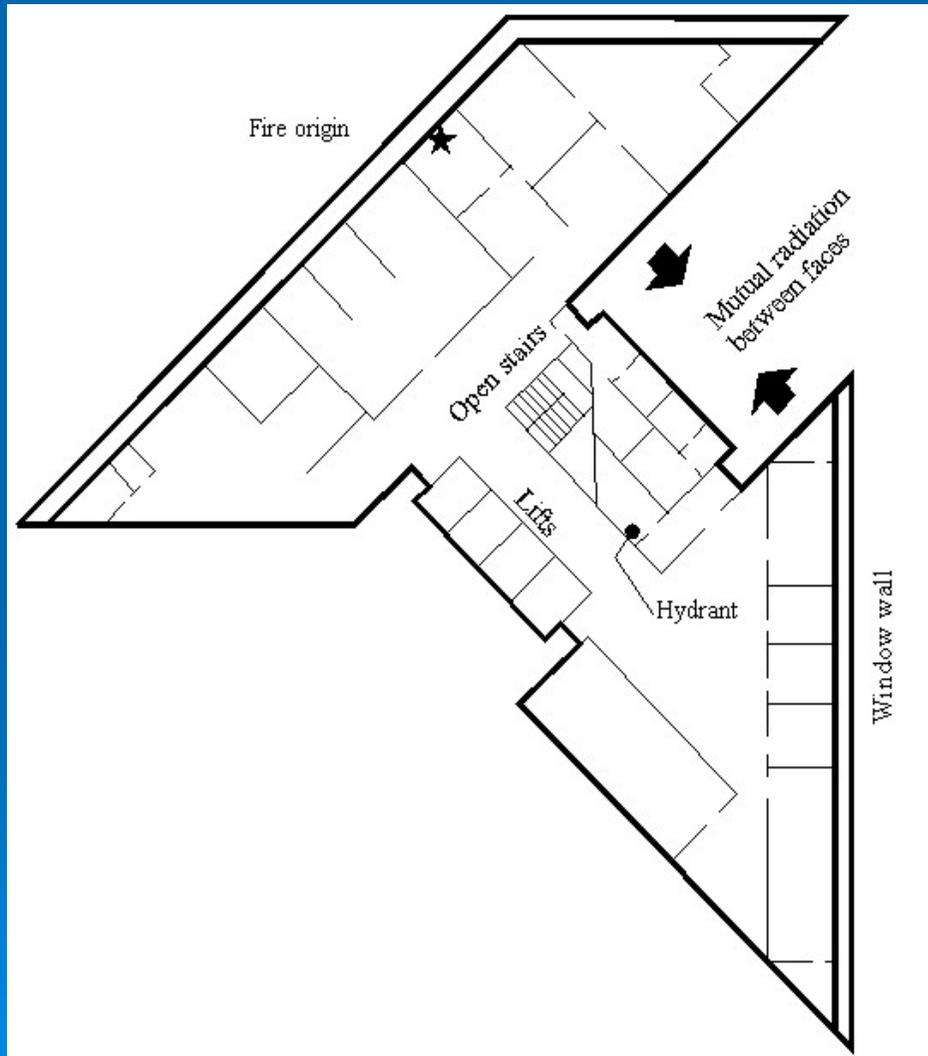


Joelma



- Joelma plan.
- Note open plan with no protection to stairs and bank of lifts.
- Fire origin shown by asterisk



Joelma – the building

- The beams, columns and floor slabs were of reinforced concrete with a floor-to-floor height of 2.6 m.
- Plan shape featured two oddly-shaped office wings joined by a central services core comprising a single staircase and bank of four passenger lifts which ran the full height of building.
- The service core was not separated from the office accommodation by partitions.
- Roofs were covered with corrugated asbestos sheeting and had parapet walls only 0.3 m high.
- Windows were of 6 mm glass in aluminium frames and had openable portions.



Joelma – the building

- Office areas had partitions which were of timber.
- Suspended ceilings were of 20 mm combustible fibre tiles on wood strips.
- There was no emergency lighting, no manual or automatic alarms, no automatic detection and no automatic fire suppression system.
- There was one 64 mm diameter rising main with 38mm hose in cabinets at each floor level.
- Water storage for this main was in a tank on the roof and the supply make-up was pumped from the basement by electric motor.



Joelma – fire timeline

- 08.50. A crackling sound heard coming from a window-mounted air-conditioning unit on the 12th floor, and Supervisor shuts off local electrical supply. Curtains caught fire and fire started to spread. Fire said to be too smoky to fight with a fire extinguisher. Meanwhile another employee went to the first floor to prevent more workers from entering the building. The 4 lifts were then used to evacuate several lift-loads (estimated at 300 people) and lifts are eventually grounded.
- 09.03 Occupant of building across the street sees the fire and phones the fire brigade
- 09.10 Fire brigade arrives and are faced by fire rapidly spreading up the two window walls. Occupants get onto the 0.9 m spandrel (portion of floor slab which projects beyond window) at several storeys seeking air and rescue from fire brigade. Fire involves storeys 12 to 20. It is impossible to enter the building. Many occupants go to the roof expecting to be lifted off by helicopter, while others jump from windows causing a hazard for the fire fighters



Joelma fire



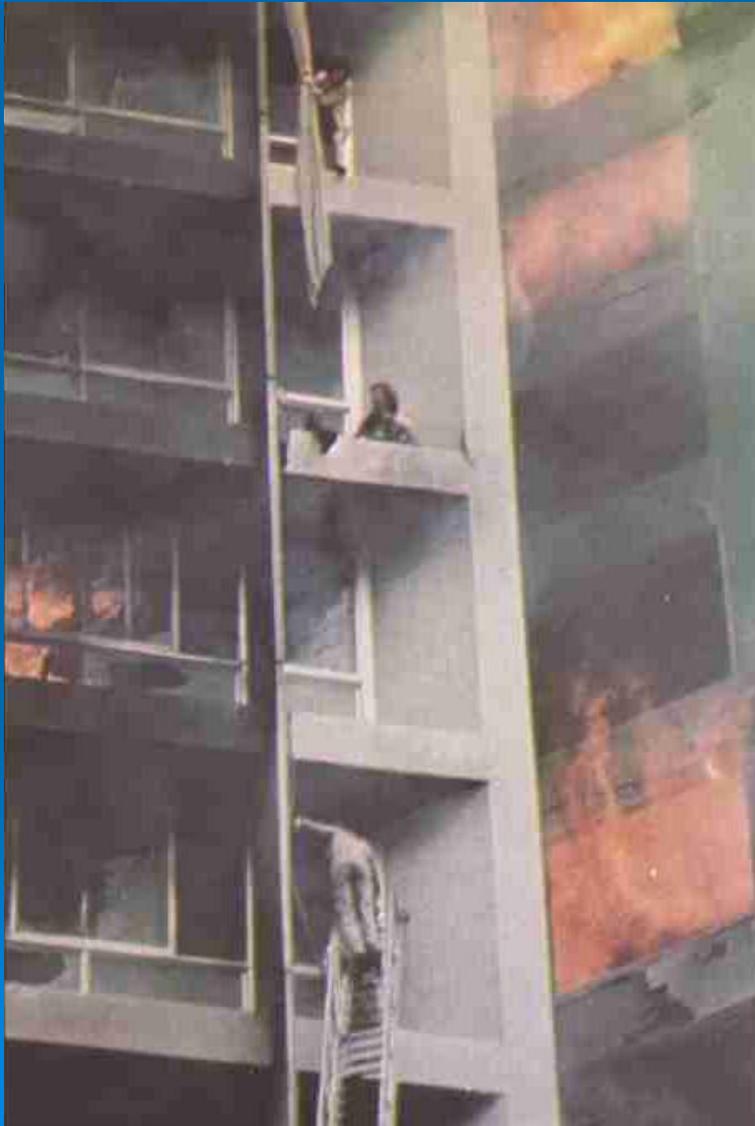
Joelma fire



Joelma fire



Joelma – balcony protection



- Joelma 3 hours after fire started.
- Many people still waiting to be rescued, protected by the building balcony projections



Joelma



- Person falling after jumping off higher floor (centre of picture).
- Telescopic fire rescue ladder at right



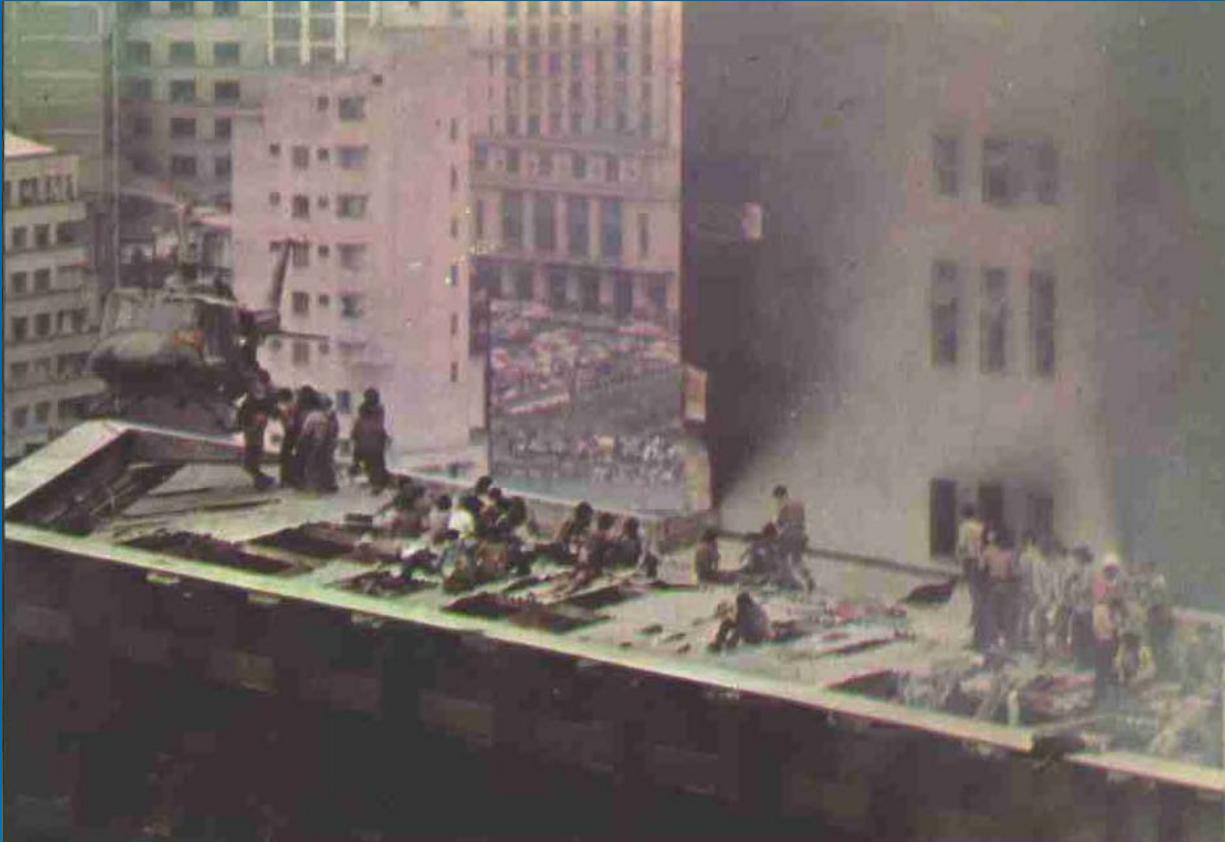
Joelma



- Many people rescued from high positions by turntable ladders



Joelma – rooftop refuge



Some of those who reached the roof died there or jumped.

Survivors were taken off by helicopter



Joelma - observations

- Fire started due to an electrical fault caused by lack of a circuit breaker
- Whereas the concrete structure was demonstrably fire resisting, the interior finishes (partitions and ceilings) were entirely of combustible materials and this encouraged rapid fire spread
- Only one stairway was provided and it was not enclosed – smoke and fire could and did spread internally from storey to storey
- There was no fire separation between the two office wings
- There were no local evacuation alarms, no exit signs, and no emergency procedures for occupants
- The lifts were used intelligently and they stopped only at wanted floors. Luckily the power supply to the lifts was not affected early on and some 300 people were evacuated by lift
- Downdraft from helicopter rotors was said by some survivors to be a help to survival for those taking refuge on the roof.



Joelma - observations

- Some occupants, aware of the successful helicopter rescue from the Andraus building fire two years before, moved up to the roof, but there was no wind to deflect the plume of smoke and hot air and helicopters could not reach many on the roof top in time. The UK policy is to discourage the use of helicopters in this way.
- A decree in 1963 and its related code recommended that there should be fire-proof and smoke-proof escape stairways separated from the main building by a 250 mm thick wall with non-combustible doors to each story, but this had not been complied with.
- Research by BRE concluded a) that a 2 ft horizontal projection between windows in vertically-adjacent storeys is inadequate to prevent flames from a fire entering the upper storey unless fire-resisting glazing is used, and b) that the only sure way to prevent external fire spread would be to omit all windows from the storey immediately above the one with windows.
- If combustible interiors are present and there are unprotected shafts (e.g. open stairs and lifts) the building should be retrofitted with an automatic sprinkler system

