9- 15 Moss Hall Road, London N12 8PE

Type 3 –1970's UPVC/timber sheet cladding

1.0   HHSRS assessment
2.0   Introduction

This assessment was undertaken following a visual external inspection of a fire affected terrace of 4x two storey houses on 3rd August 2023 that were destroyed or damaged by fire that occurred on 8th June 2023.

3.0   Background

3.1   There are three terraces in Moss Hall Grove comprising 2x 4 houses and 1x8 houses. I believe that all the houses have been similarly clad with PVC shiplap panels over the original timber frames.

3.3   It is understood that the fire originated and took hold at the rear of the terrace and rapidly spread to the adjacent buildings either side, resulting in severe damage to all 3 of the mainly affected properties, the end house having significant internal damage.

3.4   Generally, a thorough HHSRS assessment of a house requires full internal and external inspection. No access was permitted to the inside of the dwellings as they are all structurally unsafe. No access was made to any of the similar houses nearby for fear of causing unnecessary anxiety to the occupiers.

3.5   This HHSRS assessment undertaken by viewing the terrace externally. 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. Additional ignition risks may include additional fire loading, overloaded electrical installations or increased use of the kitchen resulting in multiple ignition opportunities. 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.

4.0   Property description
4.1   They layout of the houses are assumed to be the same as originally built with a compartment wall between the front kitchen and the rear reception room. Sales details which are freely available on the Rightmove website show that the kitchen wall has been removed/altered. This may not be unusual across parts of the privately owned stock. It is assumed that the houses are all a generally similar layout internally at the first floor.

4.2   The houses have a ground floor reception/diner and kitchen. The kitchen is at the front of the house closest to the front door which is the primary means of escape.

4.3   The first floor has three bedrooms and a family bathroom with a single staircase into the hallway and front door.

5.0   Construction.
5.1   The houses were originally constructed most likely during the 1970s. It is likely that during the past the original fire-resistant façade has been replaced with flammable UPVC cladding and a layer of insulating material in the cavity. No evidence is available from Building Control to confirm when the external wall cladding, and insulation was installed.

5.4   The houses are timber framed, separated by a masonry cavity compartment wall. The end gable walls are similarly masonry.

5.5   The first floors of the houses are of timber joist construction which is in-built into the separating party walls at either end. The front and rear walls are constructed of a timber framed arrangement which are tied to the party walls via a concrete post with mechanical fixings. The roofs are timber truss framed, pitched roofs with a concrete tile covering.

5.6   The front and rear external wall finish are UPVC cladding panels over plywood sheeting that have been attached directly to the original timber frame. It appears very likely that that the panels were attached in long sections with no fire breaks between the houses across the façade.

Rear view number 13   Rear view number 9

5.7   The UPVC cladding clearly bridges the fire compartment, exposing the plywood sheeting leading to the rapid spread of flames across the external wall. Parts of the front of the terrace appear not to have been correctly insulated. The plywood sheeting is clearly visible.

Rear view 11 and 13   Front view 15

5.8   The roof eaves soffit and fascia boards are similar UPVC. It is likely that these are replacement elements. The soffit boards are vented at regular intervals to provide ventilation into the roof space. There is no fire compartmentation at the roof level. There was nothing to stop the rapid spread of flames along the soffit and into the roof space.

5.9   The combustible UPVC & timber sheet cladding fixed directly to the timber battens, allowed for the spread of the fire from one house to another as there were no barriers to stop the spread between the timber frame.

6.0   Services

6.1   There is a possibility that some of the electrical installation may be original, approaching 50 years old.

6.2   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.

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

6.4   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.

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

7.0   Assessment

7.1   Vulnerable group

The HHSRS refers to a person in the most vulnerable group. The assessment considers 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.

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

7.2 Matters relevant to the likelihood of an occurrence include:

It is not possible to assess all the relevant matters as no access was possible into a typical undamaged dwelling.

Relevant matter	Evidence/provision	Score
Heater/cooker position- inappropriate siting and/or close proximity of flammable materials	Unable to adequately assess	Unable to score
Space heating – inadequate for the whole of the dwelling encouraging use of supplemental heaters.	Unable to adequately assess	Unable to score
Defects to heating – defects or disrepair to appliances or system.	Unable to adequately assess	Unable to score
Clothes drying facilities – lack of indoor facilities.	Unable to adequately assess	Unable to score
Number/siting of sockets – insufficient and/or inappropriately sited electric socket outlets.	See comments in para 6.5	Unable to score
Electrical installation – defects to the supply, meters, fuses, wiring, sockets or switches	See comments in para 6.2	Unable to score
Non-fire-resistant fabric – allowing fire to spread.	Flammable external wall covering	3
Smoke permeable fabric – allowing smoke to spread	Unable to assess the internal fabric	Unable to score
Fire stops to cavities – lack of, allowing fire to spread.	Lack of cavity barriers	3
Disrepair to fabric – walls, ceilings and/or floors may allow smoke, fumes and/or fire to spread.	Unable to assess the internal fabric	Unable to score
Internal doors – insufficient doors or doors of inappropriate materials or ill-fitting doors.	Unable to assess	Unable to score

Self-closers – lack of effective self-closers where appropriate.	Self-closing devices are not necessary in two storey family houses.	Unable to score
Smoke/heat detectors – lack of, or defective, smoke and/or heat detectors with alarms or of detection and alarm system.	See comments in para 6.2 and 6.8	Unable to score
Firefighting equipment – lack of adequate and appropriate means of primary firefighting.	No requirement for firefighting equipment in a domestic dwelling	NA
Lightning protection system – lack of a system where appropriate.	No lightning protection necessary in a two-storey domestic dwelling	NA

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

Likelihood justification.
As an internal assessment of a house was not possible a series of worst-case scenario assumptions have been made.

An unseen electrical fire starts for example from an overloaded electrical installation due to electrical shorting or similar in a plug socket outlet. 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 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 inside of the cavity ignites with rapid spread across the cavity and facade and into the roof void. The lack of cavity barriers, and lightweight timber frame may cause a chimney type effect with the fire becoming well-formed and intense, rapidly fuelled by the PVC cladding and timber frame. The fire eventually breaches the internal timber frame or windows. If this starts at the front of the house for example in the kitchen, the hallway escape route may become quickly engulfed in flames, hot gases and smoke. If the fire starts at night any smoke and heat alarms may not respond quickly enough to alert the occupiers. There is clear evidence that young children do not respond to smoke alarms in the way adults do. The increased possibility of fatalities has to be considered as part of the spread of harms outcome.

By the time a smoke or heat alarm sounds in the house of fire origin, alerting the occupiers, the intensity of a 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. It is very likely that the original wall covering has been replaced from for example asbestos boarding (or similar fire-resistant materials) with the PVC shiplap cladding. This will increase the likelihood of a fire leading to harm due to the rapid spread.

The likelihood of a fire starting, leading to harm is assessed at 1 in 180, an increase of 6 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>	

7.3   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.

7.4   Matters relevant to the spread of harms include.

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.	See comments in para 6.2 and 6.8	Unable to score
Means of escape – inadequate safe means of escape in case of fire.	An intense fire spreading quickly across the external wall system may rapidly compromise the internal escape route, particularly if at the front of the house.	Unable to objectively score
Combustible furnishings – including furniture and furnishings.		Unable to score
Fire-fighting equipment – lack of adequate and appropriate means of primary fire fighting.	No requirement for fire-fighting equipment in a domestic dwelling	NA
Lightning protection system – lack of a system where appropriate.	No requirement for fire- fighting equipment in a domestic dwelling	NA

Key
3   Seriously defective
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Spread of harms justification
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 products of combustion may include harmful toxic smoke. With the possibility of a fire 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 mat 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 points   4.6-21.5%
Class 2 increase by 1 scale point 4.6-10.00%
Class 3 increase by 1 scale point   31.6-46.4%

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)

Hazard calculation

Class	Weighting	Likelihood	Spread of harms	Score
1	10,000	180	21.5	1194
2	1,000	180	10.00	55
3	300	180	46.4	52
4	10	180	22.1	2
Score				**1328**

Overall assessment- Band C -Category 1

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