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The Lakanal Fire

LFEPa Briefing

28th August 2013

David Crowder

Business Group Manager, Fire Investigation, BRE Global
Director, Fire Investigations (UK) LLP

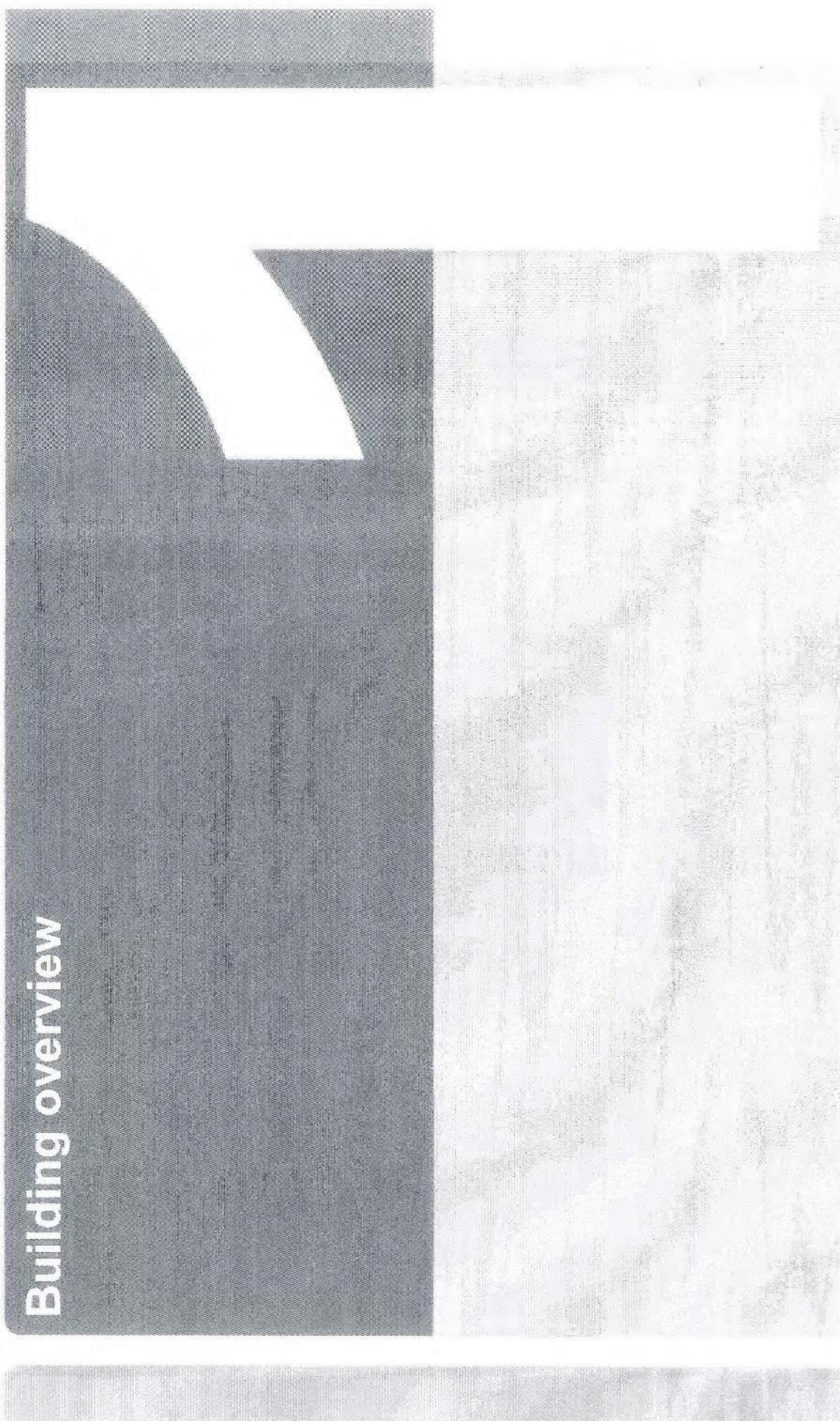
Part of the BRE Trust

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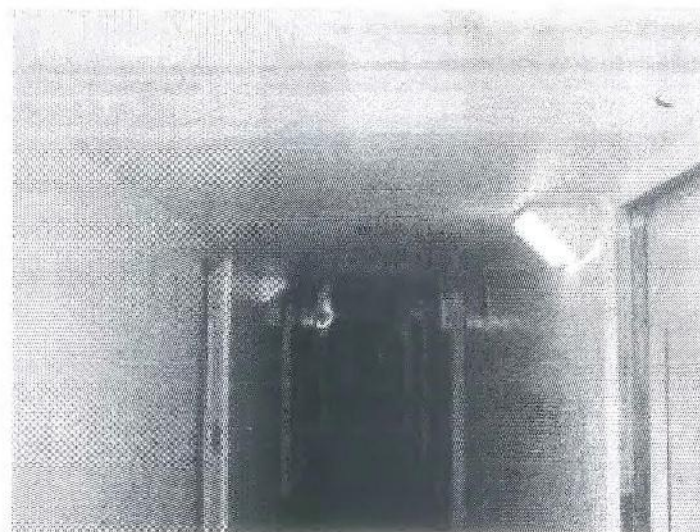
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Building overview



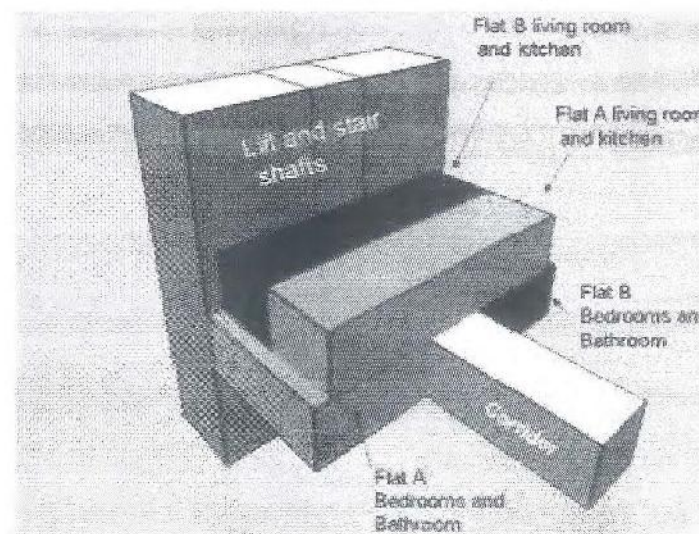
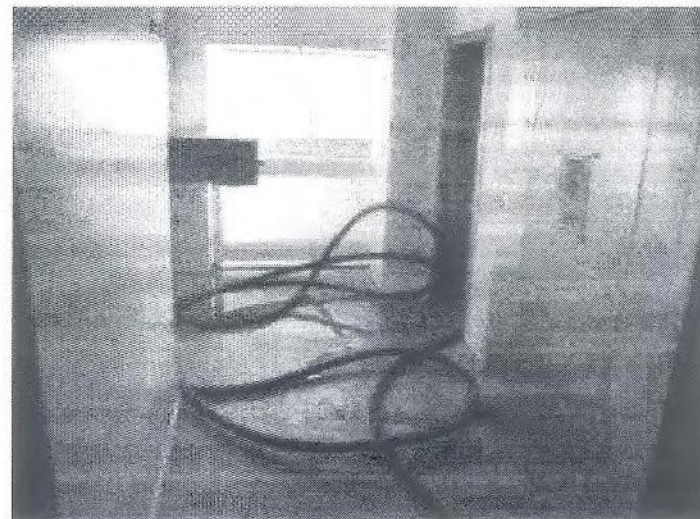
Building overview

- Constructed 1958-1960
 - Metropolitan Borough of Camberwell (later became Southwark)
 - Featured in Architects Journal
- Numerous refurbishments, including
 - Suspended ceiling introduced in corridor in 1980s
 - Security doors introduced in 1980s
 - Major refurbishment including window facades in 2006/2007
- Mixture of council rented and leasehold (right to buy) flats



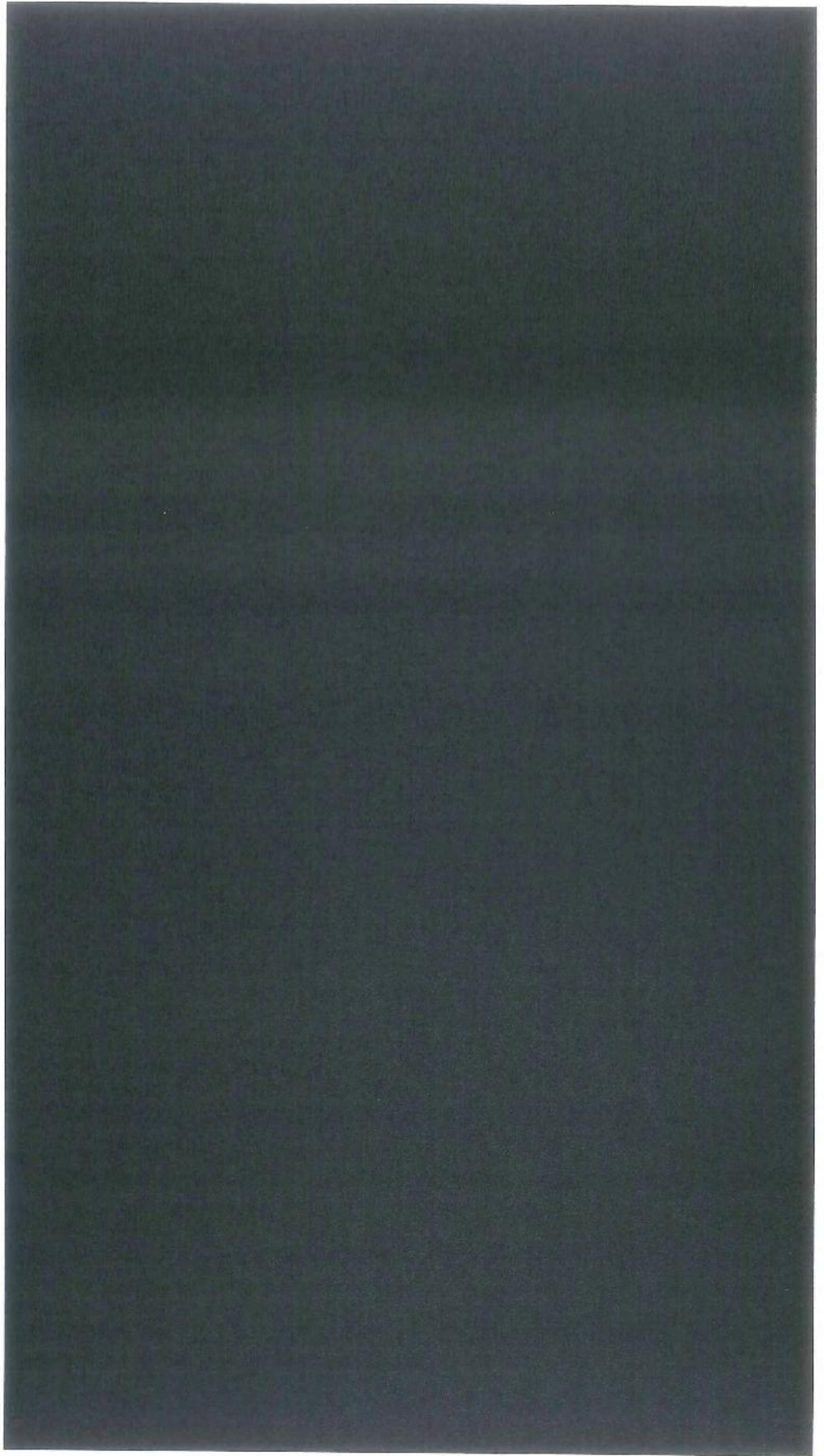
Building layout

- 16 storeys
 - 14 accommodation stories
 - Undercroft and plant level
- Access corridors on odd numbered floors
- Escape balconies on even numbered floors
- Single staircase
 - 2 lifts (one working at time of fire)
 - Lobbies housing dry riser
- Cross ventilated lobbies and corridors
- Flats in 'scissor' arrangement



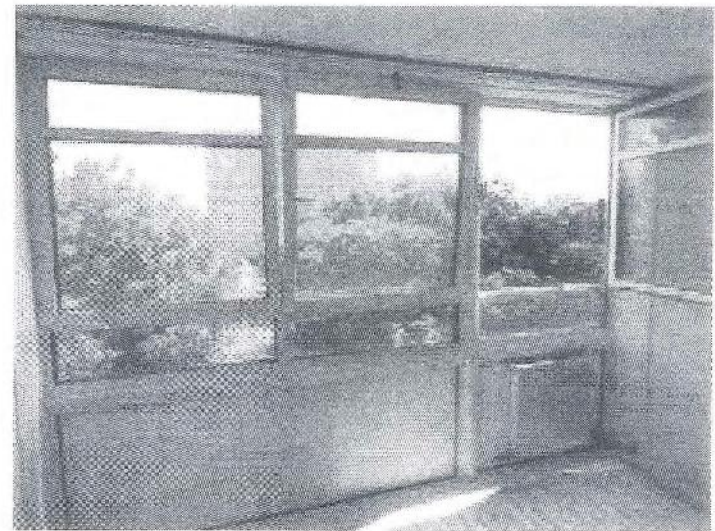
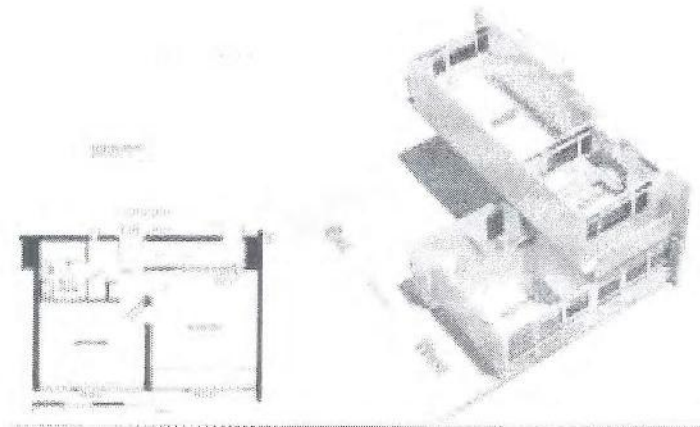
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Building layout



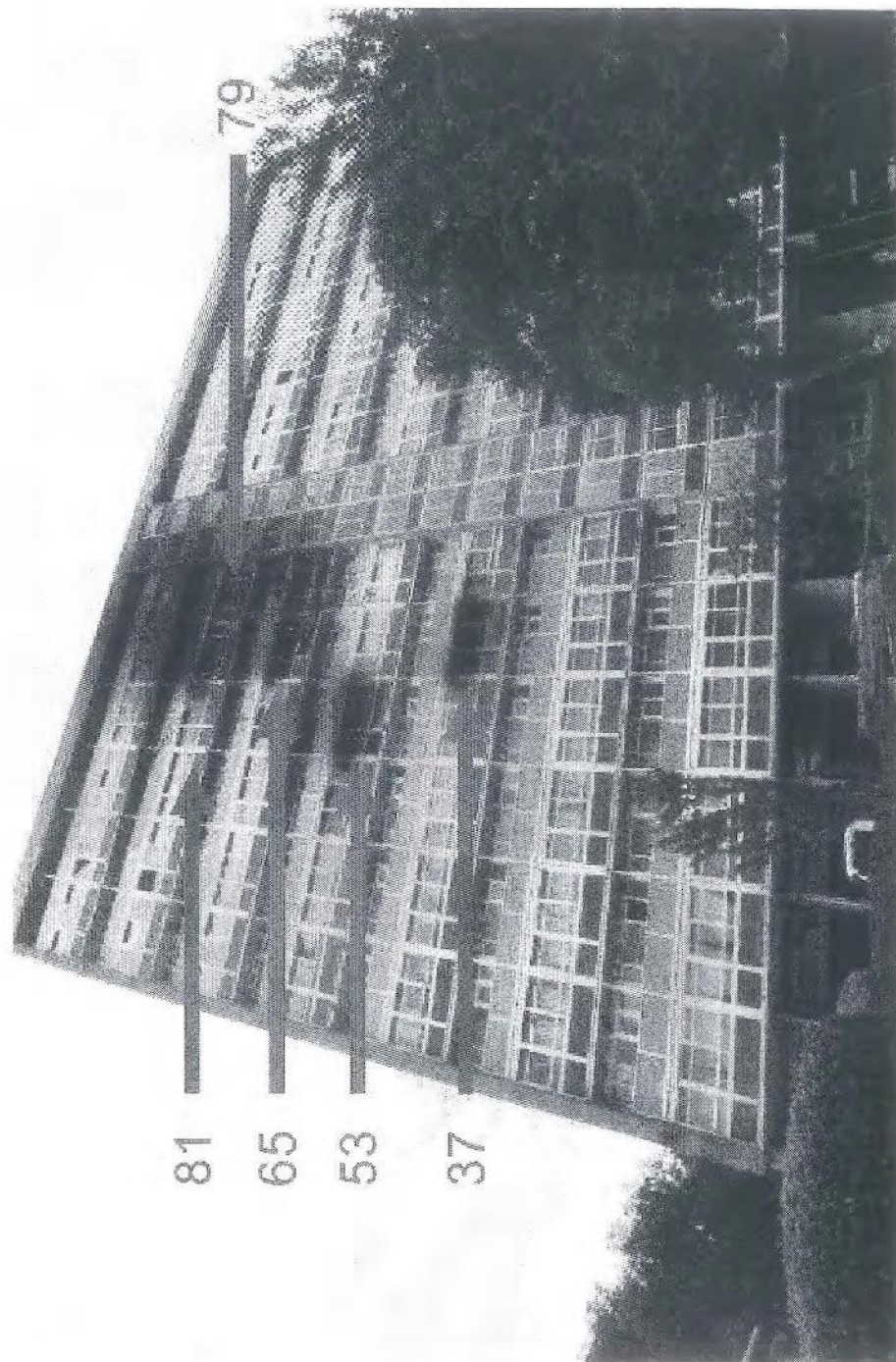
Flat layout

- Two storey maisonettes
- Bedrooms and bathroom on lower floor
 - On one 'side' of corridor
 - Access via corridor
 - Front door
 - Escape door
- Full height window façade sets on external envelope
- Living room and kitchen on upper floor
 - Across width of building and corridor
 - Emergency egress via two balconies
- Timber staircase within flat
 - Cuts into cross section of common corridor



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Fire spread by flat locations



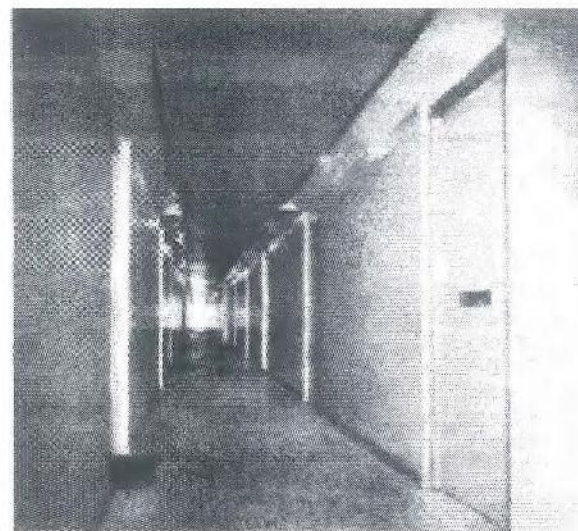
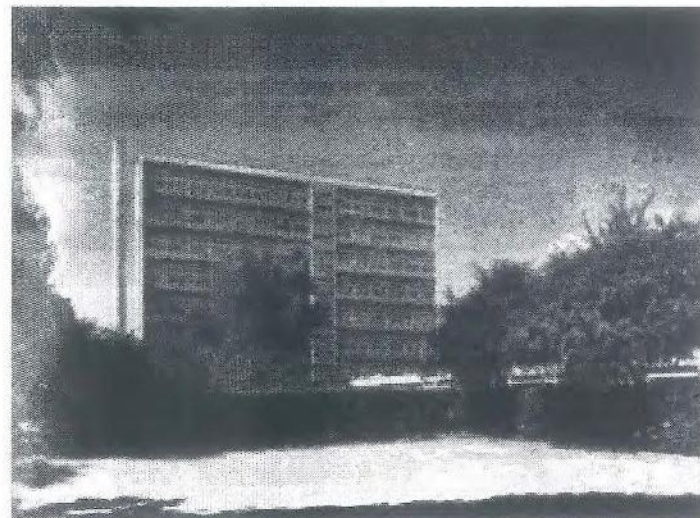
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Building construction timeline



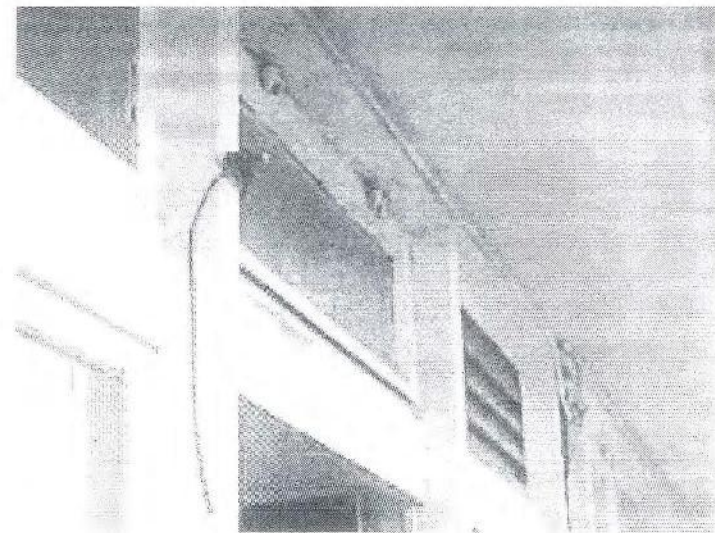
Original Construction

- Part of Sceaux Gardens Estate
 - Construction 1955-1960
- LCC Means of Escape in Case of Fire 1954
 - Single staircase
 - Cross ventilated corridors
 - 2 means of escape from every accommodation room
- Showcased in Architects' Journal 1960
 - State of the art
 - Best practice



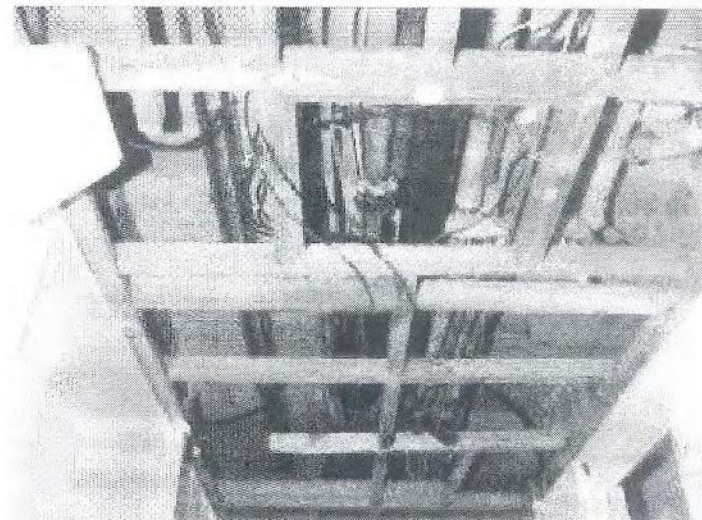
1970s refurbishment work

- Windows replaced
- Records indicate:
 - timber frame window sets
 - Asbestoslux infill panels
- External surface of panels specified as 'non-combustible'



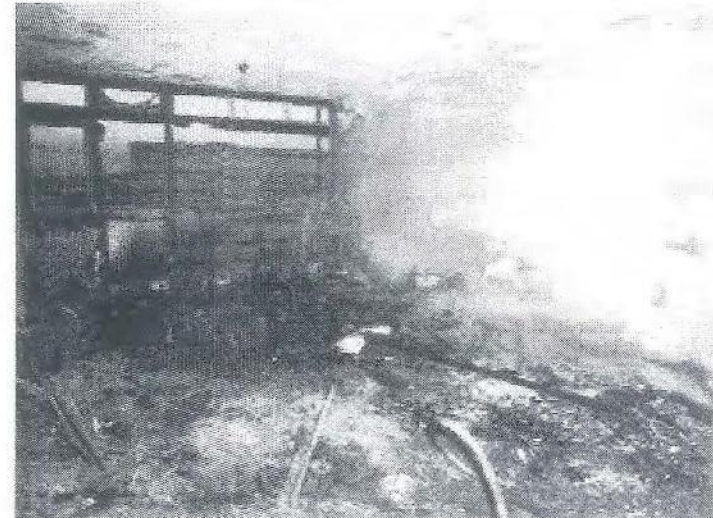
1980s refurbishment work

- Installation of security doors
 - Impact on cross ventilation recognised
 - Requirement for minimum 0.5m^2 open grille area (+ 1m^2 manually opened) in approval
- Replacement of central heating system
- Introduction of suspended ceiling in common corridors
- Subsequent upgrading of suspended ceiling with 'Panoflam' ceiling panels



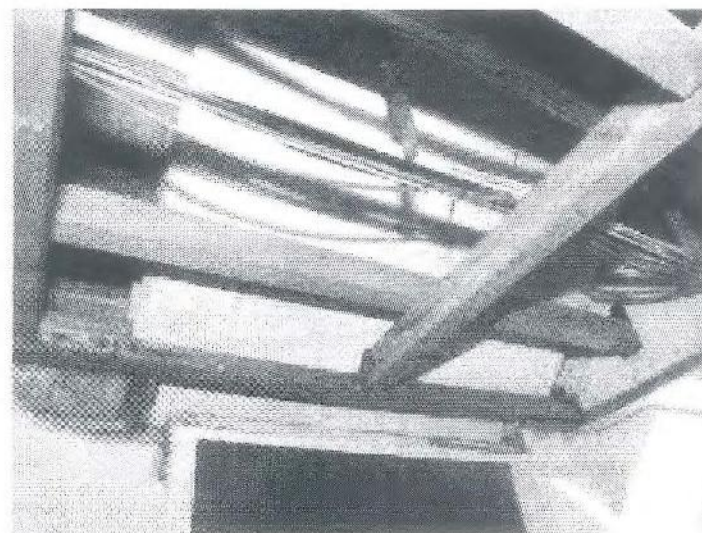
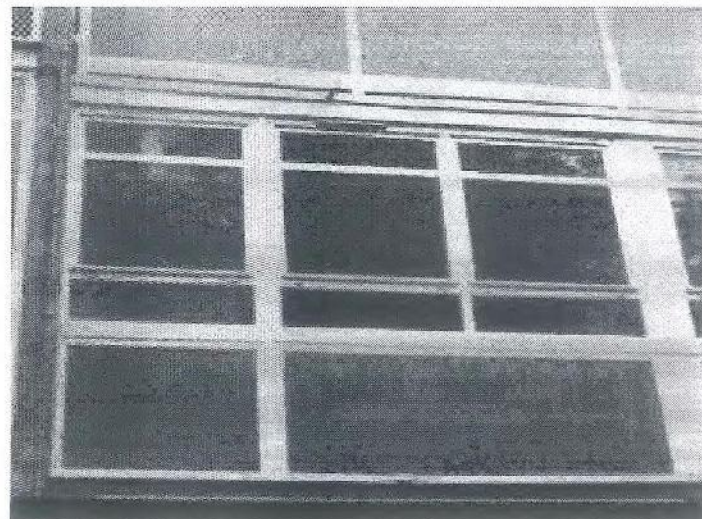
History of fires

- 1985
 - Flat 79
 - Significant damage to flat
 - Spalling of concrete
- 1988
 - Flat 95
 - Damage throughout flat
- 1997
 - Flat 81
 - Damage throughout flat
- Damage limited to flat of origin in all cases



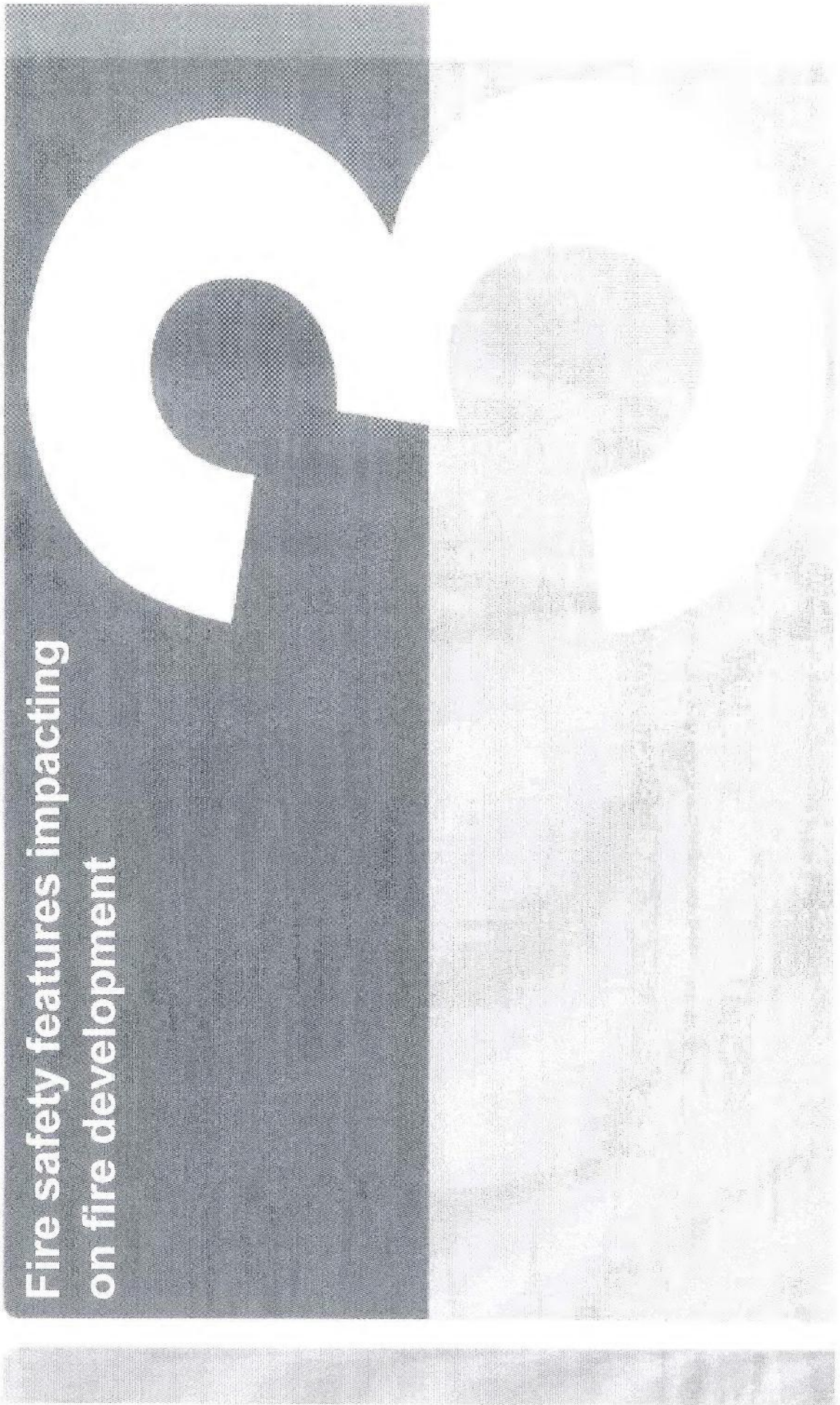
2006-2007 refurbishment work

- Planned Preventative Maintenance
- Decent Homes
- Various repairs, renewals and redecoration works
- Renewal of windows
 - Removal of asbestos
 - Installation of new window sets
- Renewal of balcony doors
- Upgrade landlords electrics and rewiring in flats where required
- Installation of kitchen extractor fans



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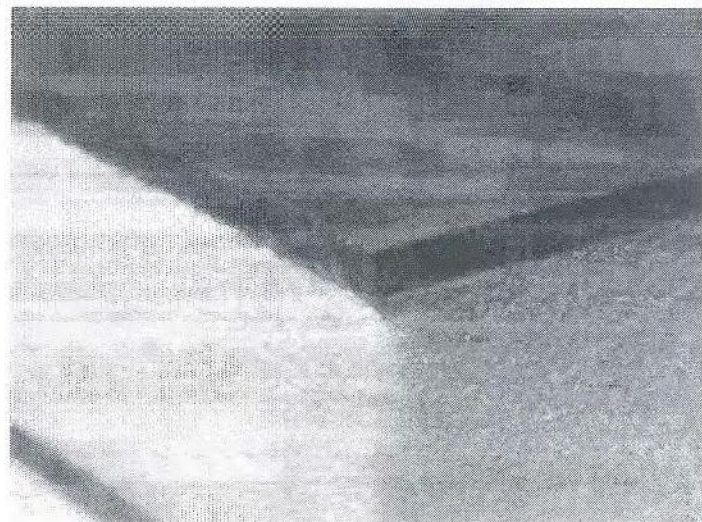
Fire safety features impacting on fire development



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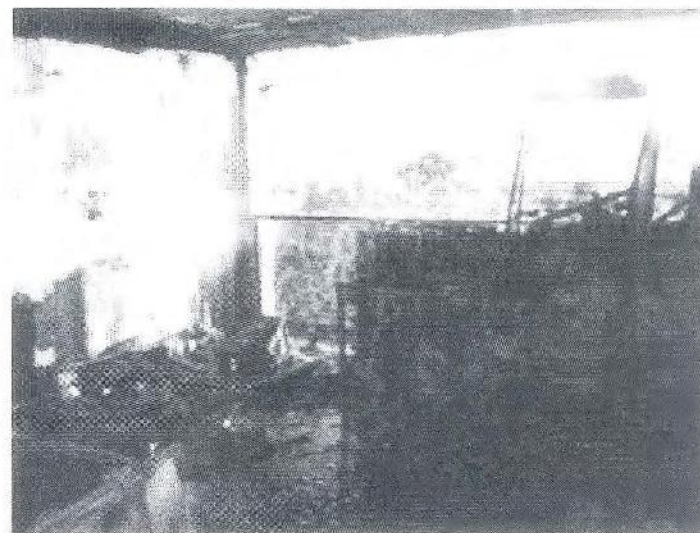
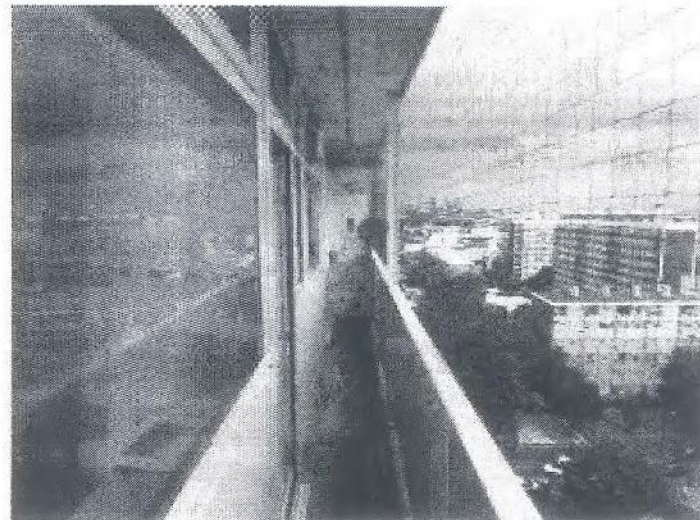
Composite panels

- Compressed resin outer layers and foam insulation core
- Class 3
- No fire resistance
- Ignited under flame impingement from burning flat below
- Burnt through in 4-5 minutes
- Introduced flaming on inside of flats
- Introduced during refurbishment 2006-2007, replacing asbestos



Balcony-flat doors

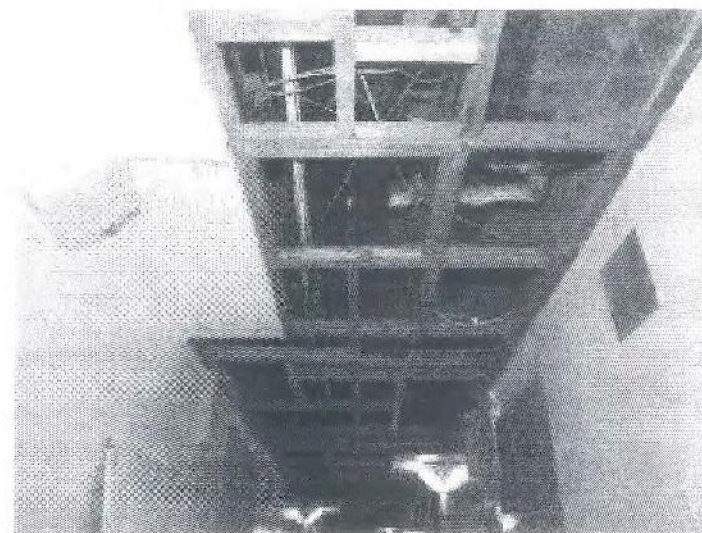
- Glazed upper half
- Composite panel lower half
- Aluminium frame
- Not fire resisting
- Introduced during refurbishment 2006-2007
- Replacement for fire resisting doors (full height)



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Suspended ceiling in common corridor

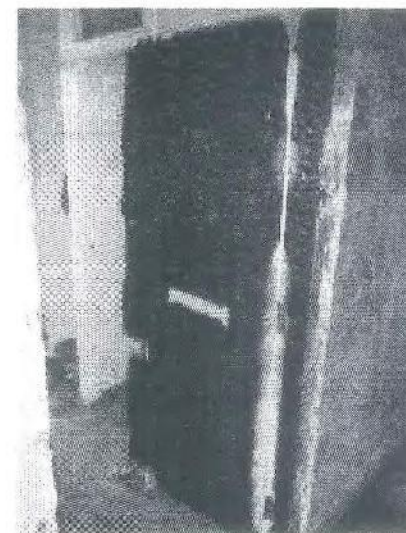
- Laminated particle board (fire retardant)
 - Timber supporting structure
 - No sub-division of void above
 - Significant quantity of fuel in void above
-
- Ceiling panels did not support flaming
 - Timber structure and fuel above contributed significantly
-
- Introduced in 1980s for central heating works



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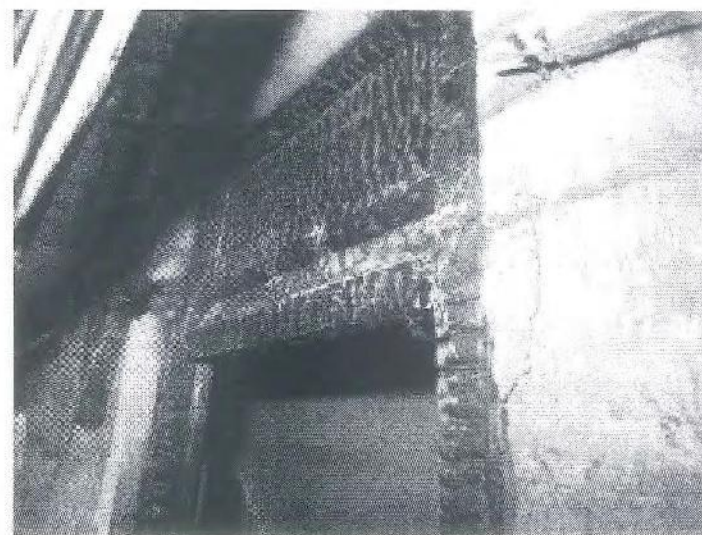
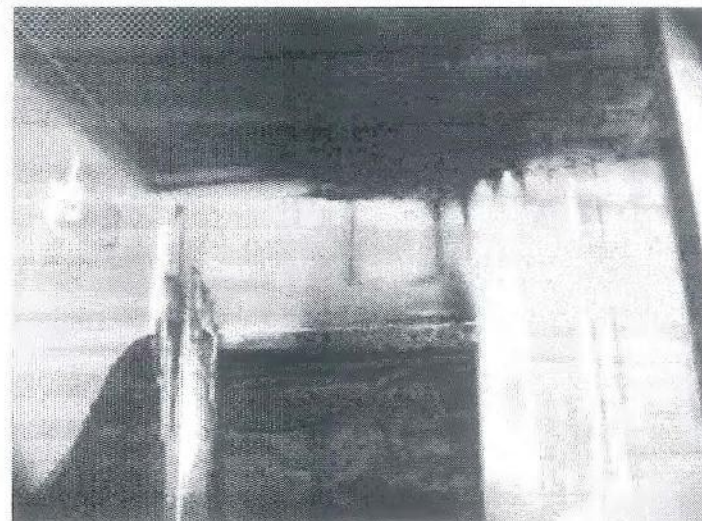
Front doors and escape doors

- Appeared to be FD30
- No smoke seals
- Allowed smoke travel
 - into corridors from flats
 - into flats from corridors
 - into stairwell from lobbies
- Piecemeal replacement over life of building
 - Some FD30, others not



Panels above front doors

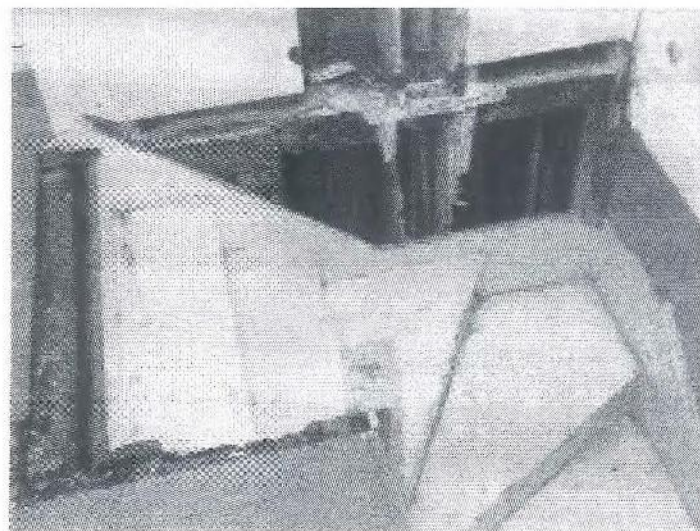
- Timber
- Some fire resistance, possibly as much as 30 minutes against standard furnace
- Originally part of doorset between flat and corridor
- Communicating with suspended ceiling void once this was introduced



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Boxing in under stairs

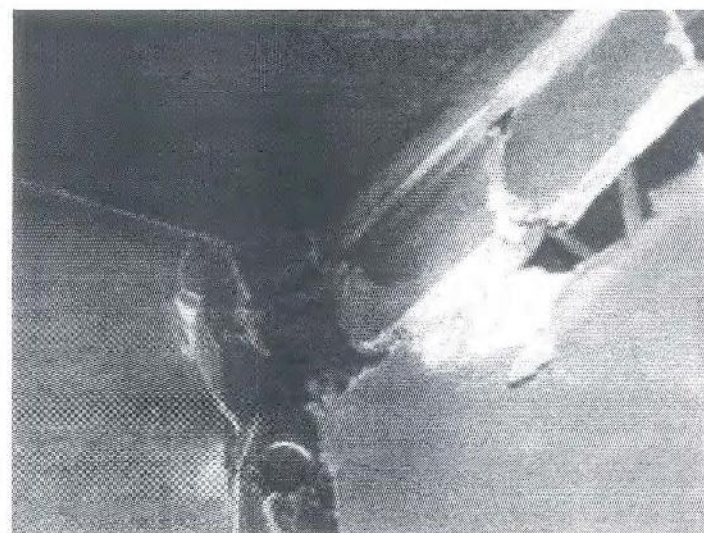
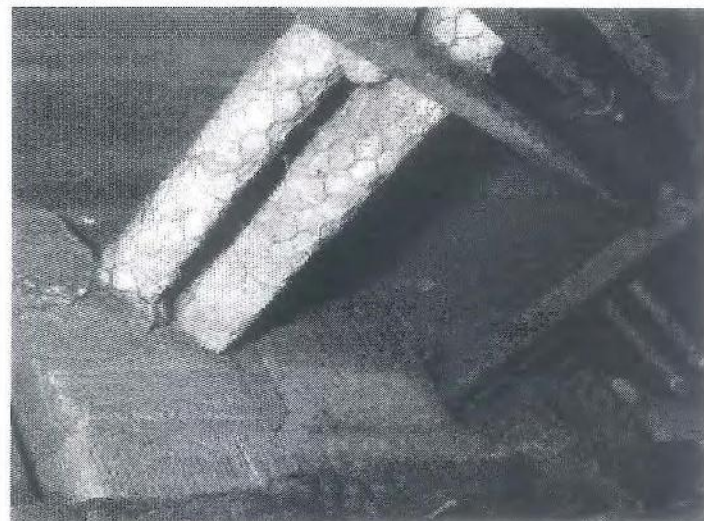
- Sheets of Supalux nailed to underside of timber stairs
- Negligible fire resistance
 - 2-3 minutes
- Original installation date not known
- Unlikely to be original, though similar arrangement previously in place



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Corridor walls – fire resistance

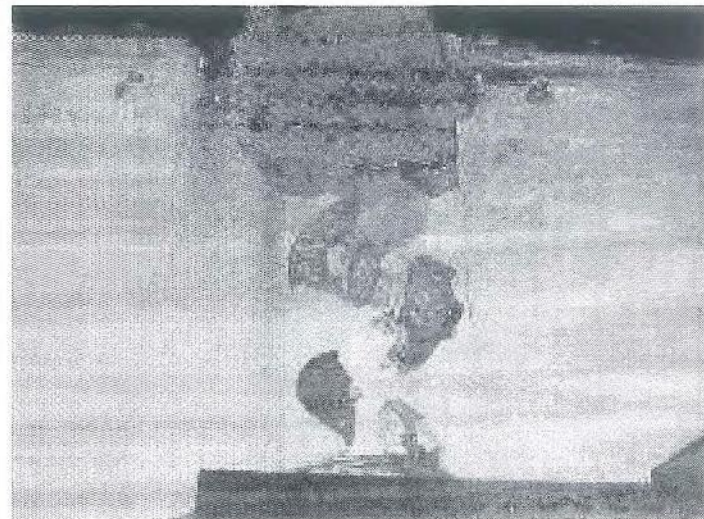
- Concrete – likely 60 minutes FR
- Multiple penetrations in all flats
 - Original heating pipes
 - New heating pipes
 - Cabling
- Incomplete and absent fire stopping
- Allowed smoke to pass through



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Corridor walls – reaction to fire

- Multiple layers of paint built up since original construction
- Some layers flame retardant
- Significant contribution to fuel load in corridor



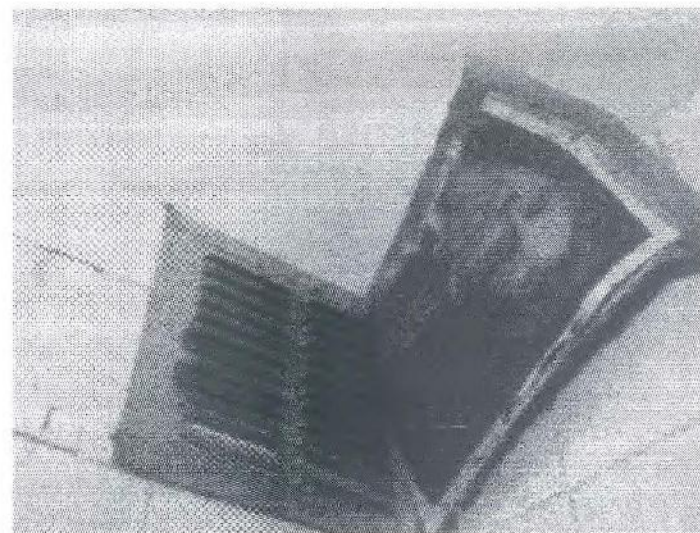
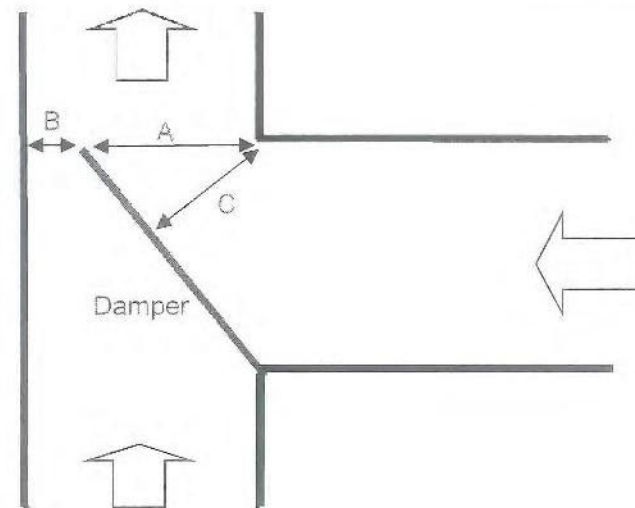
Cross ventilation scheme

- Original feature
 - ‘State of the art’ at the time of construction
- Compromised by installation of security doors in 1980s
 - Reduced ventilation area
 - Not enough free area to clear smoke
 - But not compartmented either



Bathroom extraction

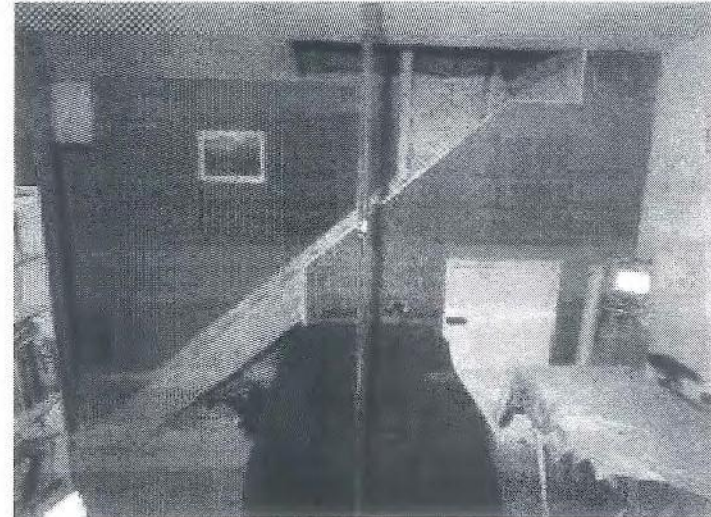
- Original feature
- No separation of extraction between flats
 - Standard practice at time
- Provided route for smoke spread from Flat 53 to Flat 81



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Flat 79 modifications

- Wall removed
- Risers in staircase removed
- Both done by occupant in mid 1990s
- Influenced fire spread



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Incident timeline

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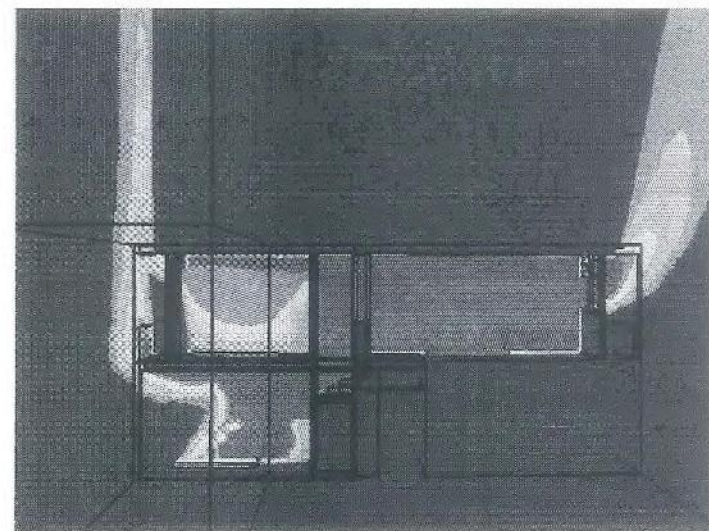
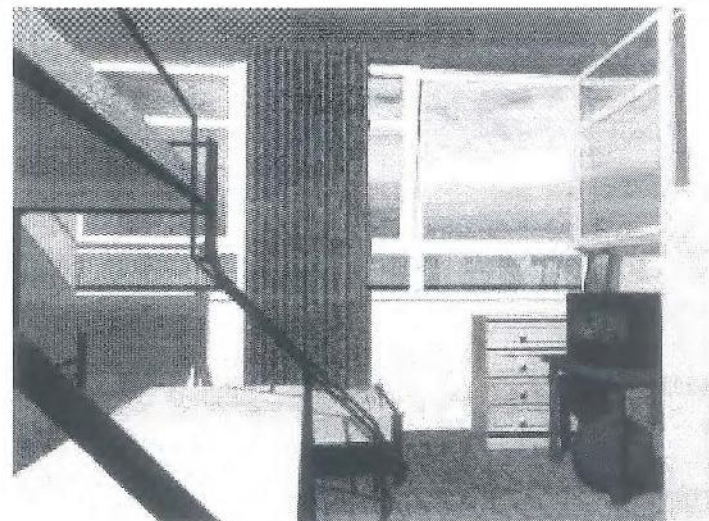
Preamble

- Incident lasted in excess of five hours
- This timeline is:
 - only concerned with 16:15 to 18:00
 - limited to information presented during the inquest
- Information concerning LFB presented without interpretation
 - Not my area of expertise

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16:15 to 16:25 – Fire in Flat 65

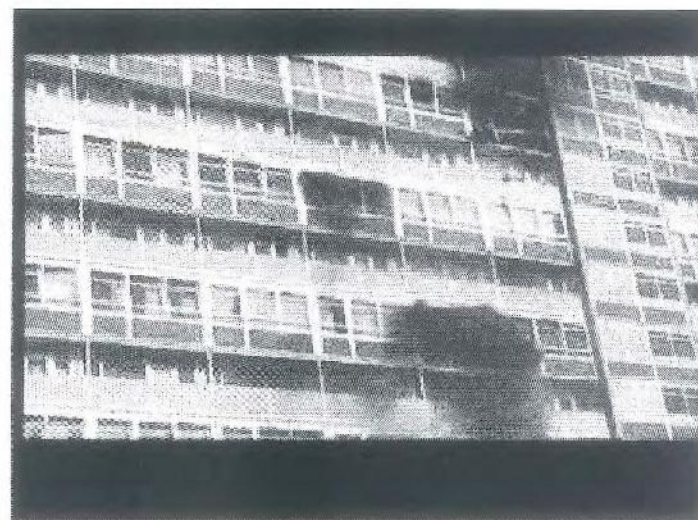
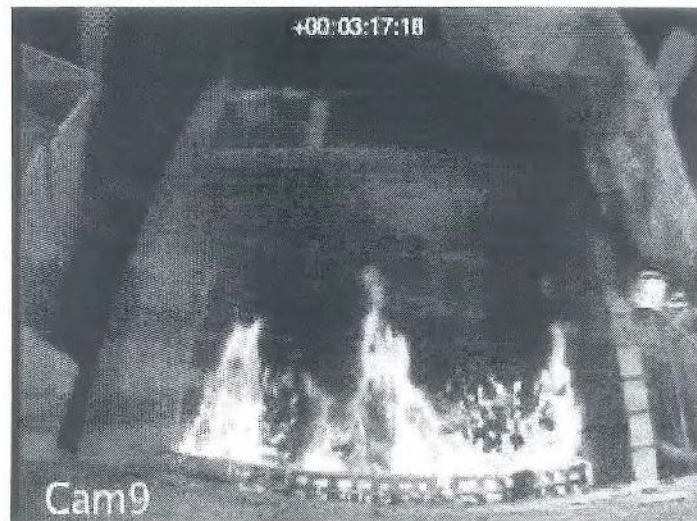
- 16:15 – Fire starts in television set in bedroom 1 of Flat 65
- 16:16 – Fire alarm in Flat 65 actuates
- 16:18 – Fire well established
- 16:19 – First call to LFB
- 16:21 – Fire spreading to upper floor
- 16:23 – Smoke beginning to affect other floors; smoke logging escape routes and Flat 79 above
- 16:23 – First appliances arrive
- 16:25 – Flashover in upper floor, flames impinging on panels of Flat 79



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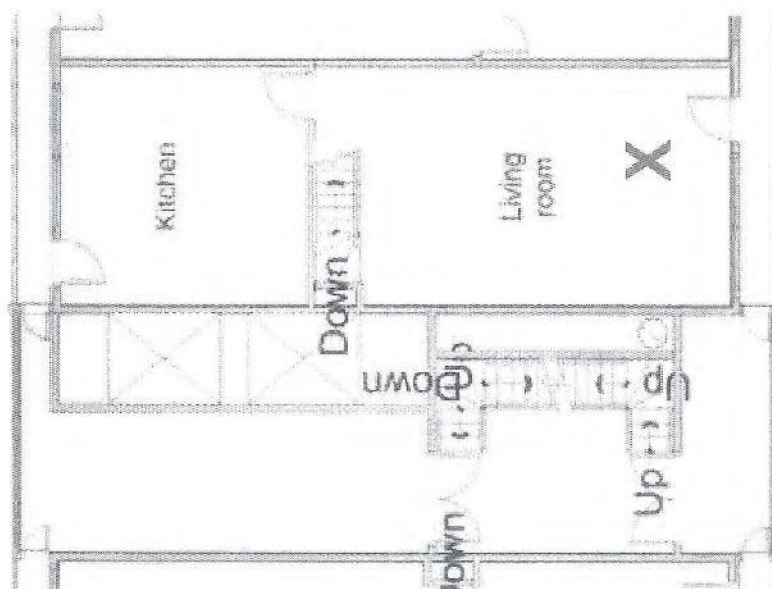
16:25 to 16:50 – Fire Spread to Flat 79 and Flats 37 & 53

- 16:25 – Flames impinging on panels of Flat 79, panels alight
- 16:30 – Fire spreads inside Flat 79 via window panels
- 16:30 – Bridgehead being established on 7th floor
- 16:36 – Fire fighters reach Flat 65
- 16:40 – Flat 65 fire suppressed
- 16:47 – Fire starts in Flat 37, 5th floor
- 16:49 – Fire starts in Flat 53, 7th floor
- 16:50 – Conditions in upper floor of Flat 79 no longer survivable



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Victim in Flat 79

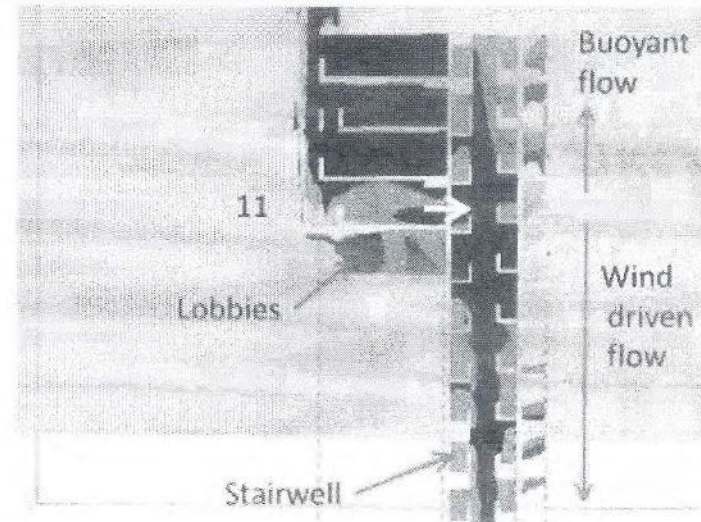


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16:50 to 17:00 – Fire spread into 11th floor corridor

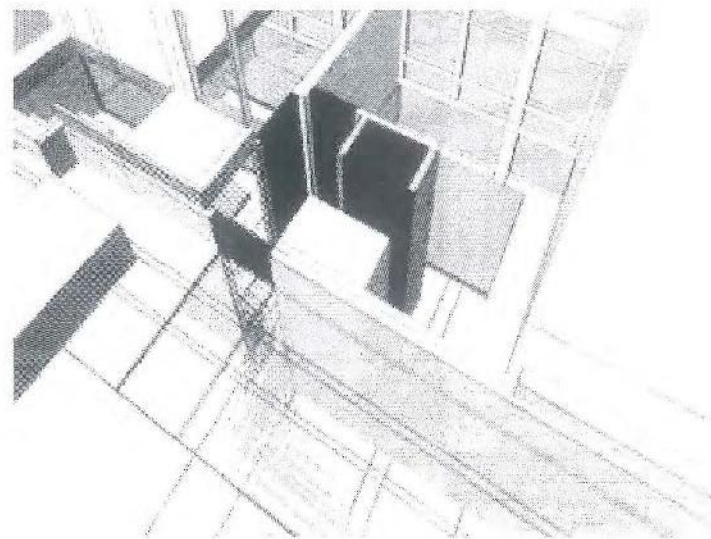
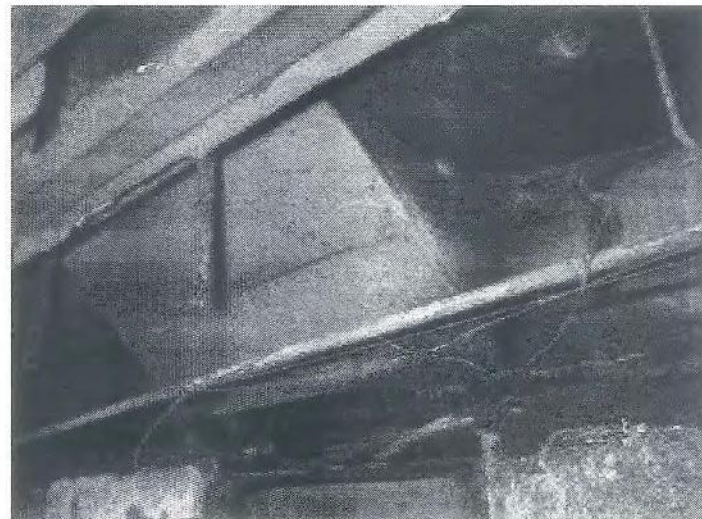
- 16:52 – Fire directly impinging on elements of compartmentation to 11th floor corridor
- 16:56 – Significant smoke logging at 7th floor bridgehead and throughout height of communal staircase
- 16:57 – Smoke entering flat 81 bathroom via
 - ventilation grille, from Flat 53
 - smoke leakage paths through Flat 81
- 17:00 – Bridgehead moved down, eventually re-established outside building at 17:17



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17:00 to 17:20

- 17:02 – Fire fighters reach Flat 53
- 17:06 – LFB crew committed to rescue family on 12th floor balcony
- 17:08 – Fire breaks through elements of construction into the suspended ceiling void of the 11th floor corridor
- 17:16 – Flat 53 fire suppressed
- 17:20 – The front door of Flat 79 collapses into 11th floor corridor
 - Severe fire rapidly develops in 11th floor corridor
 - Increase in smoke entering Flat 81

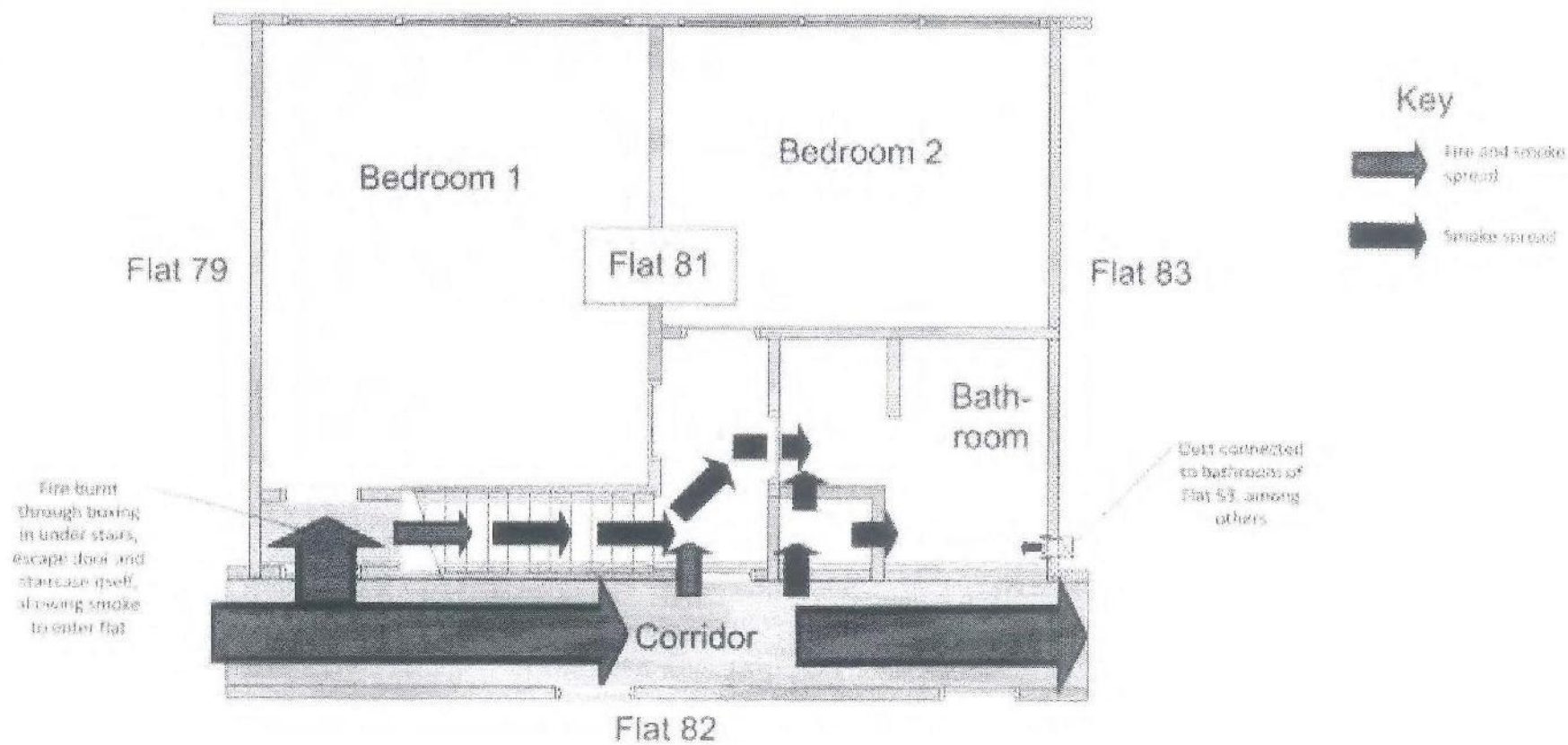


17:20 to 18:20

- 17:22 – Smoke seen from north end of 11th floor corridor
- 17:30 – Compartmentation of Flat 81 beginning to fail
- 17:36 – LFB encounter severe fire in 11th floor corridor
- 17:42 – Flat 37 fire suppressed
- 17:46 – LFB cannot identify Flat 81 due to numbers in 11th floor burnt off
- 18:00 – Conditions in bathroom of Flat 81 no longer survivable
- 18:20 – LFB find three casualties in Flat 81

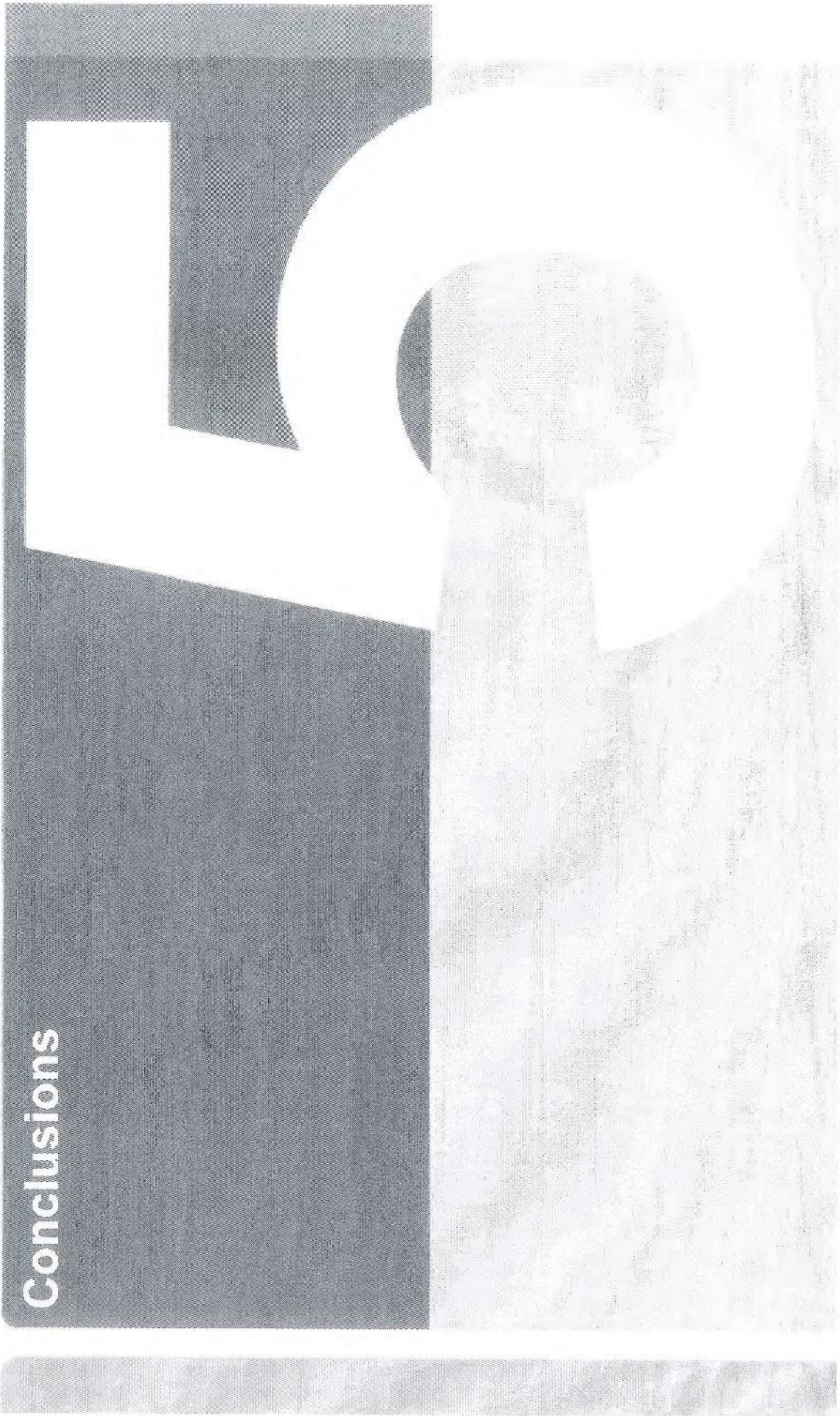


Flat 81



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Conclusions



Conclusions

- Building considered 'state of the art' when built
- Featured in Architects' Journal
- Large number of issues crept in over a number of years
- Overall worsening of conditions through years of neglect
- No one single factor sufficient to have caused death in isolation



Thank you

David Crowder

Business Group Manager, Fire Investigation, BRE Global
Director, Fire Investigations (UK) LLP

BRE Fire and Security

T:

M:

F:

E: crowderd@bre.co.uk

W: www.bre.co.uk/fire

BRE Global, Garston, Watford WD25 9XX, UK