HHSRS assessment
House type: Timber framed. The end terrace houses have a wooden end post as part of the frame. They are all externally clad with shiplap timber that originally would probably have been creosoted.

1.0 Introduction

1.1 This assessment was undertaken following a thorough external and internal inspection of 3x terraces of similar 4 number timber framed and shiplap timber clad houses. The purpose of the inspection was to assess the hazard of fire as the houses are of a similar architype 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 timber cladding was opened up on 9th October 2023 to allow for an intrusive visual survey for the presence of any cavity barriers and compartmentation between the houses. A head and shoulders inspection of the loft spaces was undertaken to view the masonry separating fire break walls between the houses.

Property description

2.0 Internal

2.1 The 3x houses visited were all a similar design and internal conventional layout comprising.

- Ground floor- kitchen and living room. The kitchen is at the rear of the house furthest away from the primary fire escape route and front door.
- First floor 3 bedrooms and bathroom.
- Single straightforward staircase discharging to the front door and to a place of safety. There is a rear door from the kitchen into the long rear gardens which are also a place of safety.
- All internal doors are thin panel construction, in at least one house the kitchen door has been removed as the kitchens are small.
- Combined heat and smoke alarms at ground floor and first floor.
- Modern electrical installations noted with a mix of non-fire-resistant polycarbonate enclosures and fire-resistant metal enclosures.
- At least one of the cupboards where the electrical consumer unit was situated was not adequately sealed. In the event of an unseen electrical fire in this cupboard the smoke heat and flames can escape into the cavity.

2.2 External description and construction type

The houses appear to be similar to the Scano type 3 built by London County Council between 1925-1928. Barnet Homes confirmed these houses were built during the 1930's.

Front

Rear

2.3 The houses are all timber framed. The end terrace houses have a wooden end post as part of the frame. They are all externally clad with shiplap timber that originally would have been creosoted. It is considered unlikely that all the original timber cladding would have not rotted over time. It appears that at least some of the original external shiplap timber cladding has been replaced.

2.4 The removed cladding revealed what appeared to be an original vent from what could well have been an original heating system vent. This has since been covered over with shiplap cladding presumable to remove an unnecessary a draught.

3.0 External timber cladding

The external cladding is fixed directly to the frame. The timber panels are 18-20mm treated cladding with a breather membrane (or similar) which appears to be impregnated with bitumen. It is not known what the external timber has been treated with however, it is assumed this is not fire resistant (or similar) to reduce the spread of flames across the facades. Barnet Homes were unable to verify the treatment.

3.1 The cladding clearly bridges the fire compartment leading to the rapid spread of flames across the external wall.

3.2 The combustible timber cladding is fixed directly to the timber frame. Fire can spread from one house to another as there are no effective barriers to stop the spread across the façade nor in the wall cavity.

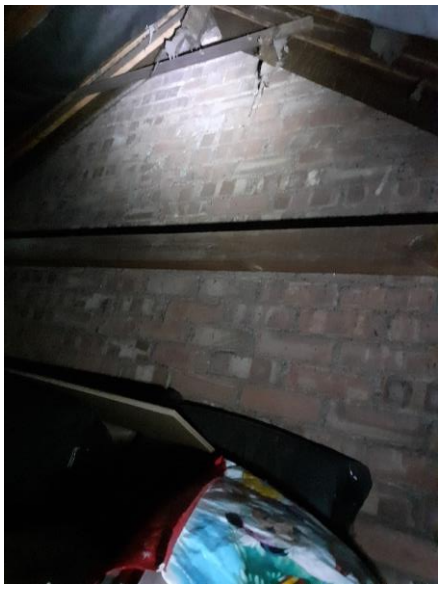
4.0 Wall cavity

4.1 All the houses have a 125mm cavity at ground floor level with no cavity barriers. At first floor level between the ground floor ceiling and first floor floorboards there is a deep void of at least 1500mm, with electrical cables and gas pipes running across the voids.

4.2 The vertical masonry wall between the houses appears to have gaps and voids between the mortar joints, indicating this a not a fire barrier between the houses.

5.0 Loft space fire breaks

A head and shoulders inspection of the loft space was made. There are separating fire walls between the houses, however, it is very likely that there will be gaps between the wall and the rafters and joists.



5.1 The eaves were all slightly different with some enclosed with combustible UPVC and others the original exposed wooden roof rafters overhanging the wall. There are no compartmentation stops between the eaves allowing a clear route of fire spread from one building to the next across the eaves for example at Watling Avenue. There is no fire compartmentation at the roof

level and no barriers to prevent the rapid spread of flames along the soffit and into the roof space.

6.0 Assessment

6.1 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.

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

6.2 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 increase the likelihood of accidental fires starting in houses.

6.2 Matters relevant to the likelihood of an occurrence include:

The relevant matters were assessed from the evidence noted in the houses 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 escape route.	-
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.	Non noted.	-
Clothes drying facilities – lack of indoor facilities.	All houses have large gardens with space for external clothes drying facilities.	
Number/siting of sockets – insufficient and/or inappropriately sited electric socket outlets.	Adequate in houses assessed, 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 units to current standards. See comments in para 2.1. Halogen downlighters (where installed) are assumed unlikely to have been fitted with intumescent caps.	1
Non-fire-resistant fabric – allowing fire to spread.	Flammable external wall covering.	3
Smoke permeable fabric – allowing smoke to spread	Evidence of not adequately sealed plasterboard in the electrical cupboard. Halogen downlighters have pierced the ceiling compartments allowing smoke to percolate and spread int the ceiling void.	2
Fire stops to cavities – lack of, allowing fire to spread.	Lack of cavity barriers to the external wall or eaves. No fire barriers at ground/first storey void level where electrical cables and gas pipes run	3
Disrepair to fabric – walls, ceilings and/or floors may	Generally satisfactory, however could be a deficiency in a poorly	1

allow smoke, fumes and/or fire to spread.	managed overcrowded privately rented house.	
Internal doors – insufficient doors or doors of inappropriate materials or ill-fitting doors.	At least one kitchen door had been removed, other thin panel doors in some houses were in a state of disrepair.	2
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. 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

Likelihood justification.
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, in particular 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 particular 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.

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.

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, ceiling void or cavity due to electrical shorting or similar in old cables that have been poorly joined or defective 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 void 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 shiplap cladding and timber frame. The fire eventually breaches the internal timber frame or windows. If this starts at the front of the house, 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 6248. This equates to the representative scale point of the HHSRS as 1 in 5600. The wooden framed and timber clad houses are far from the ideal. 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.

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 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.

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.	Adequate in the houses assessed	-
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. The houses have a single staircase and landing. If the hallway is smoke logged, 2x means of escape doors at ground floor level, will not assist escape	2
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

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 goes undetected, and spreads quickly, then the severity of harm will be worse. There is a possibility that the flames could spread quickly across the timber cladding from an adjacent house and break into a first-floor bedroom before smoke alarms activate.

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, especially from chemicals released by old creosote contained in the breather membrane. 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 1947-1979 have been pasted below for ease.

Class 1 increase by 1 scale points	10.0-21.5%
Class 2 increase by 1 scale point	4.6-10.00%
Class 3 increase by 1 scale point	31.8-46.4%

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 II	0	0.1	0.2	0.5	1.0	2.2	4.6	10.0	21.5	31.6	46.4	
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 >		

Class IV
100-(I+II+III)

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

Richard Lord
EHO
10th October 2023

Reviewed by Paul Maguire Team Manager and Richard Pixner Team Manager