

JAMAICA FIRE BRIGADE TRAINING DEPARTMENT



FIRES IN HIGH RISE BUILDINGS

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TRAINING DEPARTMENT

FIREFIGHTING IN HIGH-RISE BUILDINGS

Introduction

It is generally accepted that the term 'high rise' applies to buildings with floors above the reach of fire service equipment available in the area.

High rise fires are not new, possibly the first recorded occurred in New York City, in 1908, when the twelve (12) floored 'Parker' building was gutted. Shortly afterwards in 1911, one hundred and forty-eight (148) girls perished in a fire in the ten (10) floored 'Shirt Waister' factory. In 1916 as a result of these incidents, New York City revised its building codes to provide such features as protected staircases, fire mains, lifts and sprinklers in certain buildings.

The coming of the high rise era presented architects and fire services with a number of well defined problems. The most pressing of these being:

1. Designing a building which resists fire spread and provides a high degree of safety for the occupants at the building.
2. Providing fire fighting and rescue arrangements which are practical and effective. Even today, modern high rise buildings can lead to rapid fire spread causing severe problems for firefighters.

Facilities for Firefighting Operations

These provisions are generally the same for both commercial and residential buildings.

Firefighting Access Staircases.

Although not mandatory, it is preferable that at least one staircase should be designed as firefighting access staircase and should include the following design features:

- (a) The staircase should be enclosed in fire resisting materials and preferable be located on an external wall.

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(b) The staircase should be continuous throughout the height of the building and direct access should be available: from Fire Service access level.

Fire Lifts

These are normally passenger lifts arranged to be available for the exclusive use of the Fire Service in an emergency. The lifts should be located in the firefighting access staircase enclosure or lobby and a switch in a glass fronted box marked "Fireman's Switch" should be provided. The operation of this switch should render the car buttons inoperative and automatically return the lift to ground level.

Rising Mains

At least one rising main should be provided and located in the lobby, adjacent to the staircase. In buildings with a topmost storey not more than 61 metres (200ft) rising mains may be "dry", in higher buildings they should be 'wet' and serve all stories above the first.

Fixed Installations

There must be a means of firefighting provided within buildings used as offices or apartments, hotels, etc. These include sprinklers, hose reels and extinguishers. Other arrangements for firefighting are:

- a. Foam inlets for oil fired boiler houses and tank chambers.
- b. A system of ducting to provide smoke ventilation for areas below ground.
- c. A pressurisation system which activates on operation of the fireman's switch to supply air to the staircase at a sufficient pressure greater than the pressure of adjoining lobbies or spaces to keep the staircase free of smoke. Staircases may be found which are permanently pressurised.

Strategic Organization (Minor Incident)

In order to deal effectively with high rise fires, there is need for strict command and control procedures to be adopted. Much of the manpower at such an incident will be involved in control measures. It is, therefore, vital that the command centres are designated and the role of officers manning them is fully understood.

Staging Team

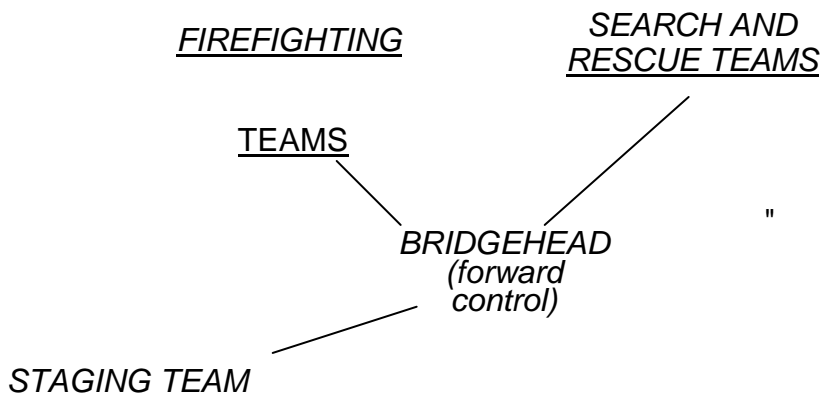
In order to facilitate the transportation of manpower and equipment to upper floors, a staging team under the command of a Staging Officer should be used. The Staging Officer will liaise with Lobby Control for maintaining the supply of resources to the Forward Control. Consideration should be given by the Staging Officer in establishing a 'staging area' on the floor immediately below the Forward Control for equipment, manpower and servicing facilities. Responsibilities of the Staging Officer are:

- a. Provision of relief crews
- b. BA servicing
- c. Provision of rescue and First aid equipment
- d. Casualty clearing area
- e. Provision of specialist equipment
- f. Rest and recovery area

Lobby Control

At a major incident the role of lobby control changes to that of providing liaison between forward control/staging team and logistics control. The responsibilities of this control are:

- a. Control of manpower and equipment into the premises
- b. Providing the officer in charge with information gained from plans, occupier, Site engineer or security staff
- c. Control of internal systems such as ventilation, fixed installation, and communications.
- d. Control of the fire lift
- e. Provide the officer in charge with



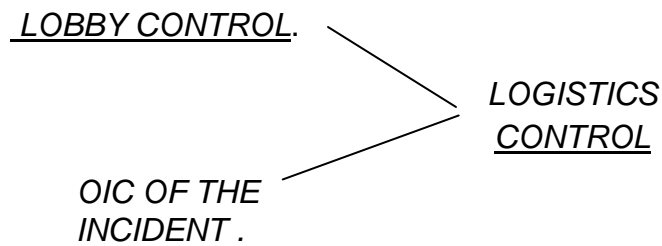


Fig.2

Tactical Considerations

Forward control will be responsible for executing the plan of attack. Firefighting operations will be launched from a protected area. Firefighting staircases are provided with a high degree of fire resistance and ventilation, by the provision of double lobby protection on each floor area leading off the staircase.

Crews committed from forward control to attack the fire should always attempt to take hose lines, uncharged to the protected lobby on the fire floor and connect to the riser outlet provided within the lobby area. This procedure will ensure that the staircase remains free from smoke. Only if the lobby area proves untenable should hose lines be connected to the riser outlet on the floor of the forward control.

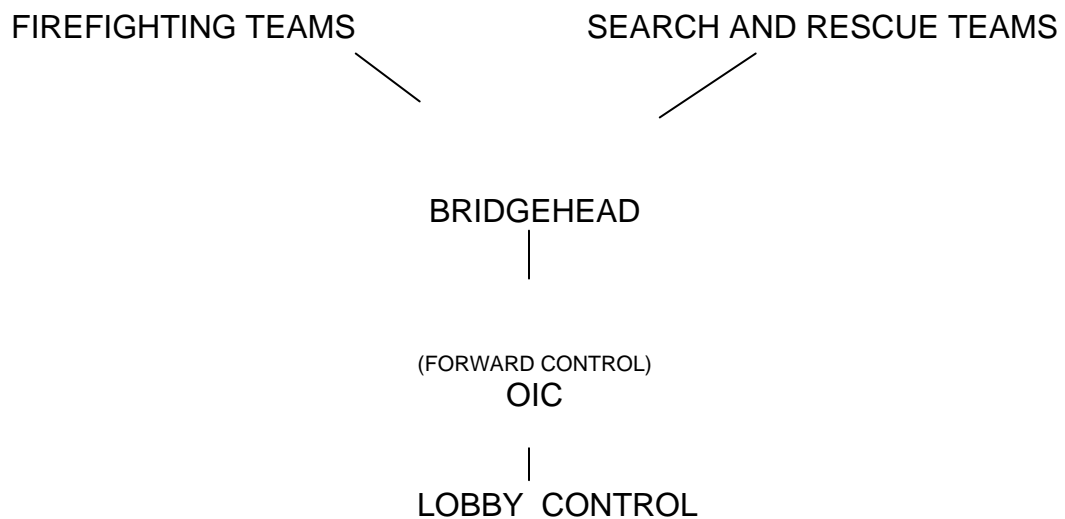
The basic rule of firemanship are of utmost importance here, to ensure that the fire is not driven into areas which would endanger other floors, e.g. spread of flames up the outside of the building re-entering in upper floors, or, spread of flames up staircases or lift shafts. It may also be necessary to stage an attack on a number of floor levels at the same time, where more than one floor has been directly affected by fire.

Apart from direct firefighting, control of the spread of fire and smoke may be achieved by close liaison with the forward control officer, the lobby control officer, and the building systems maintenance staff. Some or all of the following should be considered in this respect:

- a. Pressurisation of staircases
- b. Manipulation of ventilation and air conditioning systems
- c. Use of natural ventilation.

On arrival at an incident the officer in charge will determine the floor involved and obtain information regarding whether rescues are to be carried out. The officer will then organize

1. Charging of risers (if required).
2. Control of the fire lift.
3. Bridgehead party (which he will take charge of).
4. Effective communications between the Bridgehead (forward control) and the officer in charge at ground level (lobby control).



Forward Control/Bridgehead

Set up during the initial firefighting stages, it is normally the nearest smoke free floor below the fire floor.

This control is directly responsible for fire fighting and search and rescue and is directly supported by lobby control. The officer in charge of forward control should take with him and his crew the following equipment:

- i. BA sets and control equipment including guidelines
- ii. Communications equipment
- iii. 45mm Hose and hand controlled branches
- iv. Dividing breaching and lines
- v. Breaking in equipment
- vi. Hand held extinguishers

VII. First aid equipment

viii. Adjustable spanner/spare hand wheel.

Lobby Control: Will normally be located in a protected area or communications centre at ground level. The officer in charge of lobby control is responsible for the effective handling, use of information and control of men and equipment entering or leaving the building.

Strategic Organization (Major Incident)

Where it is obvious that there is a major incident involving a high rise building, there will be a need for a greater degree of command and control. The officer in charge will need to establish an additional control area - 'Logistics Control'.

Logistics Control

This control will normally be located outside of the building in direct contact with lobby control and the officer in charge of the incident. For a major incident the officer in charge should position himself at ground level and maintain close contact with both logistics and lobby control. Another officer should be appointed as officer in charge of the forward control, normally the officer in charge of the first attendance.

Logistics control will be responsible for:

1. Organization of all resources on the fire-ground with particular emphasis on external support, e.g. turntable ladders, roping off areas from flying glass (which may plane 200 meters or more), water supplies, use of risers, liaison with other organizations marshalling areas, etc.
2. Liaison with Lobby Control to ensure anticipated resource requirements are readily available.
3. Overall fire-ground communications
4. Overall supervision of the BA Main Control (which would be delegated to a BA officer).
5. Press and Public Relations.

The officer in charge should be aware that external wind effects may produce high fire spread which can pose a serious threat to fire crews by spreading fire and smoke, and there is the added danger of glazing and curtain walling being shed from the building and being carried by wind currents and turbulence.