[redacted] BSc. MSc.

Consultant Scientist & Engineer

Report on the Fire
at 9 – 15 Moss Hall Grove, North Finchley, N12 8PE
on the 8th June 2023
for

[redacted]

by

[redacted]

Ref: AC-4 **16th July 2024**

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1.0 INTRODUCTION

1.1 A fire starting in a back yard caused severe damage to a terrace of four houses. The houses had uPVC cladding, large areas of which were destroyed in the fire. Barnet Homes (part of Barnet Council) commissioned Capital PCC Ltd to carry out a site inspection.

1.2 Capital concluded that the wall cladding bridged the lines of the party walls, creating a route for the spread of fire between the individual houses in the terrace, and thus presented a significant risk. They also noted that fire could spread between houses at roof level due to incomplete compartmentation at the eaves and via gaps above the heads of the party walls. They recommended the replacement of all combustible cladding, fascia boards and soffits with non-combustible alternatives, and the installation of fire-stopping at the party walls.

1.3 Barnet Council were concerned that they were some 580 semi-detached and terraced houses with combustible cladding in their area – the majority of them freehold – and that these houses presented a serious risk to the health and safety of occupants. These houses were of four "archetypes", the most common - type 1 - having timber-framed front and back walls with timber cladding. Barnet further commissioned Capital PCC to assess the potential risks and to report on the feasibility of reducing the risks by replacing the cladding and installing fire-stopping. Barnet Council carried out HHSRS assessments and concluded that many of the houses could present a Category 1 hazard, in which case they had a duty under the Housing Act 2004 to enforce remedial measures. (HHSRS stands for Housing Health and Safety Rating System.) Barnet Council estimate that remedial works could cost £23,000 per house, a cost that would be borne by the free-holders. Barnet considers that there are numerous similar houses in other council areas and has called for a national approach.

1.4 I am a retired consultant scientist and engineer. I spent over forty years investigating fires on behalf of insurers, solicitors and Government departments. Much of my work was to determine the reasons for fire development and spread. My C.V. is included as Appendix 1.

1.5 I was asked to assist in this matter by a mutual friend of Mrs Andrea Corr, the owner of one of the houses with combustible cladding. I have not been to the scene of this fire, nor have I spoken to anyone who was involved directly in it. I made a brief inspection of Mrs Corr's house (type 1 archetype) on the 28th April 2024. I noted that, at roof level, there were gaps in the party wall and a lack of fire-stopping above it. This is a common problem, even in new build.

1.6 This report considers the evidence available to me regarding the fire at Moss Hall Grove and whether it supports Barnet's view that combustible wall cladding and the lack of fire-stopping is a serious

safety hazard requiring enforced remedial measures. It does not address the generalised HHSRS assessments that have been made by Barnet for each of the four house archetypes.

2.0 INFORMATION ON THE FIRE

2.1 I have been unable to find much hard evidence as to exactly what happened in this fire. Most press reports seem to be re-hashes of others. None has been written by a reporter attending the scene: instead, the primary sources were information and photographs released by London Fire Brigade's Press Office. The clearest and most comprehensive report that I could find was by Parikiaki, a news outlet for the Greek and Cypriot communities in the UK – see Appendix 2 and https://www.parikiaki.com/2023/06/fire-at-terraced-houses-north-finchley/.

2.2 A specialist investigator with the London Fire Brigade attended the fire. I have spoken to a fire officer in the investigation department. He had not attended the incident himself. He confirmed that an investigation had indeed taken place but no full report had been prepared, just the summary reproduced in Appendix 3. I was told that the investigator would have made notes and taken photographs but, in order to obtain further information, I would have to conduct an interview, for which there would be a charge. I asked the meaning of the phrase "plastic – raw material only" which had been given in relation to the material mainly responsible for the development of the fire. The officer did not know but agreed it was unlikely to refer to the cladding as it should have been stated clearly if this had been the case. The summary states that no samples were taken.

2.3 I have not spoken to any of the fire-fighters who attended. This could be done by interviews, for which there would be a charge. The fire-fighters might be able to recall whether or not the cladding was a major factor in the spread of the fire. They could provide timings and might be able to recall what was burning externally and the intensity of the fire there.

2.4 A very brief video of the fire can be found at https://www.youtube.com/shorts/_3QiiMV1PP0. This shows billowing clouds of dark grey smoke that seem to be emanating from a large fire burning in the open air, rather than one inside a building. A still from this video is reproduced on the front cover. This video was taken from the junction of Ballards Lane and Woodberry Gardens, about 125 metres east of the fire. I do not know the exact time at which it was filmed.

2.5 As far as I am aware, no specialist fire investigators were instructed by insurers. Loss adjusters probably have photographs and other details of the damage.

2.6 As mentioned in paragraph 1.1, Capital PCC was instructed by Barnet Homes. Capital do not say when they attended the scene but they prepared a "Fire Spread Investigation Report" dated 13 July 2023. The author of this report was Sean Kelly. He states that he has the requisite level of

competence, having over 25 years of experience of property management and qualifications including a BSc in building surveying. He does not state what experience he has of fire investigation.

2.7 Capital state, in paragraph 1.3 of their report: "*The purpose of this report is not concerned with the cause of the fire, or an assessment of risk to life, but will examine the construction arrangements of the properties external walls and roof and whether the constituent materials and construction type actively assisted in the spread fire from the originating property to adjacent properties, at a rate which would be beyond normal expectations*".

2.8 The report does not give any information on the cause of the fire other than saying: "*It is understood that the fire originated and took hold at the rear of No. 11 and rapidly spread to the adjacent buildings either side …*". No information is provided in the report on the size and intensity of the external fire, how close it was to the rear wall of the terrace, what was burning and how long it took before the houses ignited. No eyewitness evidence is presented. It seems no internal investigation was carried out, not even in the end house which had only suffered serious damage at roof level. It seems that no samples were taken and no ignitibility or other fire tests were conducted. The photographs used in their report were all taken from outside. I have reproduced some of these photographs in the illustrations section of my report.

2.9 Capital state in paragraph 2.1.3 of their report that the external wall finish was a mixture of uPVC shiplap cladding and plywood sheet cladding with an exterior finish of fabric and paint. They refer to photographs 6, 7 & 8 in their report. I cannot see the remains of plywood sheeting in any of them but there are certainly other areas that are clad with a board material that may well be plywood (see photograph 10 in their report and photographs 14 & 16 in my report). Capital suggest that the uPVC cladding was a later addition. I agree. It seems that the original cladding had been stripped off in places since some photographs (e.g. photograph 6 in their report, photograph 12 in mine) show areas of uPVC cladding with no other cladding beneath it.

2.10 No actual evidence of the mechanism by which the fire spread is presented in the Capital report. Instead, Capital argued that, since the uPVC wall cladding bridged the line of the party wall - in their view in contravention of Building Regulations B3 and B4, and also PAS9980 – that it "*presents a significant risk as evident in this* case" and it can be concluded that it acted as "*a conduit for the spread of the fire*" between the houses – see paragraphs 3.6.1 & 3.6.2 of their report. I disagree. (PAS9980 is a Publicly Available Specification issued by the British Standard Institute. It is a comprehensive document giving guidance on the fire risk of external wall construction. It is primarily concerned with medium- and high-rise blocks of flats and, in my view, has little relevance to two-storey housing.)

2.11 Capital have presented evidence that no cavity barriers had been installed to sub-divide the eaves box at the lines of the party walls, contrary to Building Regulations. However, they did not show that there had actually been any fire-spread via this route. They also speculated that fire could have spread between the houses at roof level because of a lack of fire-stopping above the party walls. Again, they do not present clear evidence but I do consider that there was fire-spread, at least to the house furthest from the fire origin, via this route.

2.12 Richard Lord, an Environmental Health Officer with Barnet Council's Tower Block Team, prepared a report dated 10th August 2023 in respect of the burnt houses. Most of his report is an HHSRS assessment of the fire hazard but he presents some details of construction based on a visual external inspection that was carried out on 3rd August 2023. As Mr Lord acknowledges, a thorough HHSRS assessment requires a full internal and external inspection. However, no internal inspection was carried out, on the grounds that the houses were structurally unsafe. (I doubt that this applied to the least damaged, no 15.) No internal inspections were made of any of the similar houses nearby "*for fear of causing unnecessary anxiety to the occupiers*". No eye-witness evidence is presented.

2.13 Mr Lord considers that the houses at Moss Hall Grove were probably built in the 1970s. He states in paragraph 5.1 that: "*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*". He further suggests that asbestos boarding might have been used originally. He does not, however, provide any actual evidence to show what the original façade was, or that it was "fire-resistant". There was mineral wool insulation present but this could have been from the original construction.

2.14 Paragraph 5.6 of Mr Lord's report states that the uPVC cladding had been fitted over plywood sheeting. As mentioned in my paragraph 2.9, the plywood is clearly absent in some places. There is no evidence of such plywood at the rear in the areas where the uPVC cladding has fallen away (photograph 12 in my report).

2.15 The two photographs in paragraph 5.7 of Mr Lord's report show areas where pieces of uPVC cladding have been pulled away after the fire, exposing what Mr Lord states is the underlying plywood. I am reluctant to accept that this is plywood, rather than breather paper encasing the insulation, but I accept that Mr Lord had the benefit of direct examination. The first of these two photographs does show a section of vertical board, at the party wall, but I do not think Mr Lord is referring to this.

2.16 Neither Mr Lord nor Capital specifically refer to the vertical sections of board that had been fixed, at the lines of the party walls, to cover the gaps between the edges of the timber wall frames and their concrete support posts (see photographs 13, 14 & 16). This board might well be plywood: it has been destroyed in heavily fire-damaged areas. Much of this boarding had been overlaid with

the uPVC cladding but some areas remained exposed (photographs 15 & 16). I cannot say whether or not sections of this boarding had been removed before the uPVC was fitted but I see no reason why this would have been done. In some places, a non-combustible material has been used in its place (photographs 9, 13 & 14) but I think that this is likely the result of repairs, especially as the non-combustible material seems only to extend to the property line.

2.17 Had the areas behind these vertical boards been packed with insulation, it could also have provided fire-stopping at the line of the party wall, even if this had not been the specific intention. Neither Capital nor Mr Lord seem to have removed sections of board to explore this possibility.

2.18 Photograph 3 in my report shows an image from Microsoft Maps taken on an unknown date before the fire. It can be seen that the yard behind no 11 was cluttered and contained a large shed and several other structures. Photographs 8 and 10 show that the fire had destroyed the shed, and consumed all the other structures and contents of this yard, together with the panel fences either side and to the rear. This fire area extended over about 50 square metres, consistent with the large fire seen in the video (see the still image reproduced on the frontispiece). In my opinion, the extent of the damage to the cladding on the rear of the terrace corresponds to the size of this external fire.

3.0 DISCUSSION

3.1 In my opinion, there is no evidence to show that the severe damage to this terrace was caused by the horizontal spread of fire across the uPVC cladding. Instead, I consider that the external fire that started in the yard behind no 11, became so large that flames from it impinged on the rear walls of three houses, causing a large area of uPVC cladding to fall away. This would have exposed the underlying timber frame to ignition but fire could also have spread into the houses via doors and windows, and at the eaves. In my opinion, the high fuel load in the yard presented a far greater hazard to health and safety than the cladding or any other defects in the buildings.

3.2 The uPVC cladding certainly continued across the lines of the party walls, as can be seen in photographs 1 & 2. Much of the cladding at the rear of the terrace had been destroyed but, in the areas where the cladding remained in place, it was clear that fire had not spread across its surface (photographs 11 & 12). The cladding on the front wall of the terrace had not contributed to fire-spread at all, despite the severe fire burning inside the houses (photograph 5).

3.3 It is stated in paragraph 2.1.4 of the Capital report that uPVC cladding and timber sheet cladding are considered combustible materials and generally have Euroclass ratings of C/D and D respectively. I do not disagree but would point out that, when the houses were constructed, and possibly when the cladding was replaced, uPVC cladding was considered acceptable as it is of limited combustibility

and could achieve a Class 1 rating when tested to BS 476 Part 7. This test was designed to measure the propensity of a material on a wall to support the horizontal spread of flame across its surface. I consider that the test achieved this aim. However, it provided no information on the upward spread of fire. Upward spread will normally be more rapid and extensive than horizontal spread for the simple reason that natural convection causes heat to rise, rather than travel sideways. Despite this short-coming, ratings achieved under the Part 7 test were used for many years in the selection of materials for wall cladding where the vertical spread of fire should have been a concern, and in other situations, such as ceilings, where the test again did not provide appropriate information.

3.4 Whilst I do not consider that the uPVC cladding supported the horizontal spread of fire, it could have contributed to the upward spread, even if only by softening and falling away, thus exposing the combustible timber frame. However, the size of the external fire was probably so large that flames might have reached to the eaves in any case. Current Building Regulations make no requirements to limit combustibility of external wall cladding on low-rise housing as long as the wall is at least 1 metre from the party wall or other relevant boundary.

3.5 As Capital state in section 3.3 of their report, Building Regulation B3 requires the sub-division of a building into separate fire compartments in order to limit the size to which a fire can grow before it has to penetrate fire-resisting barriers. Each house in a terrace and each semi-detached house is treated as a separate building, each being a fire compartment. The party walls that separate the houses are required to have 60 minutes fire resistance as regards stability, integrity and insulation. In order to achieve this, the party wall must not have any holes and any small gaps between its edges and the outer envelope of the building, such as the roof tiles, must be fire-stopped. Combustible materials, such as roof battens, are allowed to run over the wall so long as they are fully enclosed by the fire-stopping. Voids in enclosed eaves should be sub-divided with cavity barriers in line with the party wall. Suitable methods of construction are shown in the diagram in paragraph 4.1.3 of the Capital report, and in Defect Action Sheets DAS7 and DAS8 reproduced in Appendix 4.

3.6 There is no evidence that the external walls contained un-fire-stopped gaps that allowed the fire to bypass the party walls. There was certainly an absence of a cavity barrier in the continuous eaves void at the one point at which this feature had been examined (photographs 15 & 16). Its absence provided an unrestricted path for the spread of fire but, in the event, this had not occurred at this location.

3.7 The spread of fire to the least damaged house (no. 15) seems to have occurred entirely at roof level. Neither Capital nor Mr Lord present any evidence as to what specific defect allowed this spread to occur. I consider that the most likely reason was a lack of fire-stopping between the tiling battens, as illustrated in DAS8.

3.8 Given the extent of the remedial work that house owners might be required to carry out, and the cost and disruption involved, I consider it unfortunate that no fire tests, ad-hoc or otherwise, seem to have been carried out to gain information as to the actual hazard presented by the cladding. Since the damaged terrace was to be demolished, it would have been possible to have removed cladding for tests, or even carried out ad-hoc ignition tests in situ. Instead, the view that the cladding presented a serious risk to health and safety relies more on supposition than hard evidence.

3.9 Whilst I do not discuss Mr Lord's HHSRS assessment in this report, I would like to point out that the fire-spread scenario that he presents in section 7.3 in the paragraph beginning "*The inside of the cavity ignites …*" is, in my opinion, wholly unrealistic.

4.0 CONCLUSIONS

4.1 In my opinion, the destruction of this terrace occurred because three of the houses were directly exposed to heat and flames from an unusually large external fire. This destroyed the wall cladding but also probably ignited the houses via doors, windows and the eaves.

4.2 There clearly had been no spread of flame across the surface of the uPVC cladding in the areas where this still existed, despite heat damage to the cladding. The cladding on the front wall had remained in place, despite the severe fire within the houses, and had played no part in the spread of fire.

4.3 No fire tests were carried out on the cladding to determine its relative combustibility or its propensity to spread fire. Instead, it seems to have been assumed that, because uPVC is classed as a combustible material, it must have been responsible for the rapid spread of fire in this incident.

4.4 The cladding was not a factor in the spread of fire to the end house. This spread occurred at roof level and was probably due to a lack of fire-stopping where the tiling battens passed over the party wall, a common defect.

4.5 In my opinion, the greatest hazard to health and safety in this incident was the high fuel load present in the yard where the fire originated. This resulted in a major fire, much larger than would be expected of an external fire in a domestic setting. Flames from this fire directly ignited the rear of three houses, resulting in their destruction.

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16th July 2024