**HHSRS assessment-**
**House type:** Timber frame construction; external wall covering consisting of assumed cement material (or similar) composite cladding at ground floor level and PVC panelling at first floor level. Open plan ground floor arrangement.

## 1.0     Introduction

1.1     The property is a timber framed, two storeys, 3-bedroom mid-terraced house in a terrace of four similar houses. The ground floor has an open plan arrangement, with two means of escape at the ground floor.

The purpose of the inspection was to assess the hazard of fire as the houses are of a similar archetype to the terrace at 9-15 Moss Hall Road, London, N12 8PE that were destroyed or damaged by fire that occurred on 8th June 2023.

1.2     The external wall covering was opened on 3rd April 2024 to allow for an intrusive visual survey for the presence of flammable insulation, cavity barriers and standard of compartmentation between the houses.

1.3     The house was accessed.

**Property description**



**Front elevation**                    **Rear elevation**

## 2.0     Internal

**2.1**     Mid terrace of 4x houses; flat roof with felt covering; brick-built porch to mid front elevation.

- Ground floor- Open plan layout with kitchen and living rooms running the entire depth of the house. No doors were hung to the kitchen or living room to create an internal fire escape route. An internal escape route will significantly reduce the family living room space.
- Single straightforward staircase discharging to the full depth living room. There is a rear door from the living room into the rear garden which is a place of safety.

- 3x first floor bedrooms and bathroom.
- All first-floor internal doors are thin panel construction, offering little or no fire resistance.



- Combined multi sensor heat and smoke alarm to the entrance lobby, living room and first floor landing to LD3 coverage. No heat alarm to the kitchen.
- Assumed modern electrical consumer unit, however this was not easy to access as it was covered.

The first-floor windows do not appear to meet the requirement of a secondary means of escape windows, generally as the window cill is probably too high, (the height and window dimensions were not measured as no notice to enter the house was given and the family were in the house at the time)



The internal layout is hazardous due to the lack of an internal escape route. If a fire breaks out internally in either the kitchen or living room, there are no doors on the ground floor to prevent rapid spread of smoke or flames. The means of escape is particularly relevant to the spread of harms, the existing layout does not allow for compartmentation of the escape route from the possible room of fire origin.

## 2.2    External description and construction type

The house is timber frame construction; external wall covering consisting of assumed cement material (or similar) composite cladding at ground floor level and PVC panelling at first floor level.

- The wall system is made up of external composite material (approx. 4mm thick) at ground storey and PVC panels at first storey.
- Black heavy duty plastic damp membrane tacked/pinned to the timber frame.
- 13.3mm wooden boarding over the frame inner layer of plasterboard (or similar)

There is evidence of wooden cavity barriers (which are flammable) and a masonry wall between the houses in the terrace, which is very likely to be breached by the overlaid timber. If fire enters the cavity it will spread across the terrace depending on intensity.

There is evidence of flammable expanded polystyrene insulation panels (or similar) in the timber frame and fibre glass blanket insulation.



2.3    The external PVC panelling is fixed onto timber battens; depth of cavity is approximately 140m; both polystyrene sheets and foiled backed insulation board are in situ. The PVC panels are 18-20mm.

2.4    The PVC panelling cladding is continuous across the terrace. This will breach the masonry party walls.

## 3.0    Loft space fire breaks

3.1     Not applicable as there is a flat roof construction.

**4.0     Assessment**
4.1     Vulnerable group

The HHSRS refers to a person in the most vulnerable group of people based on age, living in a dwelling for whom the risk of a hazard is greater than for most people, even if people in these age groups may not actually be living in the property at the time. This means a vacant dwelling can be assessed and that if the dwelling is rated as safe for those considered to be most vulnerable it will be safe for anyone. For the HHSRS it does not include those registered disabled.

4.2     Most vulnerable age group for the hazard of fire is all persons aged 60 years or over.

4.3     Causes of accidental fires in houses
The HHSRS operating guidance states that *Occupier behaviour is a major factor in relation to fires starting. Over 80% of accidental fires in dwellings result from occupier carelessness or misuse of equipment or appliances.* These can include smoking materials, carelessness using portable fan or convection heaters, overloading electrical appliances. There is clear evidence that increased use of e-scooters and e-bikes and charging these inside houses increases the likelihood of accidental fires starting in houses.

The occupiers were burning candles in the kitchen at the time of the assessment.

**4.4     Matters relevant to the likelihood of an occurrence include.**
The relevant matters were assessed from the evidence noted in the house surveyed. The relevant matters considered as deficiencies are those that are under the landlord's control.

| Relevant matter | Evidence/provision | Score |
|---|---|---|
| **Heater/cooker position-** inappropriate siting and/or close proximity of flammable materials | Cooking appliances are generally integrated and sited away from the door opening (door missing at he time). | - |
| **Space heating** – inadequate for the whole of the dwelling encouraging use of supplemental heaters. | Gas fired central heating supplying radiators. | - |
| **Defects to heating** – defects or disrepair to appliances or system. | None noted. | - |

| | | |
|---|---|---|
| **Clothes drying facilities** – lack of indoor facilities. | All houses have gardens with space for external clothes drying facilities. | |
| **Number/siting of sockets** – insufficient and/or inappropriately sited electric socket outlets. | Adequate, however the provision may be not to current standards in owner occupied and privately rented houses | - |
| **Electrical installation** – defects to the supply, meters, fuses, wiring, sockets or switches | Consumer unit appeared to meet current standards. | - |
| **Non-fire-resistant fabric** – allowing fire to spread. | Flammable external wall covering. | 2 |
| **Smoke permeable fabric** – allowing smoke to spread | Continuous PVC panelling at first storey. | 2 |
| **Fire stops to cavities** – lack of, allowing fire to spread. | Risk of spread of smoke/fire is via fascia and behind external panelling to neighbouring properties. | 2 |
| **Disrepair to fabric** – walls, ceilings and/or floors may allow smoke, fumes and/or fire to spread. | Impact damage to the internal plasterboard noted | 2 |
| **Internal doors** – insufficient doors or doors of inappropriate materials or ill-fitting doors. | Poor quality composite doors to first floor bedrooms.<br><br>No living room or kitchen doors. The original doors have either failed or been removed. | 3 |
| **Self-closers** – lack of effective self-closers where appropriate. | Self-closing devices are not necessary in two storey family houses. | - |
| **Smoke/heat detectors** – lack of, or defective, smoke and/or heat detectors with alarms or of detection and alarm system. | Adequate provision and coverage in the houses assessed.<br><br>There is no guarantee that owners occupied, and poorly managed privately rented houses will have sufficient alarms. | - |
| **Firefighting equipment** – lack of adequate and appropriate means of primary firefighting. | No requirement for firefighting equipment in a domestic dwelling | - |

| Lightning protection system – lack of a system where appropriate. | No lightning protection necessary in a two-storey domestic dwelling | - |
|---|---|---|

Key
3       Seriously defective
2       Defective
1       Not satisfactory
-       Satisfactory N/A

### 4.5     Likelihood.

The likelihood of an occurrence is judged over the next twelve months which could result in harm to a member of the relevant vulnerable group. The judgement is limited to the likelihood of an occurrence resulting in outcomes which would or should require some medical attention – a visit to a doctor or a hospital.

The judgement of the likelihood involves taking account of any deficiencies identified during the inspection, whether those conditions will increase or reduce the average likelihood of an occurrence.

The judgement of likelihood must consider-
(a) the average likelihood given for the type and age of dwelling.
(b) the dwelling characteristics and conditions identified during the inspection, which are the responsibility of the landlord, which:
i. may increase the likelihood of an occurrence; and
ii. those which may reduce the likelihood of such an occurrence.

**Possible deficiencies in owner occupied or privately rented houses that will increase the likelihood.**

**NOTE:** In coming to a likelihood decision, a worst-case scenario has been considered that may be possible in a poorly managed rented house that may be overcrowded. This general assumption may need to be considered carefully before any action is taken as there is no clear evidence. However, a fire in any dwelling of this type is likely to spread rapidly both inside and across the façade.

There is no guarantee that the electrical installation to the privately owned stock have been similarly improved to the current regulations. There is a possibility that some of the installations may be 50 years old.

The number of plug sockets originally installed would have been fewer that current standards, and they are unlikely to have been provided with intumescent casing or fire rated socket outlet boxes. It is fair to assume that most houses will have a replacement consumer unit and additional sockets.

The likelihood of a fire will be increased in the houses where there are older and overloaded electrical installations.

There is a possibility that some occupiers may rely on secondary heaters for example plug in convection heaters. If these are covered or are placed close to flammable fabric the likelihood of accidental ignition is increased.

Similarly, there is no guarantee that owner occupied houses will have electrically operated interlinked smoke and heat alarms. Battery alarms may not be tested and could well be non-functioning.

### 4.6 Likelihood justification.
The assessment should include both the likelihood of a fire starting, and once started,
how likely it is the fire will go undetected and spread. The justification has taken a broad view of the likelihood of ignition in any of the houses based on a series of worst-case scenario assumptions. It has been assumed that the likelihood will be highest in a poorly managed, overcrowded privately rented house.

An unseen electrical fire starts for example from an overloaded electrical installation in the ground floor electrical cupboard, or cavity due to electrical shorting or similar in old cables that have been poorly joined or defective socket outlet, especially if the plug socket outlets have not been protected with an intumescent liner. Occupiers' behaviour must also be considered as an ignition source to include smoking material, candles, and charging e-bikes and e- scooters using incorrect replacement chargers etc.

The open plan arrangement of the house will allow flames and smoke to take hold readily and spread rapidly. The lack of a heat alarm to the kitchen and no door to the kitchen or living room will not give early warning of fire or stop a fire rapidly spreading into the house to the upper floor. There are no smoke alarms in the bedrooms, the alarm volume in the bedroom is not known. There is clear evidence that young children do not respond to smoke alarms in the way adults do. The increased possibility of fatalities must be considered as part of the spread of harms outcome.

*The HHSRS operating guidance para 24.12 states that the main sources of ignition attributable to the dwelling, rather than occupiers, are cooking appliances, space heaters, and electrical distribution equipment.*

The cladding system ignites due to an external source with rapid spread across the cavity and PVC facade. There is clear evidence of expanded polystyrene bead insulation (or similar) in the cavity. Fire may spread to the neighbouring properties along the wooden cavity lining and possibly through the flat roof fascia board.  The fire could enter the property if it blows back through first floor at first floor level. Fire alarms would not respond quickly enough to alert the occupiers as the fire is external.

By the time a smoke or heat alarm sounds in the house of fire origin, alerting the occupiers, and depending upon the intensity of the fire could have broken into adjacent houses.

The national averages for the likelihood of fire in houses constructed between 1946-1979 is of 1 in 6341. This equates to the representative scale point of the HHSRS as 1 in 5600. This construction would be assessed as significantly worse than a traditionally constructed property of that period,

The likelihood of a fire starting, leading to harm is assessed at **1 in 180**, an increase of 6x scale points from the national average of 1 in 5600. This acknowledges that an accidental fire leading to harm is assessed as unlikely.

**LIKELIHOOD**

| 5600 | 3200 | 1800 | 1000 | 560 | 320 | 180 | 100 | 56 | 32 | 18 | 10 | 6 | 3 | 2 | 1 |
|------|------|------|------|-----|-----|-----|-----|----|----|----|-----|---|---|---|---|
| <4200 | 2400 | 1300 | 750 | 420 | 240 | 130 | 75 | 42 | 24 | 13 | 7.5 | 4 | 2.5 | 1.5> | |

## 5.0    Outcomes and classes of harm

The Classes of Harm used for the HHSRS are based on the top four Classes of Harm as identified *in A Risk Assessment Procedure for Health and Safety in Buildings (2000) BRE.* While this work identified seven Classes of Harm, only the top four are used for the purposes of the HHSRS as these are harms of sufficient severity that they will either prove fatal or require medical attention and, therefore, are likely to be recorded in hospital admissions or GP records.

The following examples are considered relevant concerning the outcome of a fire.

**Class I**
This Class covers the most extreme harm outcomes including:
Death from any cause, permanent loss of consciousness; 80% burn injuries etc.

**Class II**
This Class covers severe harm outcomes, including-
Serious burns and loss of consciousness for days

**Class III**
This Class covers serious harm outcomes, including:
Sleep disturbance (including stress related) Chronic severe stress, severe burns to hands.

**Class IV**
This Class includes moderate harm outcomes which are still significant enough to warrant medical attention. Examples are-
Slight concussion: moderate cuts to face or body; severe bruising to body.

## 5.1    Matters relevant to the severity of the outcome

| Relevant matter | Evidence/provision | Score |
|---|---|---|
| **Smoke/heat detectors** lack of or defective smoke and/or heat detectors with alarms or of a detection and alarm system. | No smoke alarms in the inner first floor bedrooms<br><br>No heat alarm in the kitchen | 1 |
| **Means of escape** – inadequate safe means of escape in case of fire. | An intense fire spreading quickly across the external wall system may rapidly spread to the neighbouring property.<br><br>The internal means of escape is inadequate. Occupiers may become easily trapped. | 3 |
| **Combustible furnishings** – including furniture and furnishings. | Most furnishings are likely to be fire resistant | - |
| **Fire-fighting equipment** – lack of adequate and appropriate means of primary fire fighting. | No requirement for fire-fighting equipment in a domestic dwelling | - |
| **Lightning protection system** – lack of a system where appropriate. | No requirement for fire- fighting equipment in a domestic dwelling | - |

Key
3       Seriously defective
2       Defective
1       Not satisfactory
-       Satisfactory N/A

## 5.2    Spread of harms justification.
The severity of harm suffered will depend on how quickly a fire can spread, and how soon it is detected, and occupiers made aware of it. If a fire is undetected, and spreads quickly, then the severity of harm will be worse. There is a possibility that the flames could spread quickly across the PVC cladding to an adjacent house and break into their roof space.

There is an increased risk of occupiers becoming trapped on the first floor, the poor-quality doors will offer little if no protection. The ground floor is exposed with no doors to the kitchen or living room.

In the event of a fire with rapid spread of flames across the external wall the occupiers could very quickly be overcome by smoke, hot gasses, and flames. The lack of a fire escape route and poor quality doors will increased the likelihood of entrapment on the first floor. The products of combustion may include harmful toxic smoke, especially from chemicals released by materials contained in the black plastic membrane, these can spread internally and externally. With the possibility of a fire spreading rapidly internally and possibly breaking back into adjacent houses through windows and into the roof void there is an increased potential for Class 1 harms due to an increased risk of death, especially from inhalation of smoke and toxic gases and significant burns.

The additional mental health and wellbeing harms highlighted by the Grenfell Tower fire and the increased potential for non-fatal injuries and exposure to fumes similarly justify increases in Class 2 and 3 harms.

Increased class 2 harms will include serious burns and possible loss of consciousness and serious stress from the fear of a fire.

Increased class 3 harms may arise due to sleep disturbance (including stress related mental health sleep disturbances) Chronic severe stress and severe burns to hands.

The national averages scale points table for houses built between 1946-1979 have been pasted below for ease.

Class 1 increase by 2 scale point          21.5%
Class 2 increase by 2 scale point 21.5%
Class 3 increase by 1 scale point          46.4%

## OUTCOMES

| | <0.05 | 0.15 | 0.3 | 0.7 | 1.5 | 3 | 7 | 15 | 26 | 38> | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Class I | 0 | 0.1 | 0.2 | 0.5 | 1.0 | 2.2 | 4.6 | 10.0 | 21.5 | 31.6 | 46.4 | | Class IV |
| Class II | 0 | 0.1 | 0.2 | 0.5 | 1.0 | 2.2 | 4.6 | 10.0 | 21.5 | 31.6 | 46.4 | | 100-(I+II+III) |
| Class III | 0 | 0.1 | 0.2 | 0.5 | 1.0 | 2.2 | 4.6 | 10.0 | 21.5 | 31.6 | 46.4 | | |
| | <0.05 | 0.15 | 0.3 | 0.7 | 1.5 | 3 | 7 | 15 | 26 | 38> | | |

National averages for the hazard of fire taken from the operating guidance.

**Fire**
Average likelihood and health outcomes for all persons aged 60 years or over, 1997-1999

| Dwelling type & age | | Average likelihood 1 in | Spread of health outcomes | | | | Average HHSRS scores |
|---|---|---|---|---|---|---|---|
| | | | Class 1 % | Class II % | Class III % | Class IV % | |
| Houses | Pre 1920 | 4,496 | 8.7 | 3.2 | 35.4 | 52.7 | 23 (H) |
| | 1920-45 | 6,248 | 10.2 | 5.1 | 15.6 | 69.1 | 18 ( I ) |
| | 1946-79 | 6,341 | 5.4 | 4.3 | 31.8 | 58.5 | 11 ( I ) |
| | Post 1979 | 5,701 | 5.7 | 0.0 | 32.8 | 61.5 | 12 ( I ) |
| Flats | Pre 1920 | 1,681 | 5.6 | 0.0 | 27.7 | 66.7 | 39 (H) |
| | 1920-45 | 3,372 | 5.6 | 0.0 | 27.7 | 66.7 | 19 (I) |
| | 1946-79 | 2,729 | 6.0 | 0.0 | 26.5 | 67.5 | 25 (H) |
| | Post 1979 | 2,157 | 3.1 | 0.0 | 17.2 | 79.7 | 17 ( I ) |
| All Dwellings | | 4,760 | 7.0 | 2.6 | 29.1 | 61.3 | 17 ( I ) |

## 6.0    Hazard calculation

| Class | Weighting | Likelihood | Spread of harms | Score |
|---|---|---|---|---|
| 1 | 10,000 | 180 | 21.5 | 1194 |
| 2 | 1,000 | 180 | 21.5 | 119 |
| 3 | 300 | 180 | 46.4 | 77 |
| 4 | 10 | 180 | 10 | 5 |
| Score | | | | **1391** |

Overall assessment- Category 1 band C

**Richard Lord**
**EHO**
**Tower Block Team**
**3rd April 2024**

**Reviewed and agreed by Paul Maguire Team Manager and Richard Pixner Team Manager**