

Grenfell Tower – fire safety investigation:
The fire protection measures in place on the night of the fire, and conclusions as to:

The extent to which they failed to control the spread of fire and smoke;
The extent to which they contributed to the speed at which the fire spread.

Phase 1 Report – Section 20

The consequence of the failures in Grenfell Tower

REPORT OF

Dr Barbara Lane FREng FRSE CEng

Fire Safety Engineering

24th October 2018

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|---------------------------|---|---|
| Specialist Field | : | Fire Safety Engineering |
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| On behalf of | : | Grenfell Tower Inquiry |
| On instructions of | : | Cathy Kennedy, Solicitor, Grenfell Tower Inquiry |
| Subject Matter | | To examine the circumstances surrounding the fire at Grenfell Tower on 14 th June 2017 |
| Inspection Date(s) | : | 6 th October, 1 st November, 7-9 th November 2017 |

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20 The consequence of the failures in Grenfell Tower

20.1 Purpose of this Section

- 20.1.1** I have described in Section 12 through to Section 18 what active and passive systems were provided in Grenfell Tower, their compliance status, and how they performed during the fire. This is based on the evidence available to me at this time.
- 20.1.2** I have explained in Section 19 how these contributed or not, to the spread of smoke and fire or how these failed to control the spread of smoke and fire.
- 20.1.3** In this section I describe the consequences of the failures. As a result, of the fire, seventy-two people lost their lives. In addition, there were other consequences including the physical injury experienced by survivors, the trauma experienced by the survivors and bereaved, as well as the loss of one hundred and twenty-nine homes.

20.2 Understanding the movement of residents who did not evacuate from Grenfell Tower

- 20.2.1** The MPS have recorded the location of all of deceased persons recovered within Grenfell Tower (MET00012529).
- 20.2.2** The MPS record (MET00012529) is currently for deceased persons recovered within Grenfell Tower, immediately outside Grenfell Tower and in hospital in the immediate aftermath of 14th June 2017. Therefore, these figures, currently record the location of 71 fatalities. There has been one further death since the fire, making the total 72.
- 20.2.3** I have analysed the recorded locations where the deceased were recovered, and compared those locations with the location of the flat where they are believed to have originated from, in Figure 20.1. For the purposes of this analysis, I have assumed that a person was in their own flat when the fire started, however this will need to be confirmed in due course.
- 20.2.4** At the time of writing, the Bereaved, Survivor and Resident oral evidence is still ongoing. I will need to update my analysis based on this evidence once it has been completed.
- 20.2.5** From my analysis to date, I have been able to conclude that:
- a) The fatalities in Grenfell Tower comprise people who were originally located on Levels 11 and 14 – 23 when the fire started on 14th June 2017.
 - b) On Levels 15 and 16 all fatalities found on these levels also resided there. No fatalities from any other location were recovered on these floors.

- c) On Levels 11, 14 and 17 -23, a proportion of the fatalities from these floors were not recovered within the flat I believe they were in when the fire broke out.

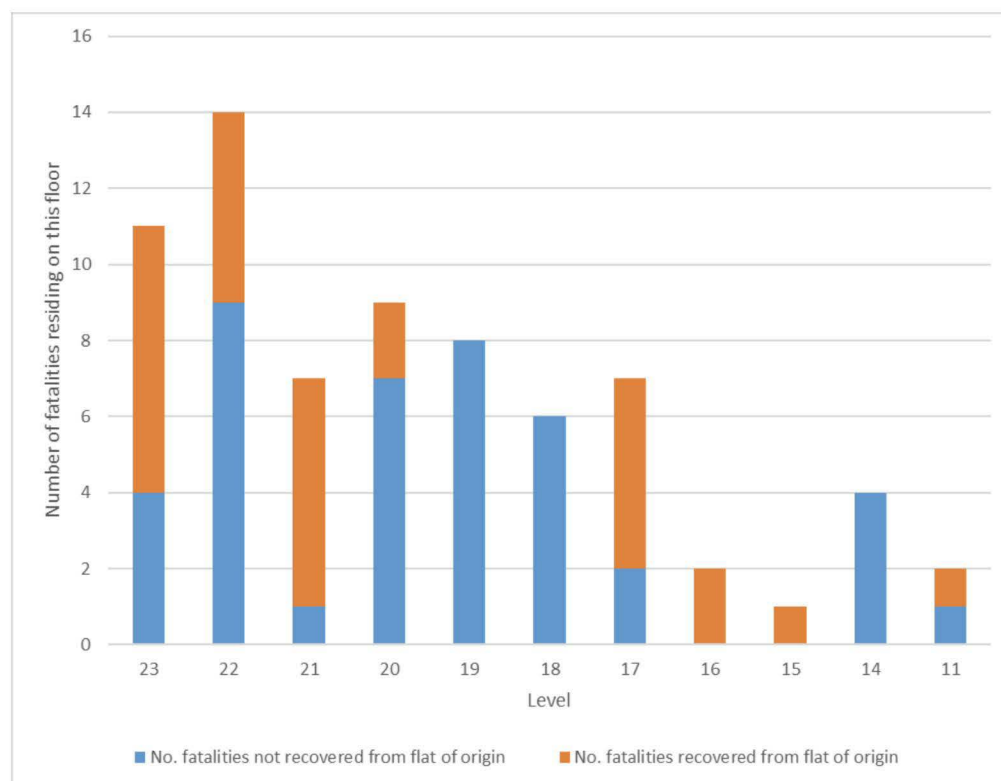


Figure 20.1 Number of fatalities in Grenfell Tower and location of their recovery compared to where they were located on 14 June 2017 (MET00012529)

20.2.6 I have therefore analysed the direction of movement of those residents, relative to the location where they were recovered from.

20.2.7 In this analysis, which I present in the following sections, I have been able to conclude that:

- a) Below Level 18 the majority of the deceased were recovered on the floor where they resided (Section 20.3);
- b) Above Level 18 significant numbers of the deceased had moved from their floor of fire origin (Section 20.4), and more specifically:
 - i. The majority of those residents, 15 in total, moved up to the flats on Level 23; and
 - ii. Eight of those residents had attempted to escape downwards through the single escape stair, but were recovered either in the stair or lobbies of floors L9, 13, 17 - 19;
- c) On three floors only, Level 14, 22 and 23 people moved from their flat to another flat on the same floor (Section 20.5);

- d) On every level of Grenfell Tower people escaped away from Flat 6, which was directly above the Flat 16 on Level 4, the location of the initial fire event. No fatalities were recovered from within Flat 6 on any floor (Section 20.6);
- e) The majority of the residents in Flat 6 on every floor evacuated the building before 01:32. Two people evacuated at 03:52, however, I believe they most likely moved to another part of the building before finally evacuating at this late time. The 11 people who did not evacuate successfully, moved to another part of the building (and 8 of those people moved up to Level 23).

20.3 Vertical direction of movement – From levels below Level 18

- 20.3.1** Thirteen of the fatalities were residents on Levels 11 -17 and were recovered on the floor on which they were residing on 14th June 2017. Three of these residents were recovered outside Grenfell Tower (Figure 20.2).

LEVEL 11 - 17

KEY

- FLOOR OF ORIGIN
- FLOOR OF FINAL LOCATION
- FLOOR OF ORIGIN & FINAL LOCATION THE SAME
- DIRECTION OF MOVEMENT

REMAINS RECOVERED
OUTSIDE GRENFELL
TOWER

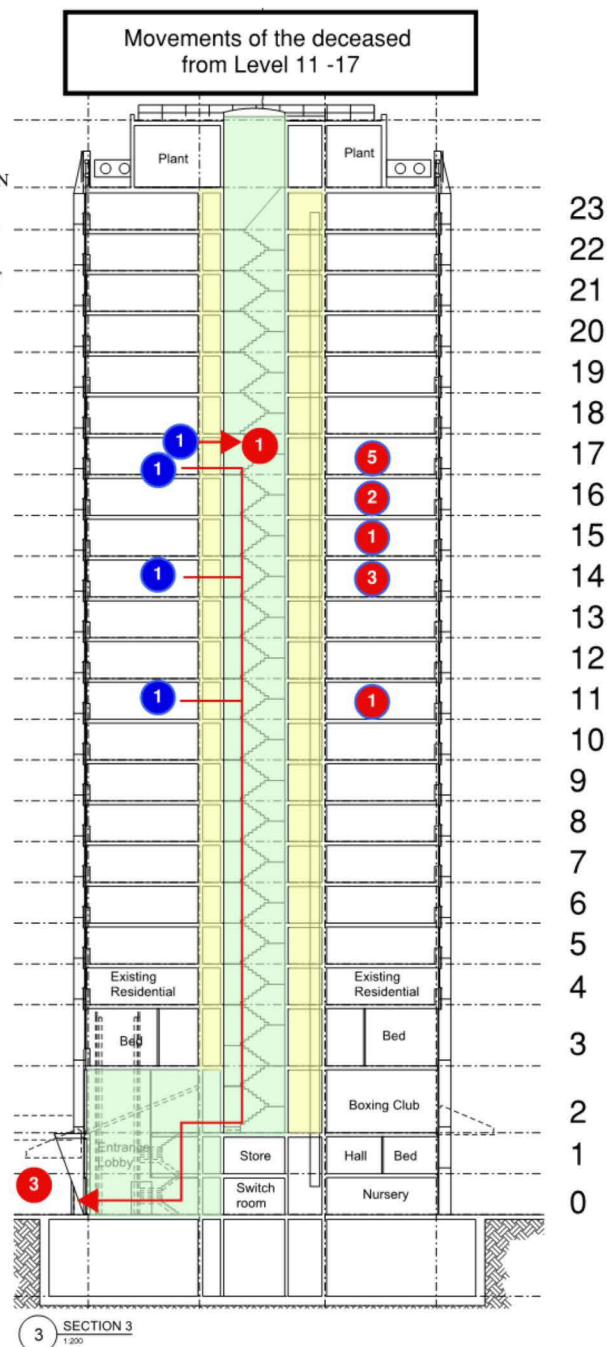


Figure 20.2 Movement of the deceased who were located on Levels 11 -17 on 14 June 2017 (MET00012529)

20.3.2 As I have explained in Section 14, thick black smoke was reported in lobbies from 01:20 and was present in increasing numbers of lobbies from 01:40 onwards. By around 02:40 the majority of lobbies contained thick black smoke.

20.3.3 Additionally, the conditions within the stair on Levels 13 – 16 in particular, appear to have been more severe than the other floors, for a period of time. The lack of any movement within the lobbies and stair, with respect to these

residents, contributes to the evidence of this particular hot zone. On Levels 11 – 17, twelve people were unable or unwilling to leave their flats; they were recovered in the same flat it is believed they were resident in.

20.4 Vertical direction of movement – Above Level 18

20.4.1 I have presented the original and final locations of the deceased from Levels 18 – 23 in Figure 20.3 and Figure 20.4.

20.4.2 A total of:

- a) 24 persons were found at Level 23,
- b) 11 persons were found on level 22,
- c) 6 persons on level 21,
- d) 2 persons on Level 20,
- e) 3 persons in the stair on Level 19; and
- f) 1 person in the stair in Level 18.

20.4.3 On Levels 20 -23 there were a number of people at each of these levels who remained within their flats. A total of 2 persons on Level 20, 6 persons on Level 21, 11 persons on Level 22 and 9 persons on Level 23. It appears these people were also unable or unwilling to attempt to escape using the protected lobbies and stair.

20.4.4 However, there are also two distinctions in location of the deceased from Level 18 and above (a total of 54 persons), compared with Level 17 and below (a total of 16 persons):

- a) A high number of people from Levels 18 – 22 moved upwards to Level 23 (a total of 15 persons). None of the deceased from Level 11 -17 were found on floors higher than where they were originally located.
- b) Eight (of those 15) people attempting to escape down from Levels 18 – 22 were recovered as fatalities within the stair and lobbies. Whereas from Levels 11 -17, one person, from Level 17 was recovered as a fatality after attempting to escape from their flat. They were recovered at Level 17.

20.4.5 In the following sections I have described these movements of people.

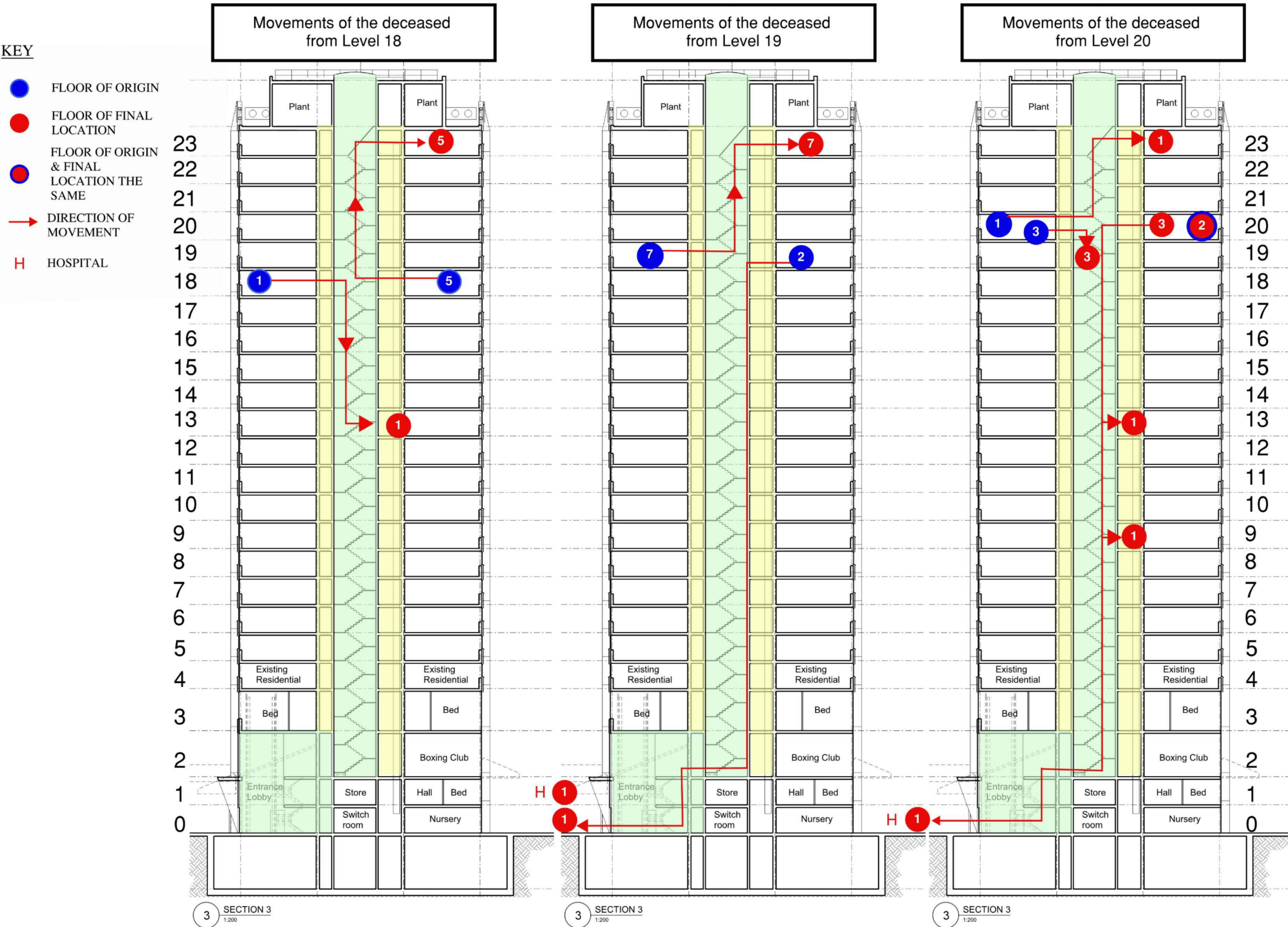
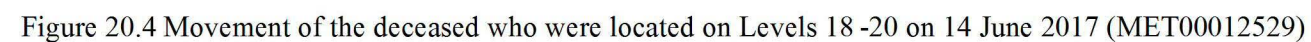


Figure 20.3 Movement of the deceased who were located on Levels 18 -20 on 14 June 2017 (MET00012529)



20.4.6 Movement of people upwards to Level 23

20.4.7 A total of 15 persons moved upwards from Levels 18 -21 to Level 23. On Level 23, 13 of those people were recovered within the flats and 2 persons from the lobby. This is in addition to the 9 people recovered from Level 23 who were also resident there.

20.4.8 I have presented the origins of all persons recovered on Level 23 in Figure 20.5.

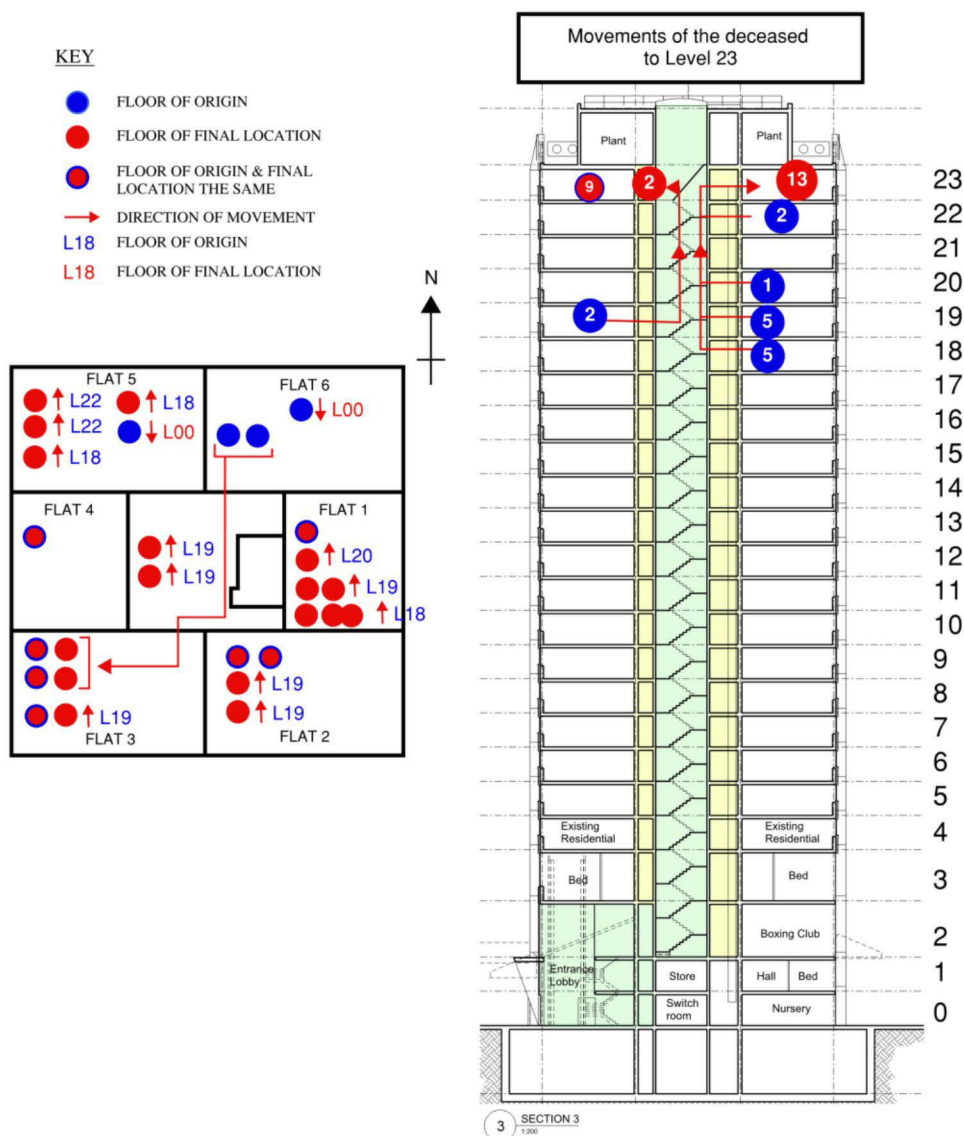


Figure 20.5 Movement of people from Levels 18 -22 upwards to Level 23 (MET00012529)

20.4.9 The majority of persons were recovered within the flats on Level 23. Two persons from Level 19 were recovered in the lobby of Level 23; it is unknown whether these people were in the process of trying to reach a flat on Level 23 or were attempting to escape having already done so.

- 20.4.10** I currently consider that the persons who moved from Levels 18 - 21 to Level 23, had departed from flats on the East side of the building: Flats 1 - 2 and 6, or Flat 5 which is on the North West corner of the building. Fire spread to these locations occurred early from 01:29 – 02:22 (Section 12).
- 20.4.11** Therefore, it appears the initial external fire spread from Flat 16 upwards (the Flat 6 on the East elevation on every floor above Level 4) and the subsequent spread on the North and East elevations (Flats 5, Flat 2 and 1), caused people to leave their flats.
- 20.4.12** This also coincides with the time, currently recorded, at which the stair and lobbies became logged with thick hot smoke (Section 14).
- 20.4.13** The resident witness evidence I present in Section 14.5 provides evidence as to why people perceived they were unable to escape down through the stairs between 01:20 to 01:49.
- 20.4.14** The resident evidence for this period provides the following explanations as to why people walked up the stairs:
- a) they encountered smoke in the stair and they perceived it as too smoky to escape; or
 - b) they were told to ‘go back’ by other residents; or
 - c) they considered the stair too busy to escape.
- 20.4.15** These people therefore moved up to the top floor of the building on Level 23.
- 20.4.16** The engulfing of Level 23 by the external fire occurred between 01:29 when it first reached Flat 6 on the East elevation and 03:43 when it finally reached Flat 3 on the South West corner. As this occurred, fire began to spread from the exterior to the interior of the flats. Therefore, for the persons already residing in the flats in Level 23 (11 persons) and those who I have described moving there (a further 15 persons) these flats progressively failed as a place of relative safety.
- 20.4.17** I have described the times at which this occurred and the number of fatalities recovered for each Flat on Level 23:
- a) On Level 23 no persons were recovered from Flat 6 on the North East corner of the building. The fire first spread to Level 23 at this point around 01:29 (Section 12). The persons within this flat moved to Flat 3, which was diagonally opposite Flat 6 across the central Lobby. I describe the fatalities who originated from Flat 6 further in Section 20.6.
 - b) Seven persons were recovered from Flat 1 at Level 23, including 6 persons from lower floors. Flat 1 is located on the East façade of the building. Fire had spread to the external wall of Flat 1 on Level 23 by 01:52 (Section 12).

- c) Four persons were recovered from Flat 2 including two persons from lower levels.
- d) Four persons were recovered from Flat 5, all of whom were from lower levels of the building. Flat 5 is located on the North West corner of the building. The external fire had spread to Flat 2 and Flat 5 on Level 23 by 02:10 (Section 12).
- e) Six persons were recovered from Flat 3 which is located on the South and West corner of the building. One person, the flat resident, was recovered from Flat 4, located on the West elevation of the building. This corner was the last to which the external fire spread; this occurred between 03:20 and 03:42.

20.4.18 The condition of the stair progressively deteriorated after 01:40 up to 03:39. Therefore, during the time at which the external walls to the flats on Level 23 were becoming engulfed by the fire, the conditions within the multiple lobbies, and within stair were becoming severe. There is currently limited evidence available to me regarding the conditions within the protected stair and lobbies after 03:39 as the London Fire Brigade withdrew crews from above Level 4 at this time. All 999 calls from inside any of the flats on level 23 stopped after 03:23 (LFB00000420, LFB00004695).

20.4.19 Rescue was therefore not possible by LFB because they had withdrawn from above Level 4.

20.4.20 However, it should be noted between 01:52 and 02:10 the formal fire survival guidance was still to 'Stay Put'. Therefore, it is likely that residents calling 999 during this time were not advised to self-evacuate.

20.4.21 Only two people escaped from Level 23. They were located in Flat 205 and exited the building at 02:42 (MET00016072 MET00016072, MET00012529). This was after fire had spread externally to Flat 205 (Section 12). They took the decision themselves to self-evacuate (IWS00000886).

20.4.22 The consequence of the contribution of the external wall construction to the spread of fire and the simultaneous failure of the internal active and passive fire protection systems to control the spread of fire and smoke on individual lobbies, resulted in persons becoming trapped, or perceiving they were already trapped, within the flats on Level 23.

20.4.23 I have provided a more detailed investigation of the conditions on Level 23 using new evidence in Section 20.8.

20.4.24 **Fatalities which occurred during escape in the protected stair and lobbies**

20.4.25 Eight people were recovered from the protected stair and lobbies on floors below where there are believed to have originated from during the fire. It therefore appears that these people attempted to escape from their flat but were unable to reach ground level via the lobbies and stair due to the conditions within.

- 20.4.26** I have presented the origins of all persons recovered within the stair and lobbies in Figure 20.6. Persons were recovered from the protected stair and lobbies on Levels 19, 18, 17, 13 and Level 9.
- 20.4.27** The precise time at which these persons attempted to escape is currently unknown. In Table 20.1, I have included the last recorded 999 call times from those residents. This is not the precise time at which they attempted to escape; it is the last time they were known to have been inside a flat and therefore not yet in the stair or lobby.
- 20.4.28** These times are between 02:11 and 03:33. The majority (5 out of 8) are after 03:00.
- 20.4.29** Therefore, it appears, the consequence of the failure to control the spread of fire by means of the internal active and passive fire protection measures created fatal conditions within the protected escape stair of Grenfell Tower for a number of people who attempted to escape through it.

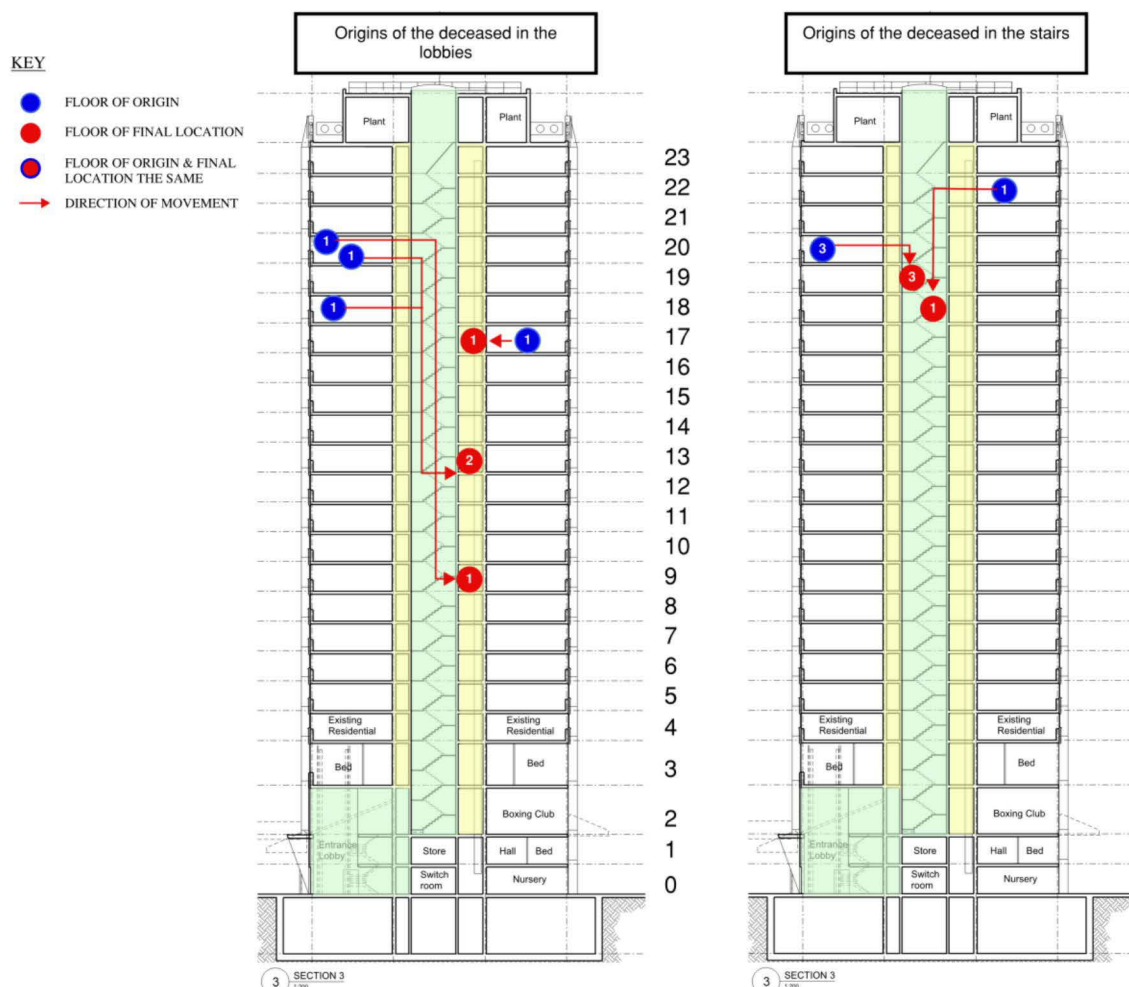


Figure 20.6 Fatalities which occurred in the protected stair and lobbies as people attempted to escape downwards from above Level 17 (MET00012529)

Table 20.1 Last know call times from those fatalities recovered from the stairs and lobbies of Grenfell Tower

| Name | | Origin | | Recovered | Stair/Lobby | Time (LFB0004695) | Source | Reference |
|---------|---------|--------|------|-----------|-------------|----------------------|--|-------------|
| | | Level | Flat | | | | | |
| Husna | Begum | 17 | 142 | 17 | Lobby | 03:20 | Last 999 call time | LFB00000419 |
| Issac | Paulos | 18 | 153 | 13 | Lobby | 03:26 | Last 999 call from Flat 153 | LFB00000574 |
| Mary | Mendy | 20 | 173 | 13 | Lobby | 03:33 | Last 999 call made by friend outside of the building | LFB00000583 |
| Khadija | Saye | 20 | 173 | 9 | Lobby | 03:33 | Last 999 call made by friend outside of the building | LFB00000583 |
| Omar | Belkadi | 20 | 175 | 19 | Stair | 02:11 | Last 999 call from Flat 175 | LFB00000342 |
| Farah | Hamdan | 20 | 175 | 19 | Stair | 02:11 | Last 999 call time | LFB00000342 |
| Leena | Belkadi | 20 | 175 | 19 | Stair | 02:11 | Last 999 call from Flat 175 | LFB00000342 |
| Anthony | Disson | 22 | 194 | 18 | Stair | 03:02 | Last 999 call time | LFB00000395 |

20.5 Movement of people on a floor in Grenfell Tower

- 20.5.1** In addition to the vertical movement of people, it appears that people on Levels 14, 22 and 23 moved from their flat to another flat on the same floor (Figure 20.7). This was either by their own decision (Level 22 and Level 23) or because they were moved by LFB (Level 14).
- 20.5.2** In all cases people moved from the North and East side of Grenfell Tower (Flat 6, 5 or 1) to Flat 3, which was diagonally opposite, on the South and West elevations. The position of Flat 3 also meant it was the last flat on every level the external fire spread to (as I have shown in Section 12).
- 20.5.3** This provides further evidence that the external fire spread caused people to leave their flat but that they were unable or unwilling to use the escape stair to evacuate from the building.
- 20.5.4** Rosemary Oyewole (IWS0000852) who was a resident of Flat 113 on the 14th floor also describes people being from moved by the fire service from other flats (Flat 115 and 111) to their flat around 02:00 as it was 'safer'. The three residents moved to Flat 113 from Flats 115 and Flat 111 did not escape nor were they rescued from the Flat.

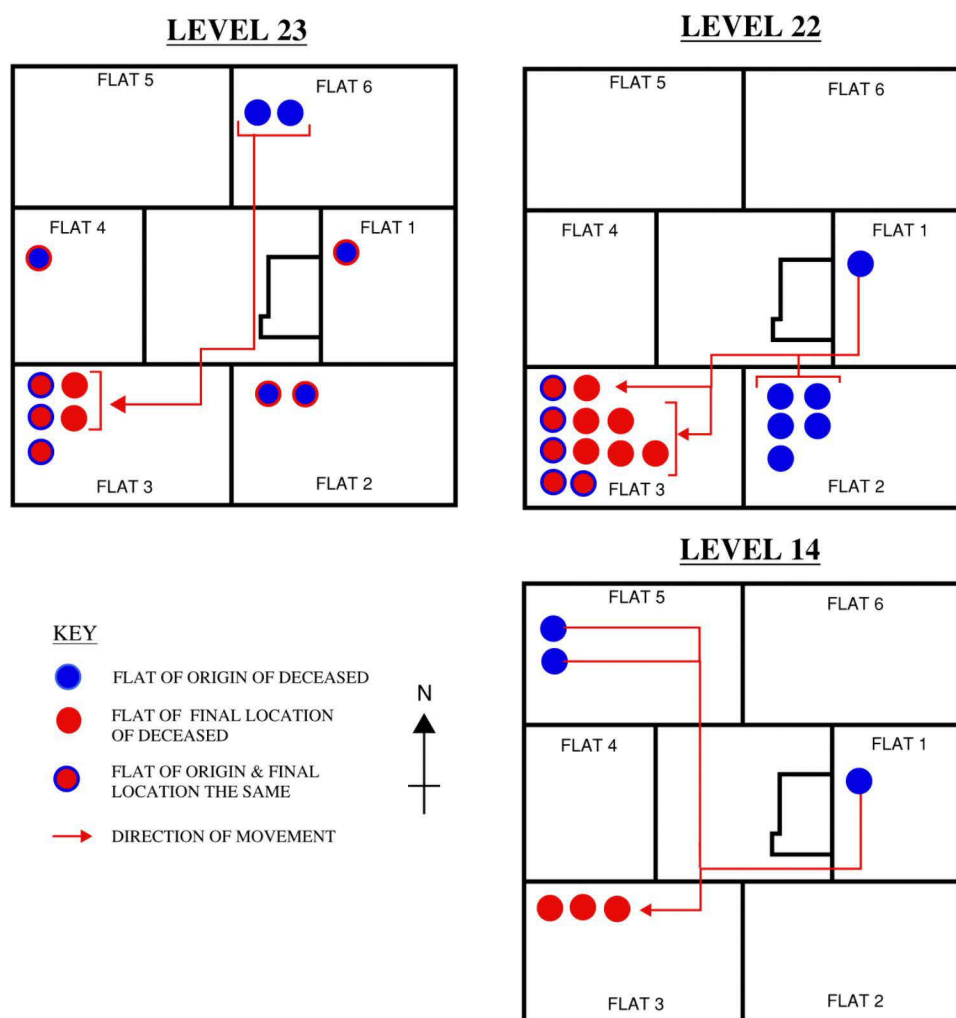


Figure 20.7 Movement of people within floors in Grenfell Tower (Levels 14, 22 and 23) (MET00012529)

20.6 Movement of people from Flat 6

- 20.6.1** In my assessment of the location of fatalities within Grenfell Tower. I have also observed that no fatalities were recovered from within Flat 6 on any level of the building. As I have explained in Section 5, the fire initially spread vertically from Flat 16 to roof level.
- 20.6.2** In Figure 20.8 I have illustrated the evacuation times (MET00016072) where occupants of Flat 6 were able and willing to escape to ground level. This occurred on Levels 4 -18, and 20. All evacuations from these flats was prior to 01:40, after which time the stair is currently evidenced as becoming increasingly smoke logged, and after which time the evacuation rates slowed substantially. If residents were still in the building after this time, and particularly after the change in 'Stay Put' guidance from around 02:35, their ability to self-evacuate was substantially reduced.

- 20.6.3** The exception is Level 21, where two occupants escaped from Grenfell Tower between 03:27 and 03:52. These two occupants escaped at the same time as the family in Flat 183 on level 21. The external fire spread to the walls of Flat 183 on Level 21 occurred between 03:21 and 03:43 (Section 12). These residents appear to have made their own decision to leave in the very last minutes possible from that location.
- 20.6.4** There were a total of 11 fatalities of people residing in Flat 6. Eight of those fatalities were recovered at Level 23, including 6 from Levels 19, 20 and 22. Three of those people were recovered outside Grenfell Tower including Ali Jafari who was separated from his daughter whilst trying to use the lift to escape from Level 11. Those persons recovered from outside may have been moved there by LFB during the fire.
- 20.6.5** This is particularly strong evidence that complying with the ‘Stay Put’ guidance from LFB, substantially reduced the ability to self-evacuate, after 01:40am, and particularly so after the guidance changed around 02:35.
- 20.6.6** In analysing these figures, after the event, it is clear to me that the window from 00:58 to 01:40 was when a total evacuation of Grenfell Tower needed to occur.
- 20.6.7** A recognition that a total failure of the compartmentation had occurred by 01:26 was exceptionally important. That this would trigger a change in the Stay Put guidance, was also exceptionally important.
- 20.6.8** From 01:19 to 01:38 more and more lobbies were filling with thick black smoke, becoming increasingly untenable. However, in that time it is important to note 110 people did evacuate from multiple levels, including above Level 13 In the building.
- 20.6.9** Between 01:39 and 01:58 the rate of evacuation slows, just 20 people evacuate in this 20 minute window. Thick smoke with low to zero visibility is described as filling the stair, which is increasingly hot below Level 20. Additionally, lobbies on levels 6-10, 14, 19 and 20 are all described as being smoke filled. Lobbies on Levels 6 - 10 are described as containing smoke hotter than the stair
- 20.6.10** Between 01:59 and 02:38 just 13 people evacuate. Extreme heat was occurring in multiple lobbies throughout the building. The highest floor to evacuate from during this period was Level 20. At 02:25 a resident overcome by the conditions with the stair was carried out by fire-fighters.
- 20.6.11** I have taken no account of any person of those who died, who could not ever have self-evacuated (for example due to disability). A full record of such persons is required, so that those specific consequences can be clearly considered and addressed.

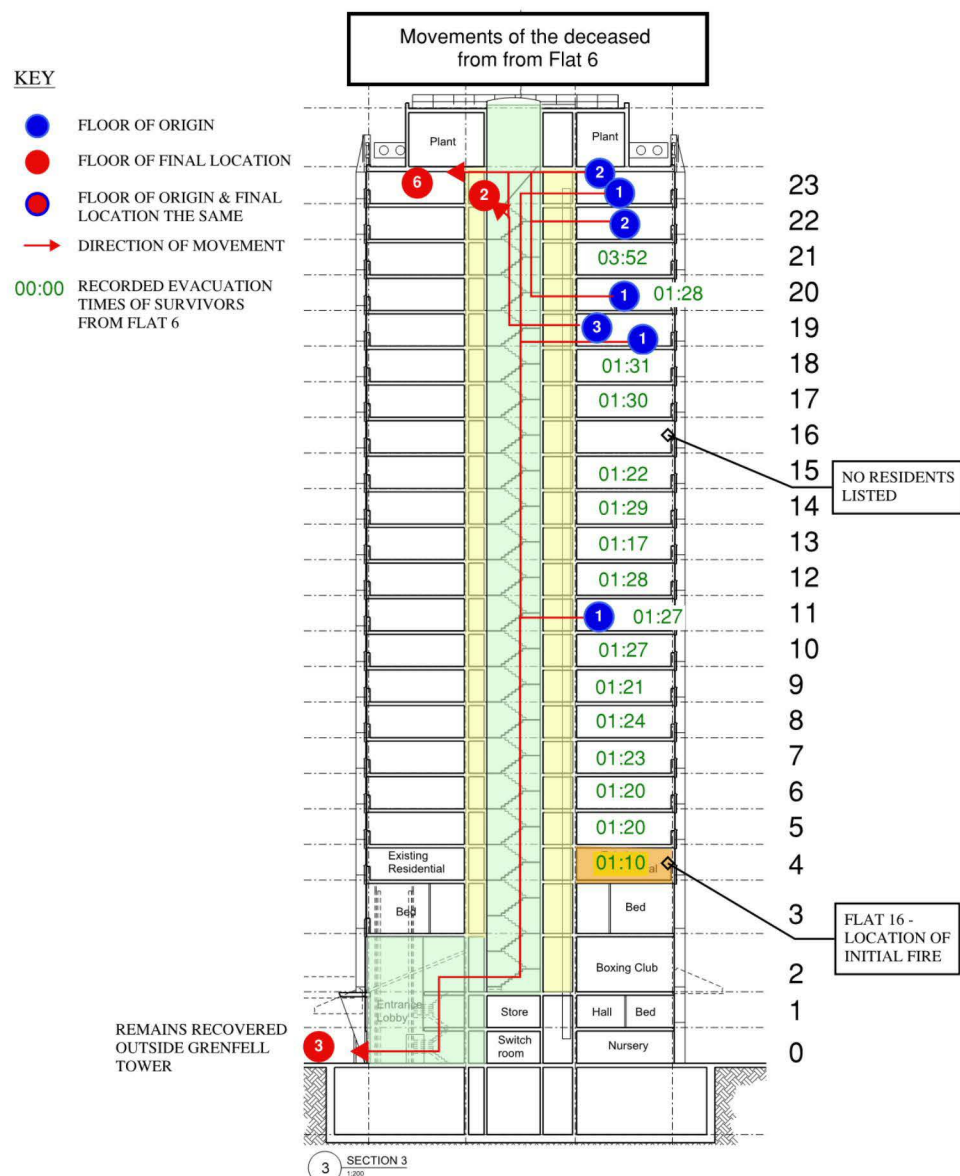


Figure 20.8 Original and final locations of Flat 6 fatalities (MET00012529) and Flat 6 evacuation times (MET00016072)

20.7 Overall summary of movement of the residents who deceased at Grenfell Tower

- 20.7.1** On Levels 11 – 17 a total of 12 people remained within their flats. They were either unable or unwilling to attempt to escape through the conditions in the protected lobbies to the stair in Grenfell Tower.
- 20.7.2** On Levels 18 – 23 a total of 28 people also remained within their flats, either unable or unwilling to attempt to escape through the conditions in the protected lobbies to the stair of Grenfell Tower.
- 20.7.3** The initial fire spread on the East elevation to each Flat 6 on every floor above Level 4 appears to have caused people to leave these flats. The

residents of Flat 6 below Level 19 appear to have been able to escape downwards. However, residents from Flat 6 on Level 19 and above appear to have been unable or unwilling to escape downwards using the protected stair and instead moved to either another Flat on the same floor or upwards to Level 23.

- 20.7.4** The times the Flat 6's above level 18 are affected by the external fire correlates with the evidence of people walking up the stairs between 01:20 and 01:41, which I present in Section 14.5.
- 20.7.5** Following the initial fire spread on the East elevation, subsequent lateral spread on the East and West elevations to Flats 1, 2 and 5 respectively caused people on Levels 18 -22 to leave their flats. In total 15 people left their flats on Levels 18 -22 and moved to Level 23. I provide a further analysis of the consequences for residents who moved to Level 23 in Section 20.8.
- 20.7.6** There is evidence on Levels 14, 22, and 23 that the early external fire spread on the East and North elevations caused people to move out of Flats 1, 2, 5, and 6, all of which have either an East or North or both external wall. On each of these levels people moved from these flats, to Flat 3 on the South West corner of the building. This was the last corner of the building to be engulfed by the external fire. I provide a further analysis of the consequences for residents who moved from flats on the East and North elevations to the South West corner in Section 20.8.
- 20.7.7** Finally, a limited number of people (8 persons) from Levels 17, 18, 20 and 22 attempted to escape but were recovered as fatalities within the protected lobbies and stair on floors below where I believe they started their escape.
- 20.7.8** The fatalities of the persons who remained within their flats, persons who moved to another flat on the same floor or a higher floor and persons who attempted to escape via the protected lobbies and stair is a consequence of:
- a) the conditions within the protected lobbies;
 - b) the conditions experienced in the stair and in particular the conditions in the lower parts of the stair as relayed to them during their first journey down the stair, causing them to turn back;
 - c) the conflict created by changing the guidance from stay put to self-evacuate, in circumstances where residents would have to evacuate through conditions considerably worse than if they had decided to self-evacuate earlier in the fire;
 - d) the options available to residents to alert LFB rescue teams to their location and safely await rescue before conditions around them prevented them from self-evacuating; and
 - e) the ability of LFB to understand all the locations of those requiring rescue, and to reach them before self-evacuation was no longer possible.

20.8 Effect of external fire spread and internal conditions for people on Levels 20 – 23

- 20.8.1** In the following sections, I have reviewed the collated evidence from resident witness statements and transcripts of 999 calls. Where either type of evidence is used I have presented the specific reference. At the time of writing, the Bereaved, Survivor and Resident oral evidence is still ongoing. I may need to update my analysis in light of the oral evidence in due course.
- 20.8.2** The times for all 999 calls quoted in this section have been taken from LFB00004695 unless otherwise stated.
- 20.8.3** The times for people evacuating Grenfell Tower quoted in this section have been taken from MET00016072.
- 20.8.4** I have investigated the consequences of external fire spread and the progressive internal spread of fire and smoke within Grenfell Tower for three individual flats on Levels 21 -23.
- 20.8.5** Firstly, for Flat 201 which was the second flat to which fire spread on the 23rd Floor. There were 7 fatalities in Flat 201; the resident of the flat and 6 people resident on lower floors who sought shelter there.
- 20.8.6** Secondly, for Flat 193, which was the last flat to which fire spread on the 22nd floor. There were 11 fatalities in Flat 193 and 2 survivors. This includes the five residents of Flat 193 and 8 people who sought shelter there.
- 20.8.7** Finally, for Flat 182 on the 21st floor. There were 5 fatalities in Flat 182 all of whom were residents of the flat.
- 20.8.8 Level 23 Flat 201**
- 20.8.9** Flat 201 was the second flat, after Flat 206 on the 23rd floor, to which the external fire spread. Please refer to Figure 20.9 where I illustrate the collated evidence supporting this Section 20.8.8.
- 20.8.10** Seven residents of Grenfell Tower were recovered from this one bedroom flat, including the resident of Flat 201. The six other people were residents of:
- a) one person from Level 20: Flat 176,
 - b) two people from Level 19: Flat 161 and Flat 166; and
 - c) three people from Level 18: Flat 154 and Flat 155.
- 20.8.11** I have presented in Section 14.5 witness evidence regarding why people walked upstairs in Grenfell Tower. In this section I investigate the consequences for those people who did.
- 20.8.12** Flat 201 sits between column C5 and B5. It has only one external wall between these two columns on the east elevation. The external wall contains three windows and two insulating core panels. The only rooms within the flat which are not bounded by the external wall are the corridor and bathroom.

- 20.8.13** The external fire reached the top of Grenfell Tower by 01:29 by spreading vertically up column B5 on the east elevation.
- 20.8.14** By approximately 02:05 the external fire had spread the full length of the external wall of Flat 201 to column C5. This is 34 minutes after the first reached column B5.
- 20.8.15** There were two 999 calls made by three separate people sheltering inside Flat 201. The first call was made at 01:30 and lasted until 02:24:25. (LFB00000507). During that call two other calls were made at 01:32 lasting until 01:36 (LFB00000667) and the third at 01:41 lasting until 02:21 (LFB00000486).
- 20.8.16** I have read the transcripts of these calls, they provide evidence that:
- a) Residents from Levels 18, 19 and 20 had moved to Level 23 between 01:30 and 01:41. This is the window of time all three 999 calls were first made.
 - b) The 999 call started at 01:30 reported smoke in the lobby of Level 23.
 - c) All three 999 calls refer to smoke within Flat 201 at the start of the calls
 - d) All three 999 calls refer to the external fire spreading into Flat 201 during the calls. It is not possible to define a precise time for this, as the call durations were long.
 - e) All three 999 calls indicate the person was unable to make themselves leave Flat 201, even whilst the external fire spread into the flat. It is not clear from the calls whether this was due to the perceived severity of the conditions in the Level 23 lobby, or from fear of whatever the three people encountered earlier in the fire and resulted in them moving up through the building.
- 20.8.17** The last 999 call ended at 02:24. From my investigation of the external fire spread fire had spread the full length of the Flat 201 external wall by around 02:05.
- 20.8.18** From the content of the 999 transcripts, the external fire spread into the flat progressively first through the living room kitchen adjoining column B5 and then finally to the bedroom.
- 20.8.19** Therefore, the external fire spread very rapidly to Flat 201 after the six people from other floors appear to have sought shelter there.
- 20.8.20** The evidence currently is that the conditions within the stair and lobby at Level 23 prior to 01:30 when these residents moved to Flat 201 were not too severe at this time. From Section 14.5 the resident witness evidence indicates people were walking upstairs between 01:20 and 01:40.
- 20.8.21** However, as conditions steadily worsened in Flat 201 after 01:30, the residents reported they were unable to leave. This may have been due to the

conditions within the hallway of the flat itself, whilst the residents sheltered in the bedroom or the lobby.

- 20.8.22** I have seen evidence from a 999 call of the resident of Flat 204 at 01:39 (LFB00000329) which appears to describe an inability see in the lobby of Level 23. *“It’s [smoke] not much come in, but I can’t go outside because I can’t see outside at all.”*
- 20.8.23** A resident who escaped from Flat 205 provided oral evidence on Day 60 of the Inquiry hearings (see Transcript 18 October 2018 at p38 – 43) Mr Neda describes black smoke slowly leaking from the Level 23 AOVs and filling up the lobby. He describes first observing this around 30 minutes after calling the TMO at 01:10 (oral evidence 18 October 2018 at p25) – therefore, this observation appears to have occurred around 01:40. He describes the smoke becoming steadily thicker. At p73-80 of the Transcript, Mr Neda times their decision to leave at approximately 02.17 and described the lobby as being full of thick smoke which was hotter than their flat.

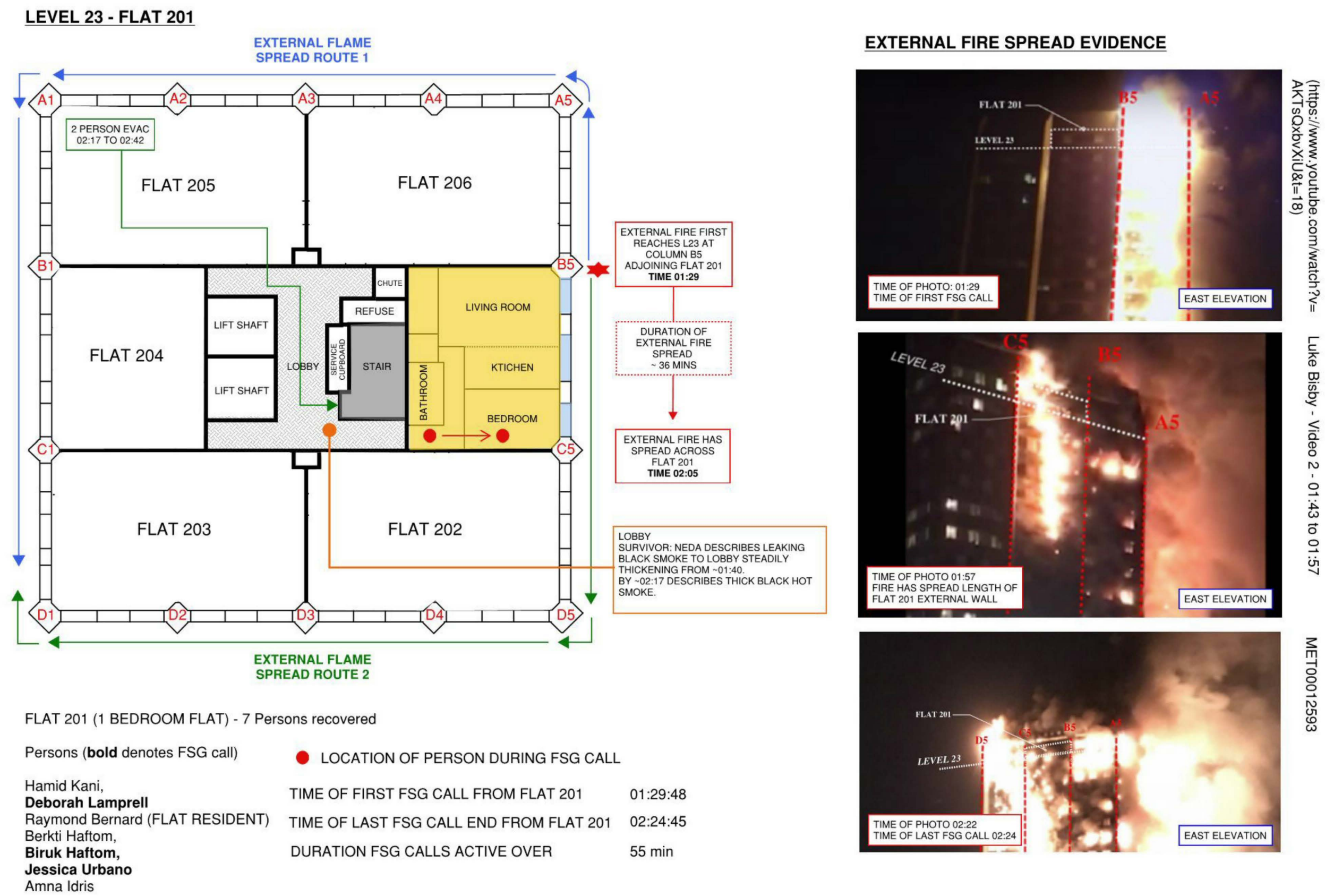


Figure 20.9 Collated evidence for Flat 201: External fire spread. First and last 999 call times from Flat 201 and evacuation times from Level 22

20.8.24 Level 22 Flat 193

20.8.25 Flat 193 is located on the South West corner of Grenfell Tower. As I have described in Section 5 and 12, the South West corner and therefore the Flat 3 on each level was last portion of Grenfell Tower to be affected by the external fire. Please refer to Figure 20.10 where I have illustrated the collated evidence presented in this section. Eleven residents of Grenfell Tower were recovered from this two bedroom flat including all five residents of Flat 193. The other six people were also residents of the 22nd Floor:

- a) One person from Flat 191; and
- b) Five people from Flat 192.

20.8.26 Flat 193 has an external wall on the south elevation between column D3 and D1. This external wall contains 4 glazed windows and two insulating core panels to the two bedrooms and the living room. It also has an external wall on the West elevation between column C1 and D1 which contains three windows and two insulating core panels to the kitchen and the living room. Therefore, the living room connects the south and west elevations. The only internal spaces separate from the external wall are the bathroom, a small store room by the flat entrance and the hallway.

20.8.27 The external fire first reached column D3 next to Flat 193 on the south elevation at 03:18; column D3 sits next to bedroom 2.

20.8.28 The external fire first reached column C1 next to Flat 193 on the West elevation at 03:52; column C1 which sits next to the Kitchen.

20.8.29 By 04:03 the external fire had spread the full length of both external wall elevations of Flat 193.

20.8.30 Therefore, approximately 45 minutes after first reaching Flat 193 the external fire spread had spread the full length of the Flat 193 external wall.

20.8.31 There were eleven 999 calls from inside Flat 193. The first call was at 01:30 and the last call ended at 03:39. Therefore 999 calls were being made from Flat 193 over a 2h9min period.

20.8.32 The witness statements (IWS00000515, IWS00000505) and 999 calls of two residents from Flat 195 place them in Flat 193 between 01:30 and 03:08 (LFB00000311 and LFB00000404).

20.8.33 I have read the transcripts of these 999 calls and the two witness statements, they provide evidence that:

- a) The two residents of Flat 195 moved to Flat 193 after attempting to use the escape stair. In her witness statement (IWS00000515) Naomi Li describes attempting to leave via the stair after her neighbour from Flat 196 confirmed the fire was now in her kitchen. When she witnessed 'a lot' of people walking upstairs (between 01:21 and 01:30), she went to Flat

193 as it was free of smoke. Lydia Liao also states the “*staircase was so crowded we decided to stay and wait*”.

- b) The witness statement of Naomi Li (IWS00000515) describes the condition of the stair and lobby as containing some smoke. It is described as ‘hazy’ only. Her flatmate Lydia Liao recalls there being no smoke in either the lobby or stair at this point. From her 999 call records, this must be between 01:21 and 01:34.
- c) The first 999 call from the family within Flat 192 is at 01:35 (LFB00000315); the caller states “*We couldn’t get down the stairs, because the stairs is full of smoke.*”
- d) The first 999 call where it is clearly stated that smoke is present in Flat 193 is at 01:48 (LFB00000325). The witness statement of Naomi Li (IWS00000515) describes there still being fresh air in the living room of Flat 193 up until around 02:40, however it steadily worsened after this time with smoke coming in from the lobby and hallway as the Choucair family returned after attempting to escape and the neighbouring family escaped their flat, 192, as an internal fire spread through it.
- e) The first 999 call to clearly state fire is about to break into Flat 193 is at 02:44 (LFB00000376).
- f) An attempt is made to leave between 02:40 and 02:50 by the Choucair family (IWS00000515).
- g) The living room starts to fill up with smoke coming in from lobby and entrance hallway after this time (IWS00000515).
- h) Naomi Li states (IWS00000515) after her 999 call at 02:50 that the family from Flat 192 next door come into Flat 193. This is consistent with the 999 call records from inside Flat 192. There are records of 7 999 calls from Flat 192 starting at 01:34 (LFB00000315), the last call placing the family in flat 192 is at 02:53 (LFB00000385).
- i) Following a 999 call at 03:06 – 03:08 (LFB00000404) Naomi Li and Lydia Liao leave Flat 193 escaping via the lobby and stair. They both exit the building at 03:22.

20.8.34 Therefore, the evidence from Flat 193 is that:

20.8.35 The conditions within the stair and lobby at Level 22 between 01:21 – 01:30 did not prevent the residents from Flat 195 escaping – rather it appears to have been the volume of people walking up the stair.

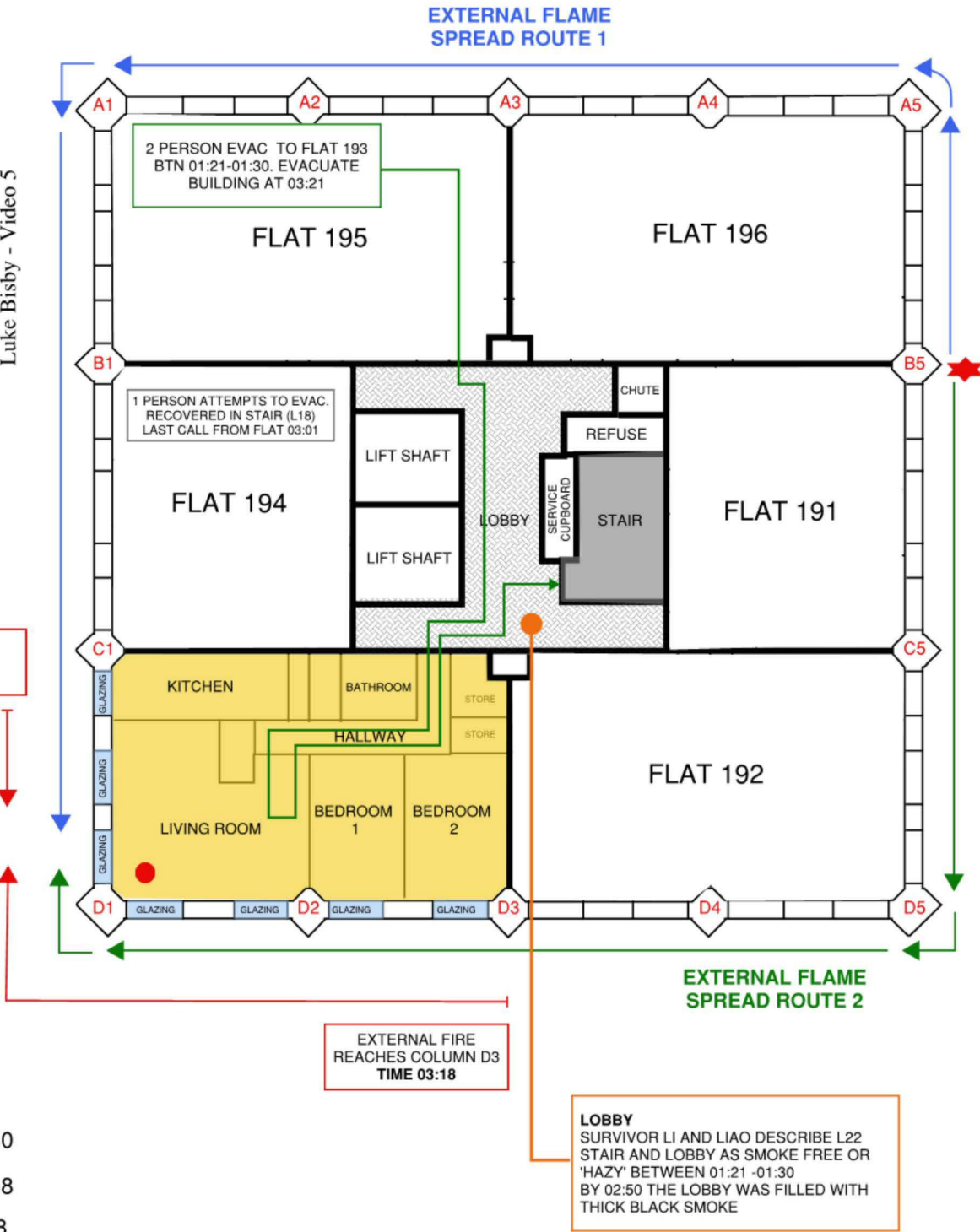
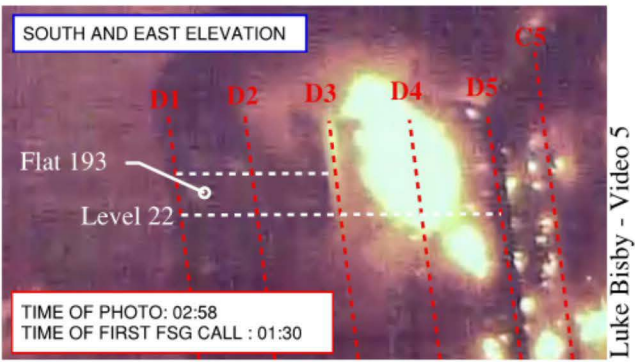
20.8.36 The perceived conditions in the stair at 01:34 prevented the residents of Flat 192 from escaping.

20.8.37 As a result, residents of the 22nd floor sheltered inside Flat 193, which being positioned on the South West corner was the last flat on the 22nd floor to be affected by the external fire.

- 20.8.38** Residents sheltering inside Flat 193 were affected by smoke spreading in from the lobby from about 02:50 onwards. At this time the external fire also started to affect Flat 193 (between 02:45 and 03:18).
- 20.8.39** I have also seen evidence of successful and unsuccessful attempts to evacuate after 03:00. Li and Lao appear to have escaped shortly after 03:08 from Level 22; they exited the building at 03:21.
- 20.8.40** However, the resident of Flat 194, who made their last 999 call at 03:01(LFB00000395) appears to have left their flat and attempted to escape through the stair. They were recovered at level 18 within the stair. I do not know at what time they attempted to make their escape.

LEVEL 22 - FLAT 193

EXTERNAL FIRE SPREAD EVIDENCE



| | | |
|--|---|--|
| FLAT 193 (2 BEDROOM FLAT) - 11 Persons recovered | | |
| Persons (bold denotes FSG call) | | |
| Nadia Choucair (Flat resident) | | |
| Bassem Choucair (Flat resident) | | |
| Mierna Choucair (Flat resident) | | |
| Zainab Choucair (Flat resident) | | |
| Fatima Choucair (Flat resident) | | |
| Sirra Choucair (Flat 191 L22) | | |
| Hashim Kadir (Flat 192 L22) | | |
| Yahya Hashim (Flat 192 L22) | | |
| Yaqub Hashim (Flat 192 L22) | | |
| Nura Jemal (Flat 192 L22) | | |
| Firdows Hashim (Flat 192 L22) | | |
| | ● LOCATION OF PERSON(s) DURING 999 CALL | |
| TIME OF FIRST FSG CALL FROM FLAT 193 | 01:30 | |
| TIME OF LAST FSG CALL END FROM FLAT 193 | 03:38 | |
| DURATION FSG CALLS ACTIVE OVER | 2h08 | |
| SURVIVORS | | |
| Naomi Li (FLAT 195 LEVEL 22) | | |
| Lydia Liao (FLAT 195 LEVEL 22) | | |
| LOCATED IN FLAT 193 DURING FSG CALLS BETWEEN 01:30 - 03:07 | | |
| EVACUATED GRENFELL TOWER AT 03:21 | | |

Figure 20.10 Collated evidence for Flat 193: External fire spread. First and last999 call times from Flat 201 and evacuation times from Level 22

20.8.41 Level 22 – Flat 182

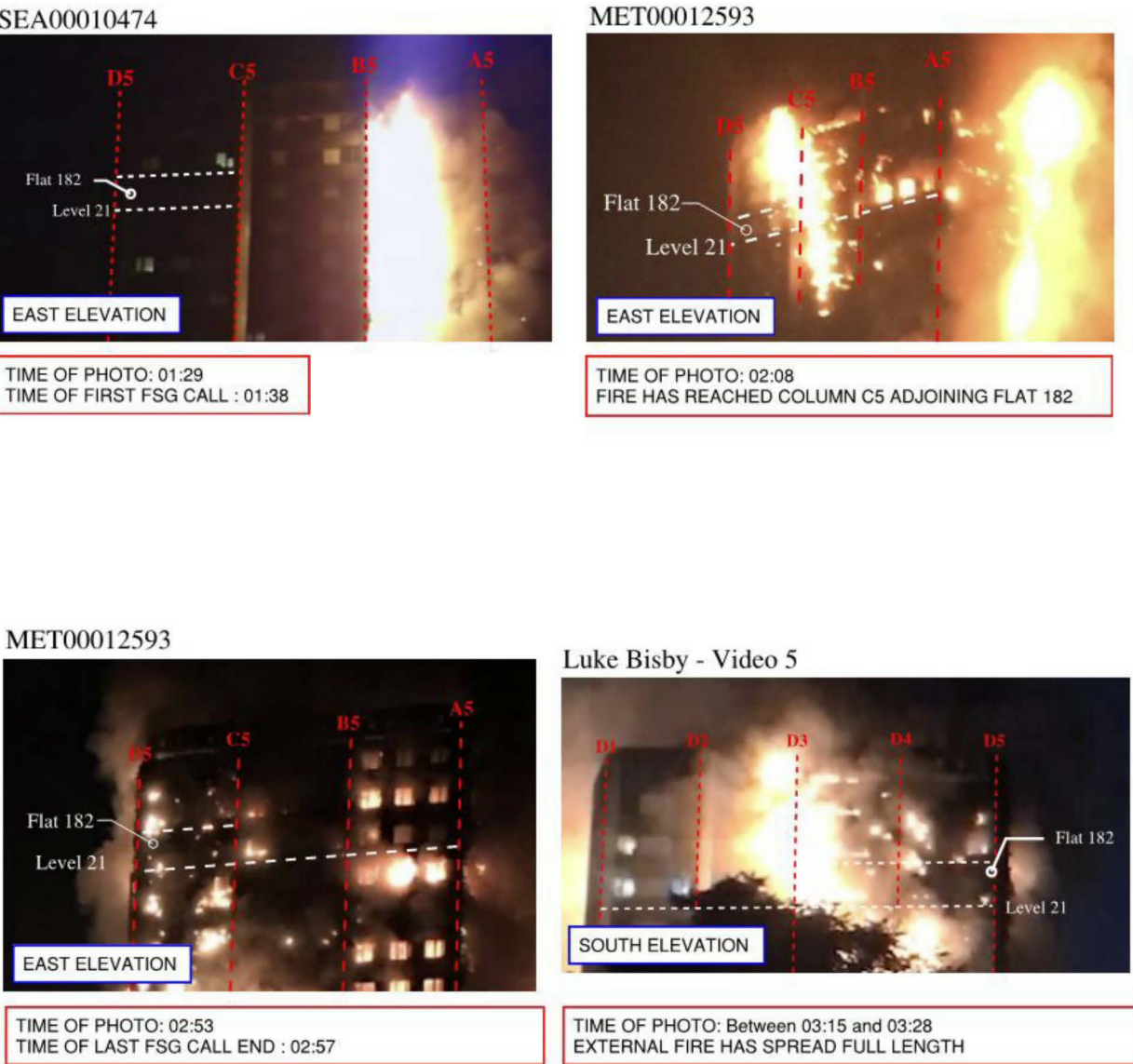
- 20.8.42** Flat 182 is located on the South East corner of Grenfell Tower. As I have described in Section 5 and 12 the east elevation was the first elevation affected by the external fire. Please refer to Figure 20.11 where I have illustrated the collated evidence presented in this section.
- 20.8.43** Five residents of Grenfell Tower were recovered from this two-bedroom flat. They were all residents of this flat.
- 20.8.44** Flat 182 has an external wall on the east elevation between column C5 and D5. The east external wall bounds the kitchen and living room; it contains three glazed windows and two insulating core panels. It has a second external wall on the south elevation containing four glazed windows and two insulating core panels facing into the two bedrooms and the living room.
- 20.8.45** The external fire first reaches column C5 next to Flat 182 on the east elevation at approximately 02:05.
- 20.8.46** By 02:27 the external fire is observed to have reached Column D5 on the east elevation and therefore spread the full length of the east elevation wall of Flat 182.
- 20.8.47** By 03:18, the external fire is observed to have reached Column D3 on the south elevation and therefore spread the full length of the south elevation wall of Flat 182.
- 20.8.48** In total, fire spread along the external walls of Flat 182 takes approximately 1h13min.
- 20.8.49** There are six recorded 999 calls from the El Whabi Family in Flat 182; the first call is at 01:39 and the final call ends at 02:57. Therefore active 999 calls were being made by the family from inside the flat for around 1h18min.
- 20.8.50** I have read the transcripts of these 999 calls. The evidence within these calls provides a similar description of events with regard to external fire spread and the perceptions of the internal fire conditions as I have described for the family in Flat 192 directly above on Level 22.
- 20.8.51** In their 999 call at 01:39 the El Wahabi family describe how they have attempted to escape using the stair but were unable to as it was too smoky (LFB00000677). At this time the external fire has not yet reached Flat 182.
- 20.8.52** In this call, which lasts approximately 59 minutes, they describe the steadily worsening conditions within their flat as the external fire spreads into their flat via their kitchen on the east elevation.
- 20.8.53** There are four subsequent 999 calls with a CRO at 02:44 (LFB00000374), 02:46 (LFB00000379), 02:51 (LFB00000383) and 02:54 (LFB00000387) in each of these calls the caller clearly states they are unable to leave due to

smoke. They refer to smoke in the corridor, which may be the internal hallway of the flats rather than the common lobby.

- 20.8.54** No further calls were made from inside Flat 182 after the 02:54 call which ended at 02:57 (LFB00000387).
- 20.8.55** Seven people did escape from Level 21. In particular, 6 people escaped between 03:37 and 03:55 from Flat 183.
- 20.8.56** Therefore, this provides further evidence that:
- 20.8.57** People who attempted to leave their flats early and before their flats were directly affected by fire, encountered conditions within the stair they perceived to be unsafe to enter.
- 20.8.58** People, then became trapped in their flats as conditions within the lobby deteriorated and they perceived they were unable to escape through the flat.
- 20.8.59** The conditions within a flat's internal corridor may also have prevented them from leaving their flats once fire had spread to their flat.
- 20.8.60** People were able to shelter within flats on the south west corner (Flat 3); however once the external fire spread to these flats, and the conditions inside the flat deteriorated, those that felt they could do so, did attempt to escape to escape through the lobbies to the stair.
- 20.8.61** At this time, they were escaping through substantially worse conditions in the lobby and stair than earlier in the fire when they either turned back, or were told by others to go back.

LEVEL 21 - FLAT 182

EXTERNAL FIRE SPREAD EVIDENCE



FLAT 182 (2 BEDROOM FLAT- 5 Persons recovered

Persons (**bold** denotes FSG call)

Faouzia El-wahabi (Flat resident)
Abdulaziz El-wahabi (Flat resident)
Yasin El-Wahabi (Flat Resident)
Mehdi El-Wahabi (Flat Resident)
Nur Huda El-Wahabi (Flat resident)

● LOCATION OF PERSON(S) DURING 999 CALL

TIME OF FIRST FSG CALL FROM FLAT 182 01:38
TIME OF LAST FSG CALL END FROM FLAT 182 02:57
DURATION FSG CALLS ACTIVE OVER 1h19

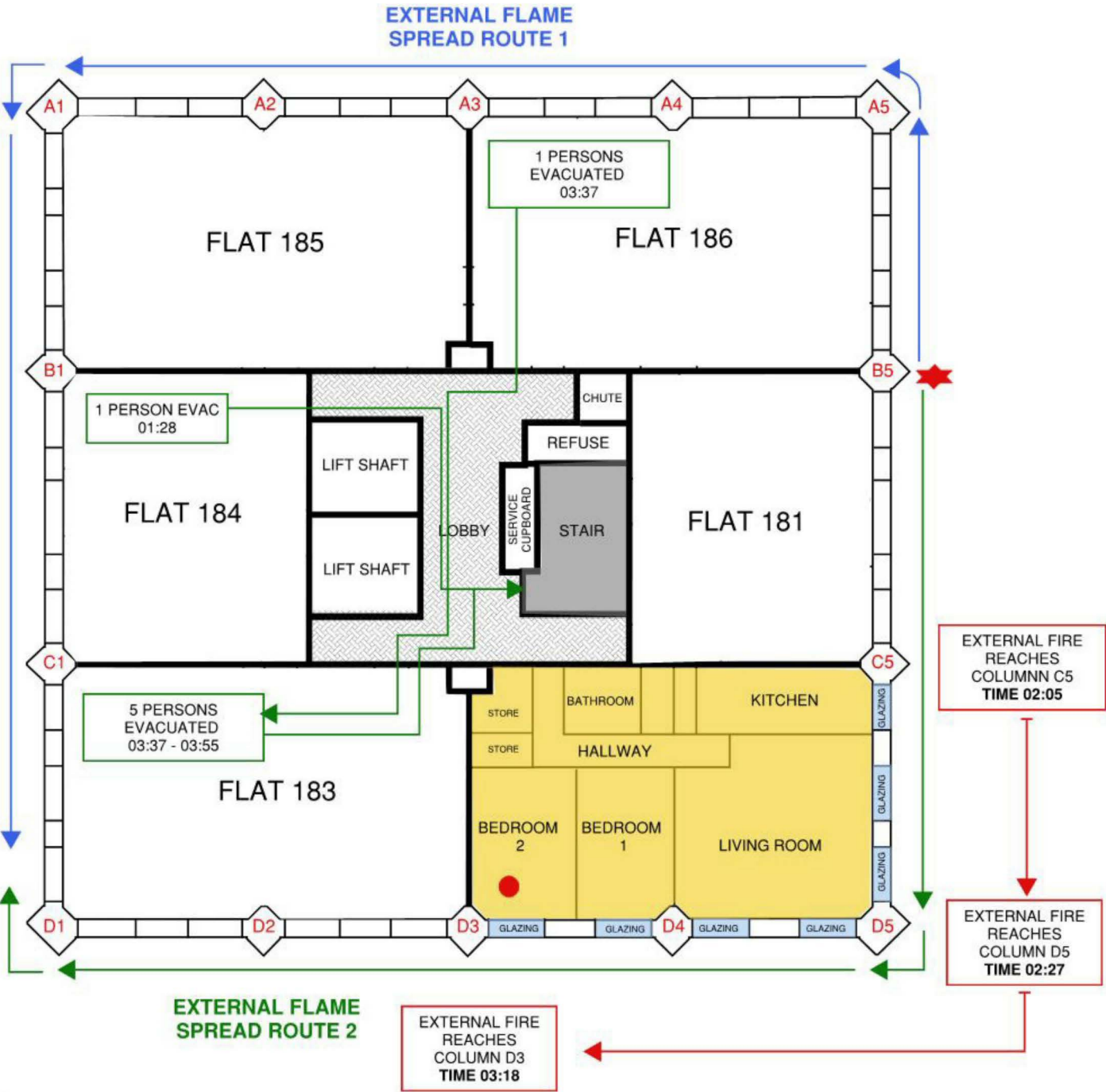


Figure 20.11 Collated evidence for Flat 182: External fire spread. First and last 999 call times from Flat 201 and evacuation times from Level 21