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 – Appendix C

Excerpts from site inspection records

REPORT OF

Dr Barbara Lane FREng CEng

Fire Safety Engineering

24th October 2018

Specialist Field	:	Fire Safety Engineering
Assisted by	:	Dr Susan Deeny, Dr Peter Woodburn, Dr Graeme Flint, Mr Tom Parker, Ms Danielle Antonellis, Mr Alfie Chapman
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 14th June 2017
Inspection Date(s)	:	6th October, 1st November, 7-9th November 2017

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Appendix C– Excerpts from site inspection records

CONTENTS

C1 Purpose of this Appendix

C1.1.1 In this appendix I present specific photographic evidence that I and my team created during our post fire inspections of Grenfell Tower between the 1st October 2017 and 9th of November 2017.

C1.1.2 I rely on these images in my report as evidence of specific materials, construction details and conditions.

C1.1.3 They helped me develop my understanding of the construction, building layout, building systems and services.

C1.1.4 They have also helped me understand the conditions within the flats, stairs and lobbies as a result of the fire on the 14th June 2017.

C1.1.5 This appendix also includes evidential photographs I have obtained from the MPS through the Public Inquiry. These photographs depict the conditions of Grenfell Tower shortly after the fire on the 14th June 2017.

C1.1.6 In this appendix I specifically present:

a) Stair and lobby damage records – Relevant to Sections 14 and 19 of my report.

b) MPS photographs of levels with missing stair doors – Relevant to Section 14 of my report.

c) Lobby AOVs and smoke shaft inspections – Relevant to Section 14 of my report.

d) Fire door surveys – Relevant to Sections 15, 16, 19 and Appendix I of my report.

e) Survey of linings to window openings – Relevant to Sections 8, 9, 10 and Appendix E of my report.

C1.1.7 I have provided copies of all photographs taken by me and my site inspection team to the Public Inquiry

C2 Stair and Lobby Damage Records

C2.1.1 In this section I present photographic evidence of the post fire damage to the stair and lobbies of Levels 03 to 23 recorded on site between 7th and 9th November 2017.

C2.1.2 In addition to photographic evidence, I have categorised the damage to lighting, doors and partitions within both the stairs and lobbies using the damage categories outlined below.

C2.1.3 In Table C.1 I have defined the categories of damage and their description for doors within the stair and lobbies

C2.1.4 In Table C.2 I have defined the categories of damage and their description for conditions within the stair

C2.1.5 In Table C.3 I have defined the categories and their description for the conditions within the lobbies.

C2.1.6 Please refer to Sections 14 and 19 of my report for detailed discussion of the content of these photographs.

Table C.1: Door damage assessment category definitions

Damage Category	Category Definition
Not recorded	Door or partition was either obstructed during my site inspection or we do not have a photographic record in our survey records.
Intact	The door itself does not appear to be damaged (e.g. charred or missing materials), although it may be discoloured and/or have soot deposition. The door fittings and/or fixtures may be damaged (i.e. letterbox, door frame).
Damaged	The door itself is damaged (e.g. charred or missing materials) or glazing is breached (where applicable).
Missing	Door is missing.

Table C.2: Criteria used for assessment of conditions within the stair

Criteria	Category Definition	Grade
Soot deposition	No observable soot on surfaces	None
	Light staining or soot depositions observed on surfaces (e.g. surface linings visible beneath)	Light
	Dark, thick staining observed on surfaces (e.g. black surfaces, surface colour not visible)	Heavy
Damage to the stair light fittings	Stair light casing is intact and has not deformed	No damage
	Stair light casing is deformed, melted or completely missing	Plastic lights melted or destroyed

Table C.3: Lobby damage assessment categories & associated assessment criteria

Damage Category	Category Definition	Assessment Criteria [1, 2]
No Damage	No relevant damage observed	None
Light Damage	There may be smoke deposition on internal linings, but there is no physical damage to the fabric of the building, fixtures, or fittings.	Soot deposition
Medium Damage	There may be physical damage to the fixtures or fittings, but damage to the fabric of the building is limited to bubbled paint on the walls and ceilings.	Softening or melting of light(s)
		Charring or deformation of smoke extract switch
		Paint bubbled on walls and/or ceiling
		Intact flat entrance doors
		Charring or deformation of northwest and southwest riser coverings [3]
Heavy Damage	There may be damage to the fabric of the building.	Damage to floor surface cover (revealing brick) [4]
		Damaged or missing flat entrance doors
		Damaged or missing stairway door
		Damaged or missing doors and partitions to center riser [5]
		Damaged or missing refuse chute access door
		Damage to plasterboard ceiling – caused by heat [6]
		Evidence of spalling of concrete on any surface

[1] The *Medium Damage* category may include any of the assessment criteria listed under the *Light Damage* category. The *Heavy Damage* category may include any of the assessment criteria listed under the *Medium Damage* category.

[2] If any one of the criteria listed is met, the area is categorized per the higher damage level.

[3] The northwest and southwest risers adjacent to the lifts appear to be covered by a chipboard material.

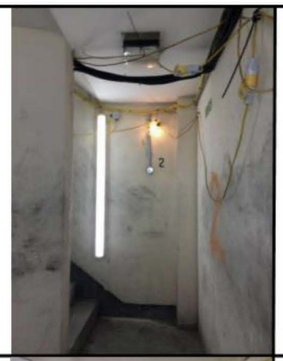
[4] Floor damage appears to be limited to the floor surface lining; no damage to the brick beneath is observed. Where floor damage is present, is it in irregular patterns. NFPA 921 section 6.2.7.8.2 notes *"Irregular patterns are common in situations of post-flashover conditions, long extinguishing times, or building collapse. These patterns may result from the effects of hot gases, flaming and smouldering debris, melted plastics, or ignitable liquids."*

[5] The riser on the east of the lobby (referred to herein as "centre riser") appears to be enclosed by partition walls constructed of plasterboard and separated from the lobby by a fire door (as indicated with signage on the door).

[6] A plasterboard ceiling is installed near the flat entrance doors on the north and south of each lobby. It was observed that the plasterboard ceiling has been removed by others in several locations post-fire. "Damage to plasterboard ceiling – caused by heat" refers to damage that appears to have been caused by heat, as indicated by the damage of the associated metal framing and/or soot deposition on the slab above.

C2.1.7 Level 3

Level 3



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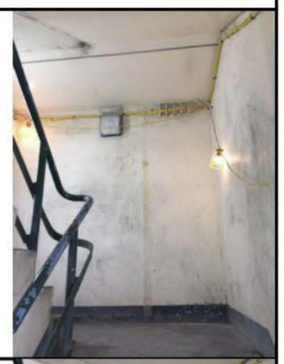

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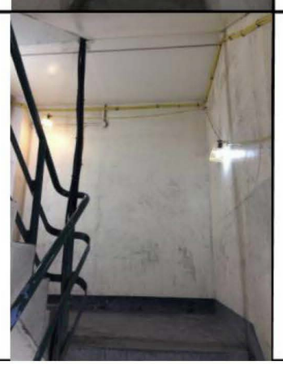

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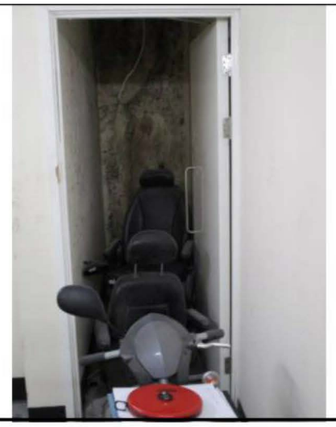
42-STA-3



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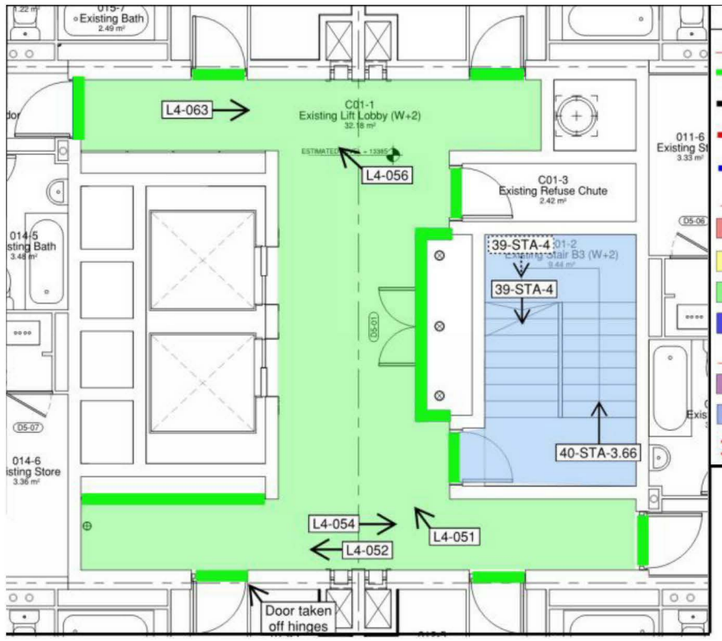
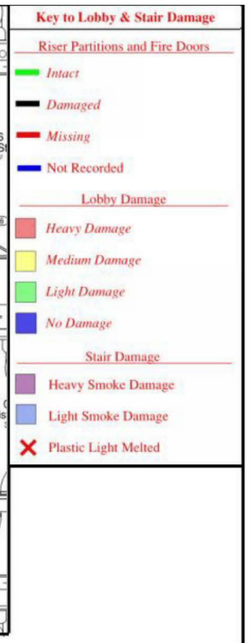
L3-039

L3-043

L3-039

C2.1.8 Level 4





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40-STA-3.66

39-STA-4

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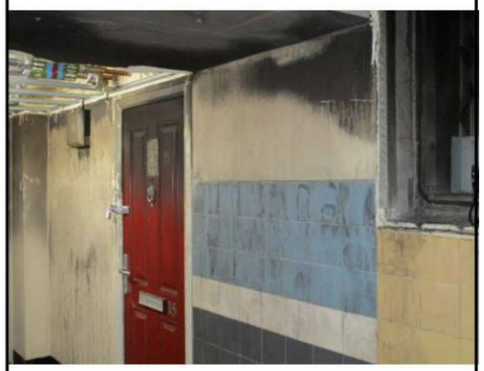

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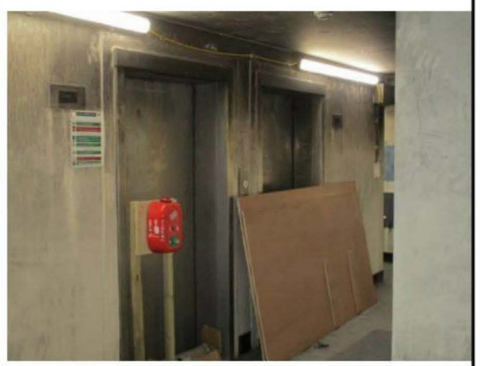

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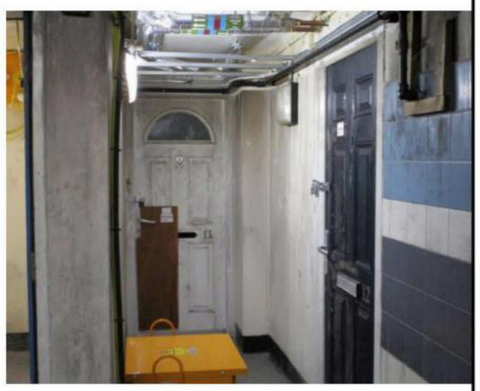

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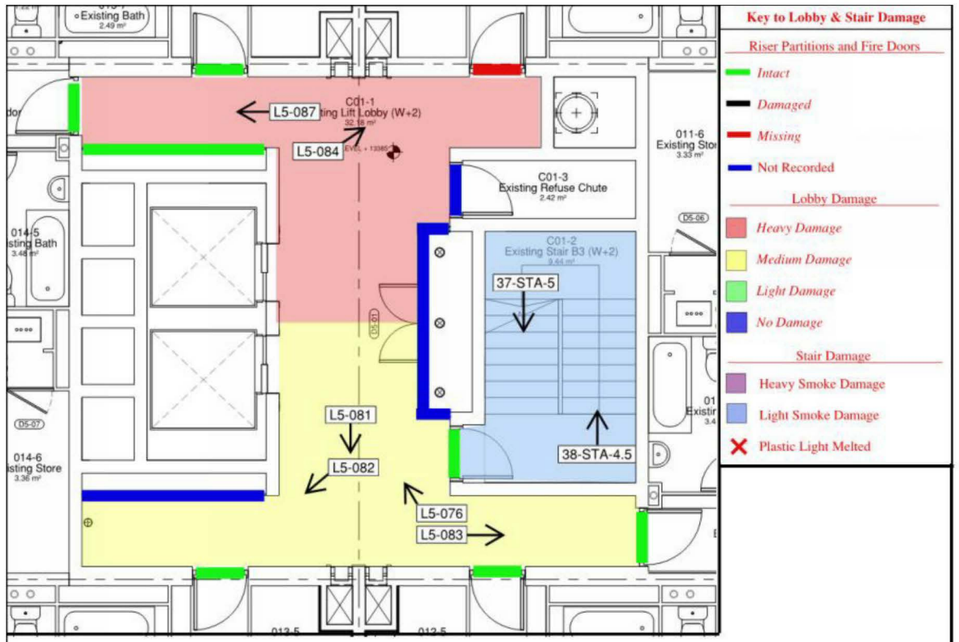

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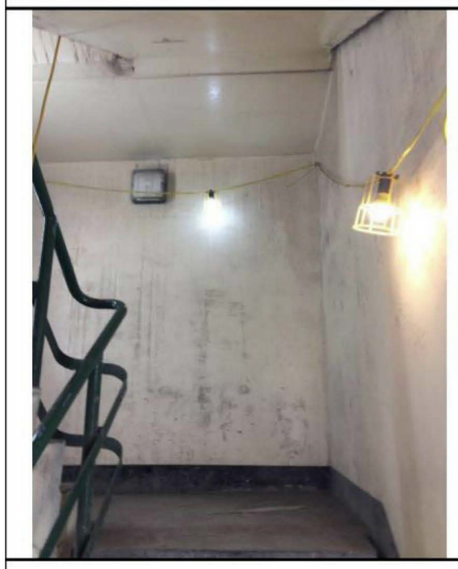

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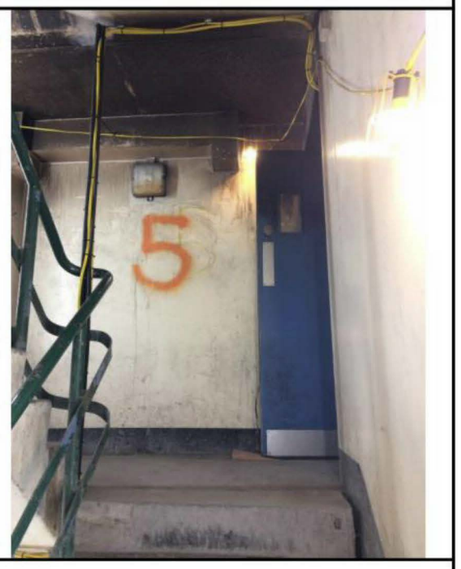

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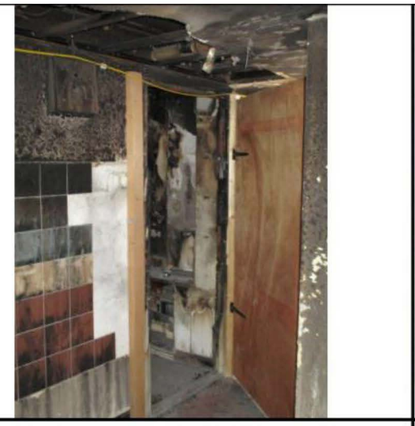

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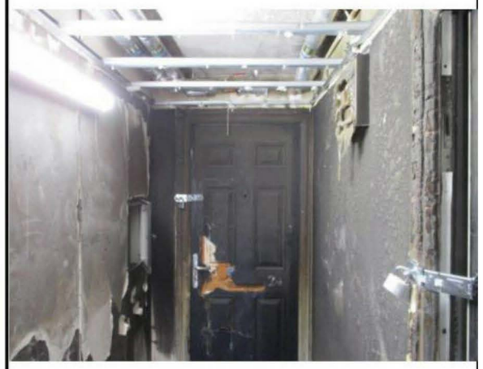

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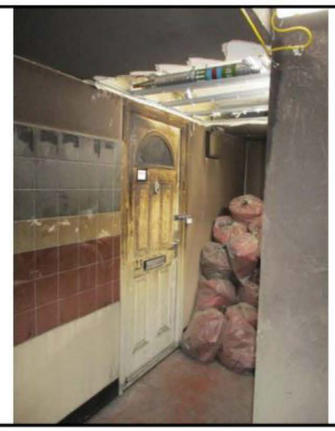
L5-076

L5-081

L5-083



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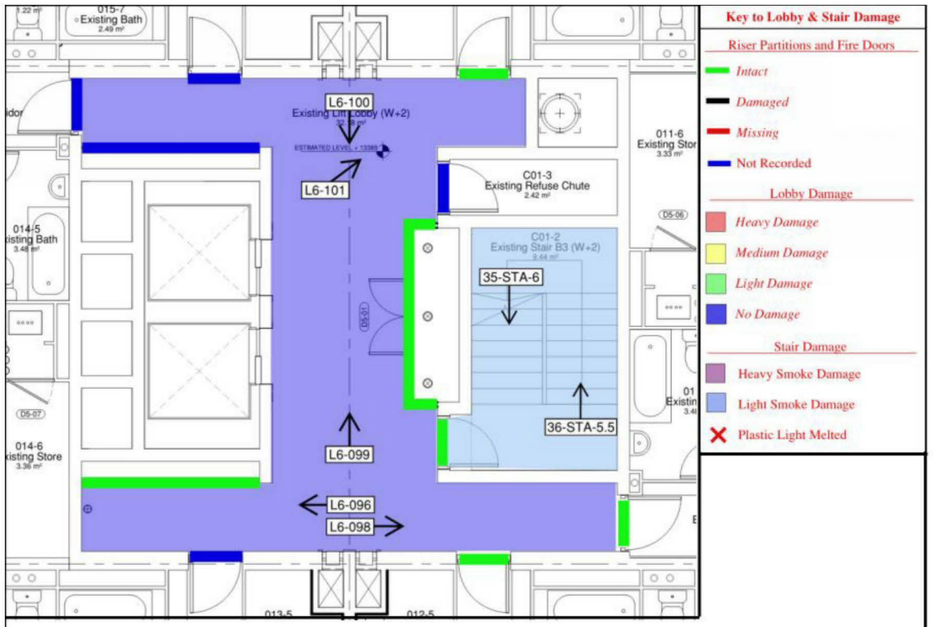


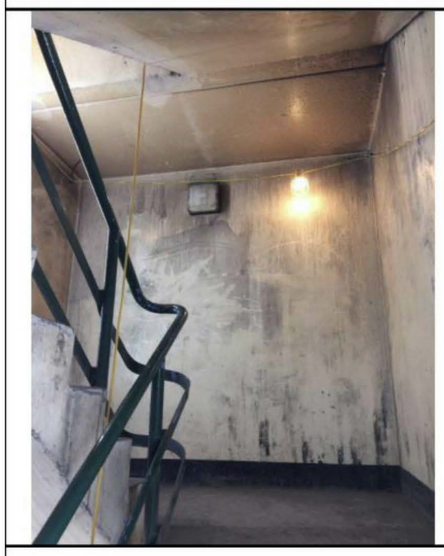
Key to Lobby & Stair Damage

Riser Partitions and Fire Doors
- Intact
- Damaged
- Missing
- Not Recorded

Lobby Damage
- Heavy Damage
- Medium Damage
- Light Damage
- No Damage

Stair Damage
- Heavy Smoke Damage
- Light Smoke Damage
- Plastic Light Melted

Level 6



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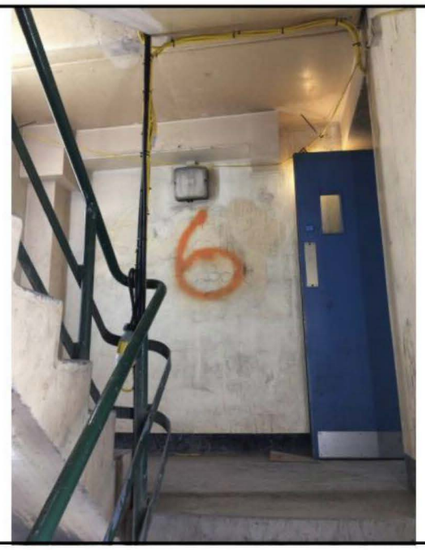

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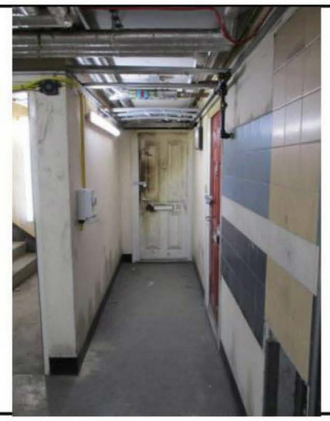
L6-099

L6-100



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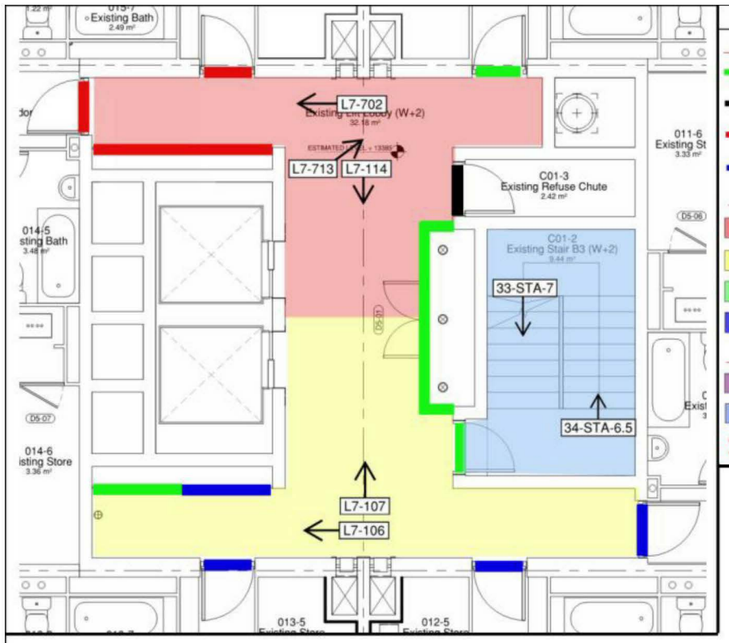

Level 7

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33-STA-7

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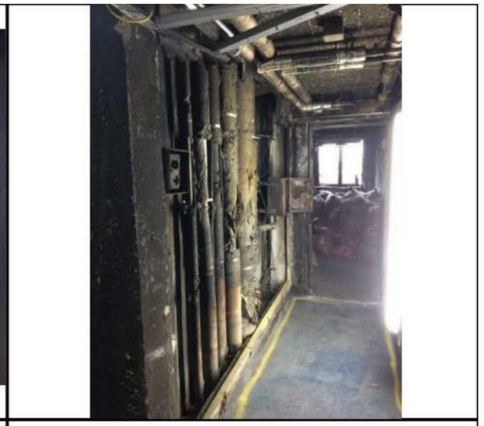

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L7-106

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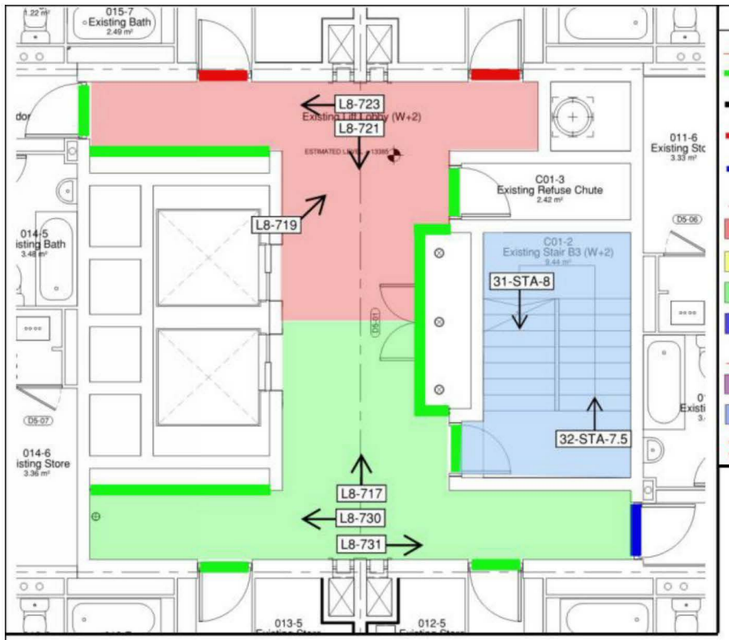

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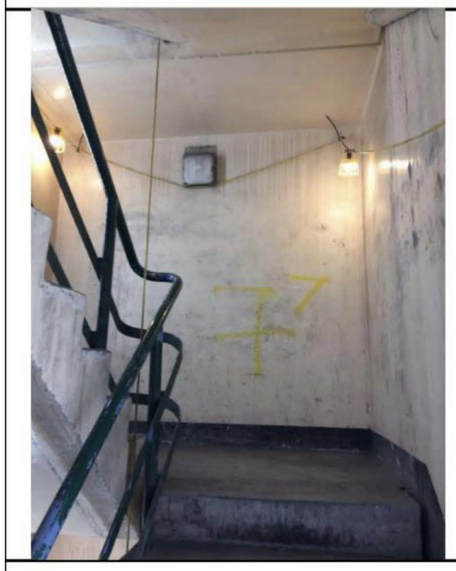

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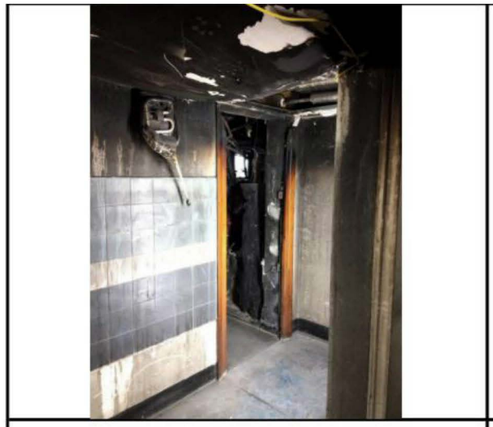

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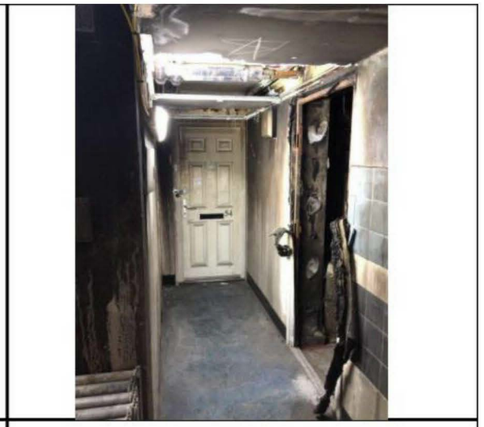

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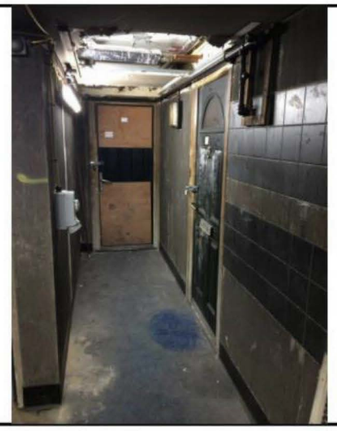

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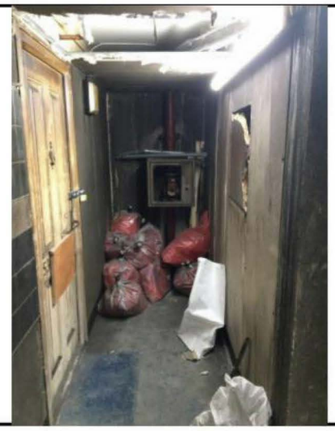

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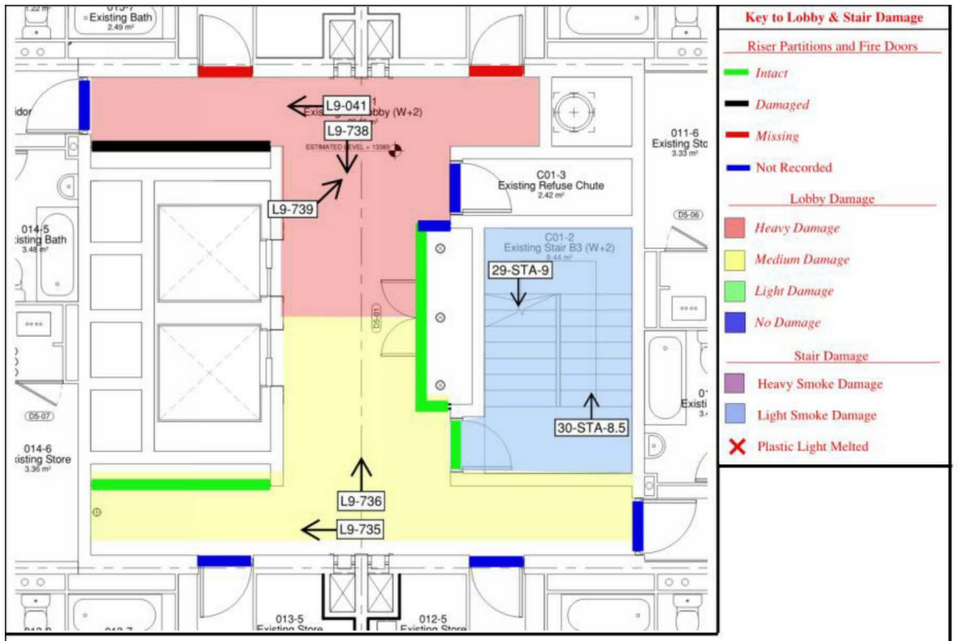

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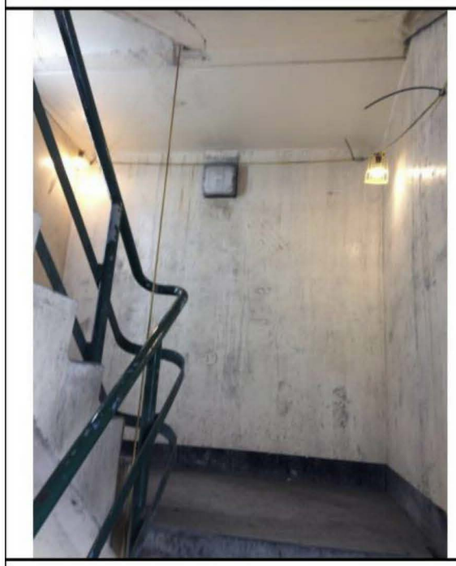

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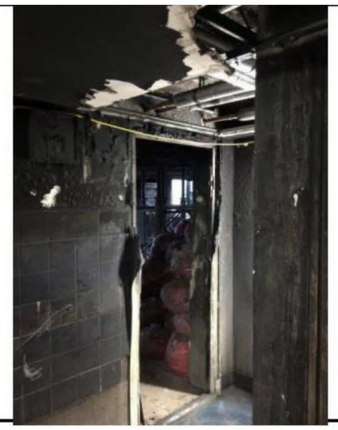

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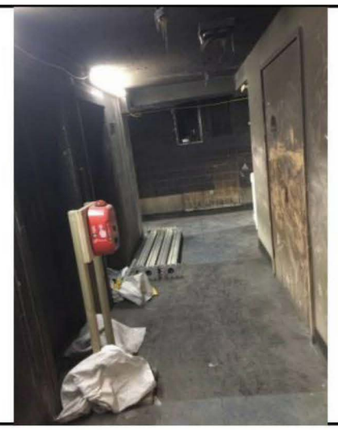

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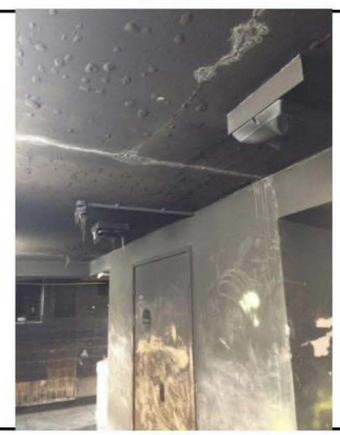

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L9-735

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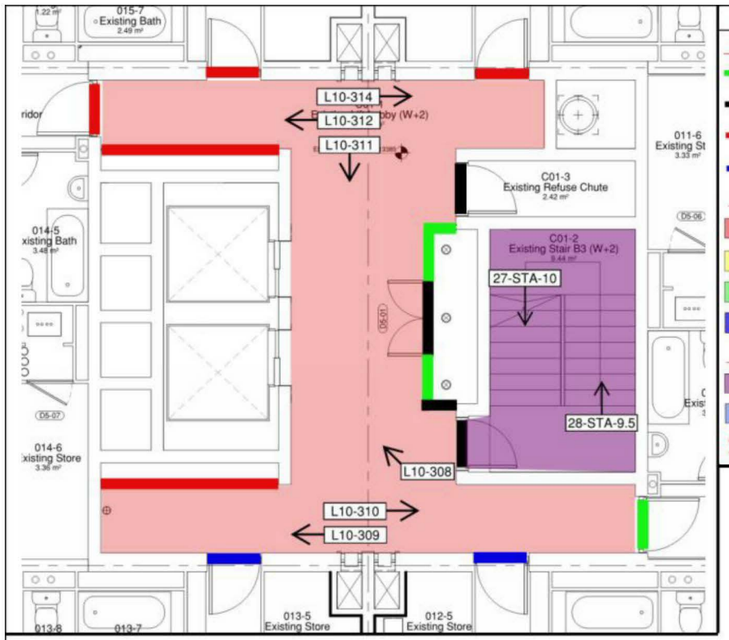

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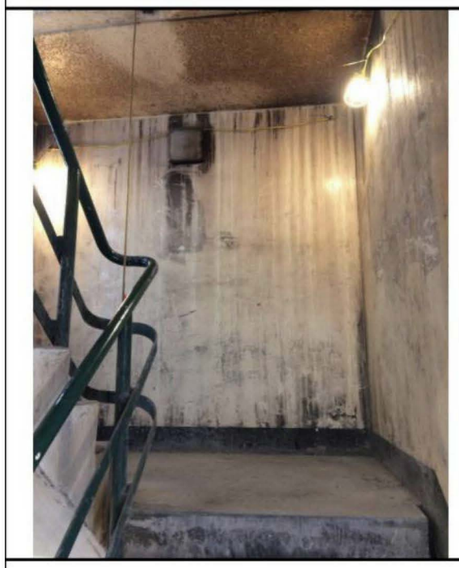

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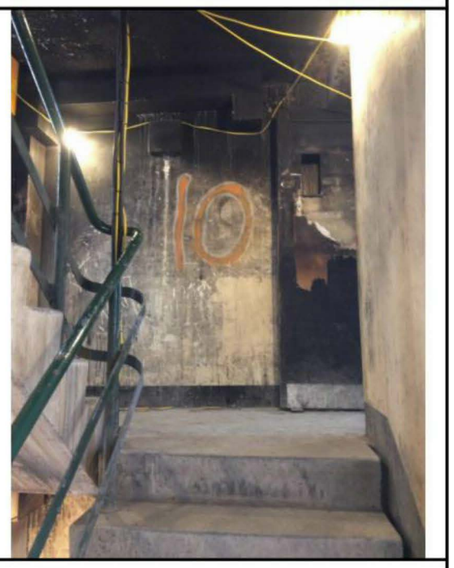

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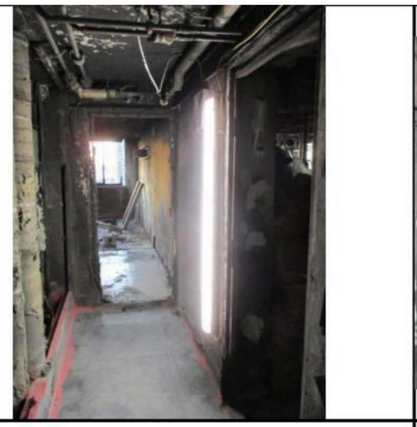

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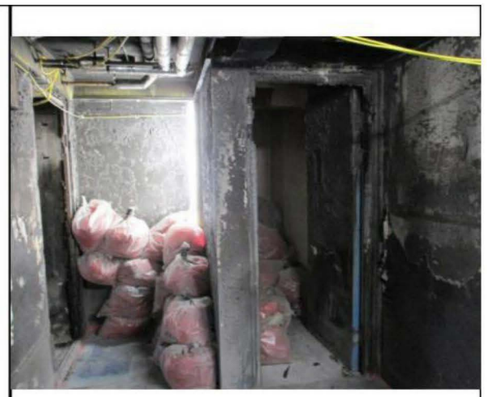

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L10-308

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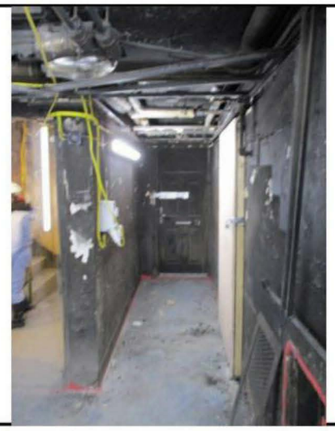

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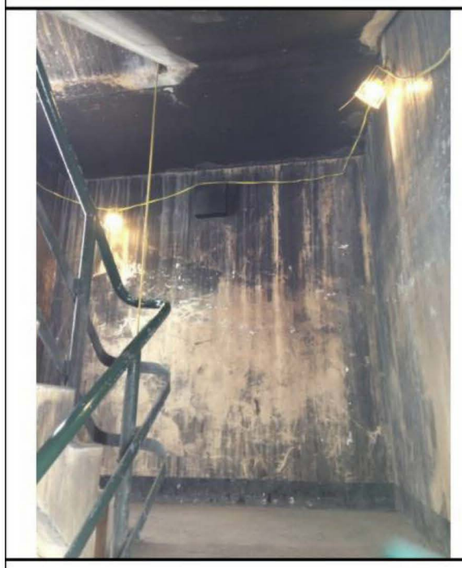
L10-309

C2.1.15 Level 11

Level 11



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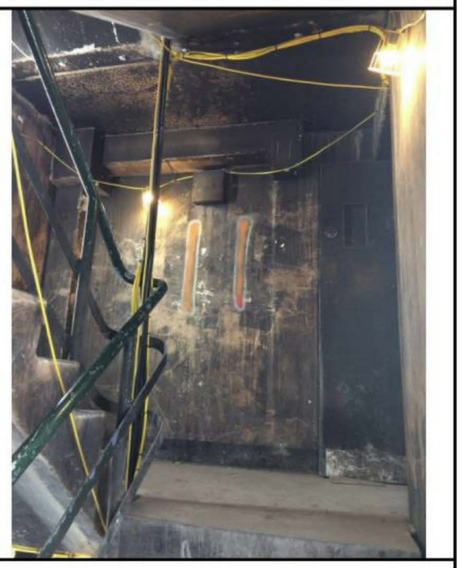

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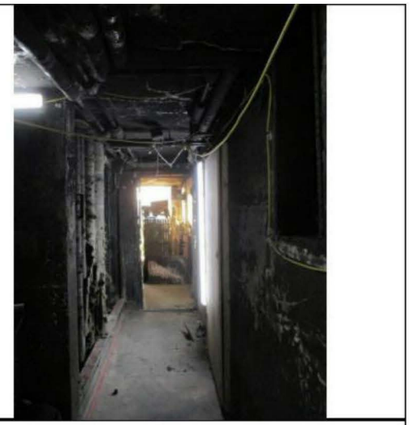

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L11-297

L11-295

L11-294

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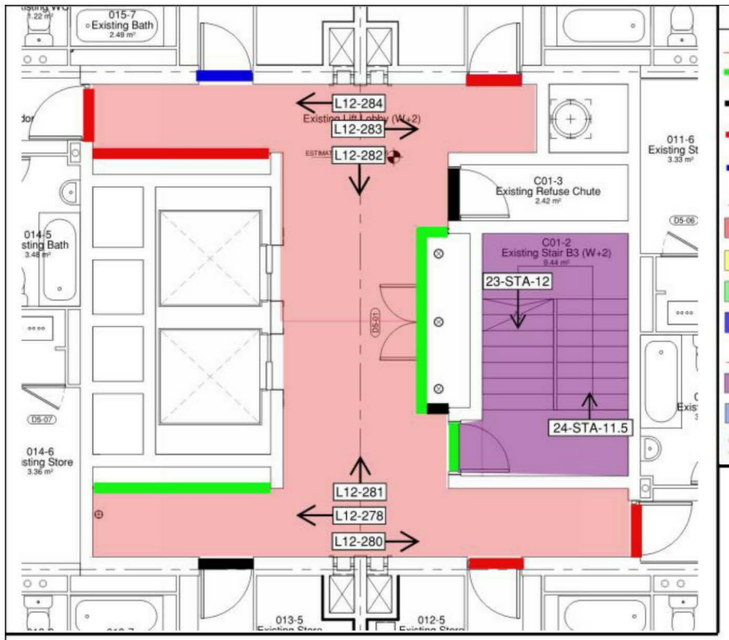

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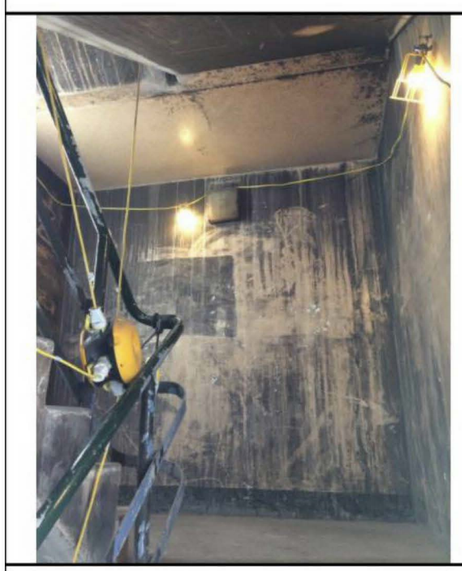

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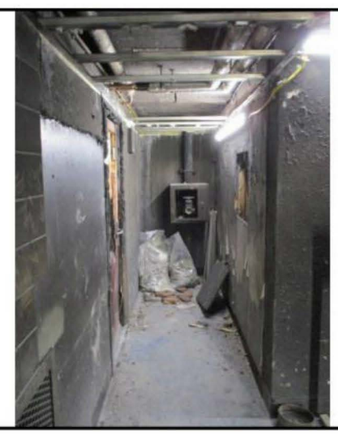
L12-283

L12-284

L12-281

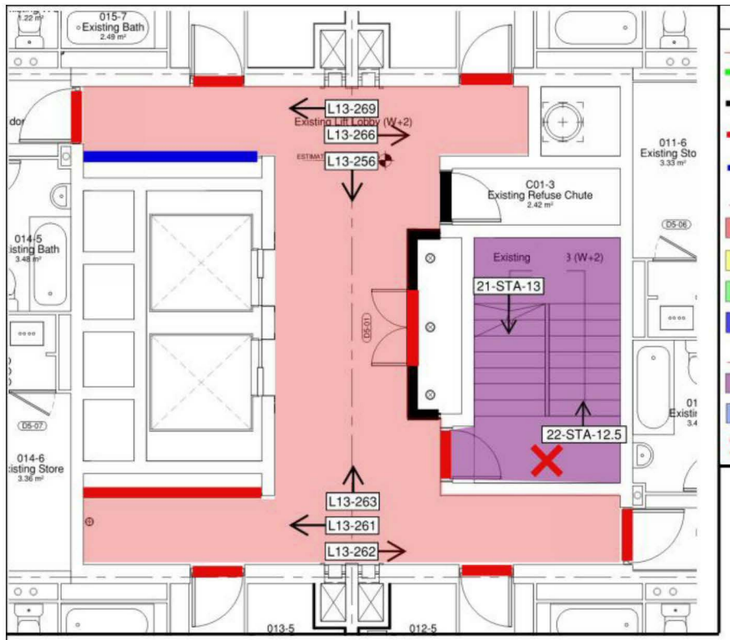
L12-282

L12-280

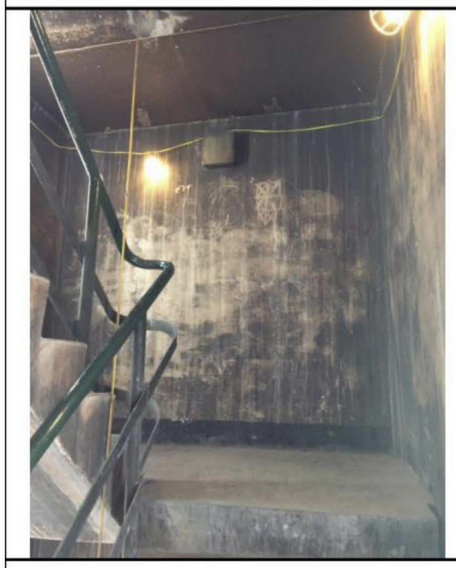


L12-278

C2.1.17 Level 13



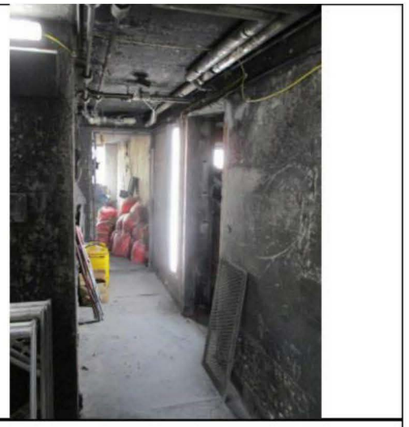
Level 13



22-STA-12.5

21-STA-13

L13-266

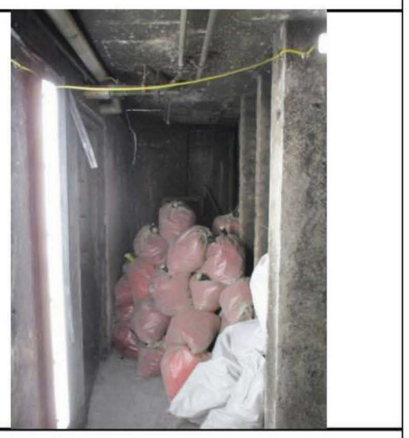


L13-269

L13-263

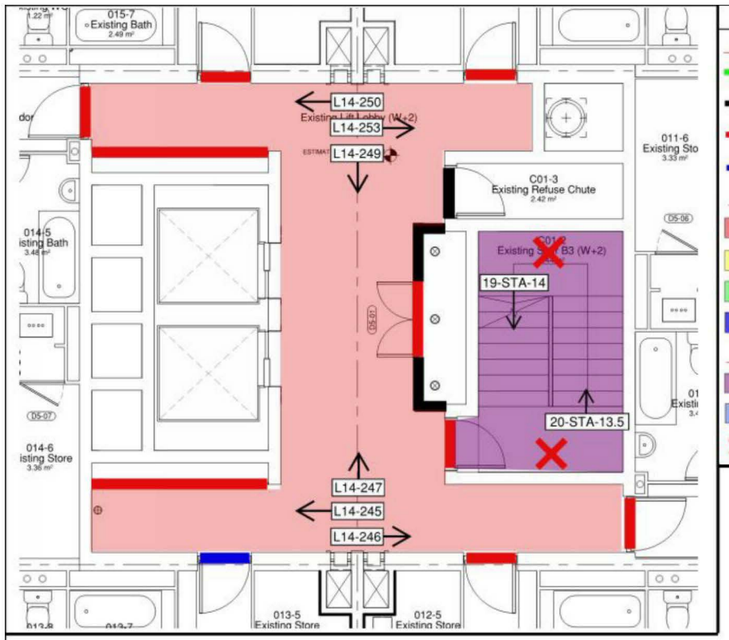
L13-256

L13-262

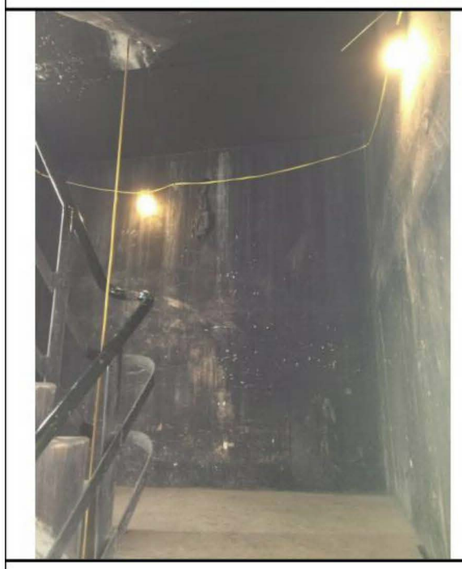


L13-261

C2.1.18 Level 14



Level 14



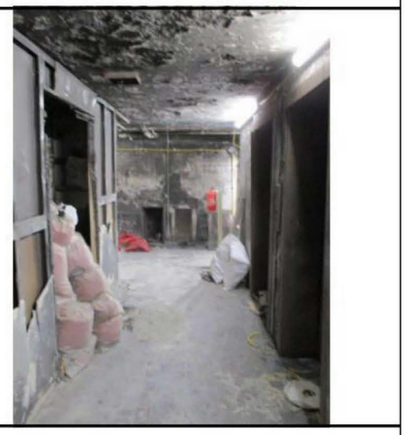
20-STA-13.5

19-STA-14

L14-253

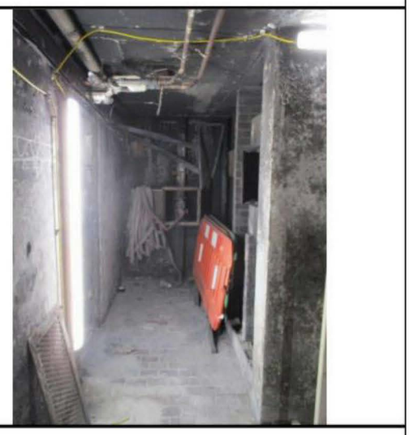
L14-250

L14-247



L14-249

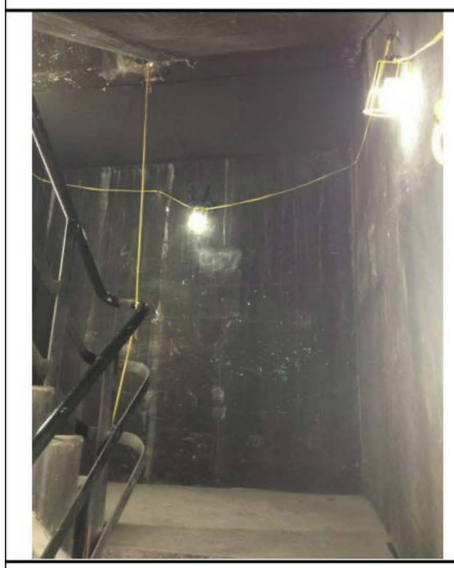
L14-246



L14-245

C2.1.19 Level 15

Level 15



18-STA-14.5

17-STA-15

L15-235

L15-236

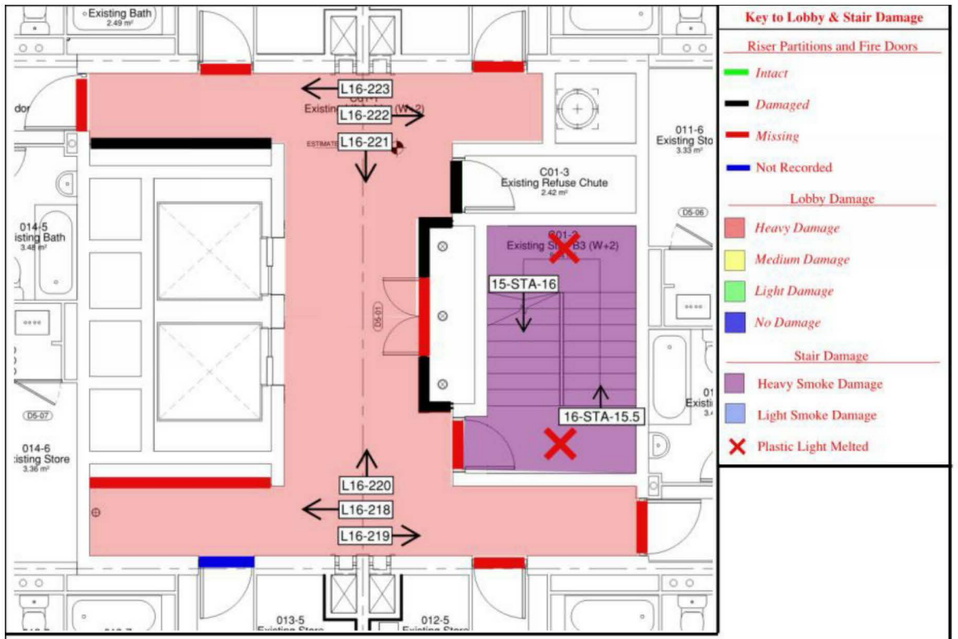
L15-233

L15-234

L15-232

L15-231

C2.1.20 Level 16



Level 16

16-STA-15.5

15-STA-16

L16-222

L16-223

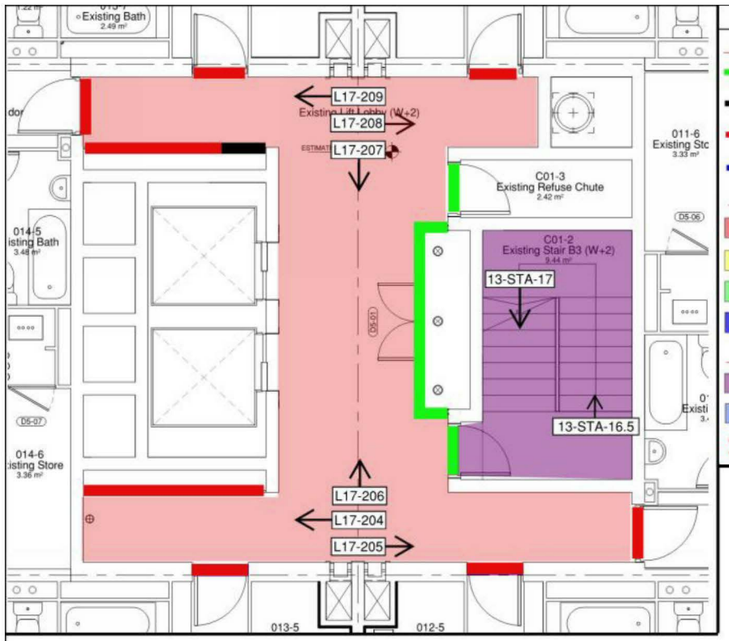
L16-220

L16-221

L16-219

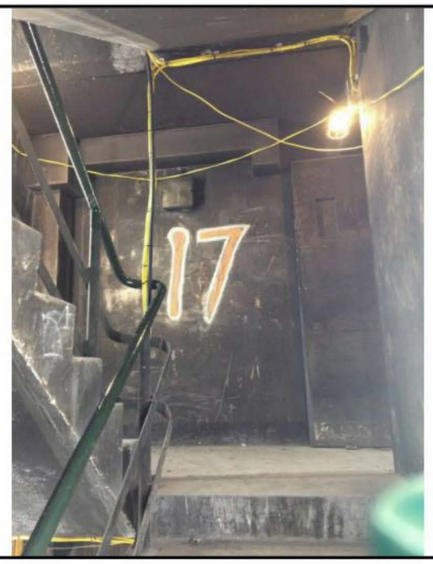
L16-218

C2.1.21 Level 17



Level 17

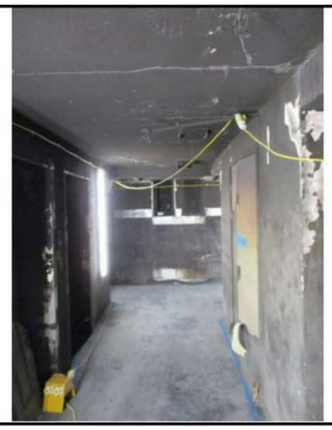
14-STA-16.5



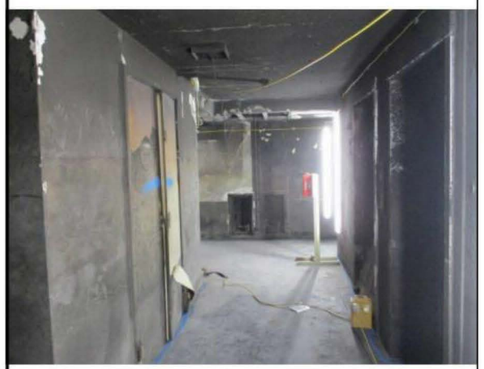
13-STA-17

L17-208

L17-209



L17-206

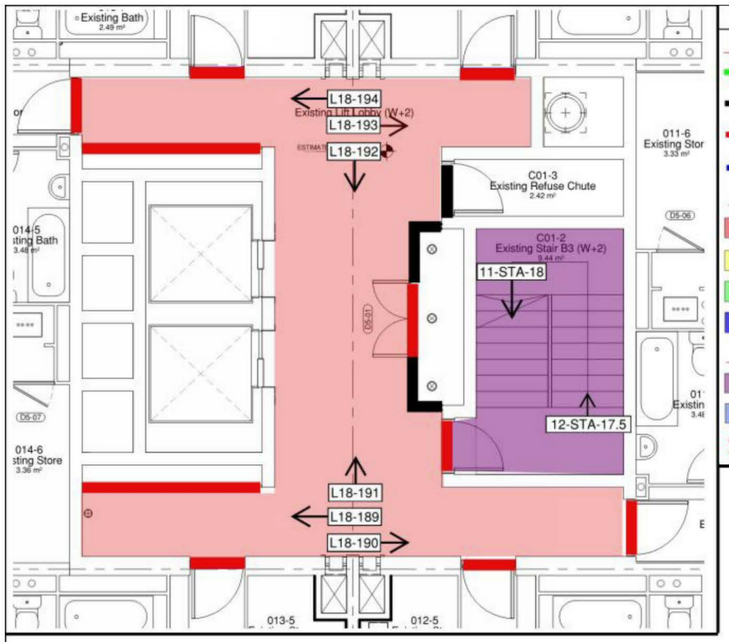


L17-207

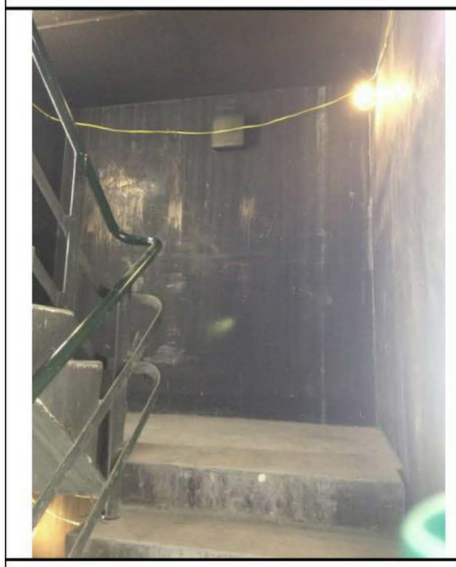
L17-205

L17-204

C2.1.22 Level 18



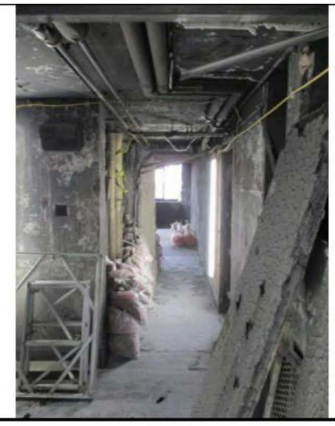
Level 18



12-STA-17.5

11-STA-18

L18-193



L18-194

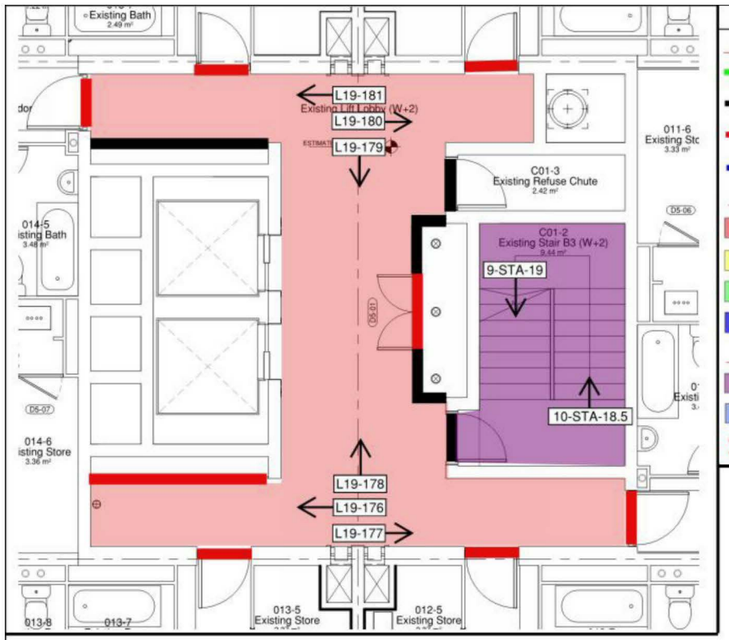
L18-191

L18-192

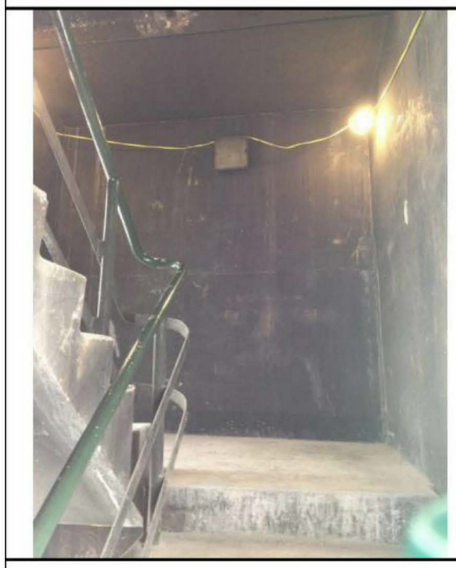
L18-190

L18-189

C2.1.23 Level 19



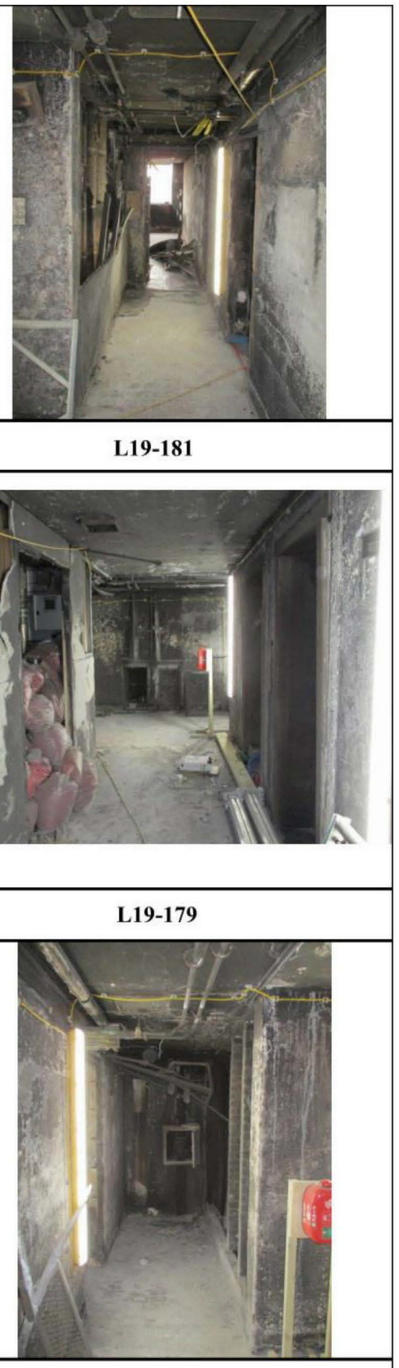
Level 19



10-STA-18.5

9-STA-19

L19-180



L19-181

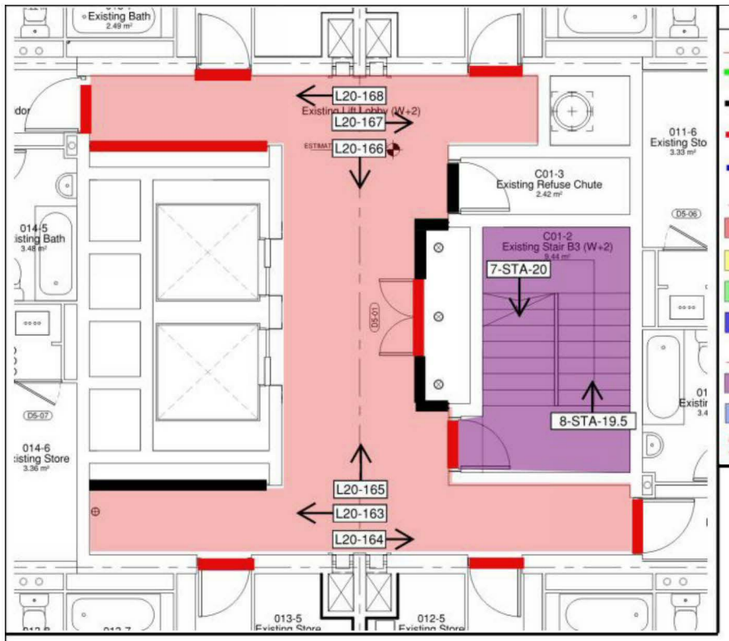
L19-178

L19-179

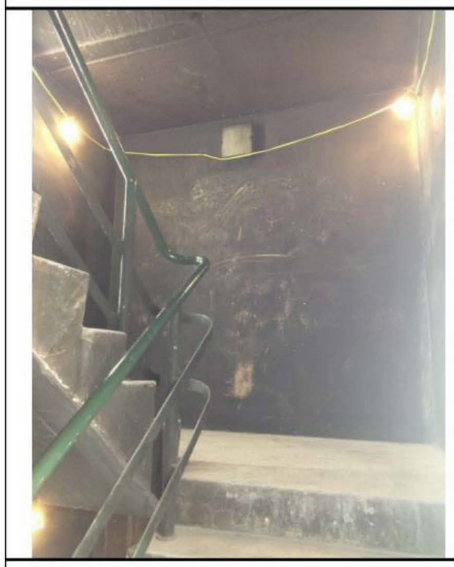
L19-177

L19-176

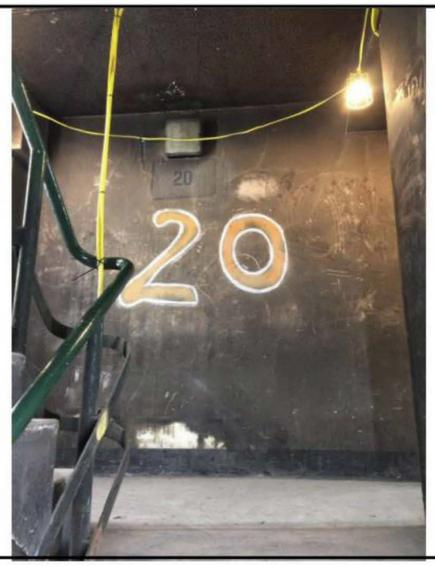
C2.1.24 Level 20



Level 20

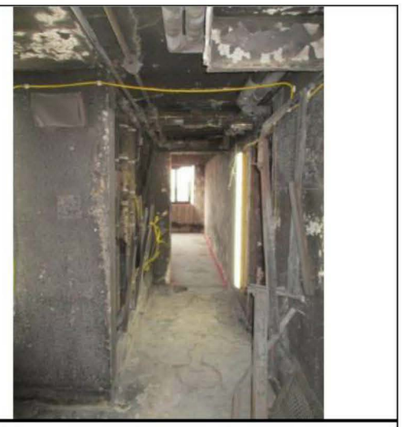


8-STA-19.5



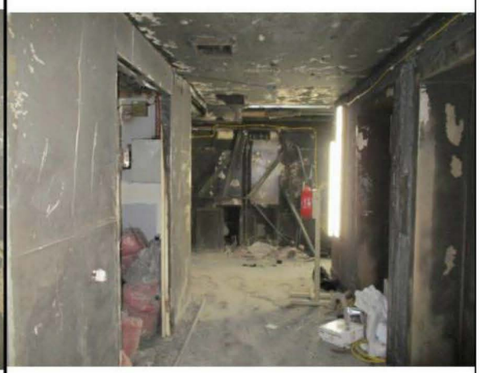
7-STA-20

L20-167



LL20-168

L20-165

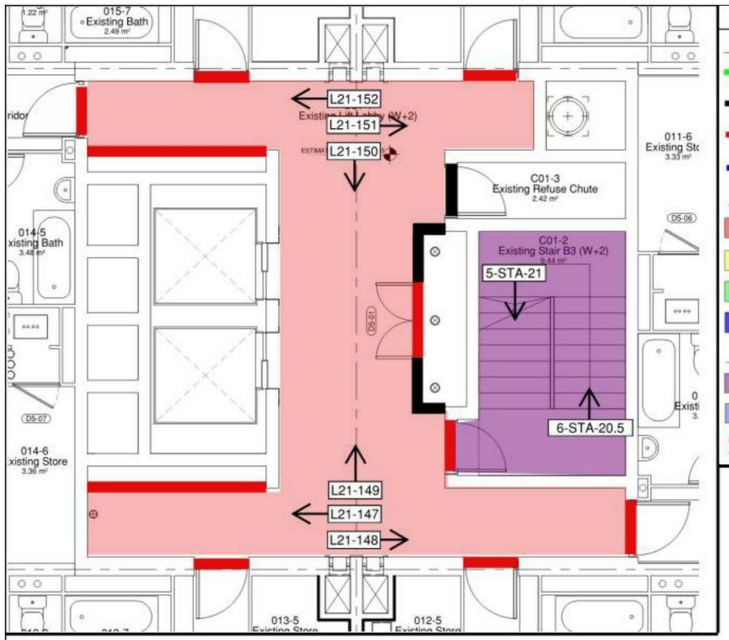


L20-166

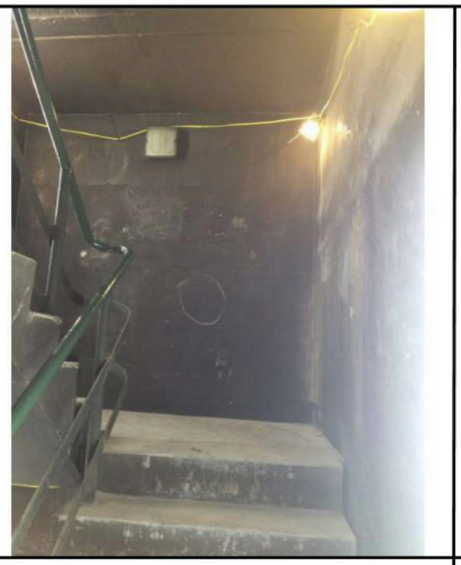
L20-164

L20-163

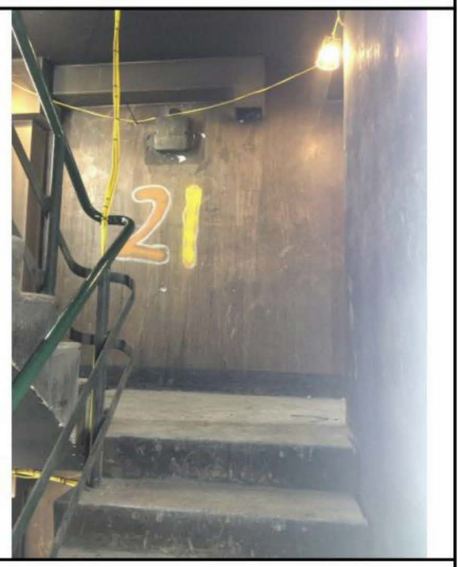
C2.1.25 Level 21



Level 21



6-STA-20.5



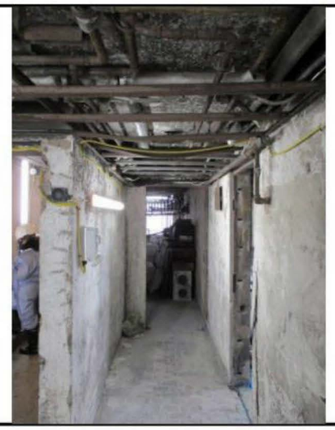
5-STA-21

L21-151

L21-152

L21-149

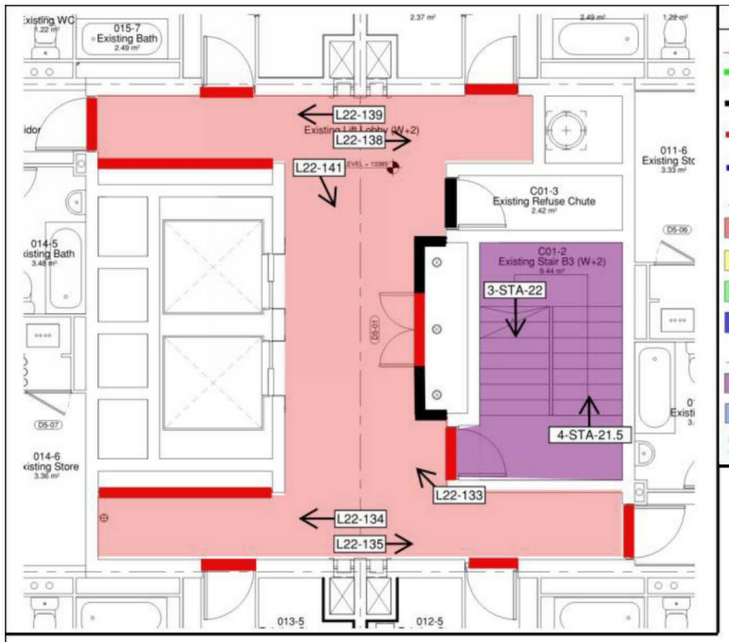
L21-150



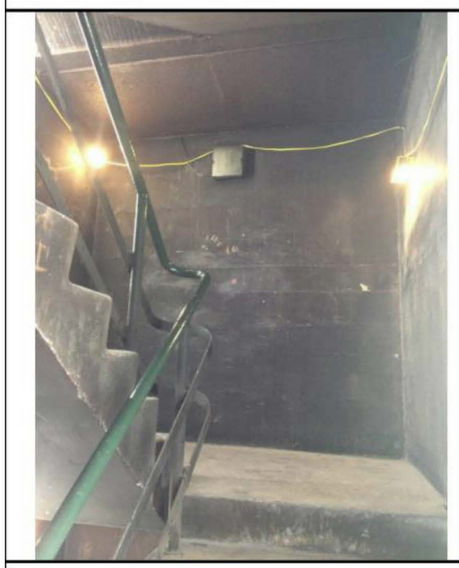
L21-148

L21-147

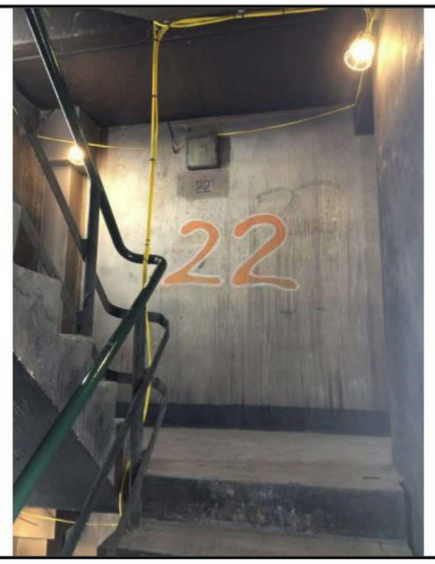
C2.1.26 Level 22



Level 22

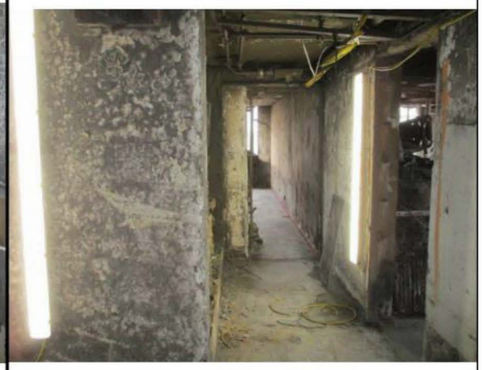


4-STA-21.5



3-STA-22

L22-138

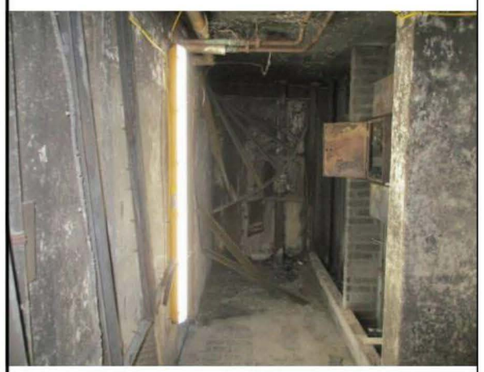


L22-139

L22-133

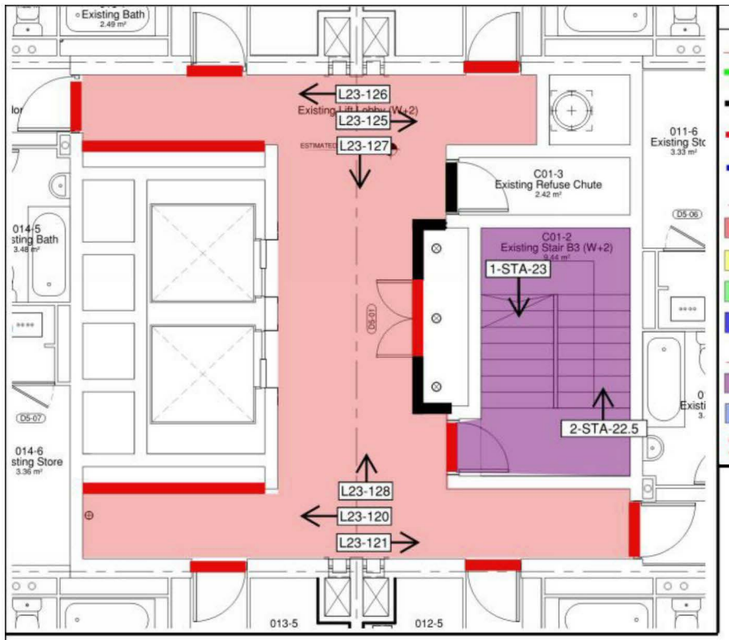
L22-141

L22-135

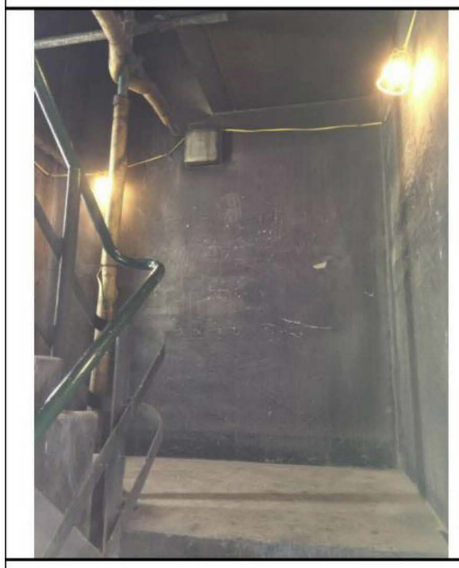


L22-134

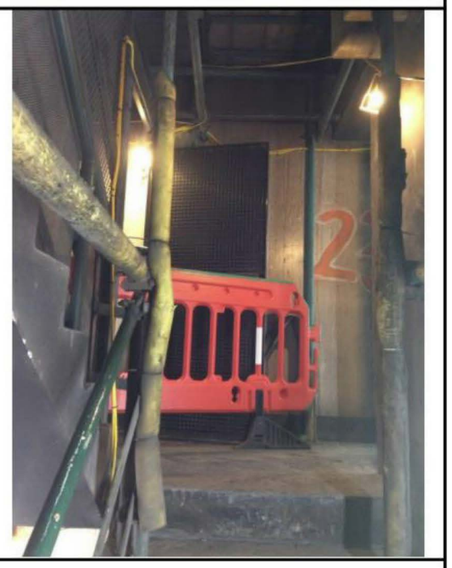
C2.1.27 Level 23



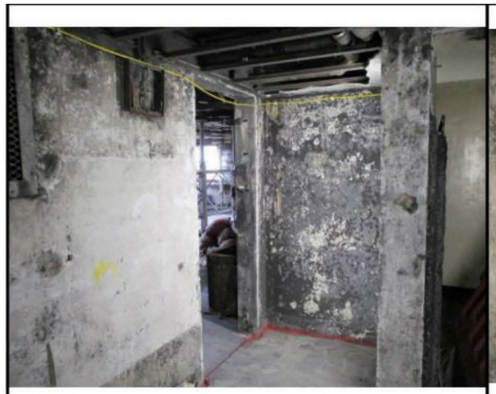
Level 23



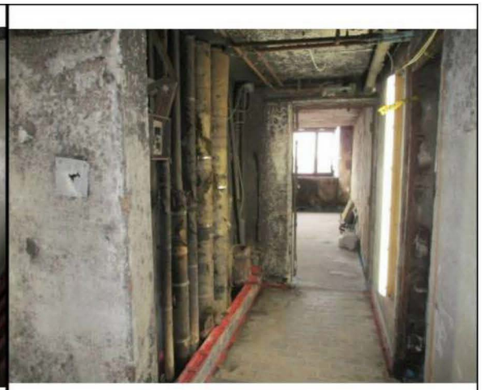
2-STA-22.5



1-STA-23

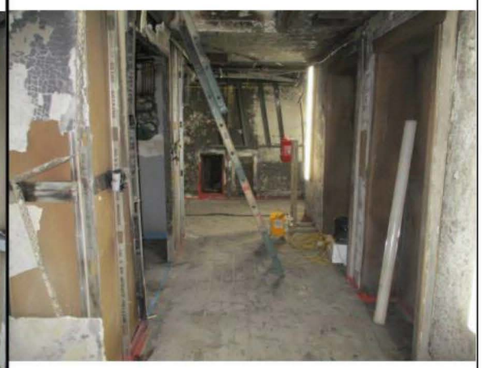


L23-125



L23-126

L23-128



L23-127

L23-121

L23-120

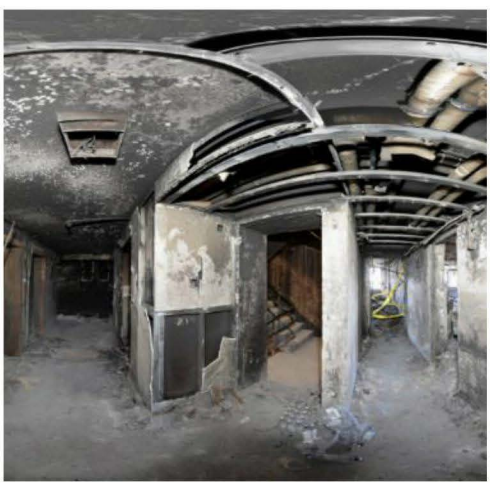
C3 MPS photographs of levels in the Tower with missing stair doors

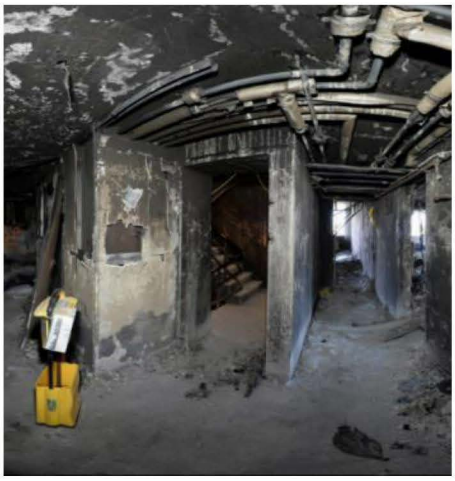
C3.1.1 During my November 2017 site inspections I observed stair doors were missing on Levels 13, 14, 16, 18, 20, 21, 22 and 23.

C3.1.2 This section provides photographic evidence taken by the Metropolitan Police (Table C.4) in the immediate aftermath of the fire. I have used these photographs to assess whether the missing doors had been removed between the fire on 14 June 2017 and my site inspection in November 2017.

C3.1.3 Please refer to Section 14 of my report where I discuss the implication of this information.

Table C.4 MPS photographs of levels with missing stair doors

Floor	Picture	Conclusions
13	 METS00017081  L13-258	Site visit: door missing MPS photo: door missing Conclusion: Door missing

Floor	Picture	Conclusions
14	 METS00017090	Site visit: door missing MPS photo: door missing Conclusion: Door missing
16	 METS00016987	Site visit: door missing MPS photo: door damaged Conclusion: door damaged
18	 METS00017003	Site visit: door missing MPS photo: door damaged Conclusion: door damaged

Floor	Picture	Conclusions
20	 METS00017130	Site visit: door missing MPS photo: door missing Conclusion: Door missing
21	 METS00017248	Site visit: door missing MPS photo: door missing Conclusion: Door missing

Floor	Picture	Conclusions
22	 METS00019977	Site visit: door missing MPS photo: door damaged Conclusion: door damaged
23	 METS00020143	Site visit: door missing MPS photo: door damaged Conclusion: door damaged

C4 Smoke ventilation: AOV, smoke shaft and external vents inspections

C4.1.1 I have recorded my observations of the evidence of smoke to the lobby AOVs and smoke shafts in Table C.5. I have used this information in my main report when assessing if the smoke ventilation system to the stair and lobby operated and/or operated as intended on the 14 June 2016.

C4.1.2 Photographic records of each of the inspections are found in Table C.6 and Table C.7.

C4.1.3 I have used this information in my main report when assessing if the smoke ventilation system to the stair and lobby operated and/or operated as intended on the 14 June 2016.

Table C.5 Recorded observations of smoke on the lobby AOVs and smoke shafts

Level	Northern shaft inspected?	Southern shaft inspected?	Northern AOV inspected? (near ceiling)	Southern AOV inspected? (near floor)	Smoke witnessed in shaft and back of AOV Northern shaft? (near ceiling)	Smoke witnessed on back of AOV Southern shaft? (near floor)
0	Not witnessed	N	Not witnessed	Y	Smoke damage not determined.	Smoke damage not determined.
1	N	N	Y	Y	Smoke damage not determined.	Smoke damage not determined.
2	N	N	Y (AOV in ceiling)	Y (AOV in ceiling)	Smoke damage not determined	Smoke damage not determined.
3	N	N	Y	Y	Smoke damage not determined.	Smoke damage not determined.
4	Y	Y	Y	Y	No visible smoke damage in the shaft or on the back of the AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.	No visible smoke damage in the shaft or on the back of the AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.
5	Y	Y	Y	Y	Visible smoke damage in the shaft. Smoke markings on louvre frame indicate AOV was closed during fire.	No visible smoke damage in or on the back of the AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.

Level	Northern shaft inspected?	Southern shaft inspected?	Northern AOV inspected? (near ceiling)	Southern AOV inspected? (near floor)	Smoke witnessed in shaft and back of AOV Northern shaft? (near ceiling)	Smoke witnessed on back of AOV Southern shaft? (near floor)
6	Y	Y	Y	Y	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.	No visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.
7	Y	Y	Y	Y	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.	Light smoke damage in the shaft and on back of AOVs. AOV frame removed. Could not observe smoke markings.
8	Y	Y	Y	Y	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.	Light smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.
9	Y	Y	Y	Y	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.
10	Y	Y	Y	Y	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.	Visible smoke damage in the shaft and on back of AOVs. Smoke markings on louvre frame indicate AOV was closed during fire.

Level	Northern shaft inspected?	Southern shaft inspected?	Northern AOV inspected? (near ceiling)	Southern AOV inspected? (near floor)	Smoke witnessed in shaft and back of AOV Northern shaft? (near ceiling)	Smoke witnessed on back of AOV Southern shaft? (near floor)
11	Y	Y	Y	Y	AOV Louvres locked in the open position. Smoke markings on louvre frame indicate AOV was open during fire. Visible smoke damage in the shaft and on back of AOVs.	AOV louvres locked in the open position. Smoke markings on louvre frame indicate AOV was open during fire. Visible smoke damage in the shaft and on back of AOVs.
12	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
13	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
14	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
15	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
16	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
17	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
18	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
19	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
20	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
21	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
22	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.
23	N	N	N	N	Smoke damage not determined.	Smoke damage not determined.

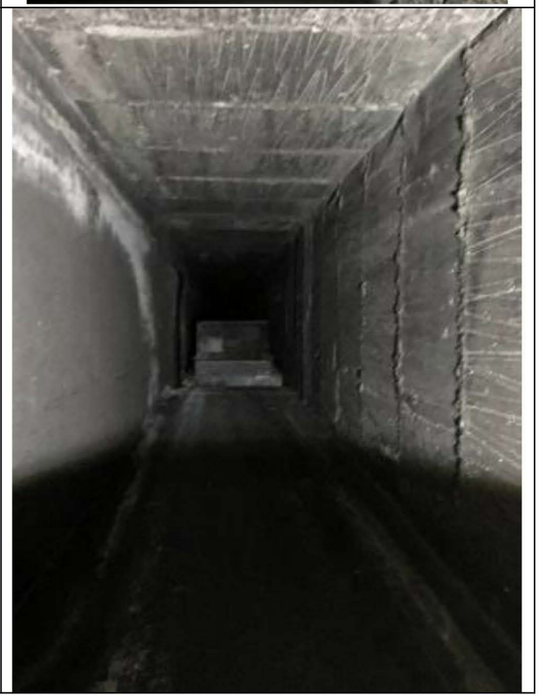
Table C.6 Photographic evidence of AOV and smoke shaft site inspections

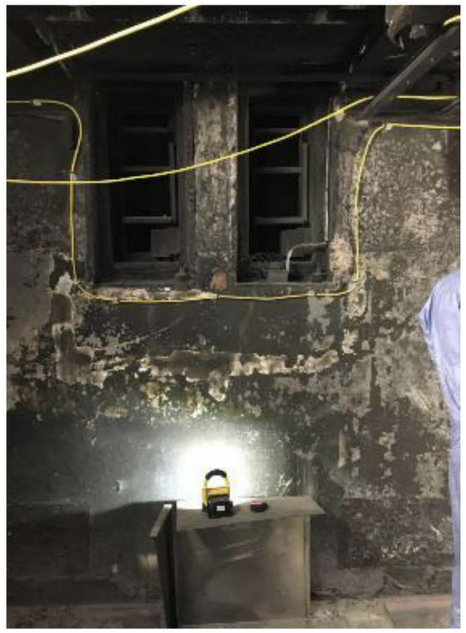
Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
0	n/a	n/a		Not inspected
1		Not inspected		Not inspected

Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
2				Not inspected
3		Not inspected		Not inspected

Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
4				
5				
6				

Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
7				
8				

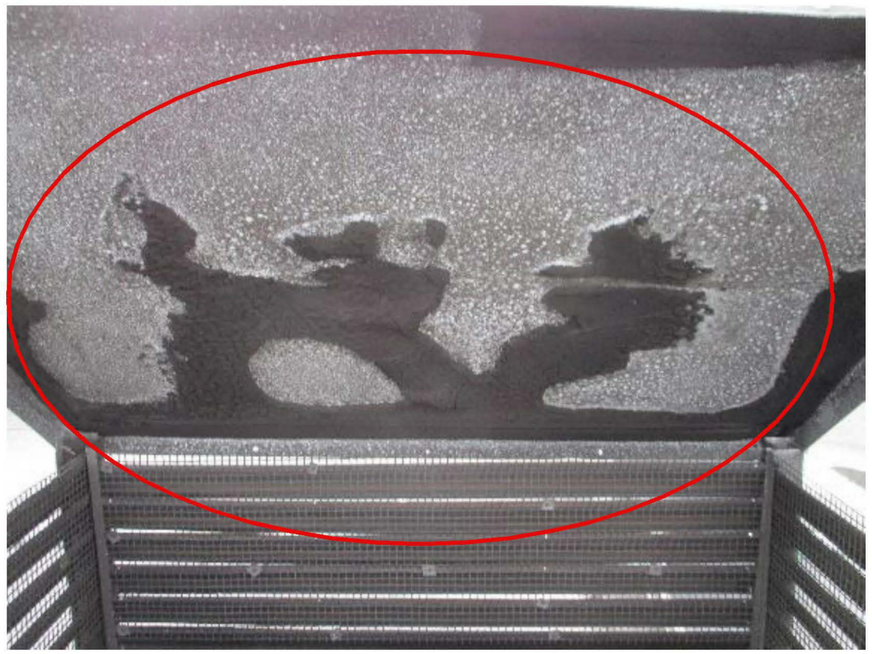
Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
9				
10				

Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
11				
12			Not inspected	Not inspected
13	Not inspected	Not inspected	Not inspected	Not inspected
14	Not inspected	Not inspected	Not inspected	Not inspected

Level	North AOV		South AOV	
	AOV	Shaft	AOV	Shaft
15	Not inspected	Not inspected	Not inspected	Not inspected
16	Not inspected	Not inspected	Not inspected	Not inspected
17	Not inspected	Not inspected	Not inspected	Not inspected
18	Not inspected	Not inspected	Not inspected	Not inspected
19	Not inspected	Not inspected	Not inspected	Not inspected
20	Not inspected	Not inspected	Not inspected	Not inspected
21	Not inspected	Not inspected	Not inspected	Not inspected
22	Not inspected	Not inspected	Not inspected	Not inspected
23	Not inspected	Not inspected	Not inspected	Not inspected

Table C.7 Photographic evidence of smoke control system components

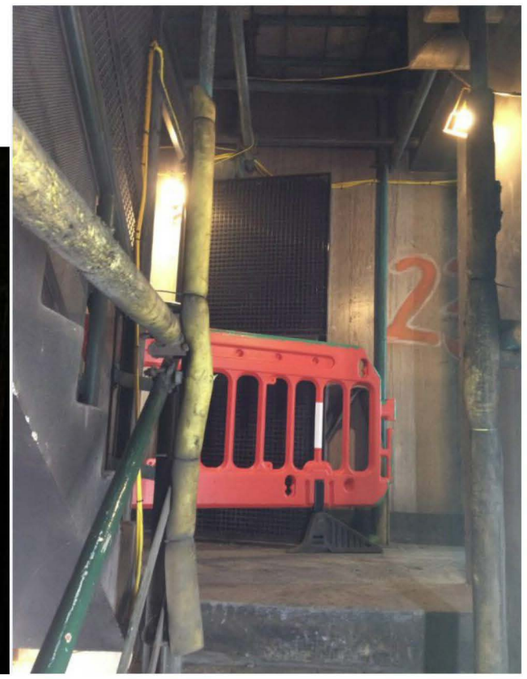
Location – upper roof	
Photograph	**Description**
	Roof cowl of lobby smoke extract North shaft looking North West Some particulate deposits on the louvres
	Roof cowl of lobby smoke extract North shaft looking South Some particulate deposits on the louvres

	Roof cowl of lobby smoke extract North shaft looking South-East Some particulate deposits on the louvres
	Inside of roof cowl of lobby smoke extract North shaft – lid lifted and photo of underside of lid taken. Dark heat-damaged (possible charring) material visible (circled).

	North Lobby Smoke Extract Shaft looking down the shaft. Low quantities of light grey soot were observed.
	North Lobby Smoke Extract Shaft looking down the shaft. Low quantities of light grey soot were observed.

	Roof top stairwell ventilator looking South East. Black particulate deposits and staining to louvres.
	Roof top stairwell ventilator looking East Black particulate deposits and staining to louvres.

Roof top stairwell ventilator looking West
Black particulate deposits and staining to louvres.



Left: Inside of stairway ventilator looking up from Level 23. This shows that the ventilator was open to the stair.
Right: The condition of the stair in Level 23 is shown below. Soot deposits on walls (light) and stair (heavy) indicate smoke was present just below the ventilator.

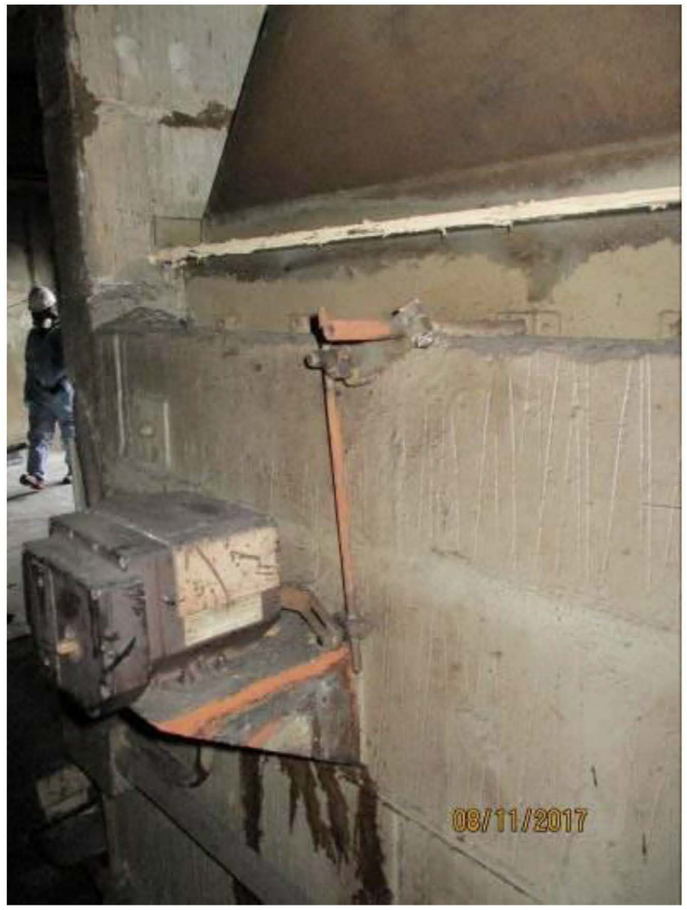
Location – rooftop plant room	
	Smoke Extract System Main Inverter Panel 2

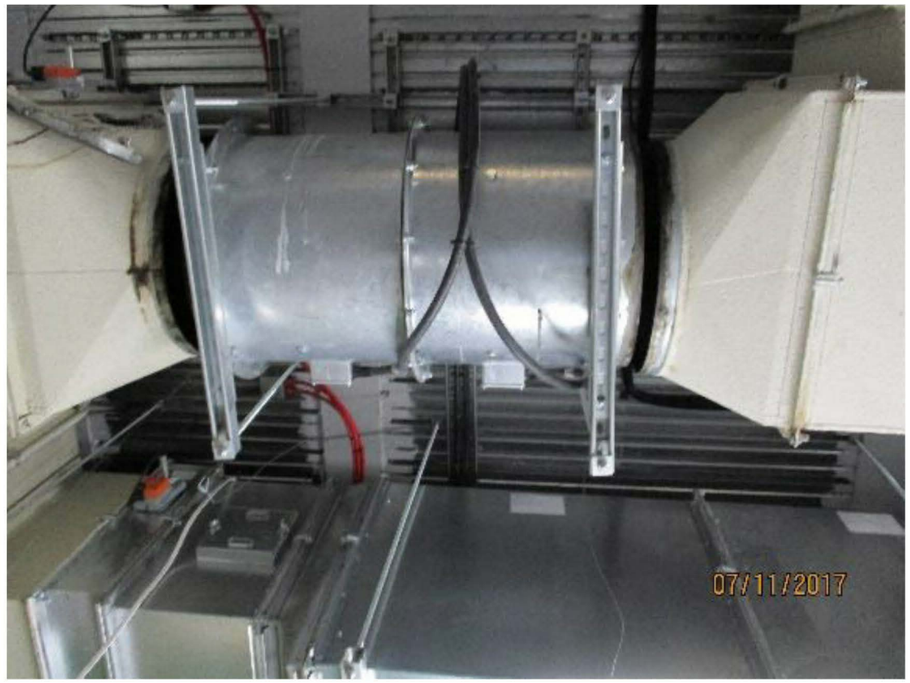
	Smoke Extract System Auto-changeover panel
	Smoke Fan Data Plate

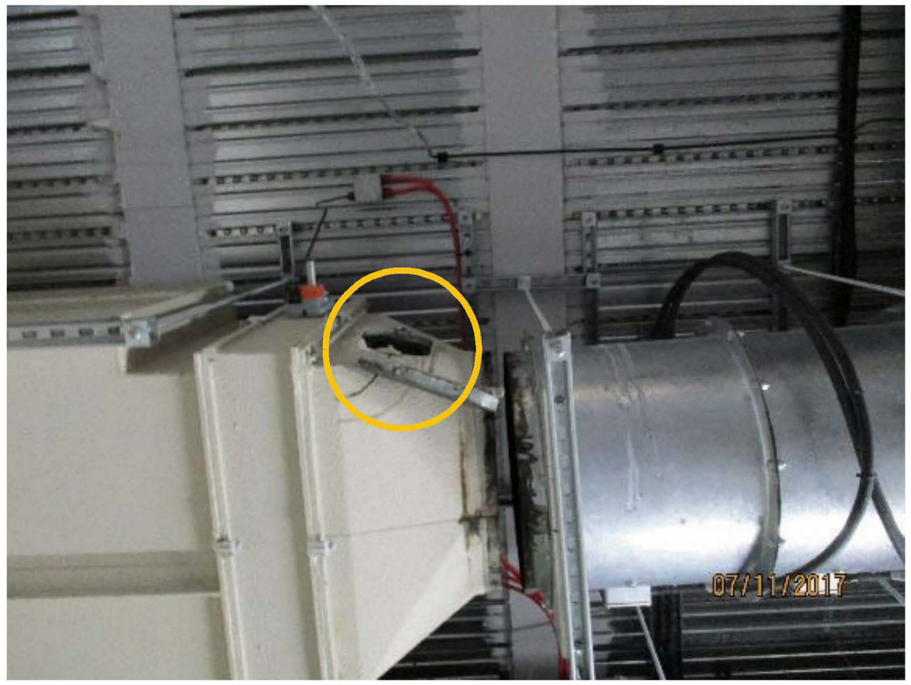
	Smoke Fan CE Plate
	Smoke Fan Set configuration 2 axial fans inline

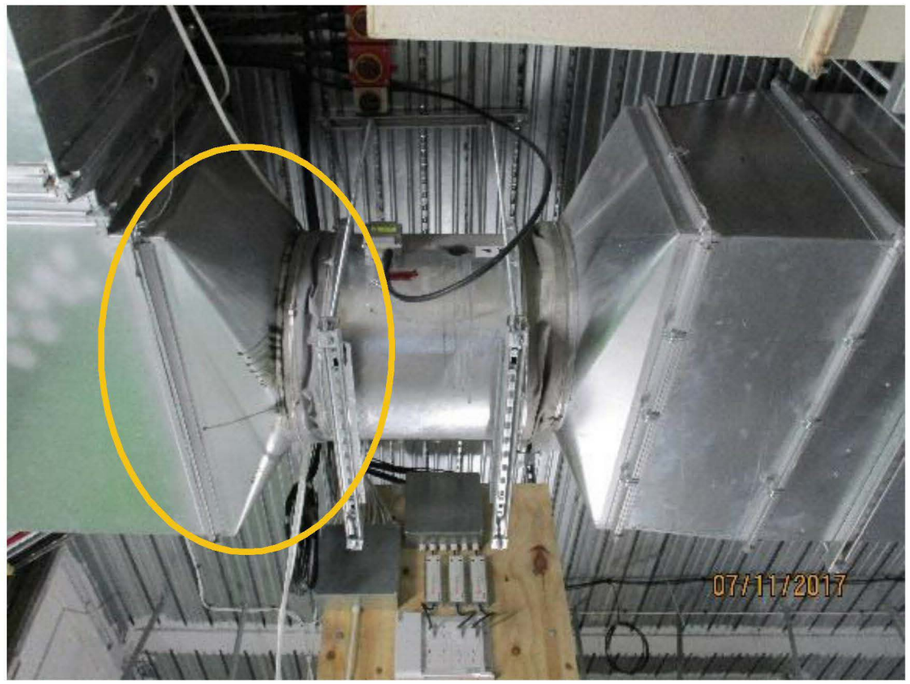
	Motorised damper blanked off on smoke extract shaft

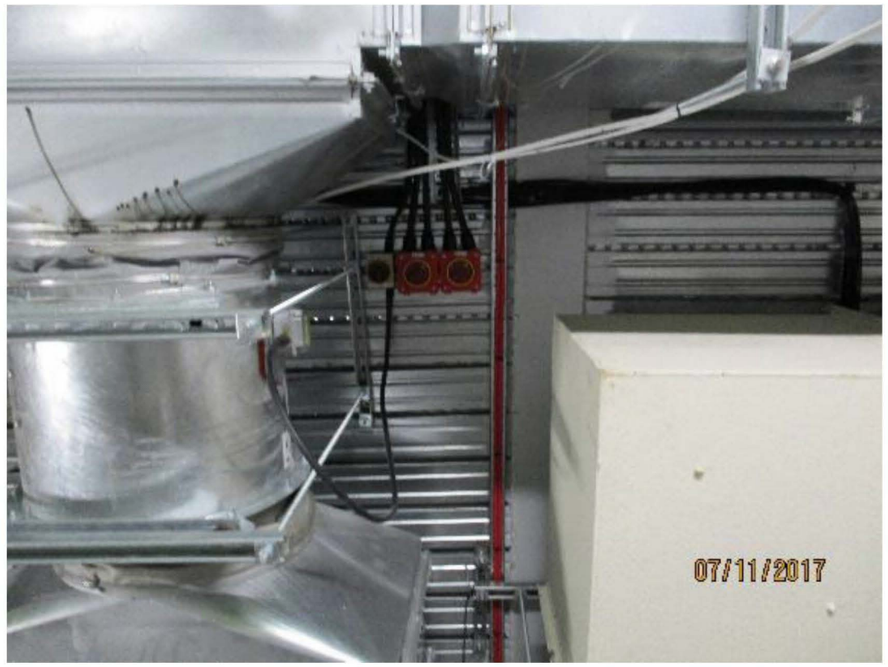
	One of the isolators for the smoke extract fans

	Motorised damper before the smoke extract fans
Location – level 2	

	Location of environmental supply fan and smoke extract fan
	Smoke Extract fan with both flexible connections missing – removed by post fire forensic investigation teams.

	Access door (circled) into smoke extract duct work open, unknown if this was closed at the time of the incident
	Motorised damper for environmental supply fan branch cabling intact, and fire rated to junction box

	Environmental supply fan, evidence of soot at the flexible connection on discharge side of fan, would indicate fan was running
	Smoke extract is made up of two fans installed in series

	Smoke extract ductwork discharges to external at high level on level 2
	Electrical isolators for the environmental supply fan and the smoke extract fans.

C5 Fire door surveys

C5.1.1 During the site inspection a total number of 14 remaining Flat entrance doors were surveyed, as follows:

a) Level 5 – Flats 21 to 26

b) Level 6 – Flats 33 and 34

c) Level 12 – Flats 91 to 96

C5.1.2 Of the 14 Flat doors, 8 doors were fully intact. Those were

a) Level 5 – Flats 21 to 25

b) Level 6 – Flat 34

c) Level 12 – Flat 93

C5.1.3 Additionally, one stair door was surveyed at Level 6.

C5.1.4 Table C.8 presents the results of this door survey conducted on the 8 intact doors. The first column of this table presents the specific questions investigated during the inspection of each door. The rest of the table records the results against these questions.

C5.1.5 A selection of photographs from this survey are presented in Section C5.1.7.

C5.1.6 Table of findings from Fire Door Survey

Table C.8: Results of door survey

Survey Items	Flat Entrance Door							Door to the protected stair enclosure inspection locations
	Flat 21	Flat 22	Flat 23	Flat 24	Flat 25	Flat 34	Flat 93	Level 06
Level	5	5	5	5	5	6	12	6
Door leaf depth:	45mm	45mm	45mm	45mm	45mm	45mm	45mm	44mm
Is there any label indicating fire performance of the door?	Blue + red dot. Not determined if this relates to fire performance.	Blue + red dot. Not determined if this relates to fire performance.	Blue + red dot. Not determined if this relates to fire performance.	See photo white + red dot. Not determined if this relates to fire performance.	See photo, blue + red dot. Not determined if this relates to fire performance.	See photo Grey dot. Not determined if this relates to fire performance.	GRP serial number on 1112075...2 GRP..... door edge.	Yes
What size of gaps are there between the door leaf and the door frame? (3-4mm normally accepted	1 - 2mm	4mm	4mm	4mm	none	1 - 2mm	Too damaged	
Is there a glazed aperture in the door? Any indication of fire performance on the glazing i.e. a standard marking?		No	Yes, no marking	No	No	No	No	Yes- Wire
Is there any transfer grilles fitted in the door? Is it clear whether there is an intumescent grille or linked to fire alarm?	No	Letter Box	Letter Box	No	No	No	Letter Box	N/A
What depth is the door rebate?	45mm	45mm	45mm	45mm	45mm	45mm	45mm	45mm×12mm
Is there any noticeable damage to the door that would compromise fire resistance? i.e. outer veneer broken etc?	Fire damage	Fire damage	No	Fire damage	Fire damage	Fire damage	Not relevant - post fire	
How many hinges are there?	3	3	3	3	3	3	3 spaced evenly at 80cm	3
Are there any noticeable areas where hinges are missing?	No	No	No	No	No	No	No	No
Are all screws fitted securely? Is there any screws missing?	All screws present and secure	1 missing	All screws present and secure	All screws present and secure	All screws present and secure	All screws present and secure	No	All screws present and secure
Is there noticeable damage to the hinges/what is its condition?	No	No	No	No	No	No	N/A	No
Does the door stand securely or does it hang loose from the frame?	Secure	Secure	Secure	Secure	Secure	Secure	Too damaged	
Are there intumescent strips fitted around the door?	Yes	Yes	Yes	Yes	Yes	Yes	Too damaged see photos	Yes
Is the intumescent strip continuous or are there breaks i.e. damaged sections?	Intumescent strip in place on internal doors frame however could not determine during the site investigation if intumescent strip was continuous behind locks/ latches	Intumescent strip in place on internal doors frame however could not determine during the site investigation if intumescent strip was continuous behind locks/ latches	Intumescent strip in place on internal doors frame however could not determine during the site investigation if intumescent strip was continuous behind locks/ latches	Intumescent strip in place on internal doors frame however could not determine during the site investigation if intumescent strip was continuous behind locks/ latches	Intumescent strip in place on internal doors frame however could not determine during the site investigation if intumescent strip was continuous behind locks/ latches	Intumescent strip in place on internal doors frame however could not determine during the site investigation if intumescent strip was continuous behind locks/ latches	Fire damaged but appeared to be continuous	

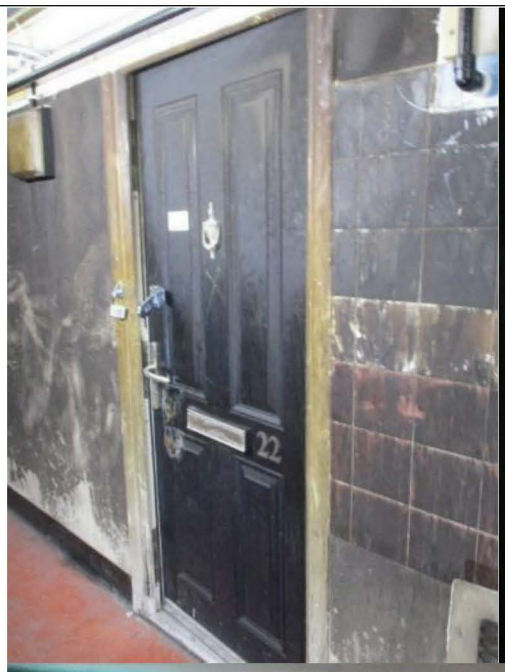
Survey Items	Flat Entrance Door							Door to the protected stair enclosure inspection locations
	Flat 21	Flat 22	Flat 23	Flat 24	Flat 25	Flat 34	Flat 93	Level 06
Is the intumescent strip securely fitted to the door?	Yes	Yes	Yes to frame	Yes	Yes	Yes	No	
What lock or latch is there on the door?	3-point lock	3-point lock	3-point lock	3-point lock	3-point lock	3-point lock	3-point lock	N/A
Is it securely fixed into the door with no visible openings around it?	Too damaged	Yes	Yes	Yes	Too damaged	Too damaged	See photos	N/A
What material is it made out of?	Metal	Metal	Metal	Metal	Metal	Metal	Metal	N/A
Does the door open easily or does the latch/lock cause resistance?	Not possible to survey in post fire condition	Not possible to survey in post fire condition	Yes- opens easily	Not possible to survey in post fire condition	Not possible to survey in post fire condition	Not possible to survey in post fire condition	N/A	N/A
What is the surrounding wall construction? Blockwork? Plasterboard stud wall?	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete	Concrete
What material is the door frame constructed of?	PVC and metal	PVC and metal	PVC and metal	PVC and metal	PVC and metal	PVC and metal	PVC and metal	Timber
Are architraves fitted? If so what material are they made out of?	PVC	PVC	PVC	PVC	PVC	PVC		Yes, Timber
Is there any visible openings between the door frame and the surrounding wall?	No	No	No	No	No	No		
What width is there between the door frame and the surrounding construction?	N/A	N/A	N/A	N/A	N/A	N/A		No, white seal
Is there any filling material visible? Can you identify the material?	N/A	N/A	N/A	Expanding foam in gap	Expanding foam in gap	N/A		
What type of self-closing device is present? i.e. self-closing ironmongery device? Release mechanism connected to fire alarm system?	Concealed closer in place but disconnected. Unknown by who or when.	Concealed closer in place but disconnected. Unknown by who or when.	Concealed closer in place but disconnected. Unknown by who or when.	Concealed closer in place but disconnected. Unknown by who or when.	Concealed door closer had been removed. Unknown by whom or when.	Overhead self closer in place	Concealed closer in place but disconnected. Unknown by who or when.	Overhead self closer in place
Does the self-closing device fully close the door? Common problems might be latch resistance or friction from the floor.	Not possible to survey	Not possible to survey	Not possible to survey	Not possible to survey	Not possible to survey	No	Not possible to survey	Not possible to survey in post fire condition
How quickly does the self-closer close the door from fully open?	Not possible to survey	Not possible to survey	Not possible to survey	Not possible to survey	Not possible to survey	30+ sec	Not possible to survey	Not possible to survey in post fire condition
Is there noticeable damage to the self-closing device?	Not possible to survey	Not possible to survey	Not possible to survey	Not possible to survey	Not possible to survey	No	Not possible to survey	Not possible to survey in post fire condition
Are there smoke seals fitted around the door?	Yes	Yes	Yes	Yes	Yes	Not determined	No	Yes
Is the smoke seal continuous or are there breaks i.e. damaged sections?	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	N/A	Not recorded
Is the smoke seals securely fitted to the door?	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	N/A	Not recorded
Is there still a gap between the smoke seals and the door frame?	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	Not recorded	N/A	No visible gap
Is there exit signage located above the door if it is a fire exit?	No	No	No	No	No	No	N/A	No

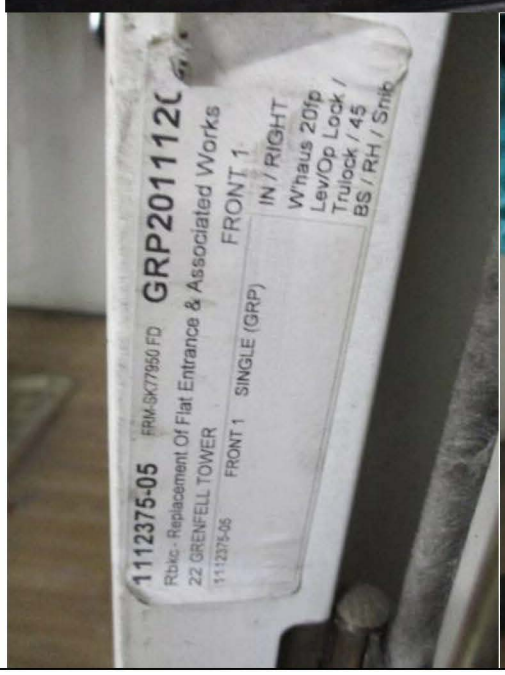
Survey Items	Flat Entrance Door							Door to the protected stair enclosure inspection locations
	Flat 21	Flat 22	Flat 23	Flat 24	Flat 25	Flat 34	Flat 93	Level 06
Is there fire door signage located on the door i.e. fire door keep locked or fire door keep clear?	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Keep shut

C5.1.7 Photographs of findings

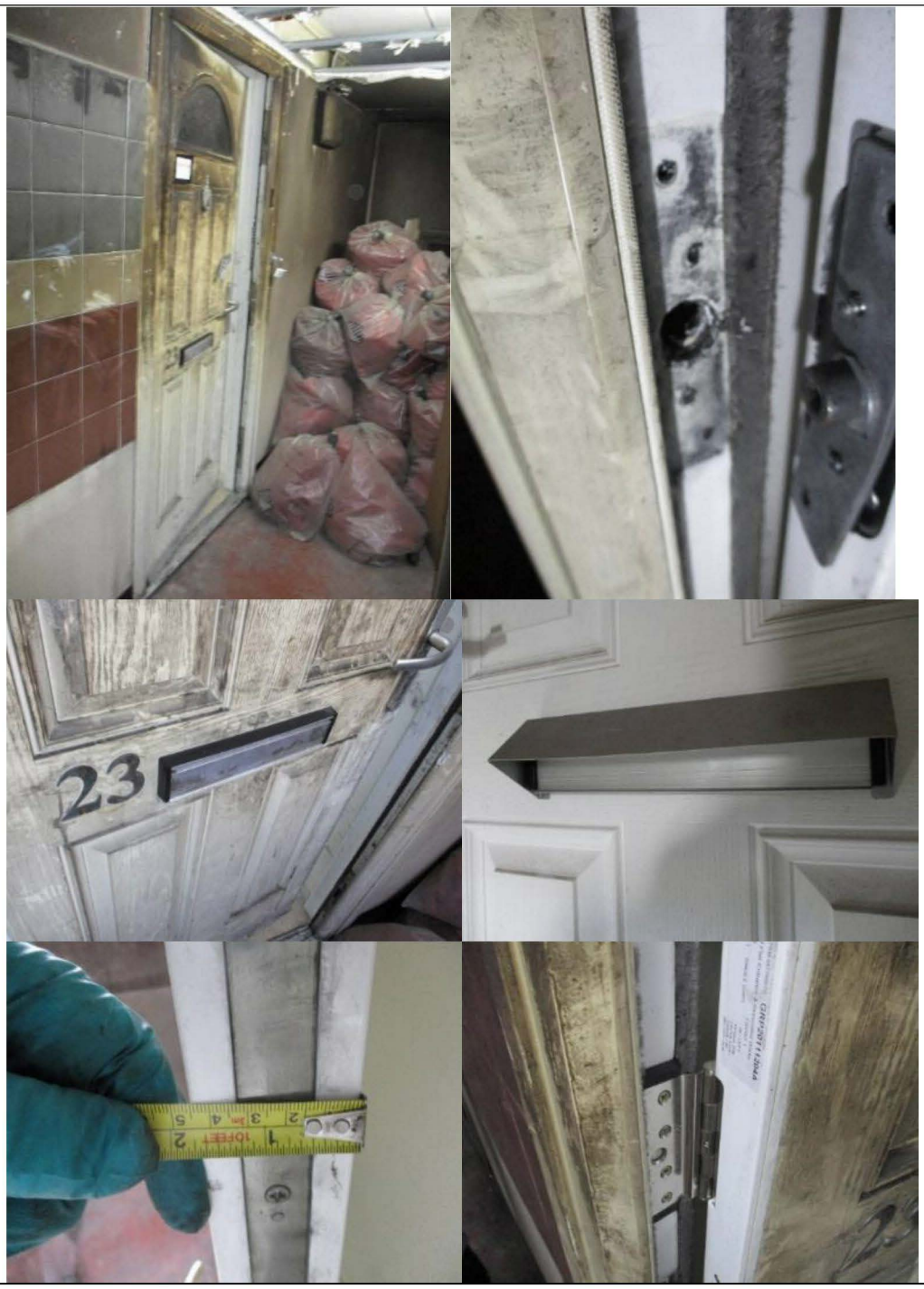
Flat 21

Flat 22

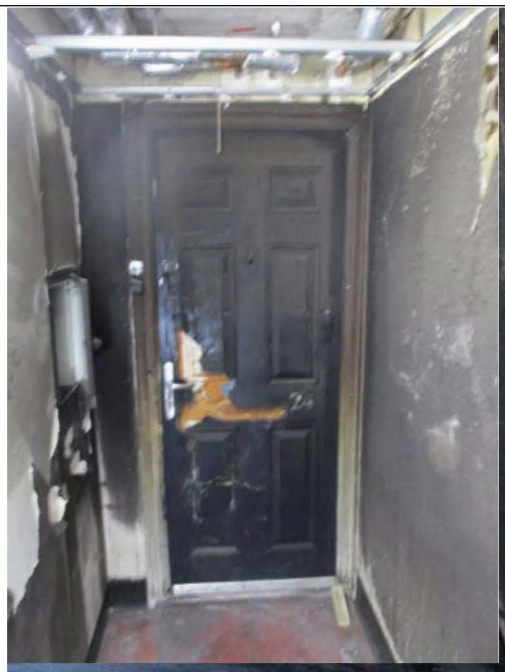

22

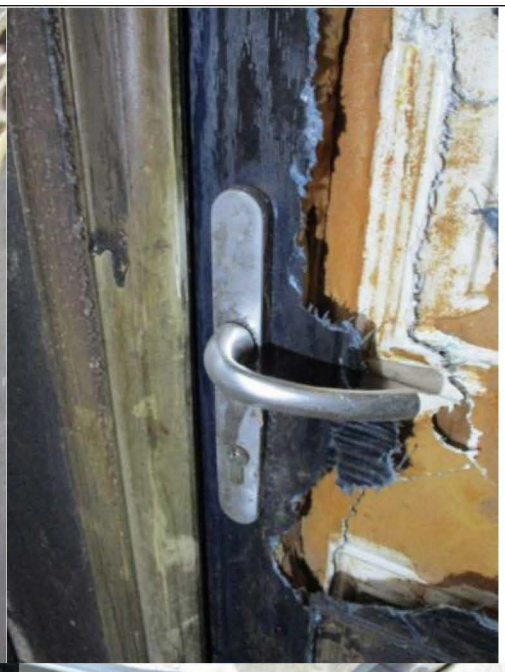

1112375-05 FRM-SK77950 FD GRP201112(
Rbkc - Replacement Of Flat Entrance & Associated Works
22 GRENFELL TOWER FRONT 1
1112375-05 FRONT 1 SINGLE (GRP)
IN / RIGHT
Whaus 20fp
LeviOp Lock /
Trulock / 45
BS / RH / Snib


10FEET

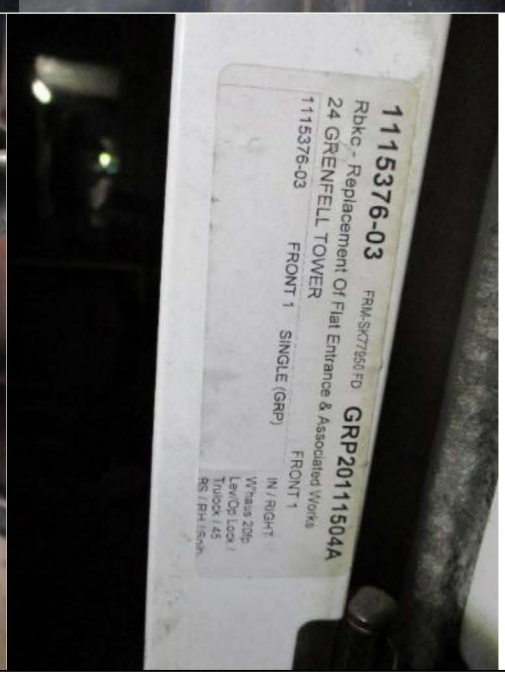
Flat 23	

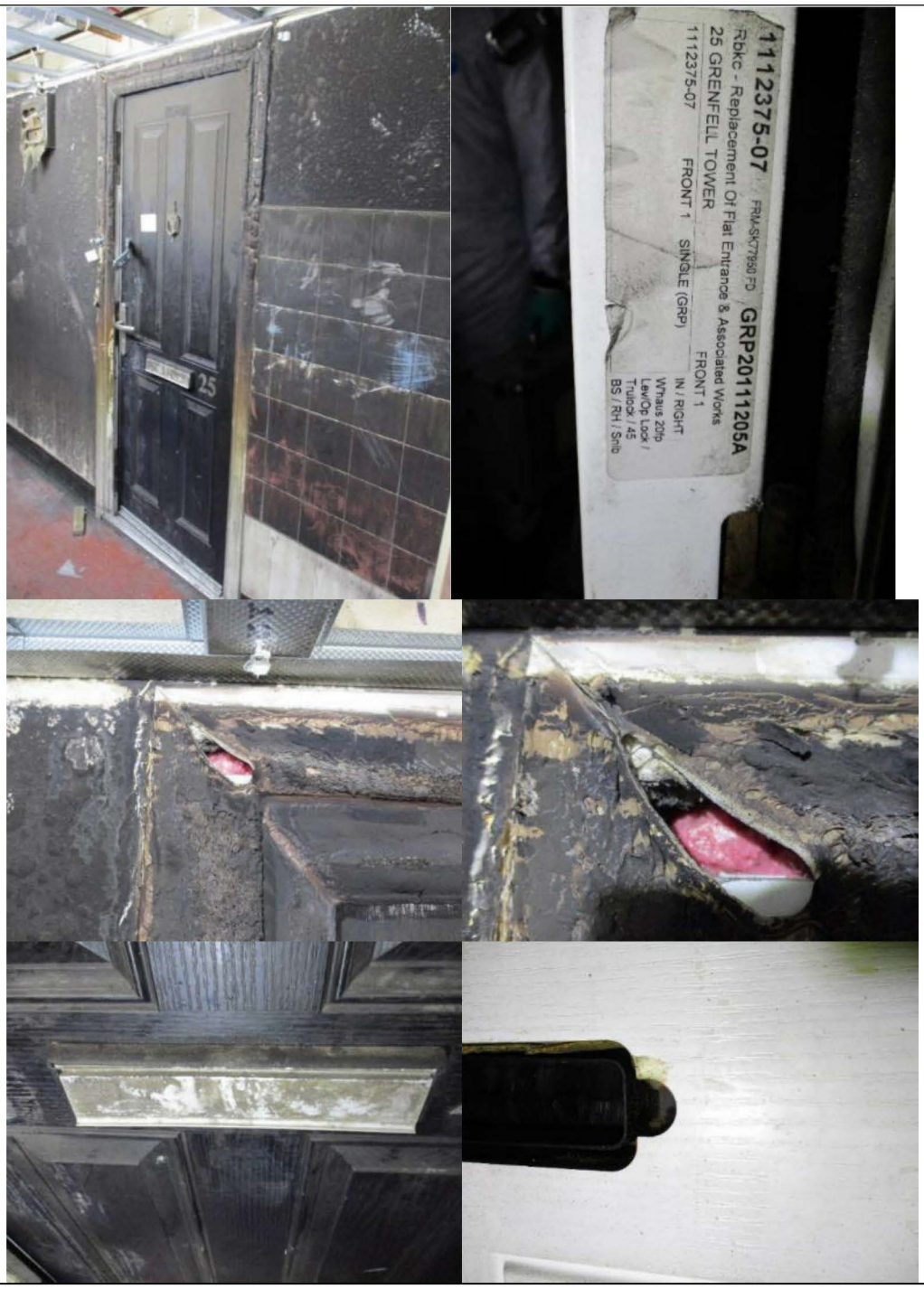
Flat 24






10 FEET


1115376-03
FRM-SK77250 FD
GRP20111504A
Rbkc - Replacement Of Flat Entrance & Associated Works
24 GRENFELL TOWER
1115376-03
FRONT 1
SINGLE (GRP)
FRONT 1
IN / RIGHT

Flat 25	 1112375-07 FRM-SK77890 FD GRP20111205A Rbkc - Replacement Of Flat Entrance & Associated Works 25 GRENFELL TOWER FRONT 1 1112375-07 FRONT 1 SINGLE (GRP) IN / RIGHT W'haus 20fp LeviOp Lock / Trudock / 45 BS / RH / Snib

Flat 26	

Flat 34	

Flat 93	

C6 Survey of linings to window openings

C6.1.1 On the 7th-9th of November I undertook a non-invasive inspection of the window linings of Grenfell Tower. That is, my inspection of the window linings was visual only. I did not remove any construction as part of my survey.

C6.1.2 I visually inspected the window linings within the following areas;

a) Level 1 – Flat 2

b) Level 2 – Flat 6

c) Level 3 – Flat 9, 10

d) Level 4 – Flat 11, 12, 13, 14, 15, 16

e) Level 5 – Flat 21, 22, 23, 24, 25, 26

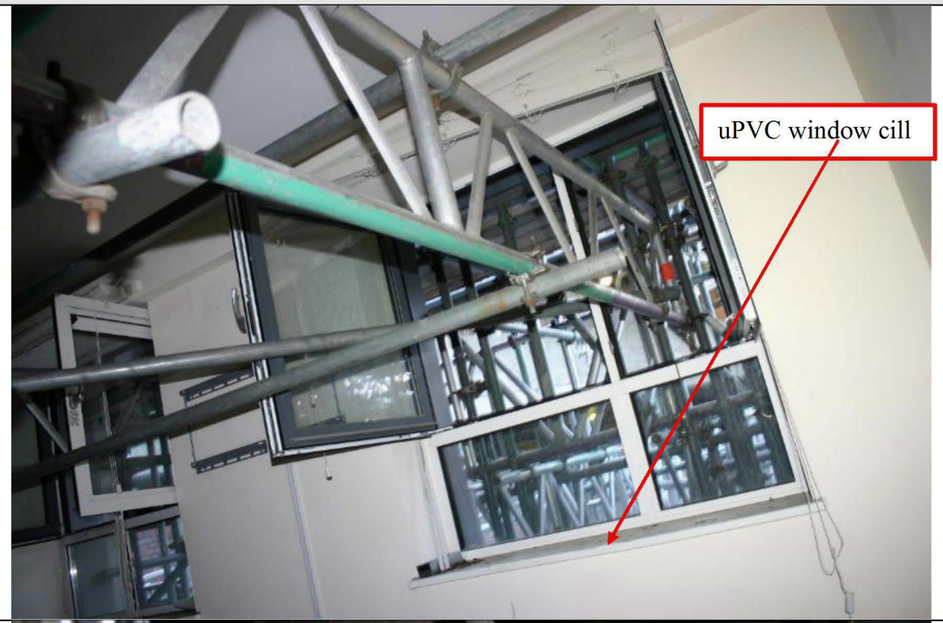
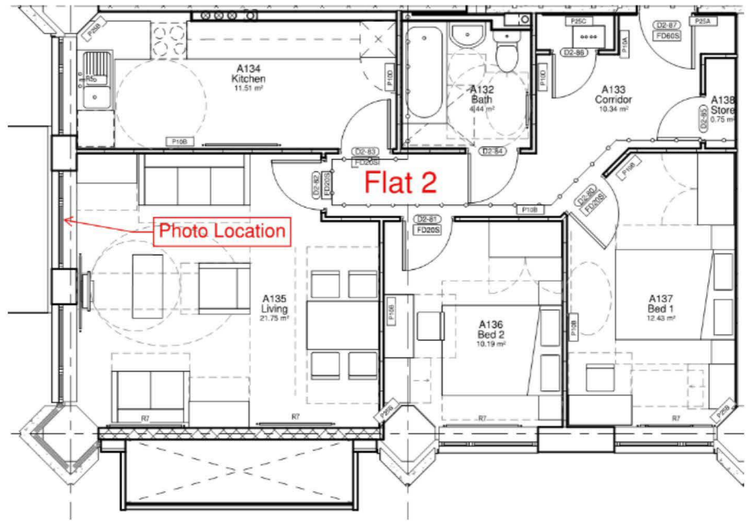
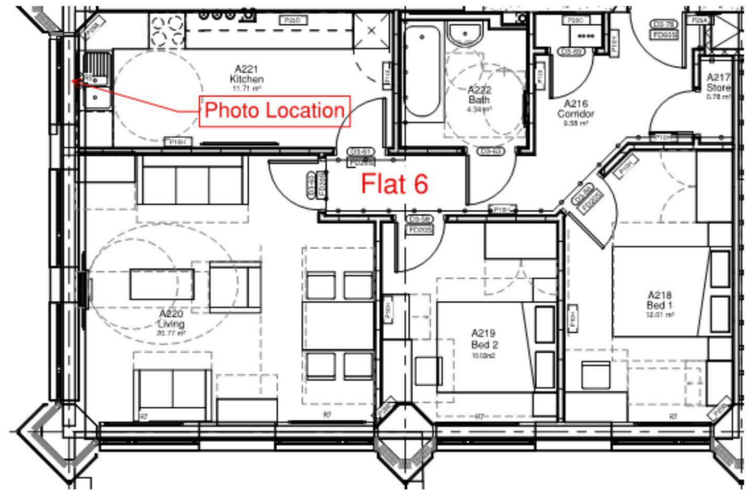
C6.1.3 Table C.9 presents a selection of the key photographs from that survey.

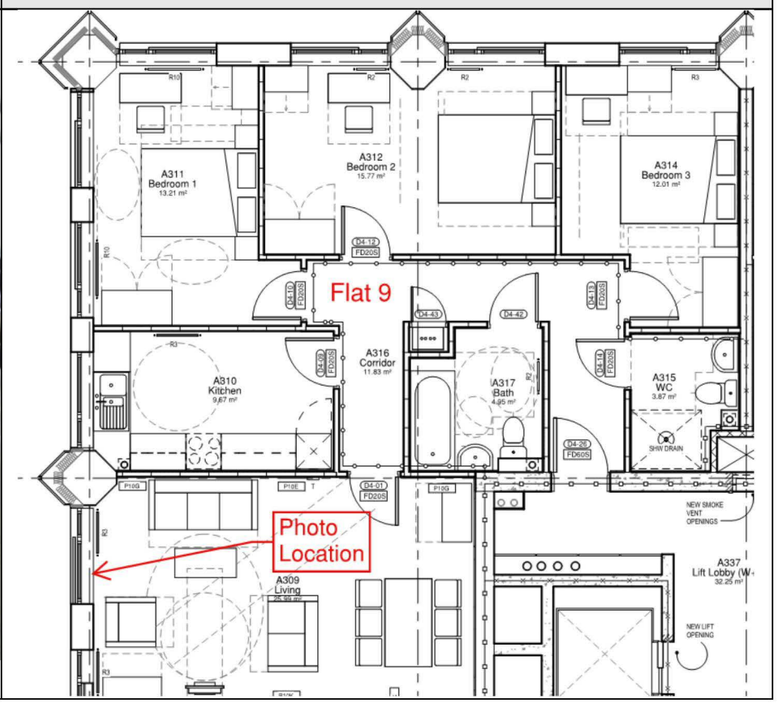
C6.1.4 Of the 16 flats surveyed, 10 flats were observed with uPVC window finishes. Those were Flats: 2, 6, 9, 10, 11, 15, 21, 22, 23 and 25. In the other 6 flats I was not able to observe uPVC finishes in place because of fire damage and/or removal by other parties.

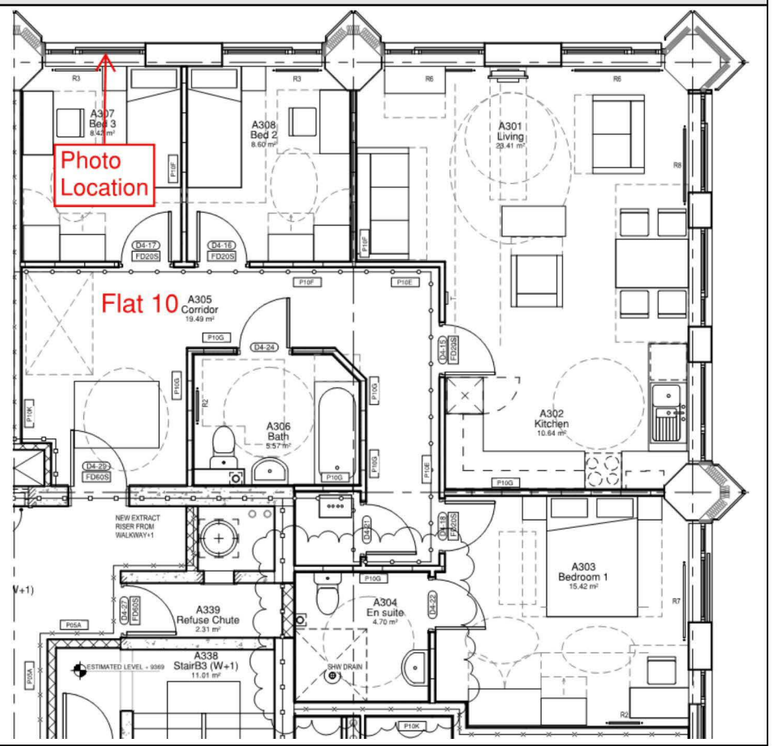
C6.1.5 Of the 16 flats surveyed, I observed combustible thermal insulation behind the cill, jamb or head of a window in 4 Flats, being Flats 15, 16, 21 and 26. In the other 12 flats, I was unable to observe the insulation because either it had been removed by other parties, was concealed behind uPVC finished, or it had burned away during the fire.

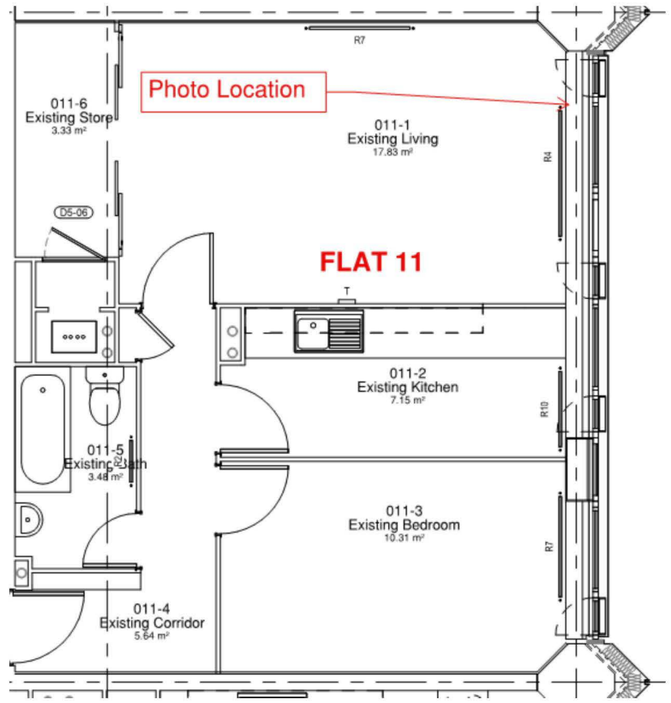
C6.1.6 Window opening survey photographic evidence

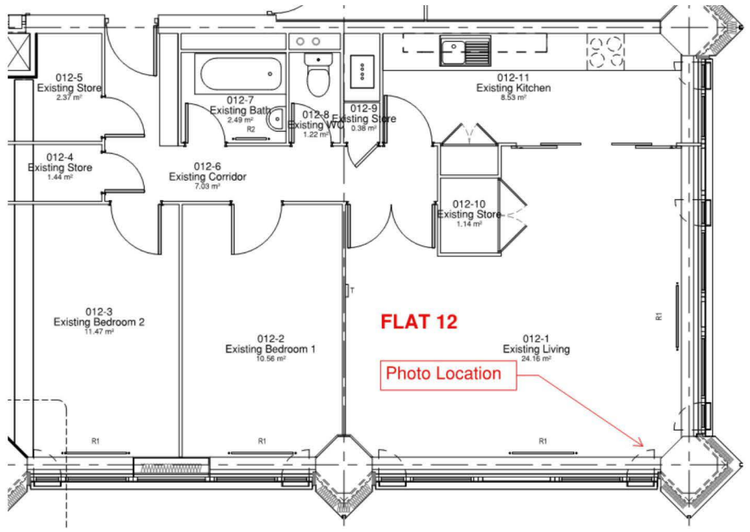
Table C.9: Photographs of windows taken on post fire inspection

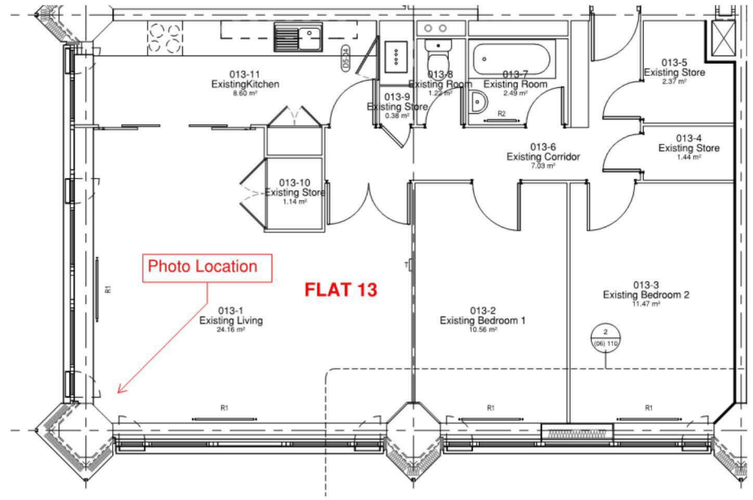
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
1	2	Yes	No – I was not able to inspect behind the window linings		
2	6	Yes	No - I was not able to inspect behind the window linings		

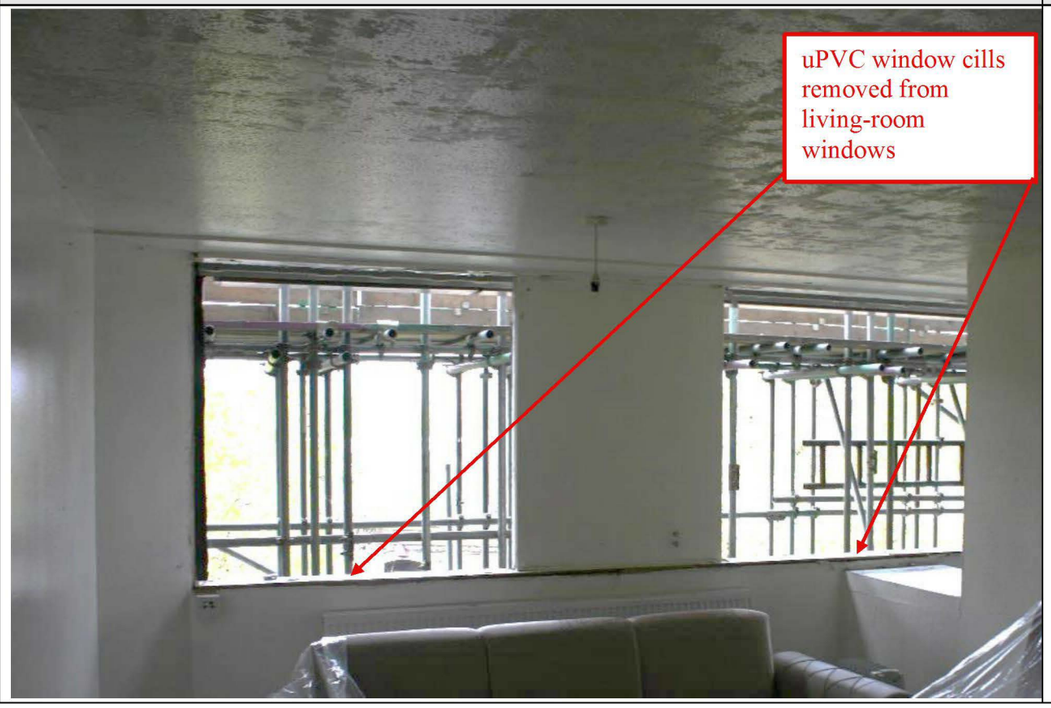
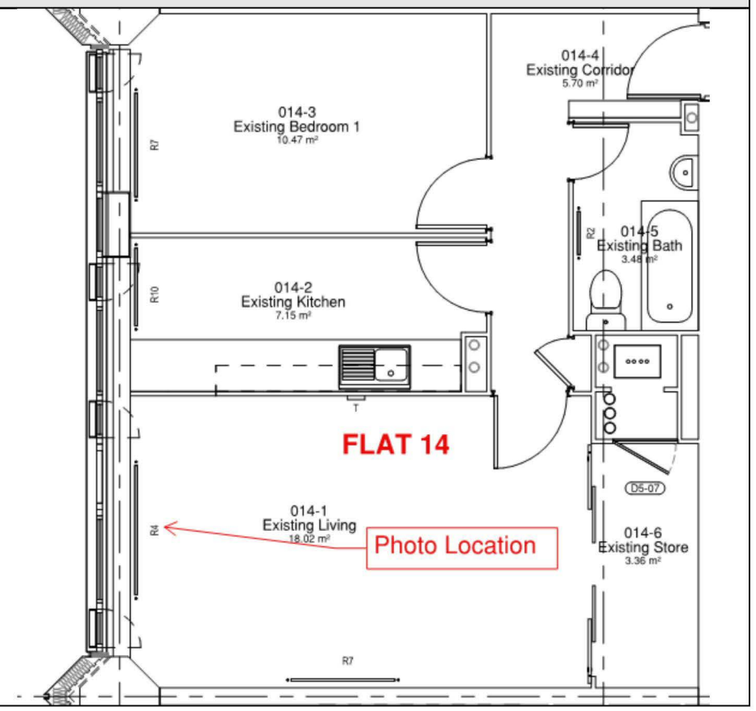
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
3	9	Yes	No - I was not able to inspect behind the window linings		

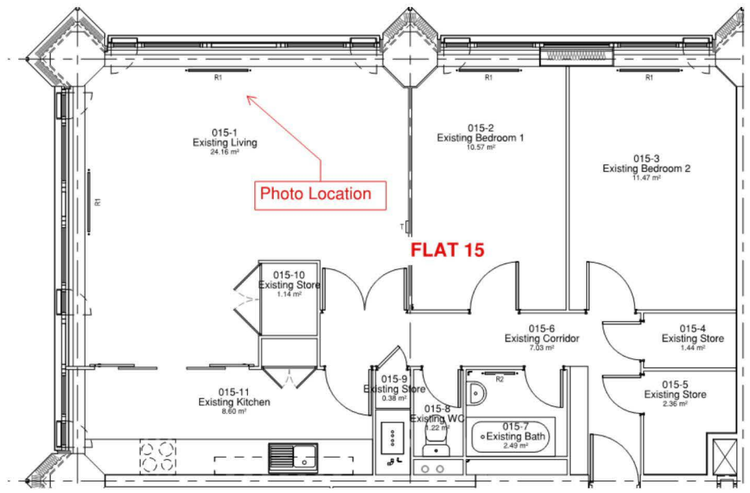
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
3	10	Yes	No - I was not able to inspect behind the window linings		

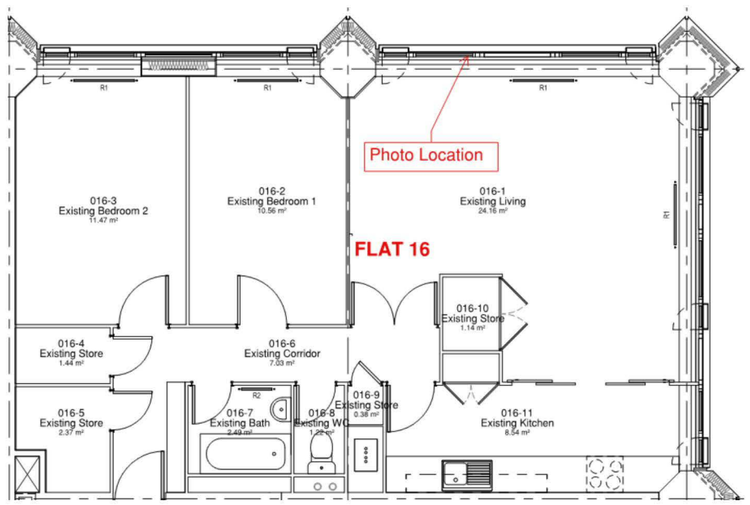
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
4	11	Yes. In place, except from the living room window reveal.	No - I was not able to inspect behind the window linings		

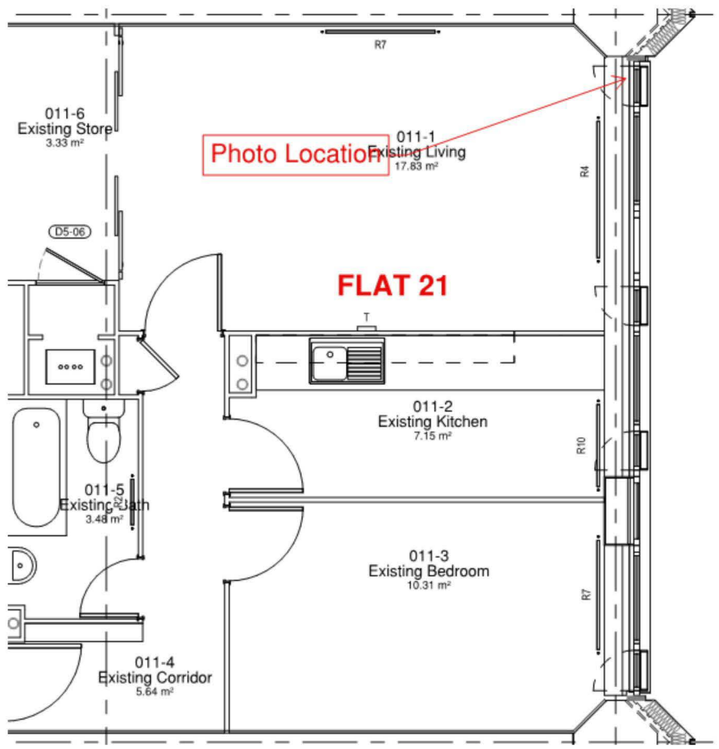
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
4	12	No. All finishes removed from windows and flat.	No – All window linings removed from windows and flat		

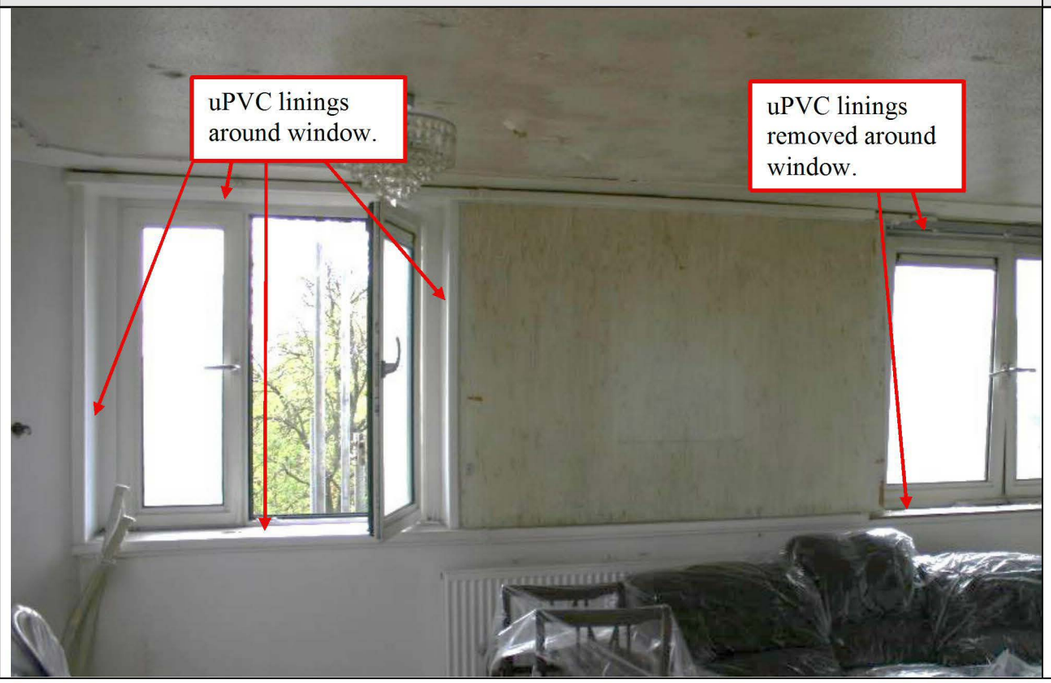
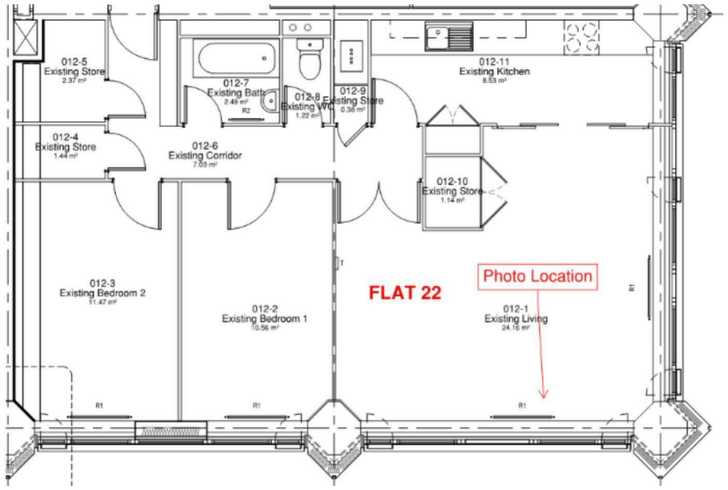
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
4	13	No. All finishes removed from windows and flat	No – All window linings removed from window and flat		

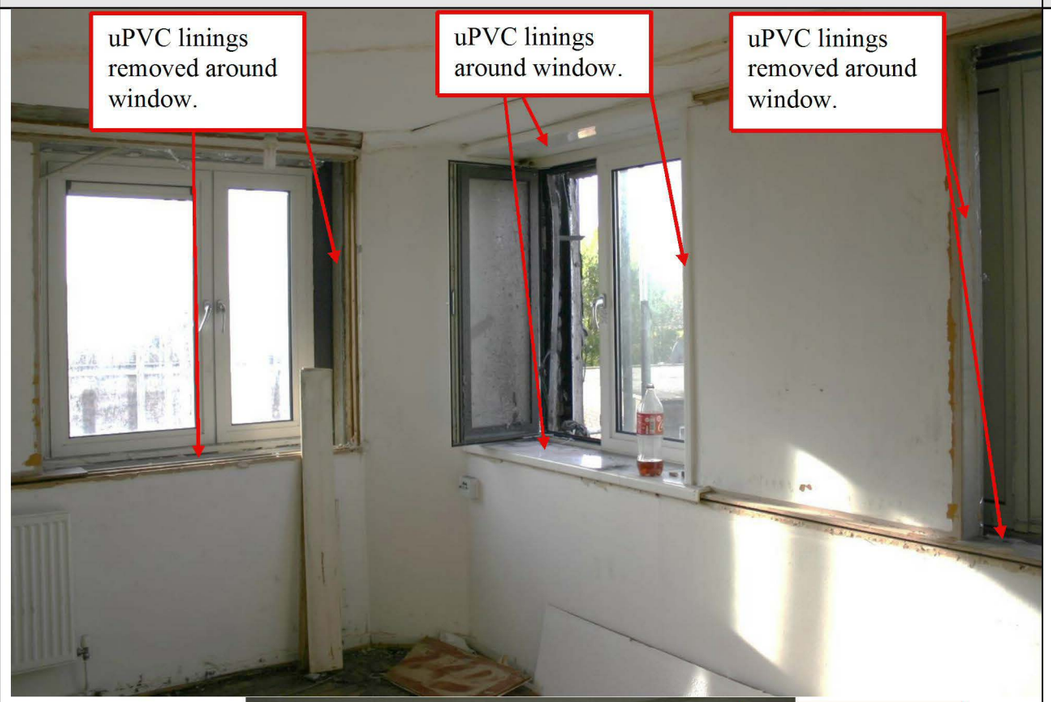
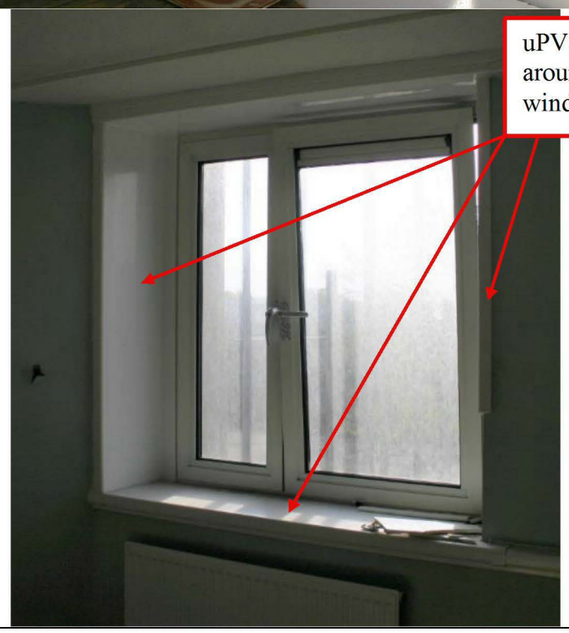
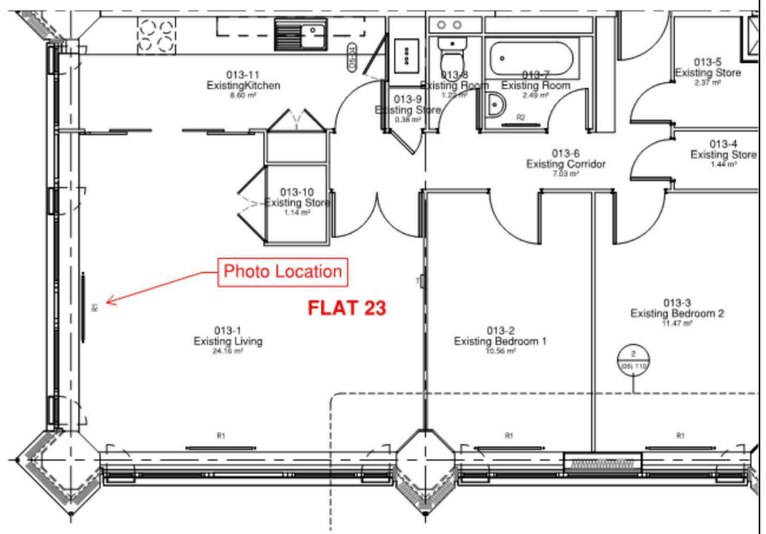
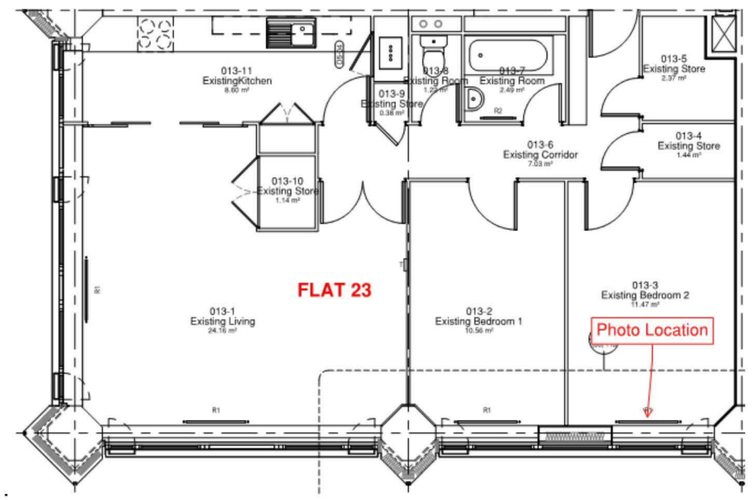
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
4	14	No. All finishes removed from windows and flat.	No – All window linings removed from window and flat		

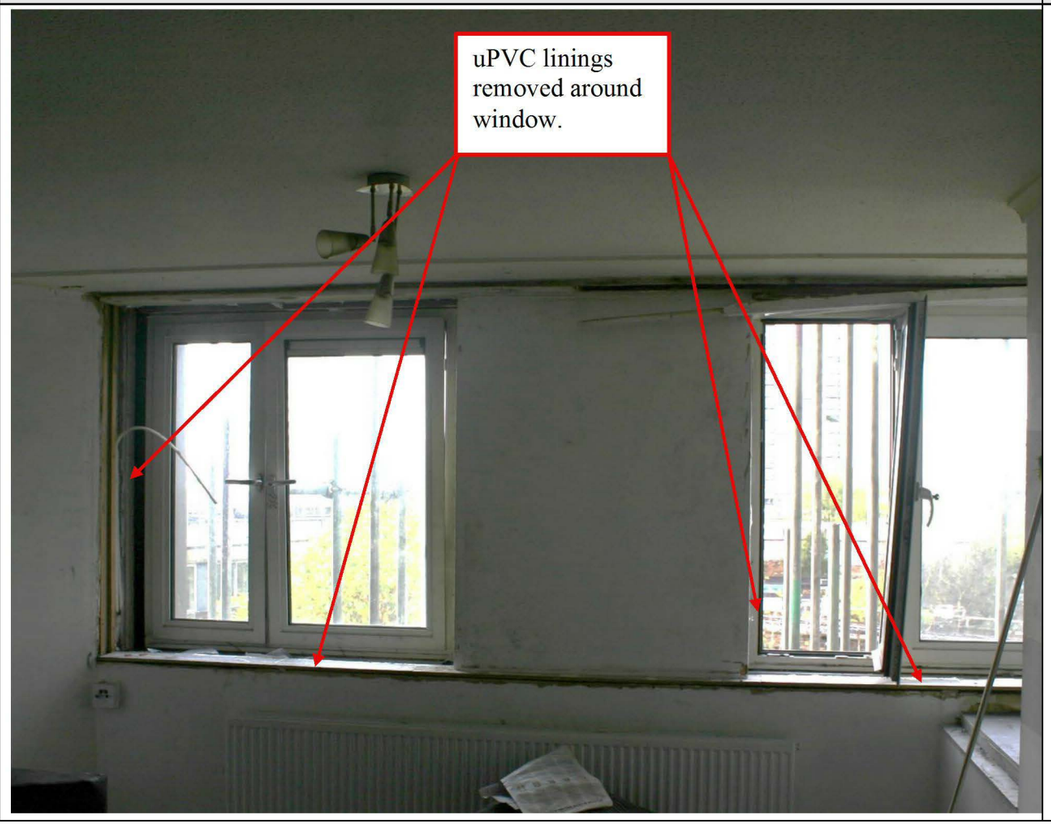
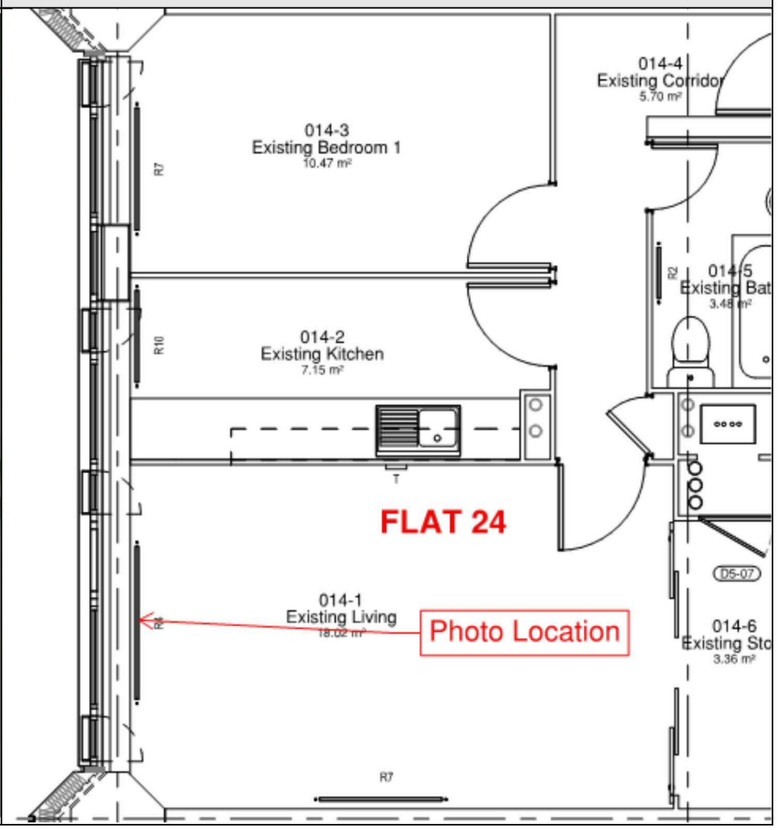
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
4	15	No. All finishes removed from around the window. Some insulation still in place.	Yes – linings removed and set next to Window		

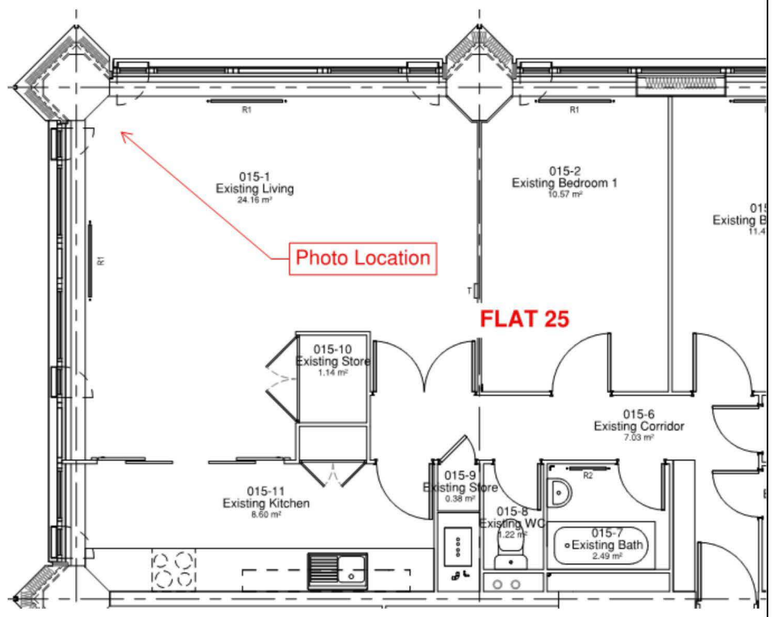
4	16	No. All finishes removed. Some insulation still in place.	Yes		

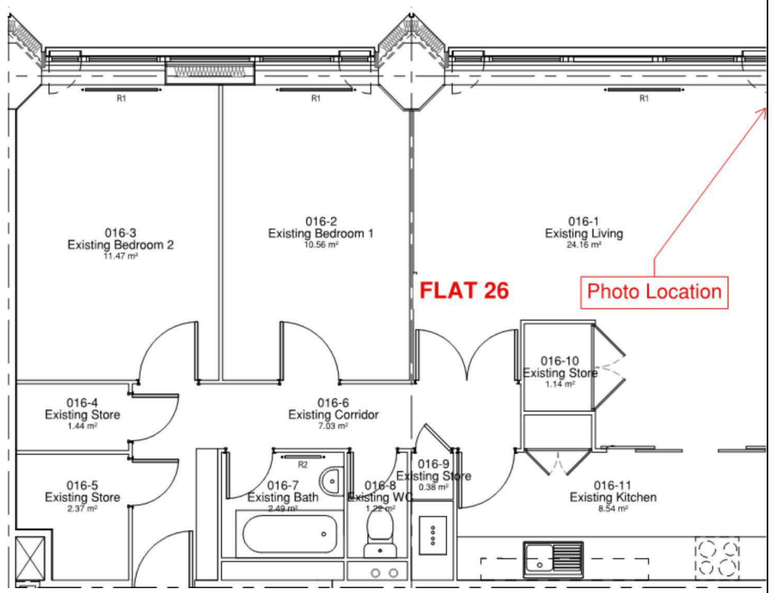
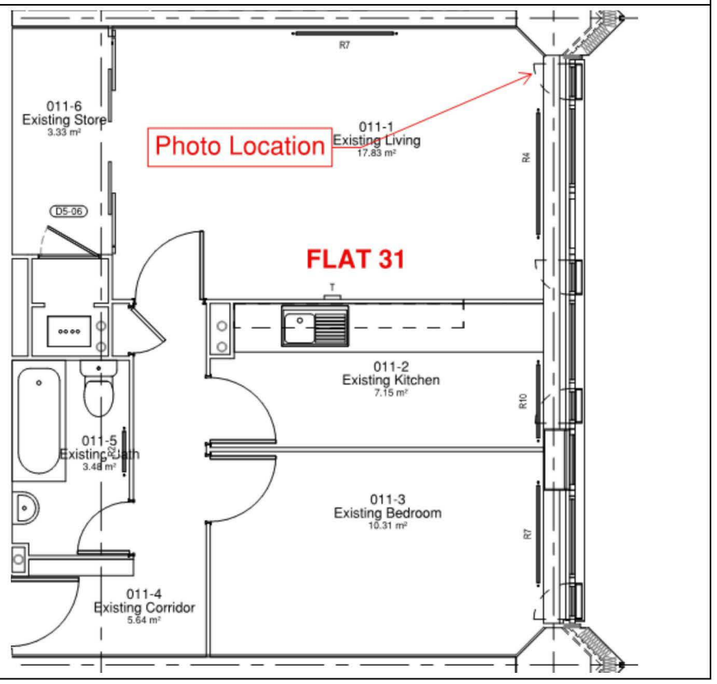
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
					
5	21	Yes. In place, though fire damage at Livingroom window reveals insulation around window.	Yes – Insulation visible behind charred uPVC		

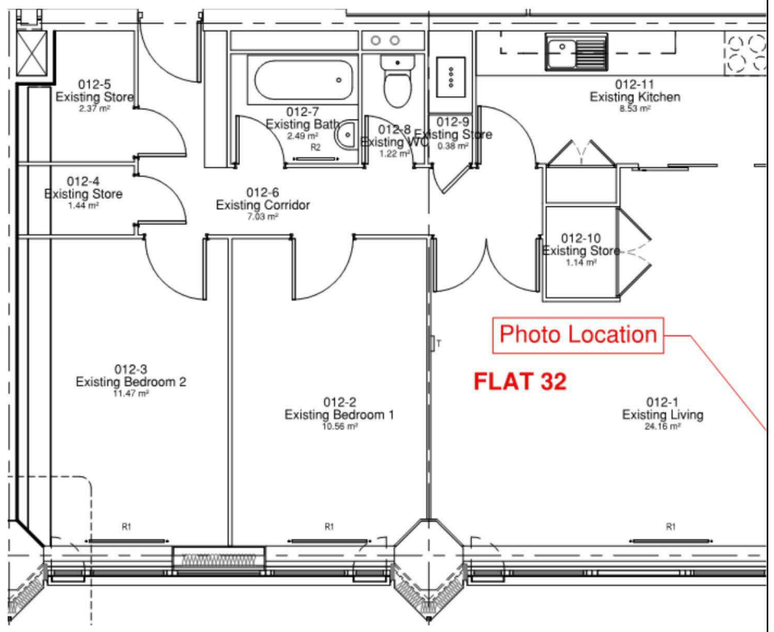
Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
5	22	No. All linings removed other than one window in living room	No – All window linings removed from window and flat		

Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
5	23	Partially removed in Livingroom. In place within bedrooms.	No – loose window linings removed from flat, other linings in place obscuring view.	 	 

Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
5	24	No. All finishes removed from windows and flat.	No – linings removed from flat		

Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
5	25	Partially - linings removed from the Livingroom window. Lining in place within bedrooms.	No – linings removed from flat.		

Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
5	26	Finishes destroyed in fire	Yes		
6	31	Finishes destroyed in fire	No		

Floor	Flat	Window Linings in place	Thermal Insulation visible?	Photograph	Location
6	32	No. All finishes removed from windows and flat.	No. all finishing removed from flat.		

BRE cladding removal witnessing

C6.1.7 On the 7th and 8th of November I witnessed BRE removing the external cladding system on Level 04 at Flat 13 of Grenfell Tower as follows:

C6.1.8 On the 7th of November I witnessed cladding removal from column D2 outside Flat 13 on Level 4. This was observed from the scaffolding at the same location.

C6.1.9 On the 8th of November I witnessed cladding removal from column D1 outside Flat 13 on Level 4. This was observed from within the living room of Flat 13.

C6.1.10 On the 8th of November, my colleague Marc Pawson witnessed BRE remove the external cladding on Level 04 at Flat 13 underneath the windows between columns D1 and D2 at the spandrel. This was observed from the scaffolding at the same location.

C6.1.11 I have submitted all my photographs taken and videos made during this removal to the Public Inquiry.

C6.1.12 In Figure C1 I have over marked the extent of cladding that was witnessed being removed.

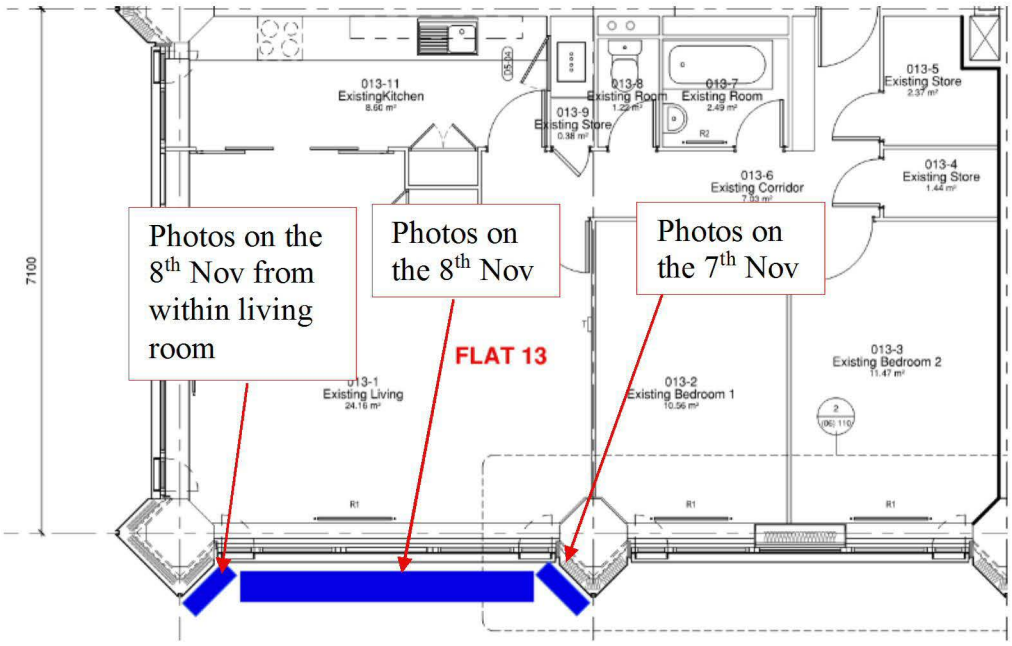
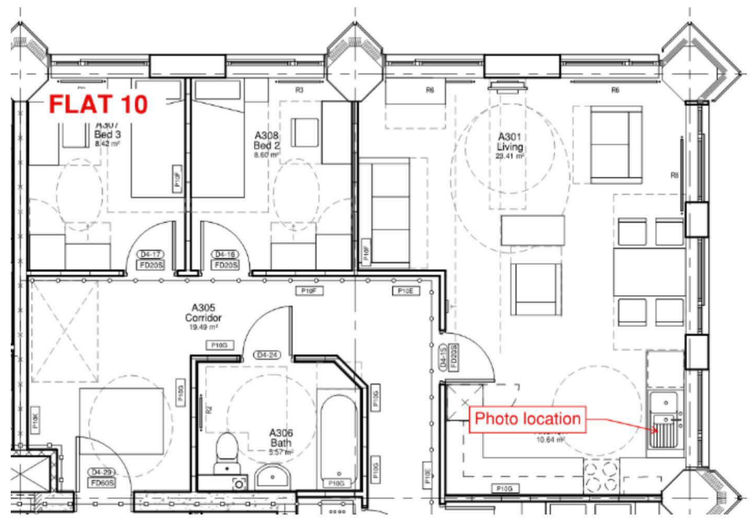


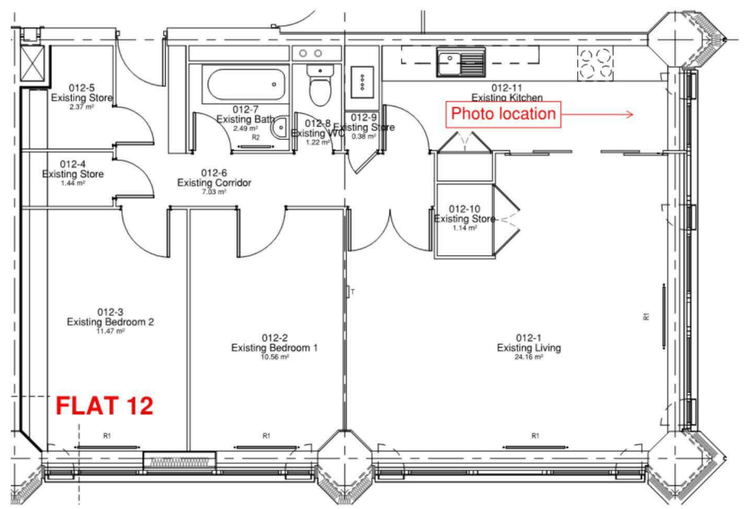
Figure C1: Extent of cladding removed on Level 4

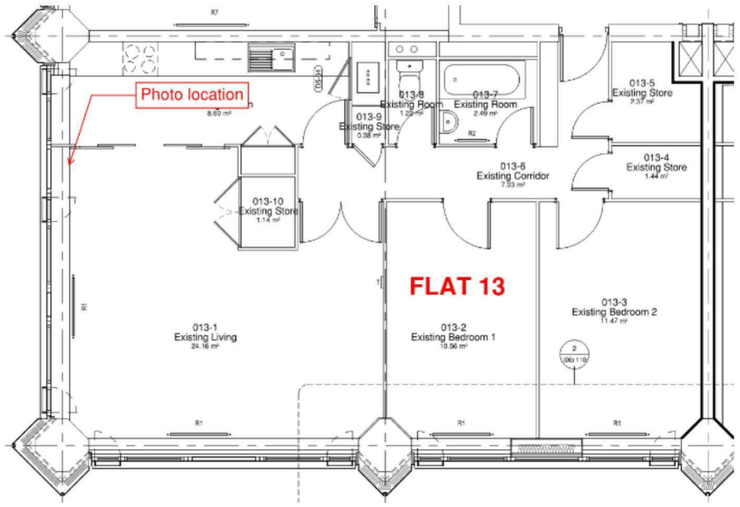
C7 Insulating Core Panels

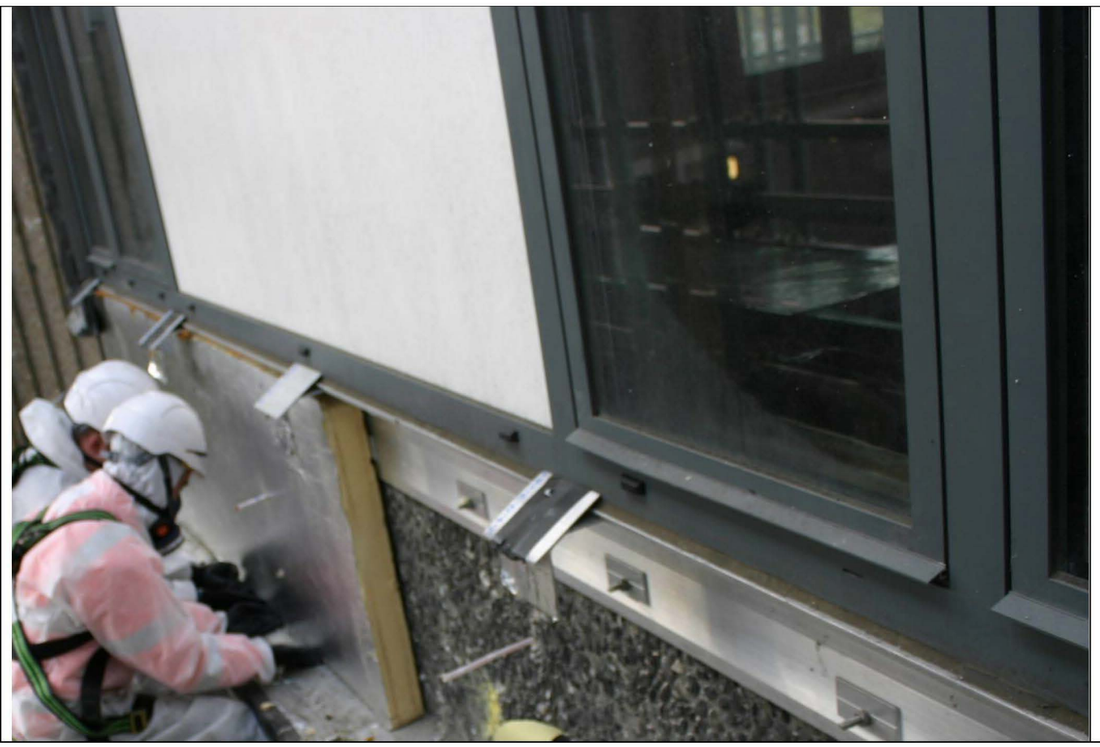
C7.1.1 In Table C.10 I included my photographs of the insulating core panels in the external wall construction I observed during my site inspections.

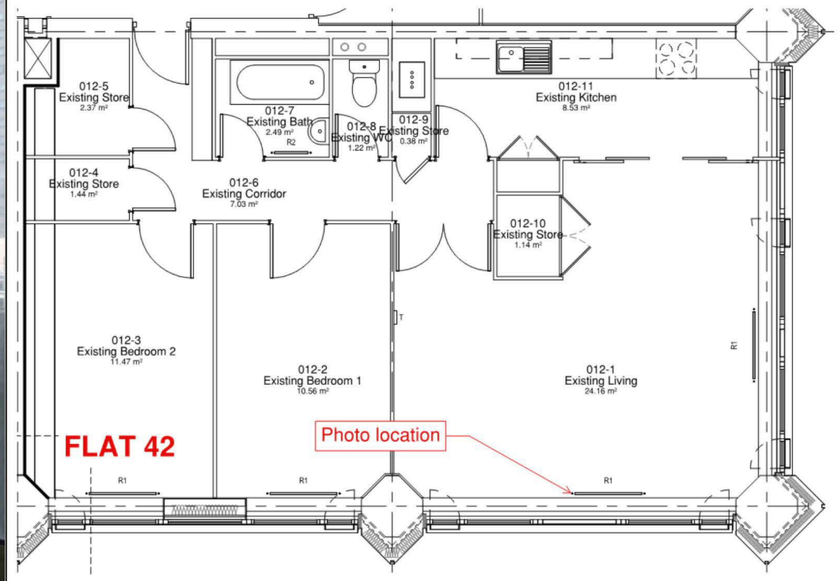
Table C.10 Photographs of the insulating core panels I observed during my site inspection

Level	Flat	Photograph	Plan location
3	10		

4	12		 012-5 Existing Store 2.37 m² 012-7 Existing Bath 2.49 m² R2 012-8 Existing WC 1.22 m² 012-9 Existing Store 0.38 m² 012-11 Existing Kitchen Photo location 012-4 Existing Store 1.44 m² 012-6 Existing Corridor 7.33 m² 012-10 Existing Store 1.14 m² 012-3 Existing Bedroom 2 11.47 m² 012-2 Existing Bedroom 1 10.56 m² 012-1 Existing Living 24.16 m² FLAT 12 R1 R1 R1 R1

4	13		 Photo location 013-8 Existing Room 013-7 Existing Room 013-9 Existing Store 013-5 Existing Store 013-6 Existing Corridor 013-4 Existing Store 013-10 Existing Store FLAT 13 013-3 Existing Bedroom 2 013-1 Existing Living 013-2 Existing Bedroom 1

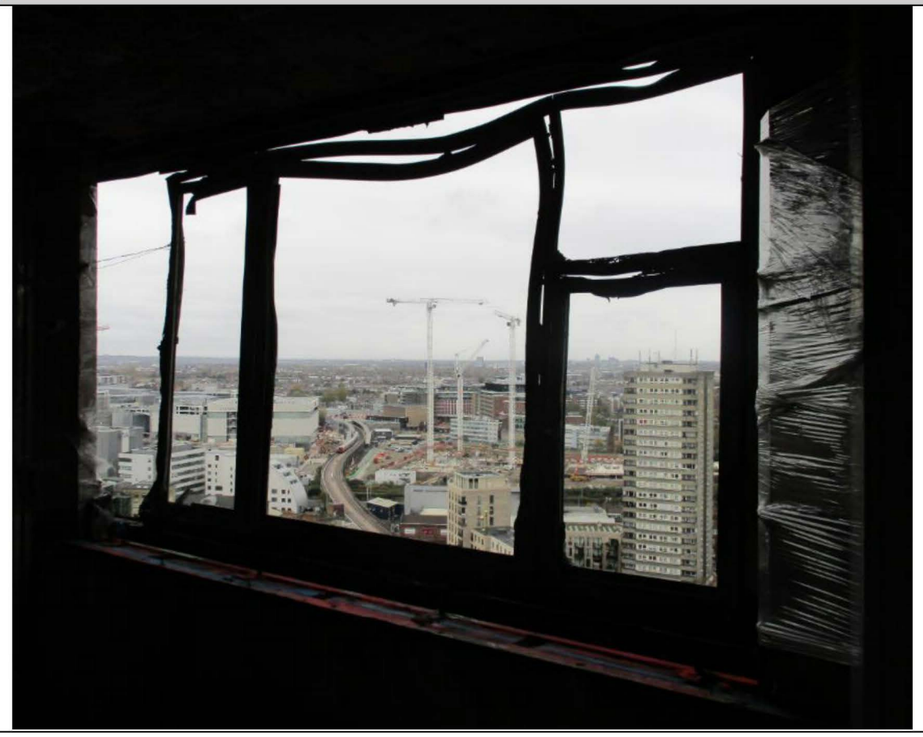
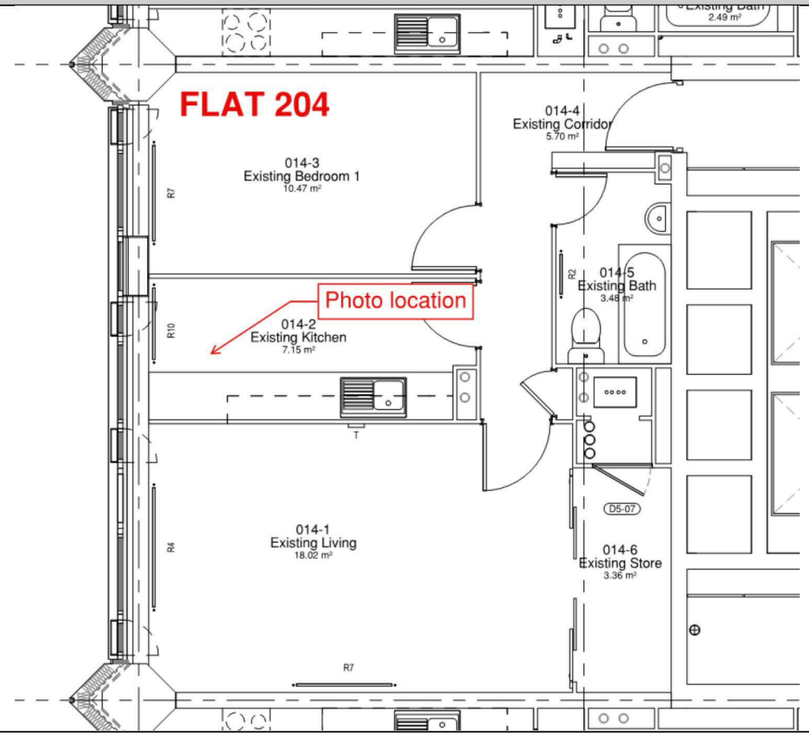
4	Exterior		Exterior – white infill insulating core panel shown between glazing

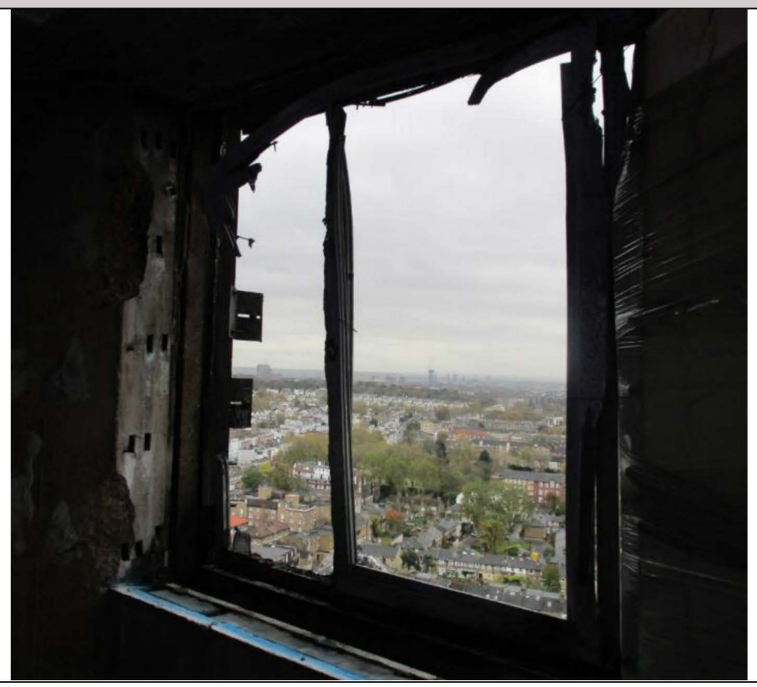
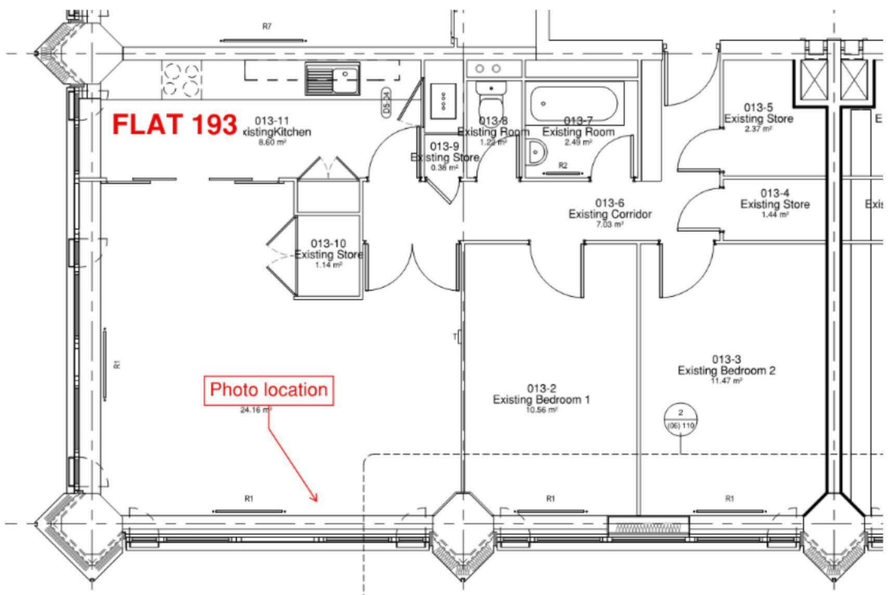
5	23		 012-5 Existing Store 2.37 m² 012-7 Existing Bath 2.49 m² R2 012-8 Existing WC 1.22 m² 012-9 Existing Store 0.38 m² 012-11 Existing Kitchen 8.53 m² 012-4 Existing Store 1.44 m² 012-6 Existing Corridor 7.03 m² 012-10 Existing Store 1.14 m² 012-3 Existing Bedroom 2 11.47 m² 012-2 Existing Bedroom 1 10.56 m² 012-1 Existing Living 24.16 m² FLAT 42 Photo location R1 R1 R1 R1

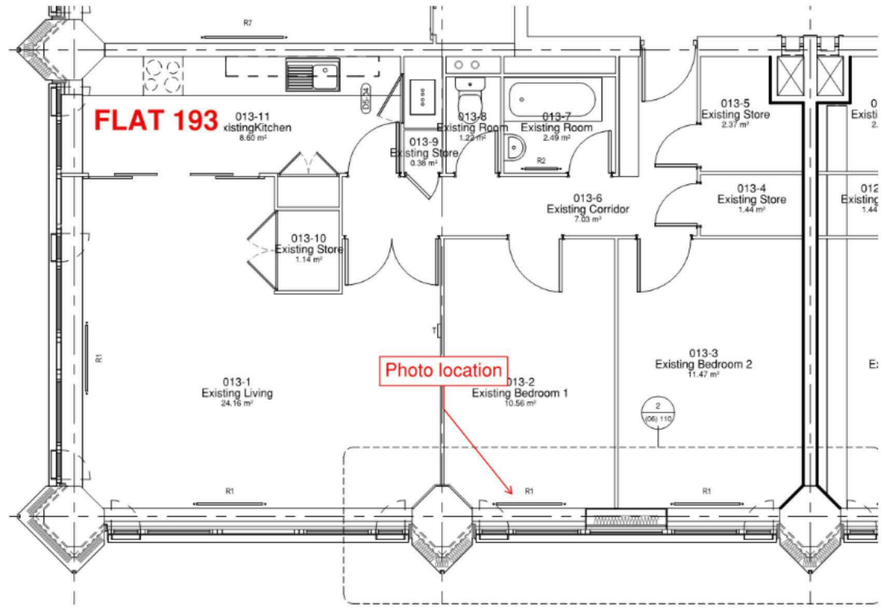
C8 External wall levels 22 & 23

C8.1.1 In Table C.11 I have included a selection of photos from my site inspections on Levels 22 and 23 which show the extent of damage to the external walls window openings when viewed from the interior.

Table C.11 Window openings observed on Levels 23 and 22

Level	Flat	Photograph	Plan location
23	204		

Level	Flat	Photograph	Plan location
22	193		

Level	Flat	Photograph	Plan location
22	193		

C9 Rooftop cladding Crown

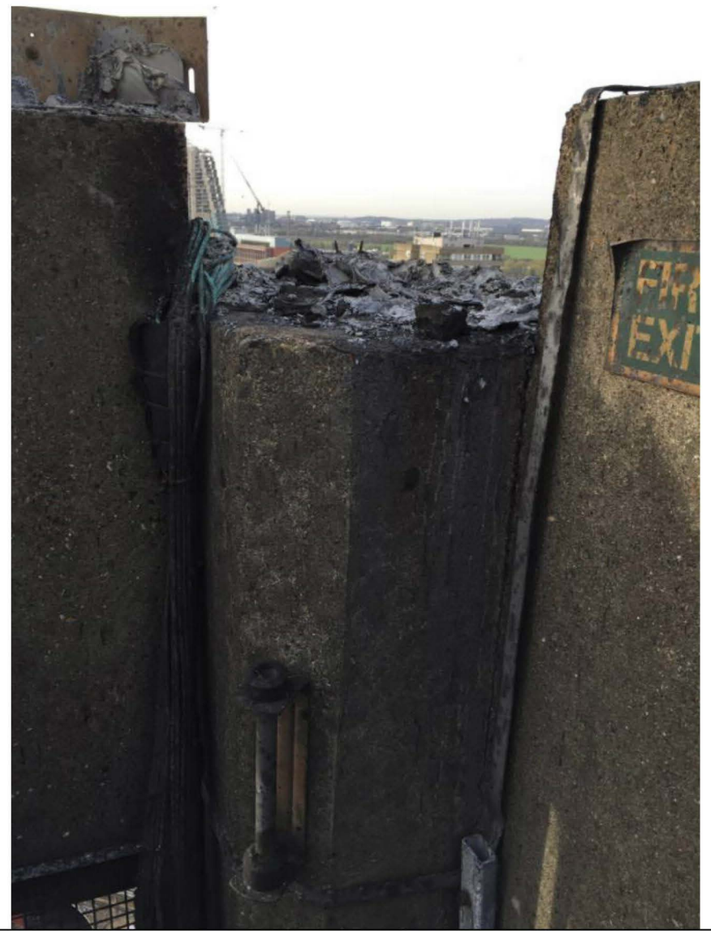
C9.1.1 In Table C.12 I have included a selection of photos from my site inspections at roof level which show the damage sustained to the façade 'crown'.

Table C.12 Observations of fire damage to the External wall ‘Crown’

Location	Photograph
Roof	

Roof	

Roof	

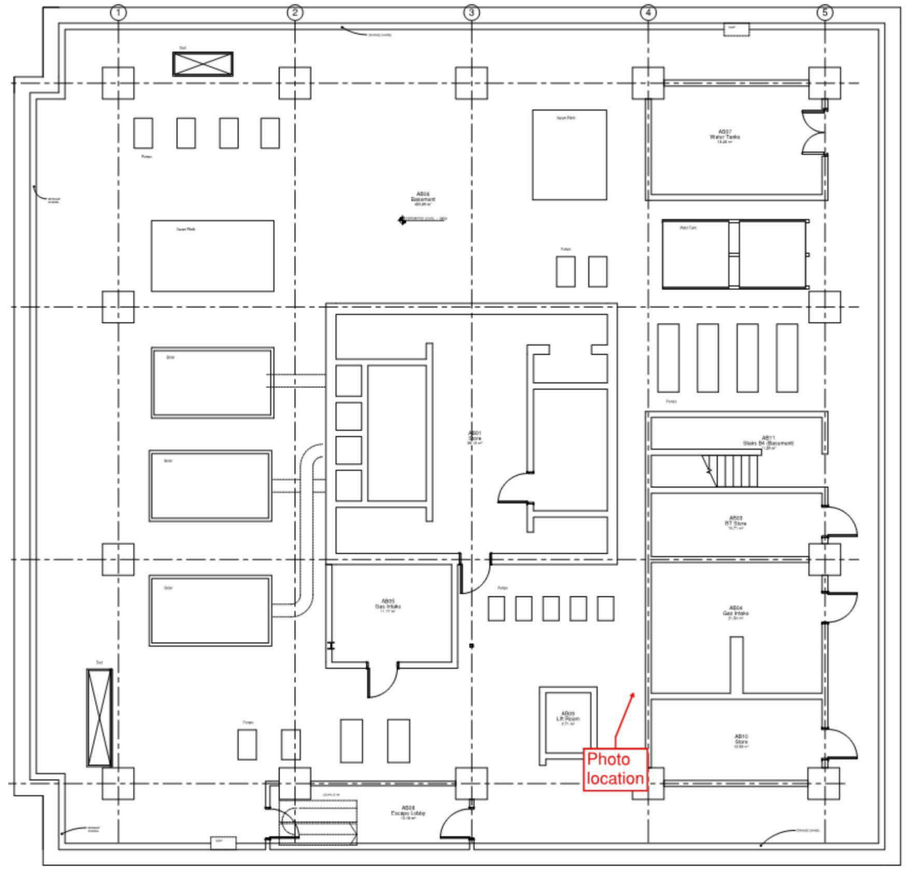
Roof		

C10 Basement & Roof top plant room

C10.1.1 In Table C.13 I have included a selection of photos from my site inspections at basement level.

C10.1.2 In Table C.14 I have included a selection of photos from my site inspections at roof level.

Table C.13 Interior views of the Basement level

Photograph	Plan location
	


Emergency exit

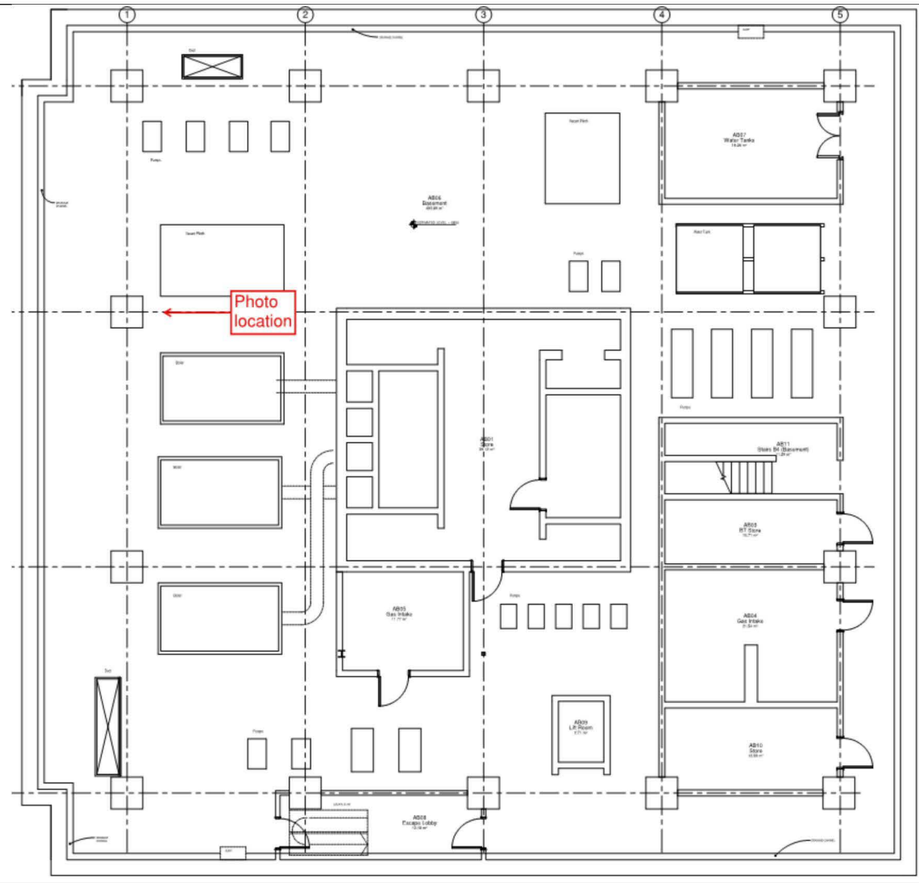
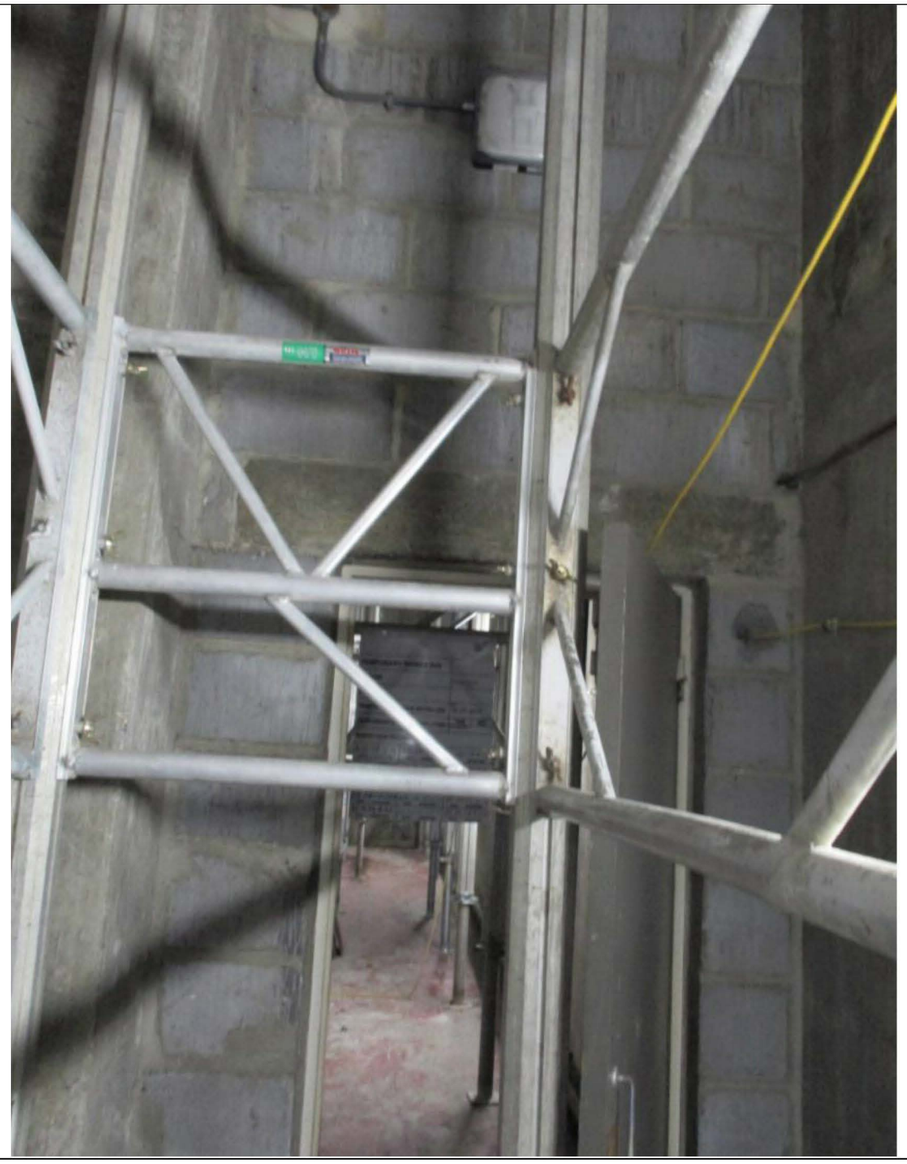


Photo location



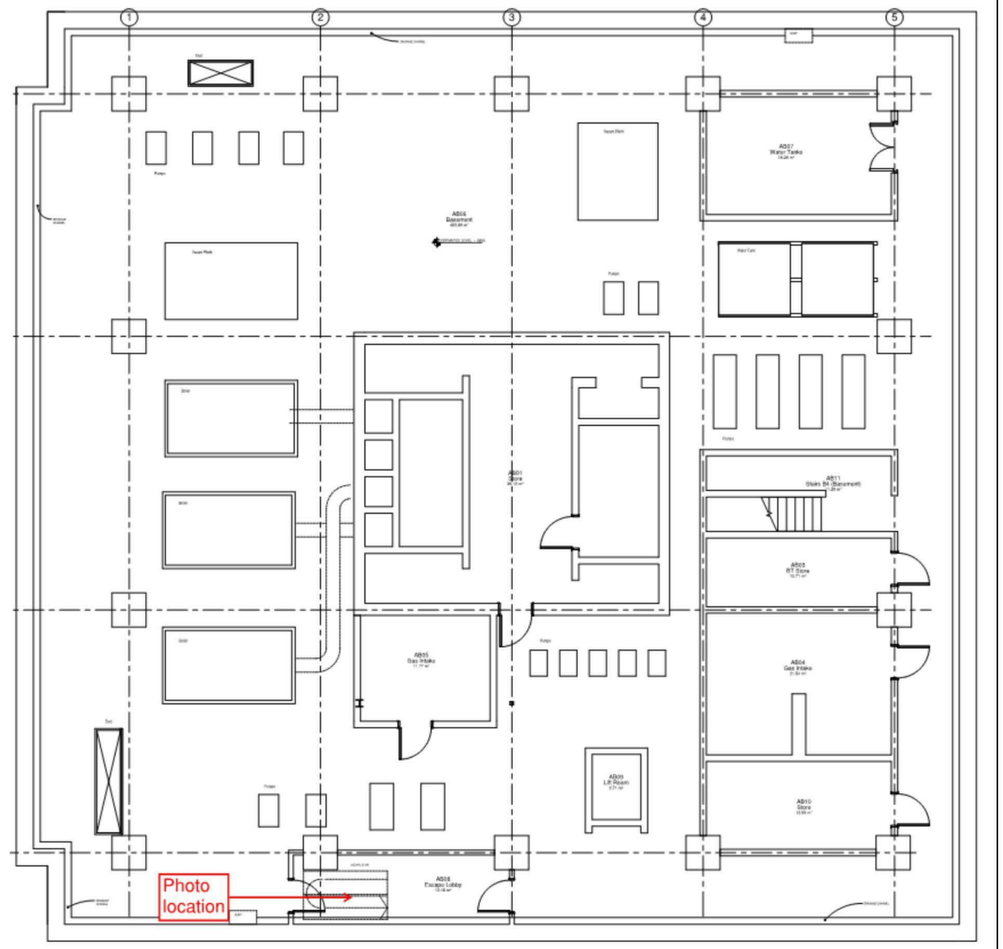
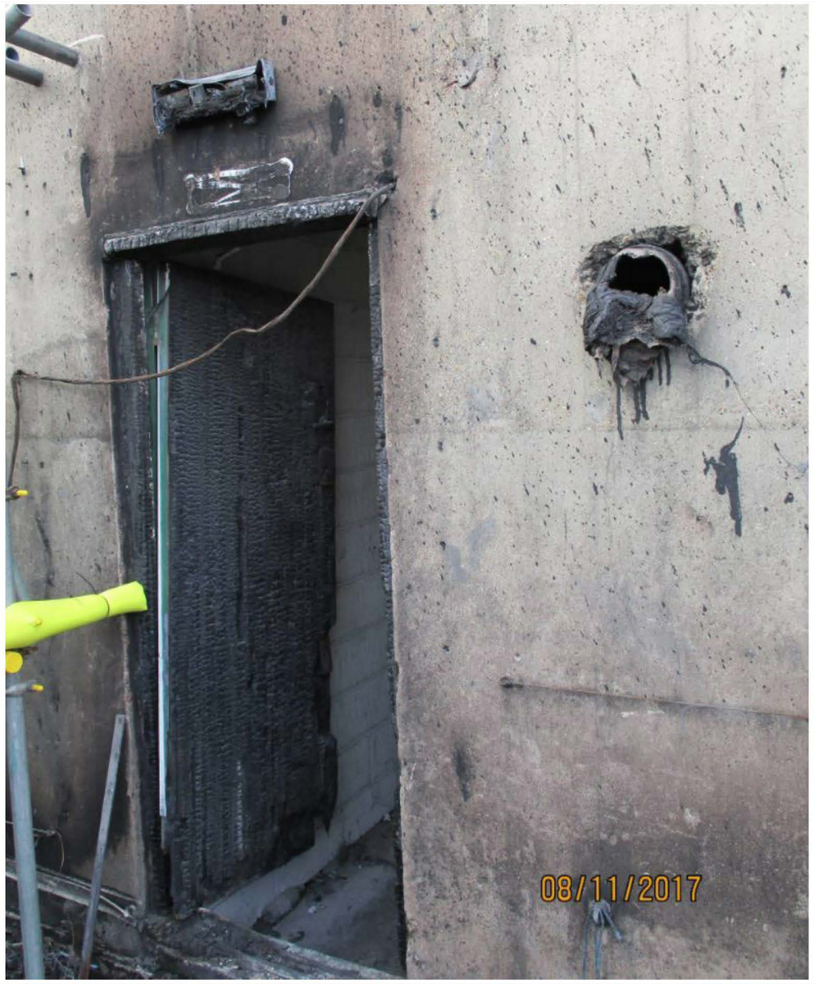
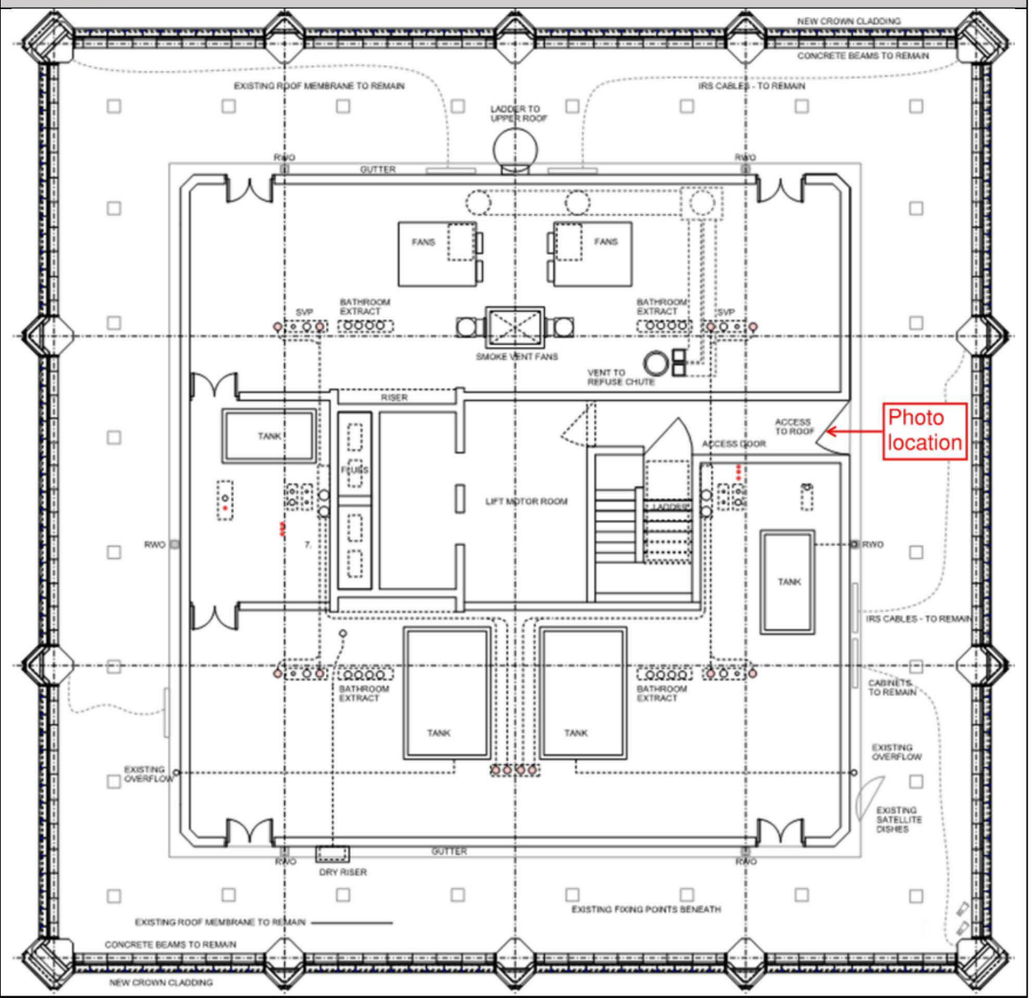
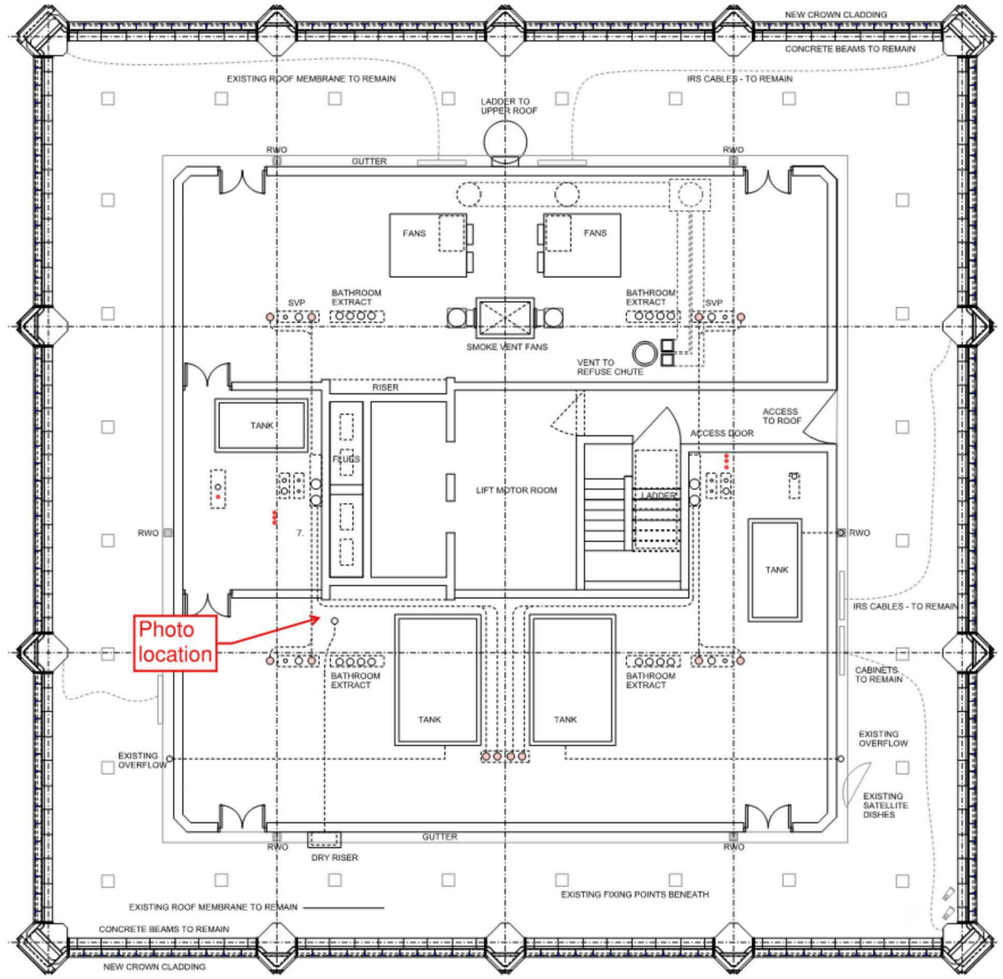

1
2
3
4
5
AB07
Water Tanks
AB06
Basement
AB01
Store
AB11
Stairs 8A (Basement)
AB03
ET Store
AB05
Gas Intake
AB04
Gas Intake
AB09
Lift Room
AB10
Store
AB08
Escape Lobby
Photo location

Table C.14 Photographs from site inspection within the roof top plant level

Photograph	Plan location
	


08/11/2017


NEW CROWN CLADDING
CONCRETE BEAMS TO REMAIN
EXISTING ROOF MEMBRANE TO REMAIN
IRS CABLES - TO REMAIN
LADDER TO UPPER ROOF
RWO
GUTTER
RWO
FANS
FANS
SVP
BATHROOM EXTRACT
BATHROOM EXTRACT
SVP
SMOKE VENT FANS
VENT TO REFUSE CHUTE
RISER
TANK
ACCESS TO ROOF
ACCESS DOOR
PLUGS
LIFT MOTOR ROOM
LADDER
RWO
RWO
TANK
IRS CABLES - TO REMAIN
Photo location
BATHROOM EXTRACT
BATHROOM EXTRACT
CABINETS TO REMAIN
TANK
TANK
EXISTING OVERFLOW
EXISTING OVERFLOW
EXISTING SATELLITE DISHES
RWO
GUTTER
RWO
DRY RISER
EXISTING FIXING POINTS BENEATH
EXISTING ROOF MEMBRANE TO REMAIN
CONCRETE BEAMS TO REMAIN
NEW CROWN CLADDING