High Rise Retrofit Pilot Project – Callow Mount, Sheffield

“Cities in the Sky” – Challenging their Safety, BRE – 12 March 2013

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BAFSA Project Manager
Cities in the sky

- Super high rise
- Futuristic
- Innovative

Should I feel inadequate?

- Existing stock – Aging
- 4000+ in UK
- 10% of population
- 25% of fires
- 23% injuries and fatalities
Serious High rise fires

19 January 2011, Dundee One dead, two injured, major fire spread

14 July 2011, Glasgow 1 dead, 2 injured, residents trapped on upper floors

26 September 2011, Norwich, 44 residents rehoused

30 November 2011 Hong Kong, 9 dead, 30 injured

8 January, 2012, Chicago, 1 dead, 2 residents and 2 firefighters injured

7 April 2012, Toronto, Fire on level 24 external spread to lower floors

1 December 2011, Berlin, man dies jumping from 9th floor

4 February 2011, London, 2 dead, 6 rescued, 35 evacuated

15 July 2011, London 19 people rescued 5 firefighters injured

12 August 2011, London 9 people rescued, 150 evacuated

10 November 2010, Shanghai, 58 dead in 28 storey block

3 March 2012 Bangkok Fire on 6th floor engulfs all upper floors of 13 storey block

14 May 2012 Roubaix, 1 dead, 10 injured in 18 storey block
Project Background

- Lakanal House Fire, 2009
  - “It is not considered practical or economically viable to make a requirement for the retrospective fitting of fire suppression systems to all current high-rise residential buildings”.

- Potential SCG/CLG Housing Directorate pilot

- CLG withdrew support and involvement

- SCG scoping document
  - South Yorkshire FRS/Sheffield Homes proposal
  - BAFSA to manage project
  - Steering Group
‘Safer High-rise Living’

- Report structure
  - Historical perspective and background
    - Legislation, Guidance and Research
  - Risks associated with high rise blocks
    - Occupants, fire-fighters and financial
  - Case studies of incidents in high rise blocks
  - Project management
  - Design, specification and installation
  - True, full and lifetime costs
  - Potential issues and benefits
  - Annex of technical information
  - Supporting video
Fire Safety in High Rise Blocks

- BRE Research Report Effectiveness of Sprinklers in Residential Premises
  - Cost effective in buildings 11 storeys and over
  - Possibly cost effective 6 storeys and over

- Building Regulations Approved Document B
  - Required in new residential blocks over 30m

- Scottish Building Standards
  - Requirement over 18m

- CFOA sponsored review of BRE report: Published November 2012
High Rise Fire Safety Guidance

- CLG Guidance Document: Fire safety fire risk assessment: Sleeping accommodation
  - There may be some safety and financial benefits in providing such a system
  - Cost effective solution to reducing risk
  - Relaxation restrictions in design
  - Permits alternative approaches to satisfying building regulations and other fire safety requirements

- LGID report – Fire safety in purpose built flats
  - Statistically - no greater risk than low rise
  - Reliance on compartmentation and ‘stay put’ policy
High Rise Fire Risks and Impact

- Fire Risk Assessment reports
  - Experience suggests passive measures are not maintained
  - Failure to ensure compartmentation not breached by other services and damage
  - Fire development in some fires supports this belief

- Potential for fire growth and spread
  - Time required to establish fire-fighting resources at bridgehead
  - Risks to occupants and fire-fighters

- Financial and social impact of incidents
  - Authorities
  - Residents
  - Community
Case Studies - Waddell Court, Glasgow

- Major refurbishment programme 2007 – 2009
  - £4.25 million per block

- 16 December 2009
  - Serious fire on 5th floor
  - One fatality and two injuries
  - Fire spread to upper floors

- Residents rehoused for up to 11 months

- Total cost of rehousing, refurbishment and loss of rental income = £2.6 million

- Only 1 of the 77 residents have house contents insurance
Case Studies - Impact of Incidents

- Callow Mount, Sheffield
  - Serious fire in single flat of adjacent block
  - Refurbishment costs to date £13k

- South Ayrshire Council
  - Fitted sprinklers as part of a refurbishment programme in 2002/3
  - Subsequently experienced two serious fires in individual flats
  - Minimal water damage
  - Refurbishment limited to redecoration of flats involved
Relaxations and compensations

- Design freedoms if undertaking major refurbishments
  - Building Regulations/Standards approval and compliance
  - Relaxations permit changes to internal layout

  - Permits relaxation of standards for means of escape, levels of fire resistance and fire alarm standards
  - Relaxation of fire service access requirements

Northampton House
- Former office block converted to flats
- Sprinklers only way to satisfy Building regulations and make conversion commercially viable
- Three fires since occupancy, residents escaped uninjured
Callow Mount Project, Sheffield

- 13 storey tower block managed as sheltered housing
- Ground floor – caretakers office, services, communal room and 4 external bin stores
- Other 12 floors have four flats
- Floors have a common lobby containing two lift shafts
- Two means of escape staircases
Contractual Arrangements

- Licence from Sheffield City Council and BAFSA
  - JCT Minor Works Contract between BAFSA and Domestic Sprinklers Ltd for design and installation
  - Kier sub-contracted to undertake ancillary works by Domestic Sprinklers
  - Marpal appointed as CDM Co-ordinators by BAFSA
  - Third party approval by Warrington Certification

- Support from BAFSA members:
  - Labour in kind
  - Provision of components
  - Cash contributions
  - Full cost invoices to BAFSA for components and labour to ensure true costs identified
Design and Approval

- Design to BS 9251:2005 Sprinkler systems for residential and domestic occupancies - Code of practice

- Approval of design by:
  - Exova Warrington
  - BAFSA (Peter Armstrong and Roy Young)
  - Zurich Insurance

- Approval of installation and commissioning by Exova Warrington
Consultation with residents

- Regular meetings and updates
- Proactive relationship with installers and individual residents
- Contact with warden and tenants liaison team (Sheffield Homes)
Water supplies

- From existing service mains
- Good pressure and flow
- Supplemented by twin electric pumps
- WRAS approval from Yorkshire Water
Installation

- Domestic Sprinklers Ltd
  - 8 staff - Badged as BAFSA

- CPVC pipework
  - surface mounted within existing or extended boxing

- Sidewall heads in flats

- Pendant heads
  - in service areas, lobbies, ground floors and bin stores

- Boxing and decoration by Kier
  - 7 staff for 2.5 weeks
## Installation Timetable

<table>
<thead>
<tr>
<th>Work commenced Wednesday 30 August</th>
<th>Installation in four flats</th>
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<tr>
<td>Week commencing Monday 5 September</td>
<td>Communal areas 90% complete. Positive feedback from residents’ meetings</td>
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<tr>
<td>Week commencing Monday 12 September</td>
<td>System installed in 12 further flats and preparation work on lobbies. Communal areas completed</td>
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<tr>
<td>Week commencing Monday 19 September</td>
<td>20 more flats and lobbies completed</td>
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<tr>
<td>Week commencing Monday 26 September</td>
<td>Installation in 11 flats, boiler room, bin stores, commissioning and snagging.</td>
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Completion date Wednesday 28 September
Feedback

Chairman of the Tenants Association David Cooke:

- “I was highly satisfied with the work in my flat. The feedback from residents has been tremendous, everybody is 100% satisfied”.

Residents and their families

- “Relatives are safer in the event of fire”

Sheffield City Council/Sheffield Homes

- “Enhance safety of residents, emergency services and minimise the financial and social impact of fire”
- Developing a programme of installation of suppression systems in their property portfolio
Callow Mount costs

- Identified true and full costs for installing sprinklers
  - Total Cost - £55,134
  - Cost per flat £1148 per flat

- Maintenance and full life costs
  - Maintenance costs £250 per annum (2011 prices)
  - Lifetime costs based 30 year period on above are circa £60k
  - Equates to between £40 and £50 per year per flat
Fairview Court, Pontypool

- 12 storey block with 70 flats: Bron Arfon Housing Association – Concerns:
  - Frequency of false alarms from detection system
  - Cost and impact of fires in blocks elsewhere in UK

- Contract for sprinkler installation awarded to Vipond
  - System is compliant to BS 9251
  - Flats, communal areas, bin and cycle stores and roof top pavilion
  - Full capacity tank for 30 minutes supply with two electric fire pumps and fire service connection

- Cost of installation circa £80k
  - Cost equates to £1150 per flat
  - Cost to supplement water supply is approximately £10k
Conclusions

- Practical and cost effective to retrofit a sprinkler system in occupied high rise housing in reasonable time and with minimum impact on residents

- Provides evidence for housing authorities, housing associations and fire and rescue services to consider the potential use and cost effectiveness of sprinklers to:
  - Enhance safety of residents and firefighters
  - Reduce financial and social impact of fire

- Provides evidence for authorities to consider the potential cost benefit of using sprinklers in:
  - Major refurbishment programmes
  - Development of fire safety policies
  - Compare benefits with other fire safety measures
Impact to date

- Widespread coverage in local, fire and construction media
  - BBC ‘Breakfast’
- 25 presentations to 3000 people and series of site visits
- Widespread interest from fire and housing sectors
  - Contracts for a number of high rise and low rise installations from local authorities and housing associations
- Callow Mount used as exemplar to support local campaigns
- LGA adopted proposal for toolkit to promote the use of sprinklers in residential and domestic premises

Changes to legislation and guidance?
Westminster Government’s Chief Fire and Rescue advisor, Sir Ken Knight – Launch Event 2012

“It is really encouraging to see the sector rising to the challenge to show retro-fitting sprinklers isn’t as costly as previously thought.” He said it would be particularly useful to target social housing and sheltered accommodation. Supporting the British Automatic Fire Sprinkler Association’s efforts to promote the report’s findings around the country, Sir Ken added: “Housing owners should be made aware of these findings and put them on their risk profile. We need to focus on the risk-based approach.”
Thank you

PROTECTING PEOPLE, PROPERTY AND THE ENVIRONMENT