in cross section area. A 1m^2 automatically opening vent is needed at the head of the stair.

North Core

Corridors up to 15m in Length

In the north core escape distances vary at different levels. Where escape distances are up to 15m, a single mechanical smoke extract shaft in the corridor will be sufficient as above.

The drawings show the a lift lobby which is separated from the main residential corridor. However, the lift lobby also provides access to apartments, which doesn't work. This is because where lift lobbies are separated from the residential corridor, they should be essentially fire sterile. We recommend that the door separating the lift lobby from the main corridor is omitted at each level so the corridor is a single undivided space.

The drawings also show at each level an apartment adjacent to the lift core which opens into the stair via a small lobby. This can work, but would require the lobby to be smoke vented. A simpler solution would be to reconfigure the lifts so that the apartment exits directly into the main corridor.

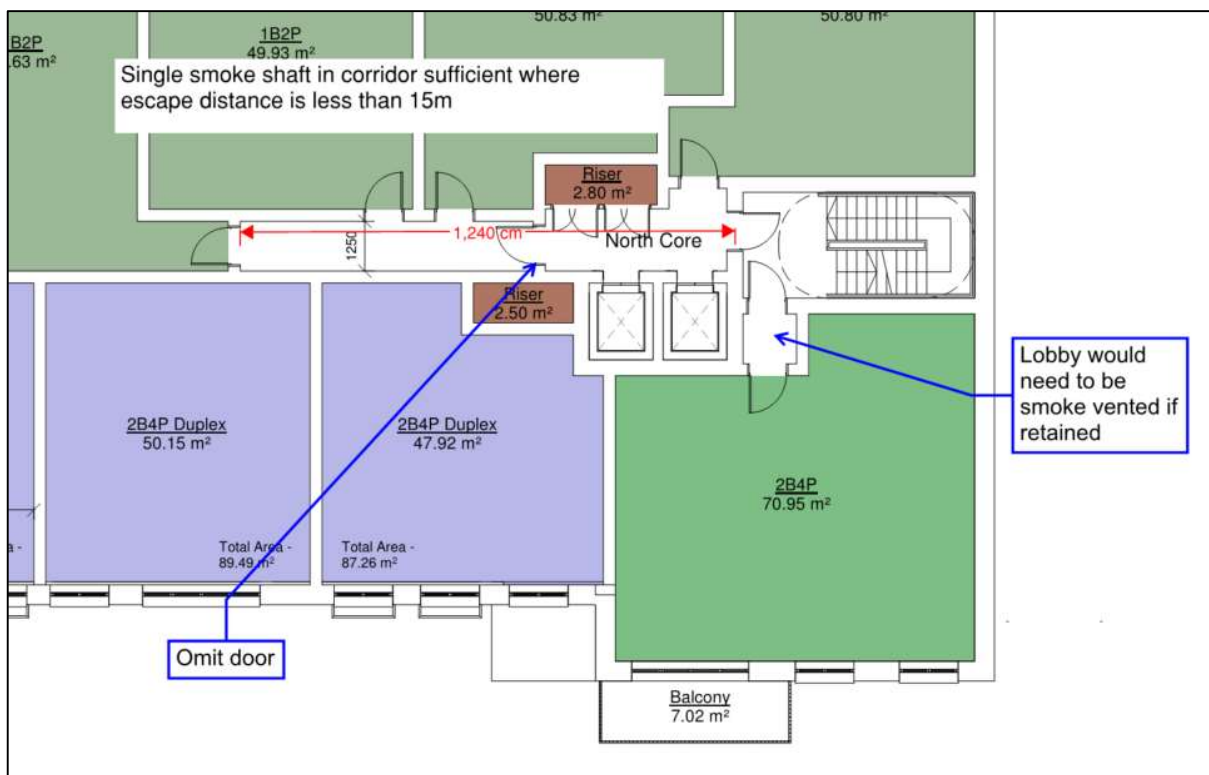


Figure 1 – Corridor arrangement up to 15m long

Corridors longer than 15m in Length

Where the escape distance in the corridor exceeds 15m, an enhanced mechanical smoke extract system will be needed, with a smoke shaft at either end of the corridor. These should be located as close to the end of the corridor as possible, and in each case no more than 5m from the end of the corridor. Computational Fluid Dynamics smoke modelling will be needed to validate the design, and there is an approvals risk, albeit relatively minor.

The drawings show an apartment entrance immediately adjacent to the stair door. In each case the smoke extract system will work better if the riser and apartment entrance can be swapped round so the smoke shaft is closer to the stair. This will especially help when carrying out the CFD smoke modelling analysis.

The lift lobby door should be omitted at each level to form a single undivided corridor.

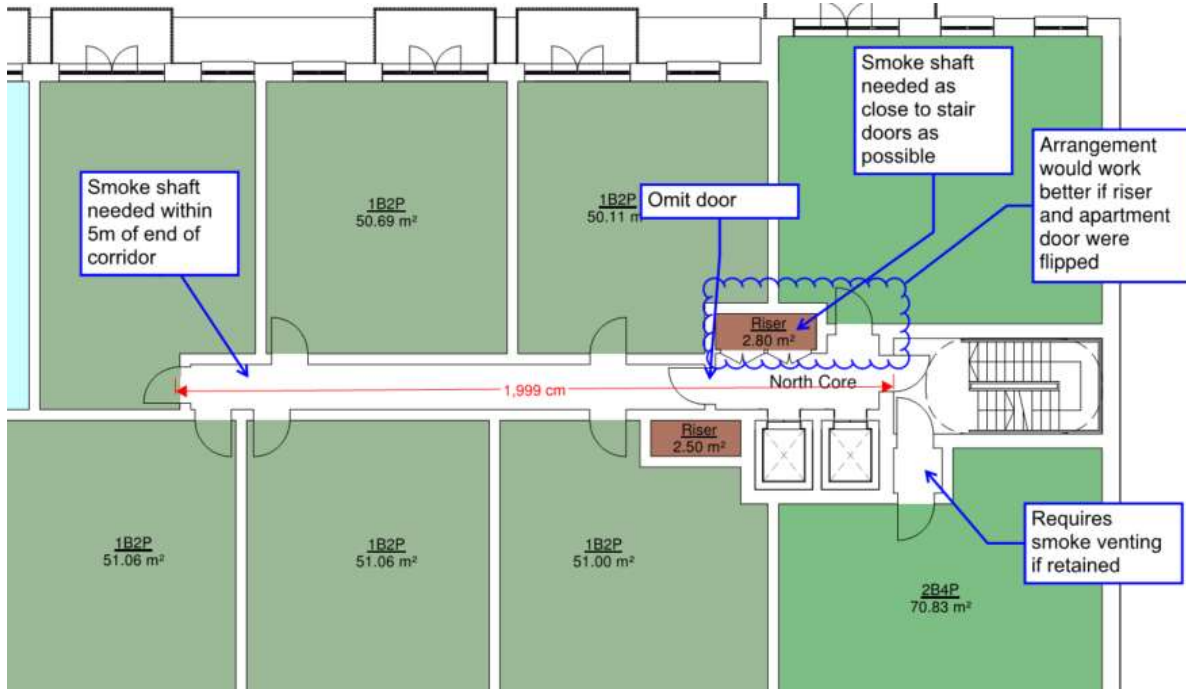


Figure 2 – Corridors more than 15m in Length

A 1m² automatically opening vent is needed at the head of the stair.

Ground Floor Layout

South Core

The drawings show the south stair lands directly in the Reception. This is fine, but the reception will need to be kept entirely fire sterile. Fire rated post boxes should be fine.

The mechanical smoke extract shaft serving the upper levels should be extended to serve the corridor between the car park and reception. We recommend allowance for a fire curtain to be provided over the corridor side of the dual entry lift.

North Core

The stair connects directly to the cycle storage at ground floor, and has connections via the lift lobby to the Waste & recycling area, as well as a plant room. Connections to these areas don't comply with Building Regulations guidance.

Given the low risk presented by the cycle store, lobby separation should be sufficient, so an additional door should be provided.

The Plant and Waste & Recycling rooms present a much higher fire risk, so additional protection will be needed. At least 2 door separation from the lobby will be needed, and the residential sprinkler system should be extended to serve these areas as well. The Waste & Recycling room may need to be sub divided into separate fire rated compartments depending on the maximum size area the sprinkler system can deal with. Input from the sprinkler designer is needed. If open louvres can be provided from the plant and waste rooms direct to outside then these would provide further protection to the residential escape route to allow smoke and heat to vent direct to atmosphere. Discussion with Building Control is needed.

Fire curtains should be allowed for on the lobby side of the two lifts.

STRUCTURE AND COMPARTMENTATION

Structural Fire Resistance

Structure will achieve 1 hour fire resistance in the South Core and 2 hours fire resistance in the North Core.

Compartmentation

The building will be provided with compartment walls and floors throughout the development including in all areas required to comply with Building Regulations guidance, including:

- All floors to the same fire rating as the structure of that core.
- Walls between apartments (1 hour)
- Walls between apartments and common areas (1 hour).
- Walls between ancillary uses (1 hour)

FIREFIGHTING FACILITIES

Fire Appliance Access

The main access to the site is via Nestles Avenue, with a service mews running along the north west elevation to provide access for servicing and a small undercroft parking area. However, access for a fire vehicle will be available to the entire perimeter of the site in the event of an emergency. This has been confirmed by an initial tracking analysis and is needed in order to provide hose coverage to the duplexes, as well as sufficient access to the fire main inlets to each core.

Fire appliances will be able to park within 18m and in sight of the dry fire main inlet into each core. The parking positions also provide hose coverage to within 45m of all areas of the duplex units which are accessed externally at ground floor.

It will need to be ensured that there is a fire hydrant in the road within 90m of each dry riser inlet.

Internal Fire Fighting Facilities

The south core is less than 18m in height, but will need to be provided with a dry fire main within the stair enclosure.

The north core is more than 18m in height so will need to be constructed as a fire fighting core to include the following:

- 2 hour fire resisting enclosure
- Fire fighting lift
- Dry fire main within the stair enclosure at every level
- 1m² automatically opening vent at the head of the stair.
- The residential corridors will act as a smoke vented lobby at each floor.

ELEVATIONS

Glazing

The extent of glazing and non-fire resisting construction to the elevations will be determined through calculation as the scheme progresses. However, given the set back from the site boundary around each elevation we don't anticipate any issues for the extent of glazing allowable.

Materials Used in External Wall Build Up

Products which form part of the external wall construction (including balconies) will need to achieve European Class A2-s1, d0 or Class A1, with the exception of sealants, gaskets, doors and windows (including frames); (see regulation 7(3) for the full list of exemptions).