Chapter 6

FIRE FIGHTING SYSTEMS

6.1.1 General

(a) All buildings, except Purpose Group I and II (residential floors) shall be provided with portable fire extinguishers.

(b) Portable fire extinguishers where required to be provided shall be constructed in conformity with specifications stipulated under SS 232 Specification for Portable Extinguishers.

(c) All portable fire extinguishers where required to be provided shall be charged, tested and maintained in fully operational conditions and properly tagged in conformity with requirements in SS CP 55 Code of Practice for Use and Maintenance of Portable Fire Extinguishers.

(No illustration)

Cl.6.1.1 (a) specifically precludes residential floors under purpose group II from the need to provide portable fire extinguishers. However, in a block of residential apartments, one would expect to find rooms or spaces designed for such use as electrical switch rooms, transformer rooms, generator rooms, lift motor rooms, general store rooms, etc. For such spaces or rooms, fire extinguishers of suitable type and capacity should be provided to take care of any outbreak of incipient fire.

Although it is not a requirement that kitchen of each apartment or maisonette unit should be provided with a fire extinguisher, every owner should, for his family safety, install a 2.5 kg (8A/21B rating) or multi-purpose dry chemical type or 2.5 kg (8B rating) carbon dioxide type fire extinguisher.

6.1.2 Type, size and siting

Classification of portable fire extinguishers provided shall be selected in accordance with criteria specified under SS CP 55 such that the nature of processes and contents within the building concerned can be effectively protected. The size, quantity and siting of these portable fire extinguishers shall comply with the requirements in SS CP 55 under the respective class of occupancy hazard.

The type, size, quantity and siting of the portable fire extinguishers shall comply with the requirements in SS CP 55.

6.1.3 Portable fire extinguishers provided shall be installed and conspicuously marked in accordance with requirements by SS CP 55.

Portable fire extinguisher should be sited next to the exit, outside the special purpose rooms as shown in diagram 6.1.3 – (a). This would allow occupants to ready themselves with the extinguishers before opening the door to the room where the fire is raging.

Common areas which require fire extinguishers

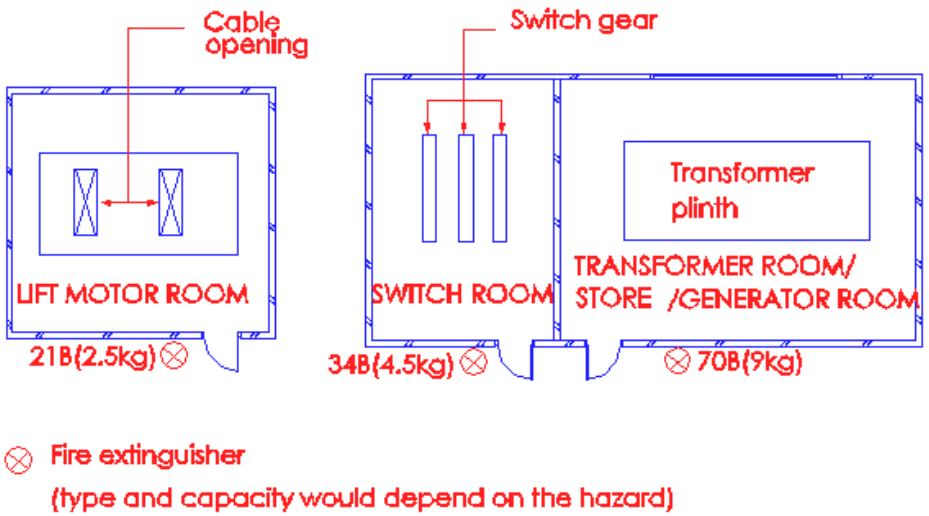


Diagram 6.1.3 (a)

(1) Installation requirements

(a) *Portable extinguishers shall be installed in every building except dwelling units.*

(b) *Portable extinguishers with a gross weight not greater than 20kg shall be installed so that the extinguisher shall be mounted 1m above the floor level.*

(c) *Portable extinguishers having a gross weight of 20 kg or less shall be installed so that the top of the extinguisher is not more than 1.5m above the floor.*

(d) *The operating instructions of portable extinguishers shall face outward when the extinguishers are located in cabinets, in wall recesses or on shelves.*

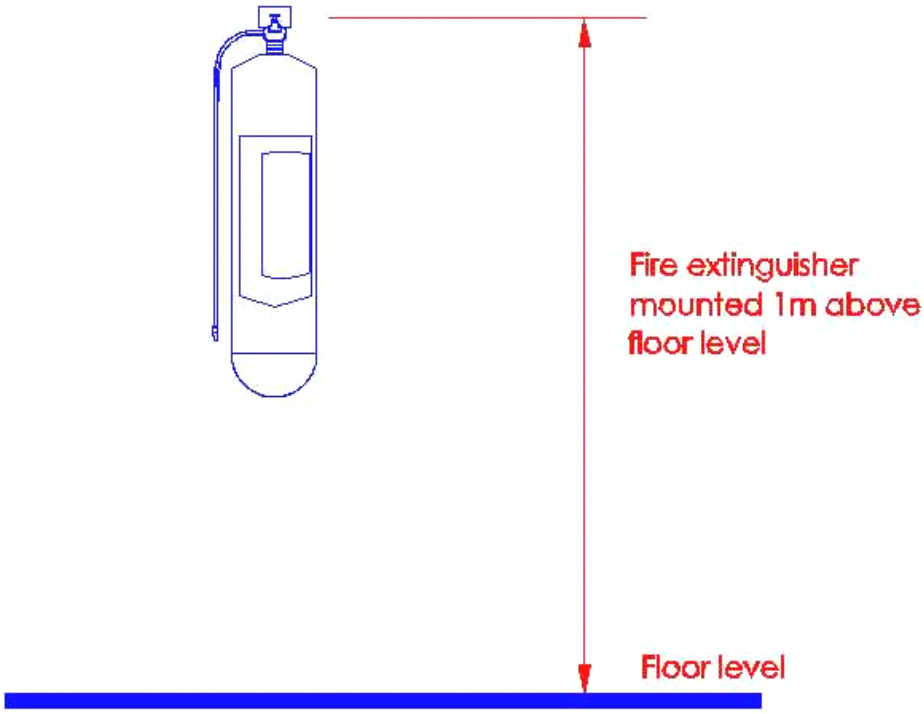


Diagram 6.1.3 (b)

6.2.1 Type of Rising Main

(a) The type of rising main system shall be provided appropriate to the building as follows:

(i) dry rising main shall be installed in buildings where the habitable height is more than 10m, but does not exceed 60m,

(ii) wet rising main shall be installed in buildings with habitable height exceeding 60 m,

(iii) separate dry and wet rising main systems in a building are permitted.

Provision of Dry Rising Mains

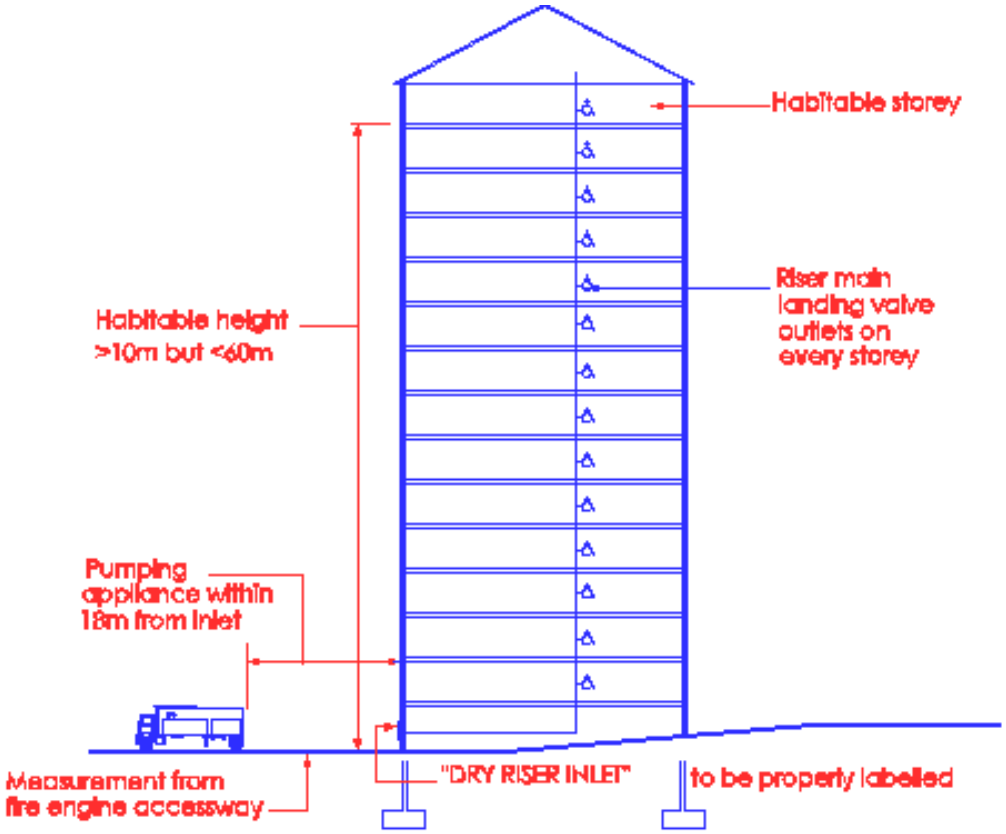


Diagram 6.2.1(a)(i)

Rising Main, Dry (Dry Riser). A vertical pipe installed in a building for fire fighting purposes, fitted with inlet connections at fire engine access level and landing valves on various floors, which is normally dry but is capable of being charged with water usually by pumping from fire engine pumps.

For buildings under Purpose Group II, the provision of rising main shall be required if the habitable height exceeds 10m. See subclause 6.2.1(d).

Provision of Wet Rising Mains

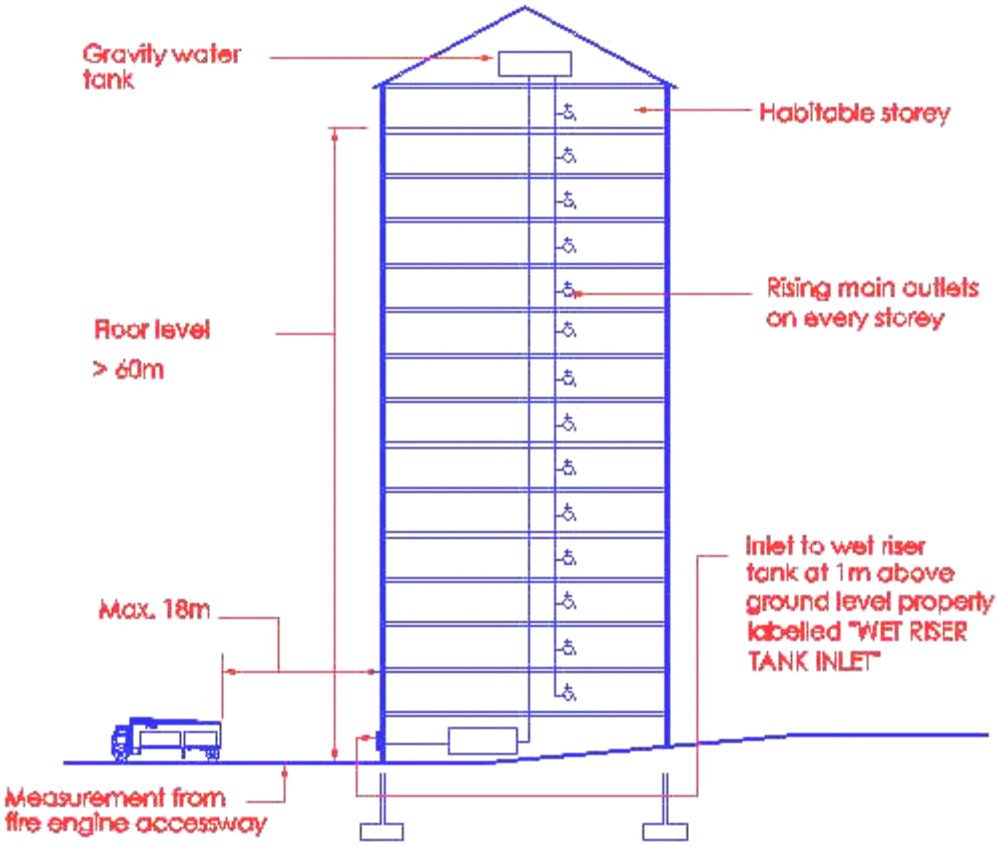


Diagram 6.2.1(a)(ii)

Rising Main, Wet (Wet Riser). A vertical pipe installed in a building for fire fighting purposes and permanently charged with water from a pressurized supply, and fitted with landing valves on various floors.

Separate dry and wet rising main system

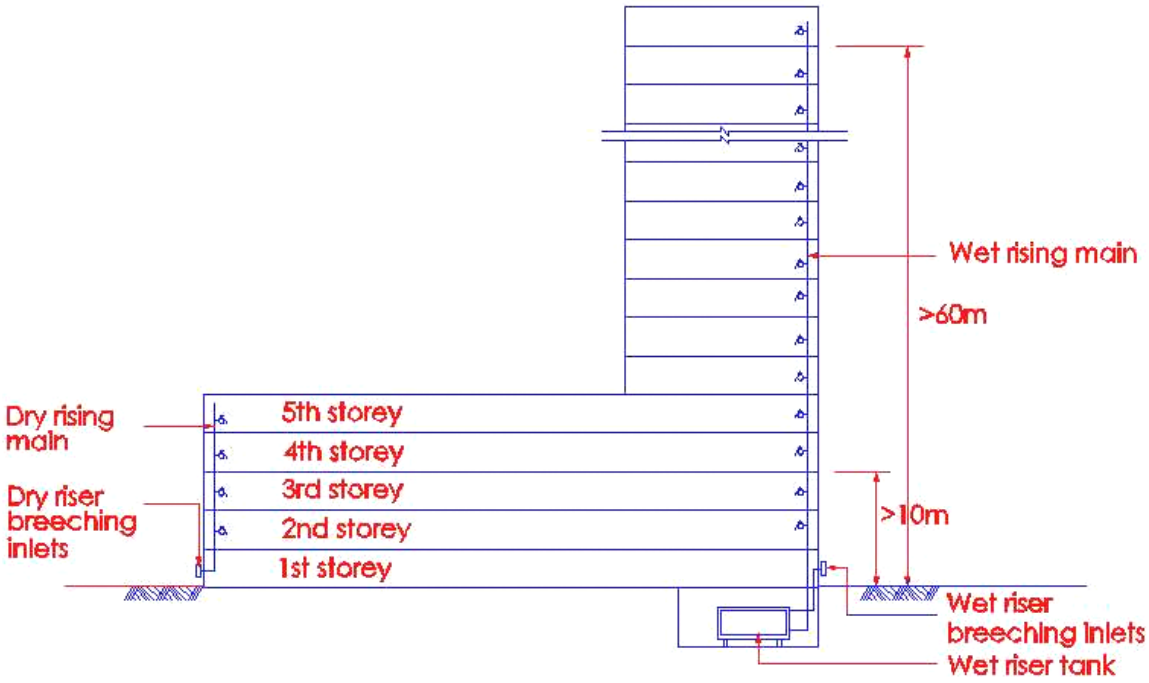


Diagram 6.2.1(a)(iii)

Where a block of residential building has podium and tower blocks integrated

(1) Tower block exceeding 60m in habitable height shall be provided with wet rising main.

(2) Podium block needs to be provided with dry rising main only.

6.2.1 (b) Notwithstanding the requirements in sub-clause (a), dry rising main conforming to SS CP 29 shall be provided to any part of a single or multiple level basement.

Rising main in basements

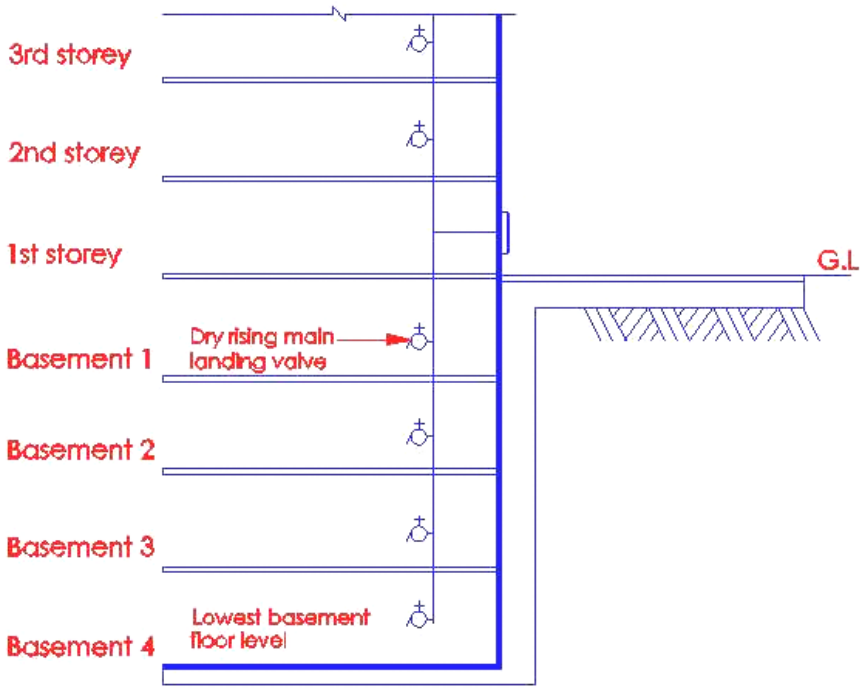


Diagram 6.2.1 (b)

All basements except those under Purpose Group I are required to be covered by dry rising main, irrespective of the depth and number of basements below ground level. Rising main would help to provide steady supply of water required by fire fighters during emergency. The provision would eliminate the tedious process of laying fire hoses from ground level into the basement floors to tackle any outbreak of fire.

Where breeching inlets are provided at the foot of the riser stack, landing valve is not required to be provided at the 1st storey level. See also Cl.6.2.3(c).

6.2.1 (c) Where the building has access from more than one ground level or road level, the height measurements for the purpose of this code shall be taken from the level of accessway or fire engine access road provided.

Type of Rising Mains to be installed in high rise buildings

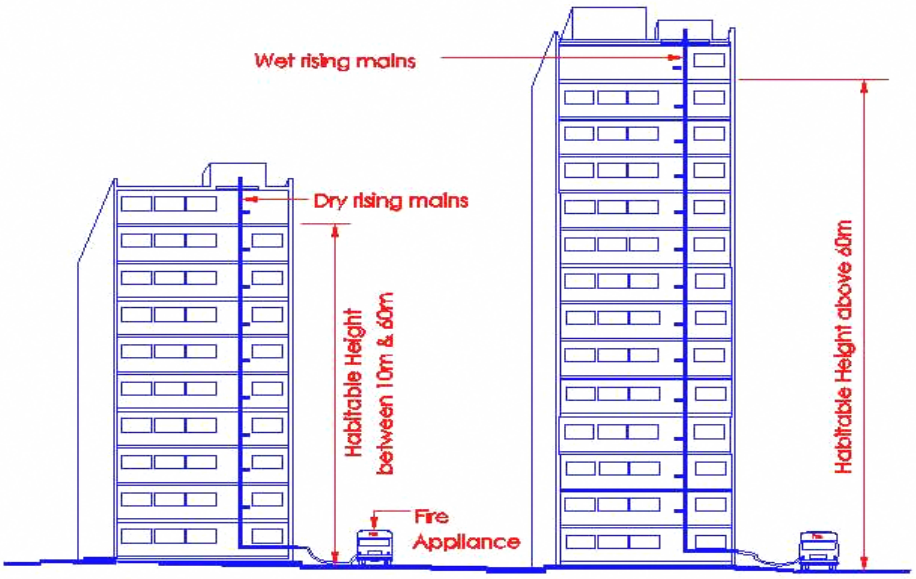


Diagram 6.2.1(c)

(1) For the purpose of determining the provision of rising main to an apartment or maisonette building, the habitable height shall be taken from the level of the lowest fire engine accessway or fire engine access road where breeching inlets are provided.

(2) Dry rising mains are basically dry water pipes. The empty mains need to be charged with water through the breeching inlets by fire engines. The dry rising mains should not exceed 60m in height to avoid excessive pumping pressure.

(3) Wet rising mains are constantly charged with water that provide the required flow rate and pressure for fire fighting and equipped with water storage capacity for a given duration of 60 mins. The breeching inlets, usually provided at ground level, are meant for replenishing the water tank.

6.2.2 Number, Location and Size of Rising Mains

(a) The number and distribution of rising mains shall comply with the requirements stipulated in SS CP 29 Code of Practice for Fire Hydrant systems and Hose Reels.

The conditions for the number of rising mains required are:

(i) Floor that are above habitable height of 24m. Each rising main shall not serve more than 930 m² of any floor space subject to all parts of the floor to be within 38m from a landing valve.

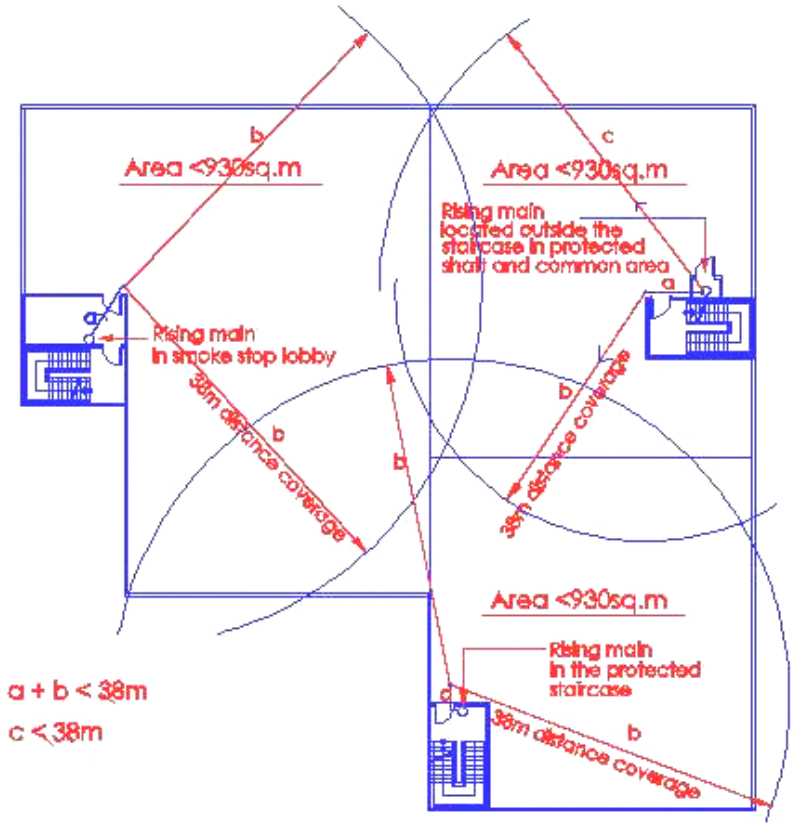


Diagram 6.2.2 (a) - 1

Any point in the above floor space shall not be more than 38m from the landing main.

The floor area coverage per rising main shall not exceed 930 m².

(ii) Floor that are below habitable height of 24m

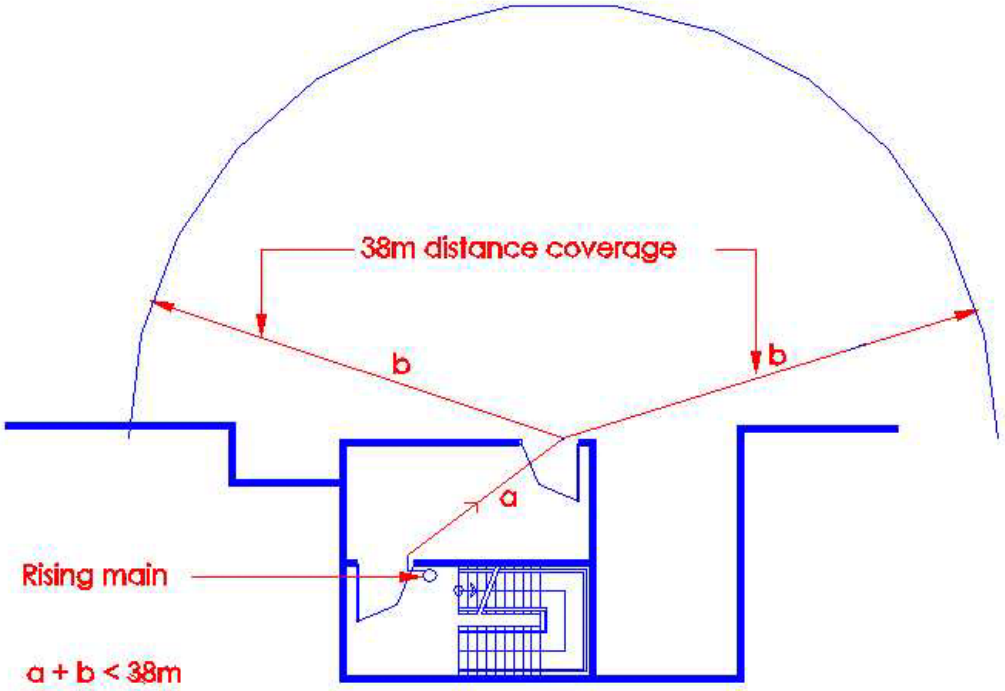


Diagram 6.2.2(a) - 2

The provision of rising main shall be such that all parts of any floor are within 38m from a landing valve, measured along a route suitable for hoselines including any distance up or down a staircase.

(b) Position of rising mains and the associated landing valves shall be located in the following order of priority:

(i) within smoke-stop lobby;

(ii) in the common area and within a protected shaft, immediately outside the exit staircase if there is no smoke-stop lobby;

(iii) inside exit staircase where smoke-stop lobby and common area are not provided.

Siting of rising mains

(i) Rising main in protected lobby

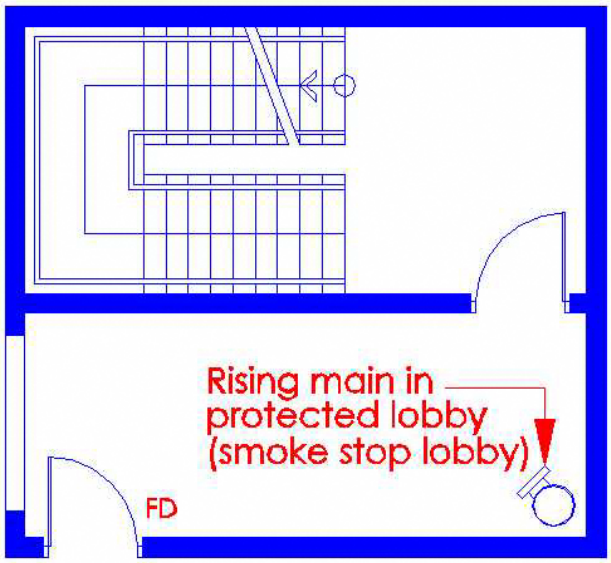


Diagram 6.2.2(b)(i)-1

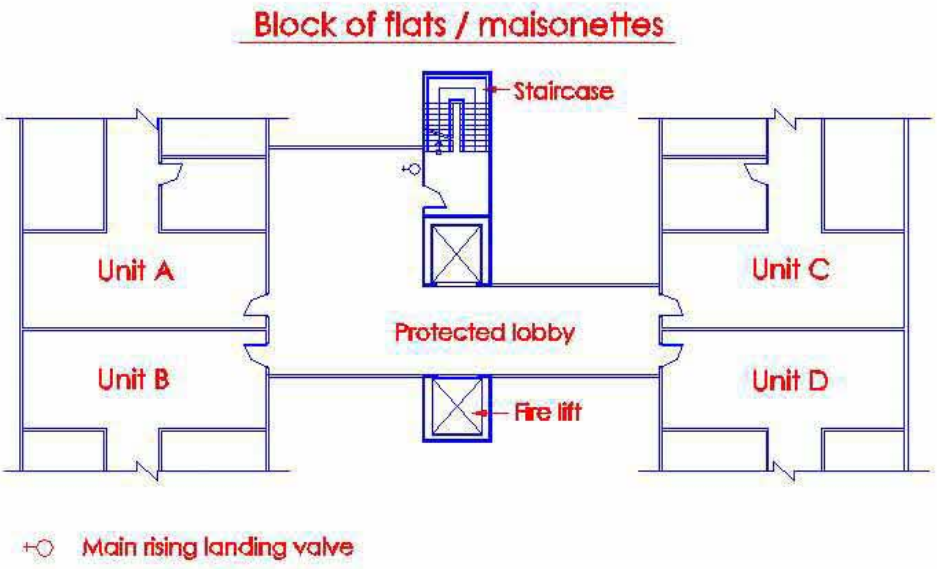


Diagram 6.2.2(b)(i) – 2

(ii) Rising main outside protected staircase

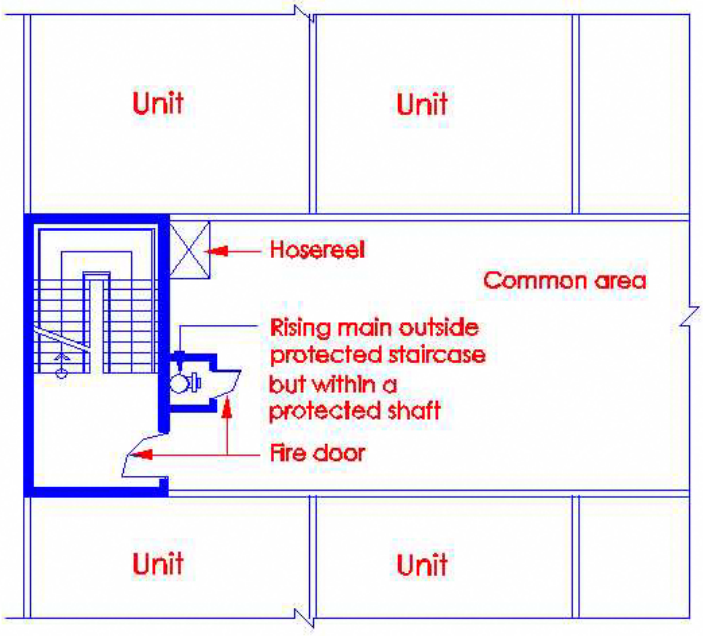


Diagram 6.2.2(b)(ii)

(iii) Rising main inside protected staircase

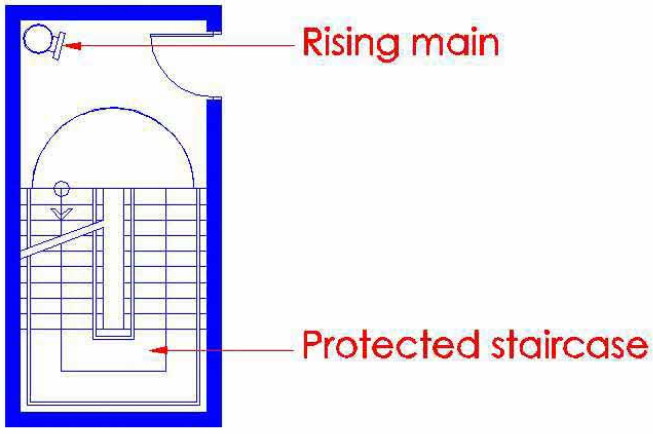


Diagram 6.2.2(b)(iii) – 1

The location of the rising main should not cause obstruction to the escape path inside the staircase.

(iv)

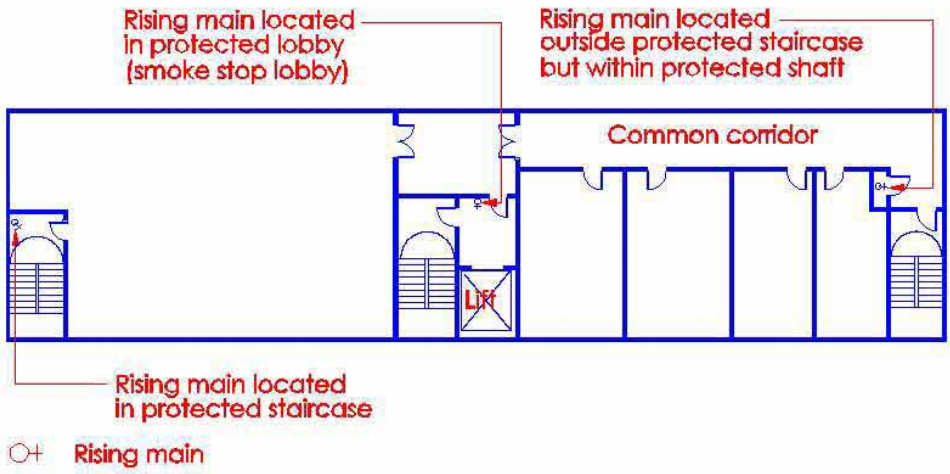


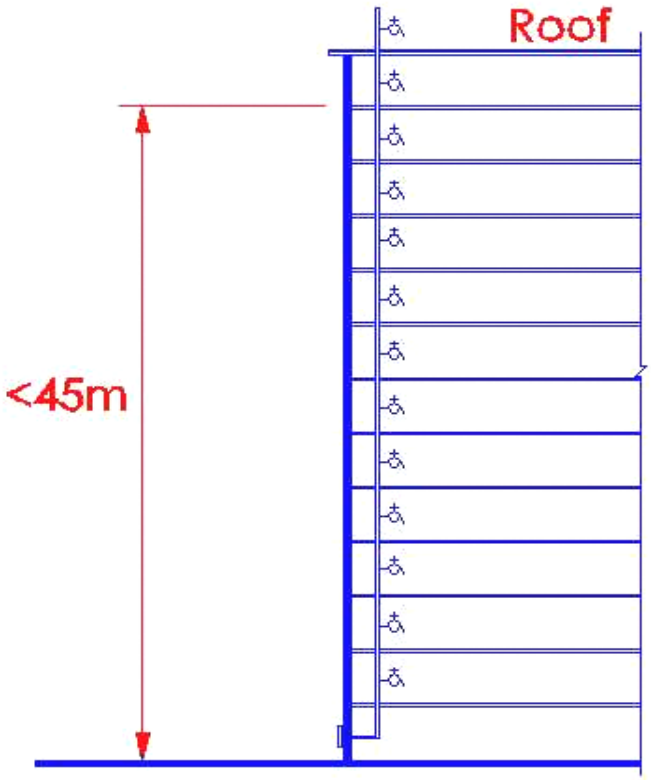
Diagram 6.2.2(b)(i), (ii) & (iii)

As rising mains provide the ready water supply to fire fighters in the building, the main and its landing valve should be protected from fire or mechanical damage.

(c) Size of rising mains shall comply with SS CP 29.

(i) Size of rising mains. The minimum nominal bore of a rising main shall be:

(a) 100mm where the rising main does not exceed 45m in height and only one landing valve is provided at each floor.



100mm minimum nominal bore

Diagram 6.2.2(c)(i)(a)

(b) 150mm where the rising main either (I) exceeds 45m in height or (ii) is permitted to have two landing valves on any floor.

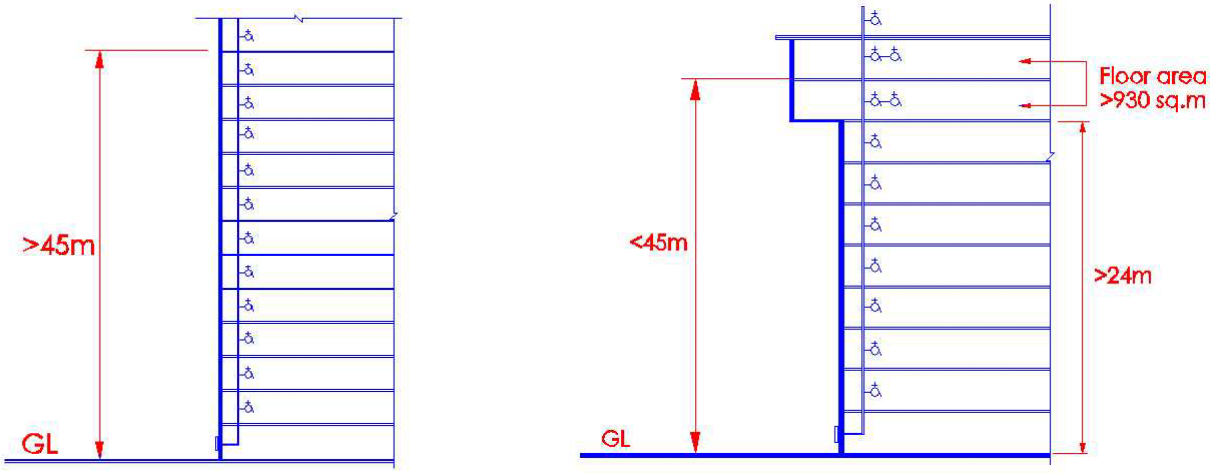


Diagram 6.2.2(c)(I)(b)

150mm min. nominal bore rising main

The height of rising main is the habitable height measured from the fire engine access level to the finished floor level of the topmost floor served by the rising main, irrespective whether or not the main is extended above roof level. The above diagram shows two landing valves being installed in the top 2 floors though the height of rising main does not exceed 45m, the minimum nominal bore of the rising main shall not be less than 150mm. See cl.2.4.12.2 of SS CP 29 which allows that where "one rising main is permitted for a floor area exceeding 930m², two landing valves shall be provided per floor, in which case the nominal bore of the rising main shall be 150mm". However, this requirement shall be not be applicable to any floor exceed 1400m².

6.2.2 (d) Location and provisions for landing valves shall comply with SS CP 29. However, all buildings, other than purpose groups I & II, there is no need to provide landing valve to any rising main at 1st storey level if any part of that storey is not more than 38m from the external wall of the building.

(i) <u>*Location of rising mains*</u>

The entire pipework and landing valves comprising each rising main system inside the building shall be confined:

(a) within a ventilated lobby of a protected lobby approach stairway, where this is provided, or

(b) in such other protected areas as may be agreed with the Fire Authority.

(ii) Rising mains shall be so located that they are protected against mechanical and fire damage.

(iii) No part of a rising main shall be placed in any shaft containing a gas, steam or fuel pipelines or electrical cables and wirings.

(iv) Where passing through other than protected area e.g. protected lobby shaft, pipe need to be encased or protected by and fire rating material with 2-hour fire resistance rating.

BLOCK OF FLATS/MAISONETTES

Example A

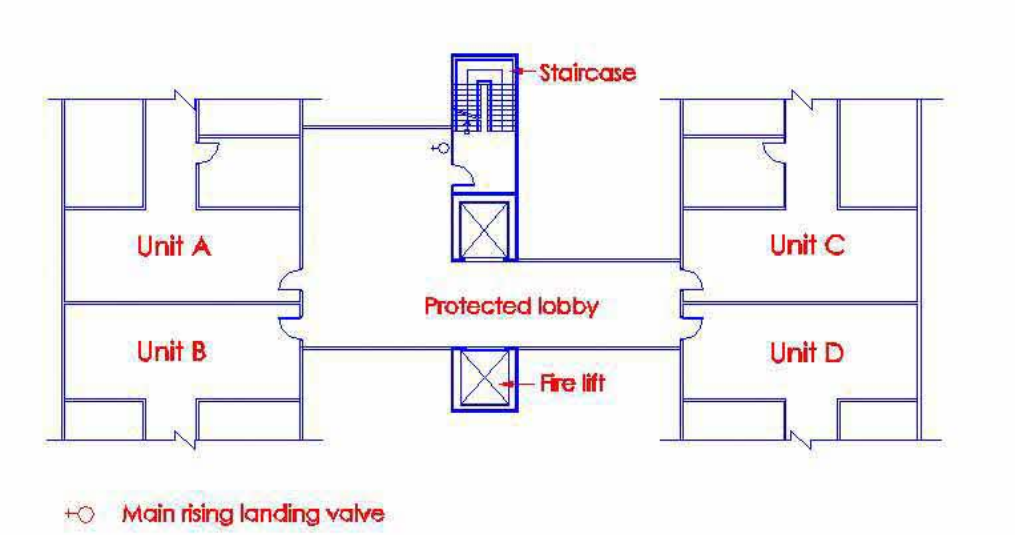


Diagram 6.2.2(d) (i)&(ii) – 1

A single rising main is provided in example A as the total floor area per storey is less than 930 sq m. In-addition the distance from the most remote point in any residential unit to the rising main landing valve shall not exceed 38m, measured along the route of travel.

Example B

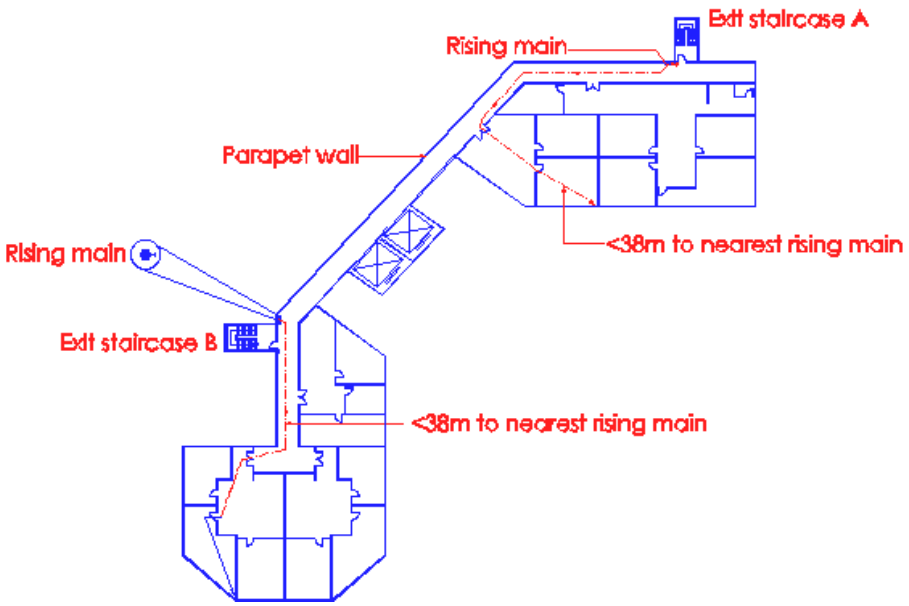


Diagram 6.2.2(d) (i)&(ii) – 2

(i) Two stacks of rising mains are required in example B if the total floor area exceeds 930sq.m, or if the coverage or travel distance to the remote points exceeds 38m.

(ii) Remote point in some apartment units is exceeding 38m from the rising main.

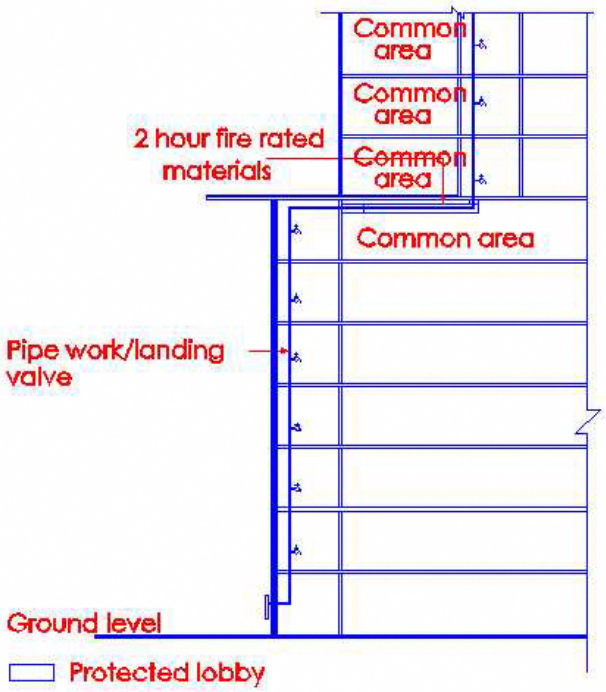


Diagram 6.2.2(d)(iv)

Where the pipe work and landing valve are located outside protected lobby or area allowed by the Relevant Authority, they shall be protected by approved 2 hour fire rated enclosures

6.2.2 (e) Installation of rising main shall comply with SS CP 29.

(No illustration)

6.2.3 Breeching inlets and Accessways

(a) All buildings fitted with rising mains shall have fire engine access road (applicable to buildings under purpose group II) for pumping appliances within 18 m of the breeching inlet. The breeching inlets shall be visible from the fire engine access road.

Distance between breeching inlets and pumping appliances

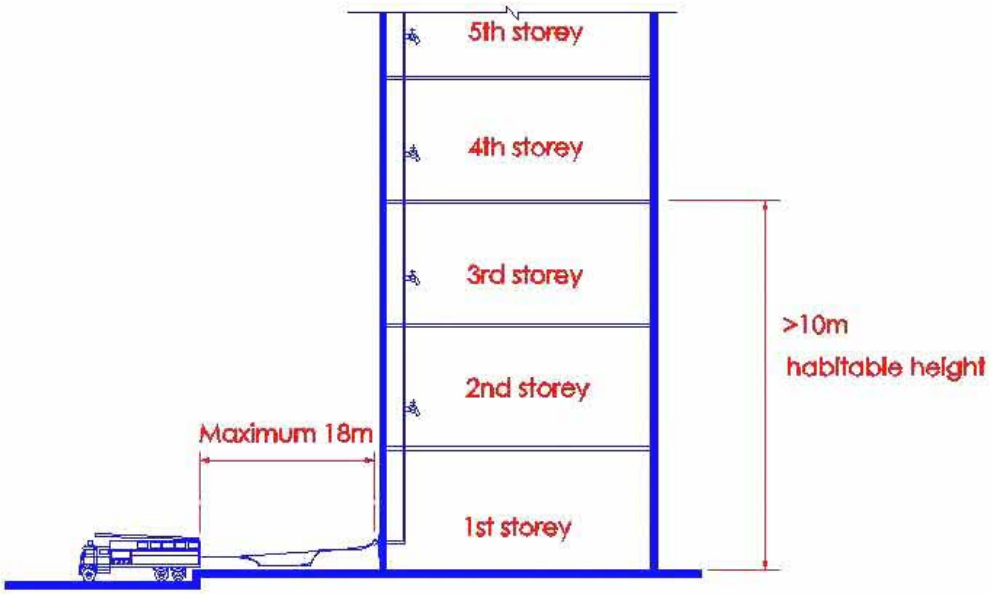


Diagram 6.2.3 (b & c)

(i) Apartment/maisonette blocks exceeding 10m habitable height are required to be provided with rising main.

(ii) At the foot of the riser stack would be the breeching inlet.

(iii) The breeching inlets would be located on the external wall of the building and to be within 18m of the fire engine accessway. The breeching inlets shall be visible from the adjacent accessway.

(iv) Thus, an accessway may serve more than one rising main to one or more buildings, provided (iii) is complied with.

6.2.3 (b) Requirements and provisions for breeching inlets for the rising main system shall be in accordance with the SS CP 29 Code of Practice for Fire Hydrant systems and Hose Reels. Connecting pipe between the inlets and the vertical run of the rising main, where applicable, shall be kept as short as possible.

(No illustration)

The inlets and the vertical run of the rising main shall be kept as short as possible. The total pressure loss of the dry rising main shall not exceed 6 bar based on the design water flow rate. This is to correspond with the maximum habitable height of 60m. See also Cl.6.2.3(c).

6.2.3 (c) For buildings under purpose group II, the breeching inlet to each rising main, either dry or wet, shall be located on the external wall above ground level nearest to the vertical run of the riser stack.

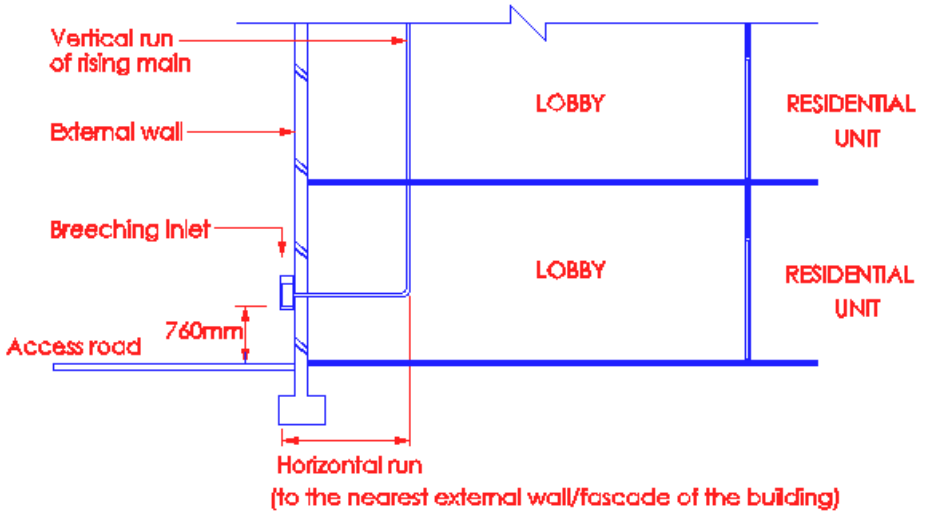


Diagram 6.2.3 (b & c)

(1) Breeching inlets shall be provided at the foot of each rising main stack at ground level.

(2) Although there is no dimension on the length of the horizontal run between the breeching inlets and the vertical run of the rising main, it shall be kept as short as possible (to the nearest external wall/façade of the building) for all maisonette/apartment blocks.

(3) This is to prevent the clustering of breeching inlets serving rising mains located in different location within a block so that the provision of fire engine access road could be reduced.

The primary objective of providing rising main is to replace the provision of fire engine access to each and every unit, thus freeing more space for other uses. By locating the breeching inlets at the foot of the rising main would ensure that at least one side of the building is still facing the fire engine access road.

6.2.4 Wet Rising Main

(a) Wet rising main

Capacity of the water supply from the public mains and the storage capacity for a wet rising main system shall comply with the requirements in SS CP 29 Code of Practice for Fire Hydrant systems and Hose Reels.
(No illustration)

(1) For wet rising mains it is essential that pressures and flows be adequate at all times to serve the required number of jets likely to be used.

(2) The water supply to the rising mains should be kept entirely independent of water supplies feeding other installations including those for other fire fighting systems.

(3) Means of supply for wet rising mains

(i) Each wet rising main shall be fed from a suction or storage tank having a minimum effective storage capacity capable of supplying water at the rate of 27 l/s for a period of at least 30 minutes.

(ii) The storage tank(s) shall be automatically supplied either directly or indirectly via other tanks from a public main(s). The pipe drawing water from public mains to the tank shall be at least 150mm in diameter.

(iii) Break tanks not serving as storage tanks shall have an effective holding capacity of not less than 11.5m³ for each wet rising main.

(4) Water tanks for wet rising mains

Tanks supplying water for domestic purposes shall not be used as suction tanks for wet rising mains.

(b) Flow

Flow requirements for wet rising main system shall comply with those stipulated in SS CP 29.

(No illustration)

(1) The minimum water supply flow rate shall be maintained in the wet rising system when 3 landing valves within the system are in the fully open position: 27 l/s for a residential building.

(2) When more than one wet rising main is required in any zone in a building, the minimum common water supply shall be as stated below. Where the total maximum supply rate exceeds those stated in (a) and (b), another common water supply system shall be used.

(a) For a residential building, 27 l/s for the first rising main and 13.5 l/s for each additional rising main, subject to a total maximum supply rate of 135 l/s.
(b) For a non-residential or any mixed occupancy building 38 l/s for the first rising main and 19 l/s for each additional rising main, subject to a total maximum supply rate of 190 l/s.

(c) Running pressure

Running pressure at each discharging landing valve on the wet rising main system shall be maintained between the minimum and maximum values as stipulated in SS CP 29.

(No illustration)

A minimum running pressure of 3.5 bar and a maximum of 5.5 bar shall be maintained at each landing valve when any number, up to three, are fully opened.

(d) Static pressure

Static pressure in any line of hose connected to a landing valve in a wet rising main system shall not exceed the specified value in SS CP 29.

(No illustration)

(i) To reduce the risk of hose bursting, arrangements shall be made in accordance with BS 5041: Pt 1 so that when the water is shut off at the nozzle the static pressure in any line of hose connected to a landing valve does not exceed 8 bar.

(ii) To dispose of excess flows and pressures over and above those required (ie when only one jet is in use) a pressure control valve shall be incorporated in the body of the landing valve which is then permanently connected into the relief pipe. This relief pipe should run throughout the length of the wet rising main installation and should terminate either back into the suction tank or to drain.

(e) The location of storage tank and capacity of break tank where required shall comply with the requirements in SS CP 29.

(For illustration see diagram 6.2.4(e) - 1)

(1) The location and number of storage tank would be determined by the design of the wet rising main system and the height of the building. SS CP 29 should be fully complied with.

(2) It is important that an early design stage of the building, the type of design of the wet rising main system should be drawn up to allow allocation of space for pumps and water tanks.

(3) Usually, storage tanks and pumps are located in mechanical service floor in upper storey and basement, and on the roof of the building.

(4) The capacity of break tank shall have an effective holding capacity of not less than 11.5m³ for each wet rising main.

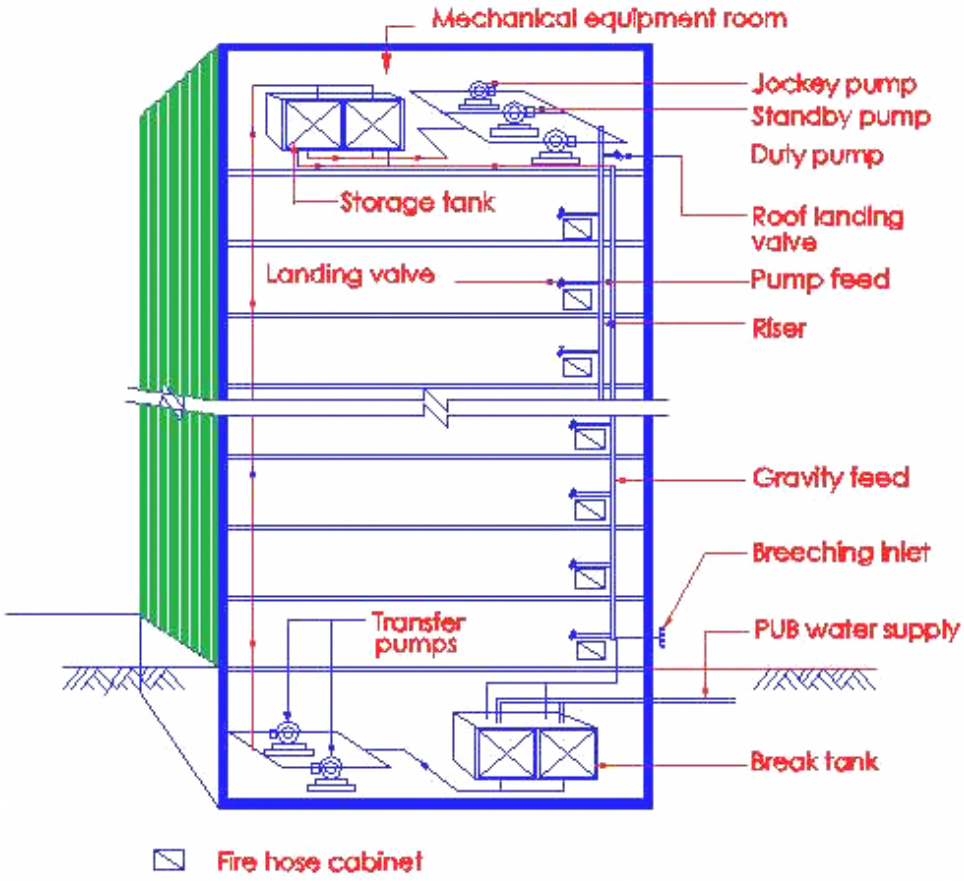
Footnote:

(1) Storage tank is water tank having a minimum effective wet rising main storage capacity capable of supplying water at a given rate for a period of at least 30 minutes.

(2) Break tank is either (a) a tank into which the incoming supply connection from the PUB water mains discharge, or (b) an intermediate tank for limiting the system pressure.

(3) Suction tank is a tank from which a pump can draw water.

Wet Rising Mains system for building height s exceeding 60m



Drawing 6.2.4(e)-1

Wet rising mains system

(1) "Wet rising mains" function similarly to dry rising mains. However, the pipes are permanently charged with water from a pressurised supply, and fitted with landing valves on various floors.

(2) The breeching inlet act as an alternative means of supplying water to the rising mains system should the incoming public water supply pipes be damaged or the water supply is inadequate.

(f) Where pumps are required for the wet rising main system, requirements specified in SS CP 29 shall be incorporated. Arrangements for the power supplies, both normal and emergency, shall be in accordance with the CP.

Pump room in basement

(1) Pumps, which are part of the wet rising main system, must be properly protected from the effect of heat and fire. As pumps are the vital nerves of the system, they should be installed in room having the necessary fire rated enclosures and door (min 2-hr fire resistance rating).

EXAMPLE OF PUMP ROOM IN BASEMENT

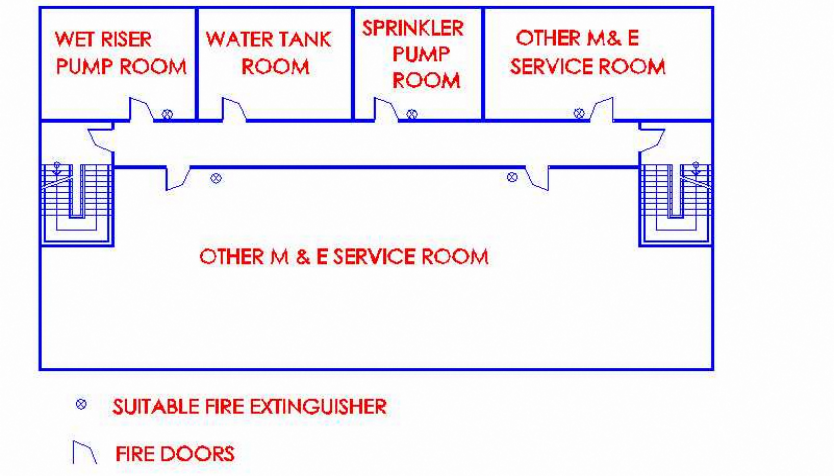


Diagram 6.2.4 (f)

(2) Pumps shall be selected to meet the design requirements of the rising main system and be listed by recognised institution such as Underwriters' Laboratories (UL) or Productivity Standards Board (PSB).

(3) There should be a voice communication system to provide intercommunication among all pump rooms.

(4) Mechanical ventilation and electrical lighting in the pump room shall be equipped with standby emergency power supply.

6.2.6 When a building in pursuance of cl.6.2.1, is required to be equipped with rising mains, such rising mains shall be installed progressively as the building attains height during the course of construction. All outlets, landing valves and inlets, water tanks and pumps, and hydrants as may be required for the system, shall be properly installed as directed by the Relevant Authority so as to be readily operational in case of fire. Please see Appendix (C) for technical guidelines on the provision of rising mains for buildings under construction.

Building under construction

Provision of wet rising main is required when building exceeds a habitable height of 60m.

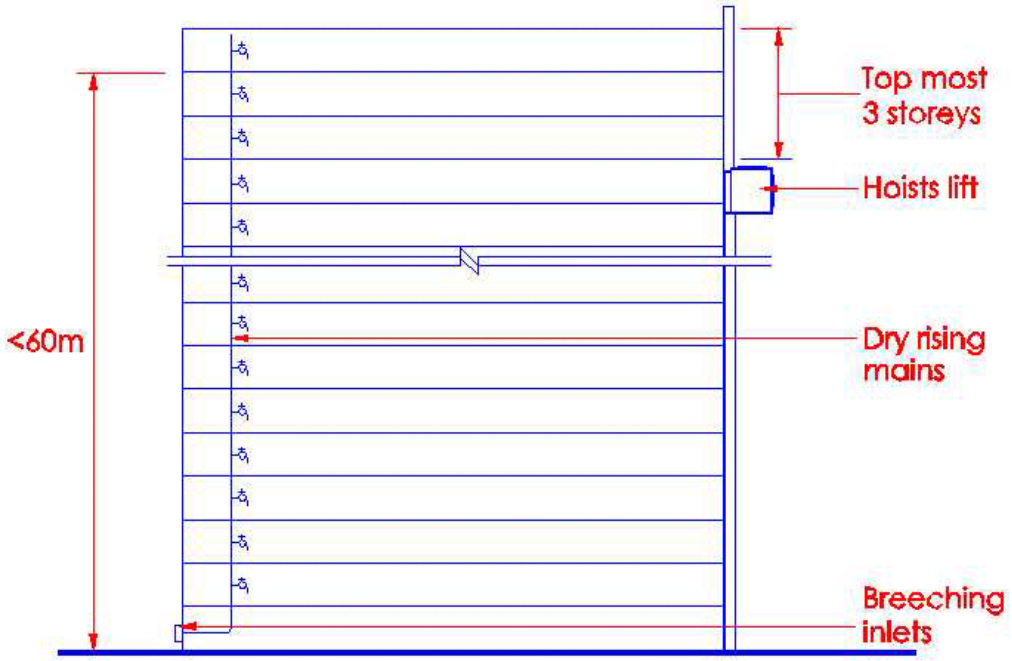


Diagram 6.2.6 – (a)

Rising main is dry type before the habitable height of 60m is reached

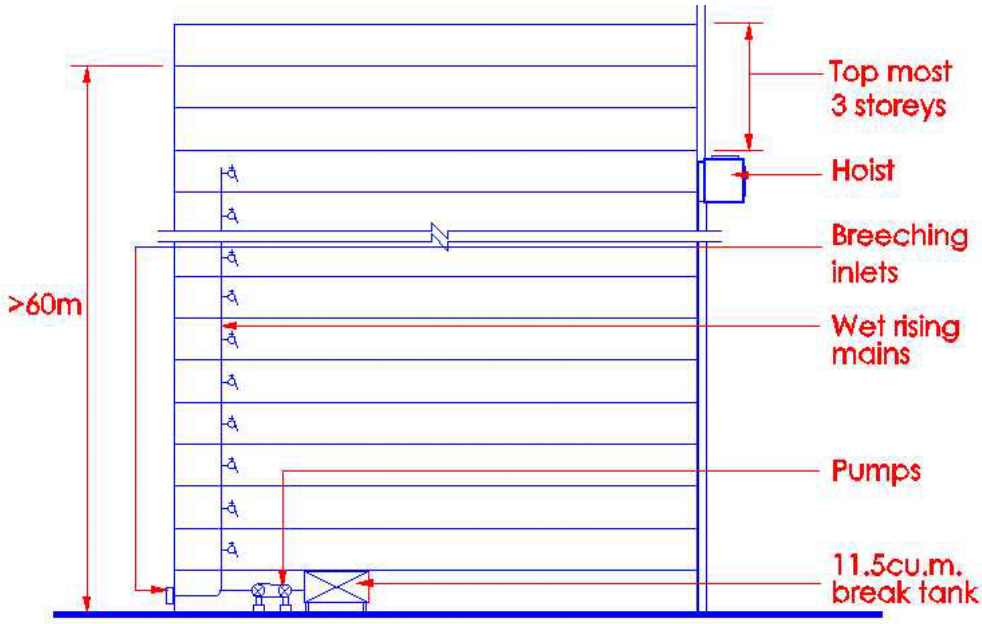


Diagram 6.2.6 - (b)

Rising main is converted to wet type with the installation of pump and water tank

(a) Breeching inlets

Breeching inlets (2-way or 4-way) should be provided as per approved building plan.

(b) Fire lift

As it is not feasible to provide fire lift for use by fire fighters, a passenger hoist, which is usually installed at site could be used. The hoist need not serve the topmost 3 floors, until the roof is being completed.

(c) Electrical power supply

Supply from power grid or generator set could be acceptable.

(d) Fire engine access road

During construction stage, there could be other works involving laying of services, excavation work etc that would prevent provision of access road and the space available would not permit the maneuverability of fire engine.
However, every opportunity should be taken to put in the access road in place. This is necessary for the purpose of conducting effective fire fighting operations should a fire occur at any time. In view of the above, additional portable fire extinguishers should be provided at each floor level instead.

(e) Rising main landing valve

Rising main and landing valve shall be provided to every floor, except the topmost 3 floors as the building gains height, and made operational.

(f) Rising main pressure & flow

As it is not feasible to provide a full-sized water tank and pump to meet the flow and pressure required for 45mins of fire fighting, a break tank of minimum 11.5m³ should be provided, instead for fire fighting of 5mins duration. Upon the arrival of fire engine the tank could be replenished via the public hydrant. The break tank must be constructed before the building reaches the 60m height.

(g) Responsibility/Accountability

The main contractor for the project shall be responsible and accountable for the provision and maintenance of the rising main in the building under construction.

(h) Checklist

Inspection and testing checklists of rising mains are attached for ease of reference.

INSPECTION CHECKLIST FOR RISING MAINS IN BUILDINGS UNDER CONSTRUCTION

S/N	*Description*	*Yes*	*If no, remedy action/comments*
Part A			
1	*All rising mains (dry & wet) shall be made operational for all floors except the uppermost 3 floors as soon as any completed floor of the building reaches 24m in height.*		
2	*Wet rising mains shall be installed progressively when the building attains a height of 60m during the course of construction. All outlets, landing valves and inlets as well as water tanks and pumps shall be provided and made readily operational.*		
3	*Provision of *2-way/4-way breeching inlet as per approved plan.*		
4	*Lift/passenger hoist ready for firemen's use.*		
5	*Generator set or adequate PUB power supply for fire-fighting purposes.*		
6	*Provision of adequate fire engine accessway and hardstanding (where practicable) for fire-fighting purposes.*		
7	*Adequate portable fire extinguishers to be provided on each floor.*		

Date inspected: _____ *by* _____ *Signature* _____
**Delete as appropriate*

S/N	Description	Yes	If no, remedy action/comments
Part B: Checklist for the testing of rising mains			
Breeching inlet		*In order*	*Not in order*	*Remarks*
1	*Inlet housed in protective enclosure*			
2	*Rigidly supported*			
3	*Labelled "dry/wet riser inlet" and numbered accordingly*			
4	*Clear of obstruction*			
Riser				
5	*Air relief valve provided*			
6	*Labelled & numbered accordingly*			
7	*Earthing provided*			
Landing valve				
8	*Blank cap provided*			
9	*Strapped & padlocked in closed position*			
10	*Clear of obstruction*			
Testing of pressure/flow				
11	*Dry rising mains* *a Pressure constant at 300psi (20.7 bar) for 30mins* *b Regularly tested*			
12	*Wet rising mains* *a Static pressure shall be less than 8 bar* *b Topmost landing valve fully opened (under pump/gravity feed) with flow rate at 27 L/S* *c Provide break tank with minimum water capacity of 11.5m³*			

Date inspected: _____ *by* _____ *Signature* _____

**Delete as appropriate*

6.2.7 Where boiler room/s or storage room/s containing highly combustible materials are located in basement or not easily accessible for fire fighting, foam inlets and pipeworks shall be provided for the purpose of delivering foam solution to an area close to the room/s concerned. A 2-way breeching inlet shall be provided at ground level with pipe run of minimum 100mm bore terminating in landing valve just outside the high fire risk room/s. The provision of the breeching inlet shall comply with the relevant clauses of SS CP 29 Code of Practice for Fire Hydrant Systems and Hose Reels.

Foam inlets

In situations where such rooms have access openings along access road, provision of foam solution inlets and outlets is not required.

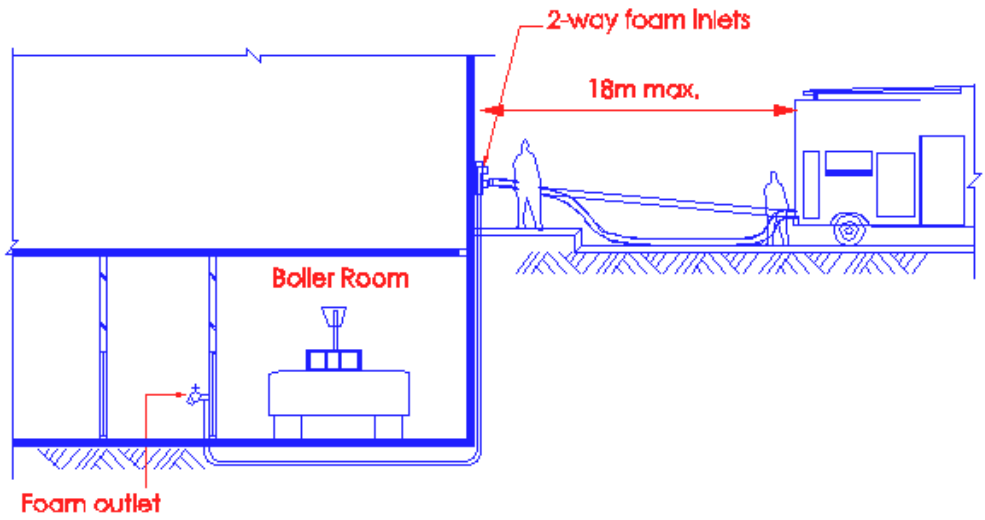


Diagram 6.2.7

The above diagram shows the foam supply pipe being run through a room adjoining the boiler room. The other alternative of routing the pipe works through the boiler room is acceptable if the pipes are enclosed with fire rated materials having the necessary fire resistance rating.

Foam inlets pipe works are provided for the purpose of delivering foam solution to the lobby or circulation area close to the room/s containing highly combustible materials. This arrangement is similar to a rising main system, except that it is meant to deliver foam solution instead of water. Under this arrangement, ready mixed foam solution would be pumped into the 2-way breeching inlets at ground level. Fire fighter would carry the necessary hoses with foam making branch to tap the foam solution from the landing valve and to jet in the foam at the seat of the fire in the room.

6.2.8 Hose Reels

(a) Hydraulic hosereel conforming to the requirements in SS CP 29 Code of Practice for Fire Hydrant Systems and Hose Reels shall be provided in every storey of every building regardless of building height, except the following:

(iii) Any other small building such as guardhouse/post, bin centre, open-sided shed, etc.

(No illustration)

Small buildings, refer to detached buildings, such as pump room to swimming pool, bin compound, guardhouse, greenhouse, garden tools shed, etc, would not be required to be provided with hydraulic hosereel. However, suitable type of fire extinguisher should be provided instead.

6.2.8 (b) Size and type

The hose reel should be of 20mm or 25mm nominal diameter, non-kinking reinforced rubber or reinforced PVC to either BS3169 Type A or AS1221, not exceeding 30 m in length and terminating in "shut-off" branches with 4 mm or 6 mm nozzles.

(No illustration)

(1) The reel or drum should be of adequate size to wind up the 30m length hose.

(2) The length of the hose should not exceed 30m. The main reasons are:

(a) an occupant using the hose reel to fight an incipient fire need not traverse more than 30m. Consideration must be given that the occupant needs to retrace his path to a safe exit if the incipient fire could not be put out. Thus, the aggregate travel distance to and from the incipient fire should not be excessive;

(b) longer than 30m hose would require a bigger reel which would create some difficulties in running out the hose and that jamming of tubing could occur when in use.

(3) An operating instruction notice plate should be provided next to the stop valve. The hose reel operating instructions shall be:

"Turn on the inlet valve before running out the hose"

(4) All hose reels should be tested at least once a year. The test is to ensure that they are maintained in working order and able produce a jet of water with a minimum of 6m throw.

(5) Hose reels located in recesses or cabinets shall bear the appropriate sign in accordance with SS 364 1993 on 'Fire Safety Signs'.

(6) Hose reels are now required to be type tested by a recognised testing laboratory to meet the standard of EN 671 – 1 or equivalent and are subject to the Productivity & Standards Board Inspection Scheme.

(c) Water supply

Water supply for hose reels in terms of flow rate and minimum running pressure shall comply with the requirements in SS CP 29.

(1) Minimum requirements

(a) As a minimum, the water supply to hosereels shall be such that when the two topmost hosereels with the least hydraulic head in a building are operating simultaneously, each will provide a jet of at least 6m in length at a flow rate of at least 0.4 l/s. For example, when a 30m length of hosereel tubing (Type A of BS 3169) is in use with a 6.5mm nozzle, a minimum running pressure of 1.5 bar will be required at the entry to each reel. Similarly, for a 4.5mm nozzle, a minimum running pressure of 4 bar will be required.

(b) Pipework shall not be less than 50mm nominal bore and feeds to individual hose reels shall be at least 25mm nominal bore.

FSSD's circular dated 20 Jan 2003:

Clause 4.5.1.1 of SSCP 29 : 1998 requires the hydraulically most remote hose reel to achieve a minimum throw of 10m at a flow rate of at least 0.4 l/s. FSSD has reassessed the 10m throw requirement and is prepared to accept a minimum throw of 6m at a flow rate of at least 0.4l/s provided that these requirements can be achieved at all times for either direct-feed system or pump-feed system.

(2) Hosereel pumps

(a) Where the water pressure in hosereel main needs to be boosted, the provision of an electrically driven pump is usually a convenient method. A duplicate standby pump shall also be provided.

(b) Both motors and pumps shall be sited in positions where they are protected against tampering and physical and fire damage and the electrical supply to them shall be by an exclusive circuit with the cables following a route of negligible fire risk or be provided with adequate protection.

(c) The hosereel pumps system shall come into operation automatically with a drop in pressure or a flow of water. Both pumps shall be automatically primed at all times.

(d) All pumps shall also be capable of being started or stopped manually. The standby pump shall be so arranged that it will operate automatically on failure of the duty pump. Where more than one source of electrical supply is available, the duty and standby pump shall be connected to the different sources.

(e) Connection for boosted supplies - pumps shall be fed from a suction tank or inter-connected tanks having a minimum capacity of 1100 l. The tanks shall be automatically supplied from a town main or a reliable source, controlled by a ball valve of minimum diameter 50mm.

(f) Use of domestic water tank - tanks supplying water for domestic purposes shall not be used as suctions for hosereel installations unless arrangements have been made for domestic supplies to be drawn off in such a manner that the requisite reserve of water for the hosereel installation is always preserved.

(d) Siting and installation

Siting and details of installation for hose reels shall comply with the requirements in SS CP 29.

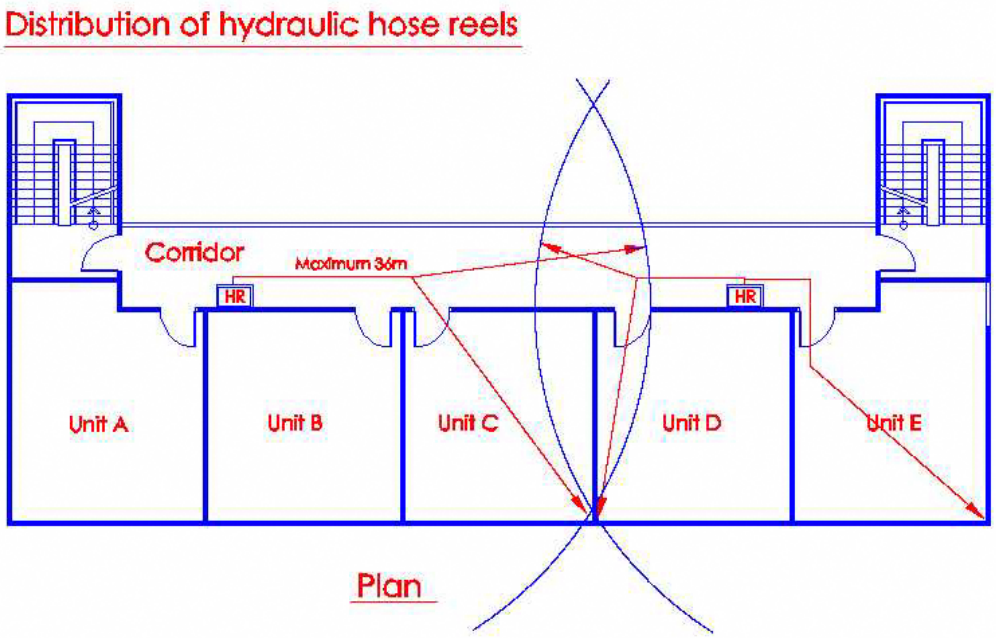


Diagram 6.2.8(d)

Distribution of hydraulic hosereel

(1) Siting

(a) Hosereels shall be sited in prominent and accessible positions adjacent to exits, preferably just outside protected corridors, lobbies or staircases on exit routes, but not inside staircases.

(b) In planning the location of hosereels, consideration should be given to the following points:

(i) Access to hosereels should not be obstructed by the parking, loading and unloading of vehicles or by the location of furniture, equipment or other material.

(ii) Protection of hosereels from mechanical damage and unauthorised use.

(iii) The location of internal walls, partitions, doorways, storage racking, stored heights of goods and other obstructions, which could restrict normal hose coverage through the building.

(iv) The distribution of hosereels shall take into consideration that if a fire happened to block the access to one hosereel site, the fire can be attacked from another hosereel located in the same floor.

(2) Installation of hose reels

References shall be made to CP 29 for details on installation of the hosereel.

(e) The use of copper or stainless steel piping is permissible for the connection of the hose reel to the PUB mains.

(No illustration)

(1) Pipework for hosereel system shall not be less than 50mm nominal bore and feeds to individual hosereels shall be at least 25mm nominal bore.

(2) Copper or stainless steel pipes may be incorporated in the pipe works supplying water to the hosereels.

6.3.1 (b) (i) Group II mixed occupancy

For a building of mixed commercial-cum-residential usage, the residential floors located on the upper storeys of the building shall be provided with manual alarm system at the common area. If the habitable height of the building does not exceed 24m, only the alarm bell of the fire alarm system need be extended to the common lobby area of each residential floor.

Mixed use with purpose group II

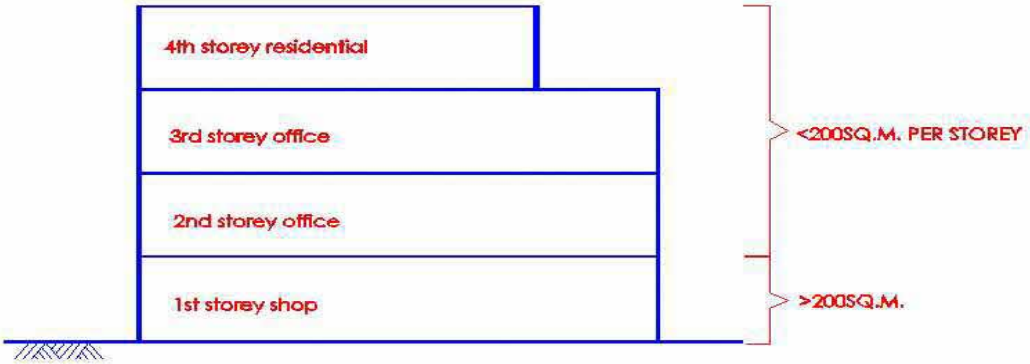


Diagram 6.3.1(a)-1

Based on the floor area of 1st storey, the above building is required to be provided with manual fire alarm system to 1st, 2nd and 3rd storey, which are for commercial usage. The bells of the alarm system shall be extended to the common areas (lobbies, corridors, staircases, etc) of the residential floor at 4th storey.

Mixed Commercial-cum-residential building

- *Habitable heights less than 24m - only alarm bell need to be extended to common area of each residential floor.*
- *Habitable heights more than 24m - and manual alarm system required to be provided at the common area of all residential floors.*

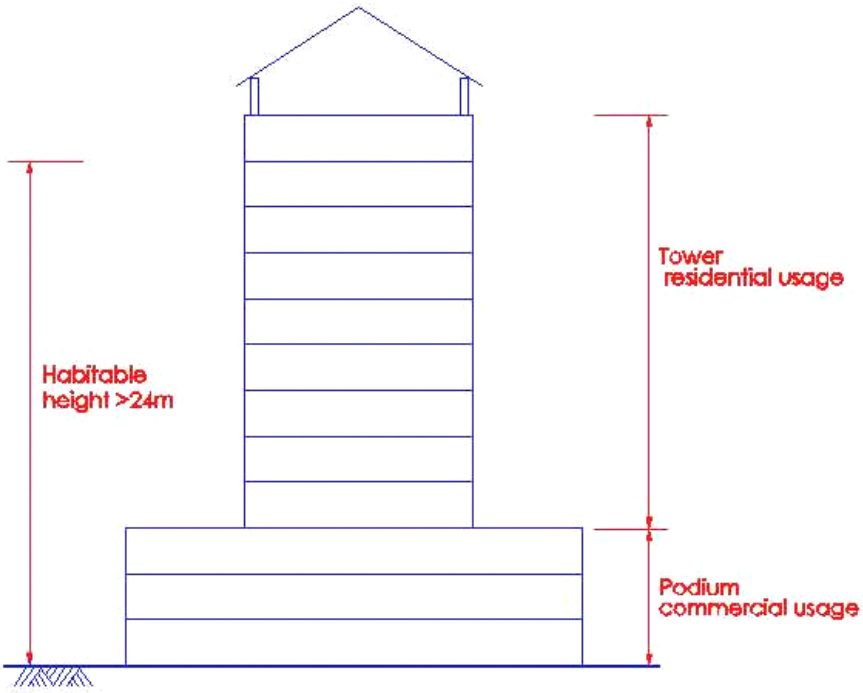


Diagram 6.3.1(b)(1)-1

The measurement of habitable height shall include the commercial the residential floors.

Residential building with only first storey shops

- alarm provision exempted

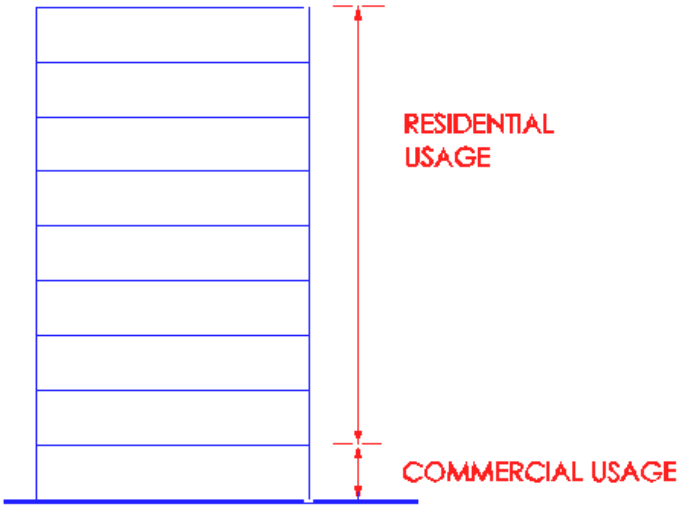


Diagram 6.3.1(b)(1)-2

(1) Where habitable height of building exceeds 24m, manual alarm system is to be provided at the common area such as lobby and corridor of each residential floor of the resident tower block. The "break the glass" call point shall be provided in the manner that no occupant needs to run more than 30m to activate the call point, measured from the entrance door of the unit to the call point.

(2) If the habitable height of the building is less than 24m, only the alarm bell of the fire alarm system of the podium block need be extended to the common area of each residential floor. The sounding level of the alarm bells shall be above the expected ambience level in each unit.

(3) Total fire separation (horizontal) shall be provided between residential floors and commercial floors.

(4) The discharge routes of residential floors shall not go through commercial floors. They shall be segregated and discharged to the exterior at grade level.

(5) Residential slab blocks of habitable heights less than 24m, with only first storey shop usage are not required to be provided with fire alarm system, subject to:

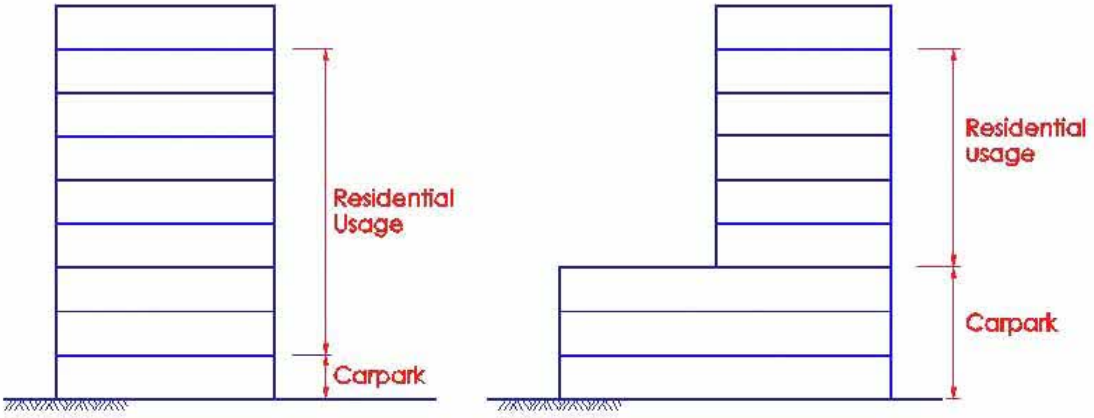
(i) the footprint of the 1st storey shop is the same as the residential blocks; and

(ii) The 1st storey comprises shop units which are individually fire compartmentalised.

(b) (ii) Group II with lower carpark floors

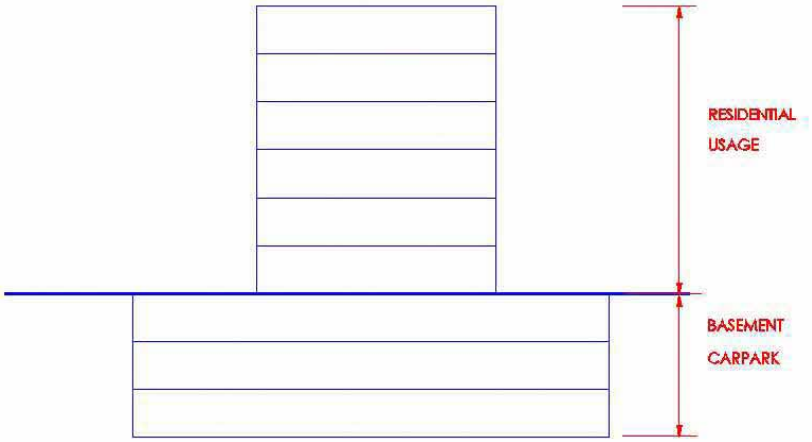
For residential developments which are located over carparks (irrespective of whether the carparks are in the basement) where fire alarm system is required under Table 6.3A, the alarm bells of the fire alarm system shall be extended to the common lobby area of each residential floor, irrespective of the height of the building.

Residential block located over car park floors



Drawing 6.3.1(b)(ii)-1&2

Residential block located over basement car park floors



Drawing 6.3.1(b)(ii)-3

(1) Alarm bell of the fire alarm system for the car park floors shall be extended to the common area of every upper residential floor.

(2) The sounding level of the alarm bells shall be above the expected ambience in each residential unit.

6.3.2 Fire Indicator Board

(a) An electrical fire alarm system of the automatic or manual type shall be provided with a fire indicator board to indicate the location of the alarm which has been actuated or operated. Such indication of location shall be accurate to the maximum allowed alarm group area limitations specified in SS CP 10.

(No illustration)

(1) Fire fighters responding to a fire call would first, on arrival at the scene, need to check the fire indicator board to confirm the location of the alarm, which has been actuated or operated before proceeding to the fire site.

(2) The FIB monitors the actuation of sprinkler flow switches, detectors and call-points.

(b) The associated control and supervisory equipment, indicating equipment, wiring and arrangement of power supplies for the fire indicator board shall comply with the requirements in SS CP 10.

(c) All automatic systems, which are activated via the general building alarm, shall be connected directly to the fire indicator board.

(d) The fire indicator board should be located near the main entrance of the building, in the fire command centre, in the guardhouse or in the fire fighting lobby, if provided, or as may be required by the Relevant Authority.

(e) Sub-fire indicator board, where provided, shall comply with the requirements in SS CP 10.

(No illustration)

(1) For buildings under purpose group II, the FIB is usually located near the main entrance of the building or in the guardhouse.

6.3.3 Manual Alarm Call Points

(a) In a manual alarm system, except as otherwise exempted in Cl. 6.3.1, the manual call points shall be provided on every storey of the building or part of the building and shall be so located that no person need travel more than 30m from any position within the building to activate the alarm.

(b) Manual call points should be located on exit routes preferably next to hosereels and in particular on the floor landings of exit staircases and at exits to the street. In the case where an automatic fire alarm system is provided, grouping for indication of location of the manual call points shall comply with the requirements in SS CP 10.

(c) Manual call points should be fixed at a height of 1.4 m above the floor and shall be located at easily accessible and conspicuous positions free from obstructions. The installation of the sounding device shall be in accordance with SS CP 10.

(1) Manual call points should be located on:

(a) Along exit routes leading to exit staircase;

(b) Adjacent to hosereels;

(c) At floor landing of exit staircases; and

(d) At exits to the street.

(2) Manual call points shall be so located such that no occupant needs to run more than 30m, measured from the entrance door of the unit to the manual call point.

Locating Manual Call Points in Block of Flats/Maisonettes

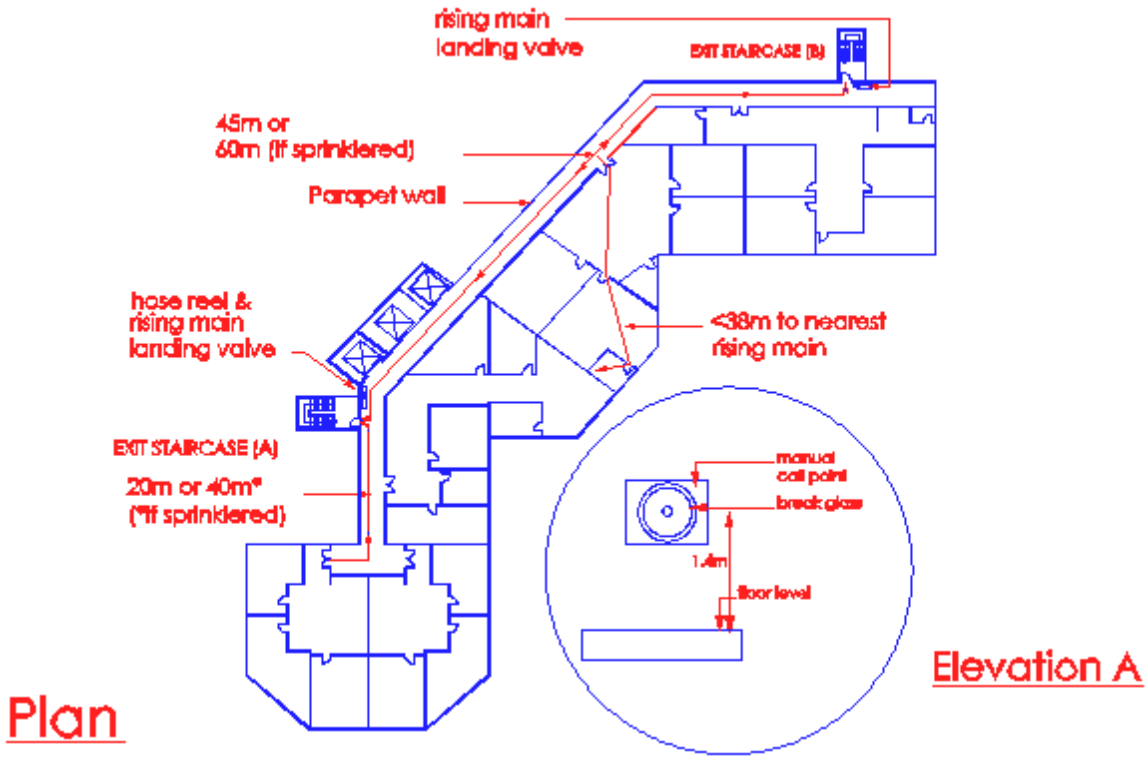


Diagram 6.3.3

6.3.4 Automatic Fire Alarm

Where an automatic fire alarm system is required by this Code, the type, location, spacing and installation of the detectors shall comply with the requirements in SS CP 10.

(No illustration)

Automatic alarm system would not normally be provided to solely Purpose Group II buildings. However, there is an advantage of providing smoke detectors, as the detectors could detect the generation of smoke from even incipient fires, hence providing occupants early warning and adequate lead-time in evacuation. Automatic fire alarm system is required in buildings of more than 4 storeys having commercial cum residential mix, for example, shops with apartment/maisonette units above.

6.3.5 Alarm Device

(a) The alarm device, which should normally issue an audible signal unless specifically allowed or required otherwise by the Relevant Authority, shall be actuated if the electrical fire alarm system is activated or operated. The type, number and location of the alarm device shall comply with the requirements in SS CP 10.

(b) The fire alarm sounder shall have a sound that is readily distinguishable from any other alarm system.

(c) All sounders in the building should be actuated simultaneously in the event of an activation. However, in cases permitted or required by the Relevant Authority where the operation of alarm sounders are grouped or activated in stages, the arrangement shall comply with the requirements in SS CP 10.

(No illustration)

It is important that the sounding from the electrical fire alarm system, for example, installed in the car park or commercial floors, should be audible and readily distinguishable to all occupants in the apartment or maisonette units. The sound level of the alarm bell shall be above the expected ambience level in the residential unit.

6.3.7 (d) A building required under the provisions of this code to be protected by an automatic fire alarm or fire extinguishing system.

(No illustration)

(1) Buildings under purpose group II are usually not provided with automatic fire alarm system or automatic sprinkler system except in basement car parking.

(2) In situations where automatic sprinkler system is proposed to meet the fire safety requirements, for example, travel distances, then sub-clause (d) above would be applicable.

6.3.8 Sprinkler protected building

Where sprinkler system is required by this Code, provision of automatic thermal/smoke detectors in sprinkler protected premises will be exempted except where such detectors are required to activate or operate the sprinkler or other systems.

(No illustration)

Where sprinkler system is provided in any building, there is no necessity to provide automatic fire alarm system (heat or smoke detection system). Exception is for electrical rooms, AHU room, lift motor room, battery room, MDF room, PABX room where sprinkler system is replaced by electrical fire alarm system. Smoke detectors are also required to be installed in sprinkler protected buildings to operate the smoke control system in atria, smoke purging system or control system in basement occupancies.

6.4.1 The following shall be provided with an automatic sprinkler system:

(a) Whenever compartmentation requirements under Chapter 3 of this Code cannot be complied with.

The provision of automatic sprinkler system is required in residential buildings under purpose group II under the following conditions:

(1) Compartmentation requirements under chapter 3 of the Fire Code cannot be complied with, for example, a building exceeding 24m in habitable height having 3-levels maisonette or penthouse units, or

(2) Residential apartment/maisonette or penthouse unit being located within a commercial tower block exceeding 24m in habitable height.

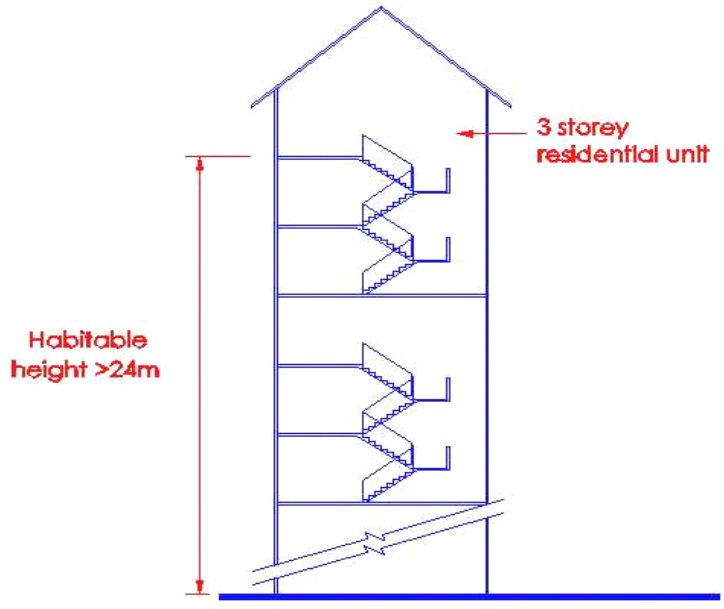


Diagram 6.4.1(a)

Residential building exceeding 24m habitable height

Clause 3.2.4 of the fire code permits only residential maisonette or penthouse to have maximum 2-storey levels above 24m habitable height. In designing 3 floors per unit, it would be contravening the compartmentation requirement under Table 3.2A of Chapter 3. To overcome the problem, automatic sprinkler system should be provided to the whole building.

(c) Mixed Development

In the case of Group II occupancy forming the upper storeys of a building of mixed occupancy with habitable height exceeding 24m above average ground level, every storey of the non-residential portion only, shall be provided with an automatic sprinkler system.

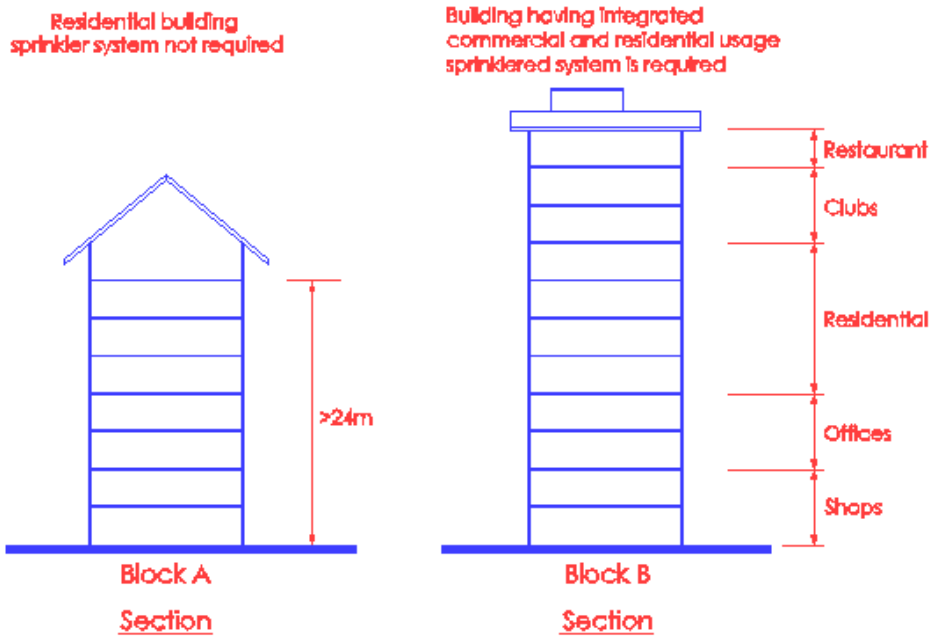


Diagram 6.4.1(c) – 1

(1) A residential building, like block A in diagram 6.4.1 (c) – 1, is not required to be provided with sprinkler system, irrespective of its height.

(2) However, in buildings exceeding 24m in habitable height where there is integration of commercial and residential usage as in block B above, the whole building including residential component of the development would be required to be sprinkler protected.

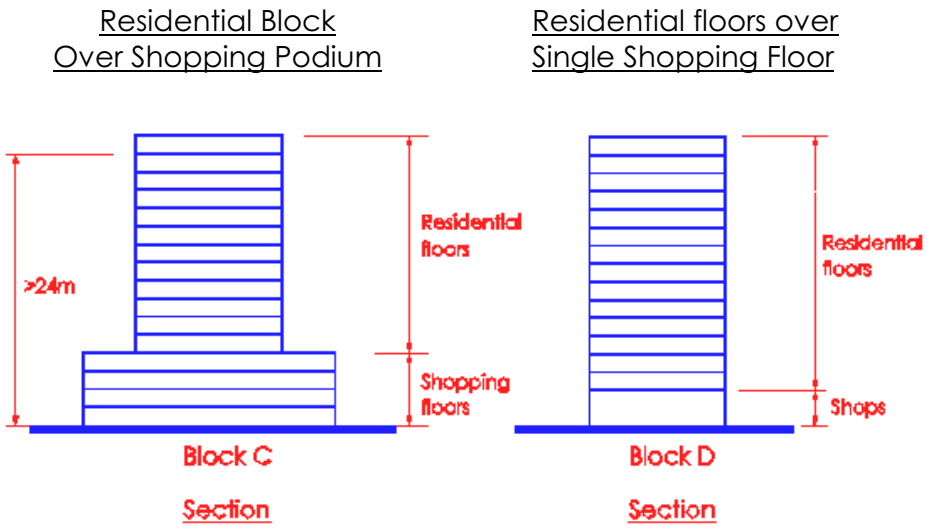


Diagram 6.4.1 (c) - 2

(3) Building of mixed development having purpose group II occupancy forming the upper storeys only, like block (c) in diagram 6.4.1 (c) - 2, only the non-residential floors are required to be sprinkler protected.

(4) A building with residential floors over a single floor of shops with each shop individually fire compartmentalised and having the same footprint as the residential block, like block B in diagram 6.4.1 (c) – 2, relaxation of the requirements on the provision of sprinklers to the shops may be allowed by the Relevant Authority.

(5) The situations in item (3) & (4) above are only allowable if there is total horizontal fire separation between the residential upper floors and the commercial floors below.

(d) (i) Basement

All basement storeys, except for those used as purpose groups I or II, shall be provided with an automatic sprinkler system irrespective of compartment size. Where the upper storeys of the building is fully compartmented from the basement storey, the requirement for provision of an automatic sprinkler system for floors above the basement shall be considered separately and in accordance with sub.cl.(a), (b) and (c).

Basement Storey forming part of Purpose Group II Building.
Area of basement shall not exceed 100m^2

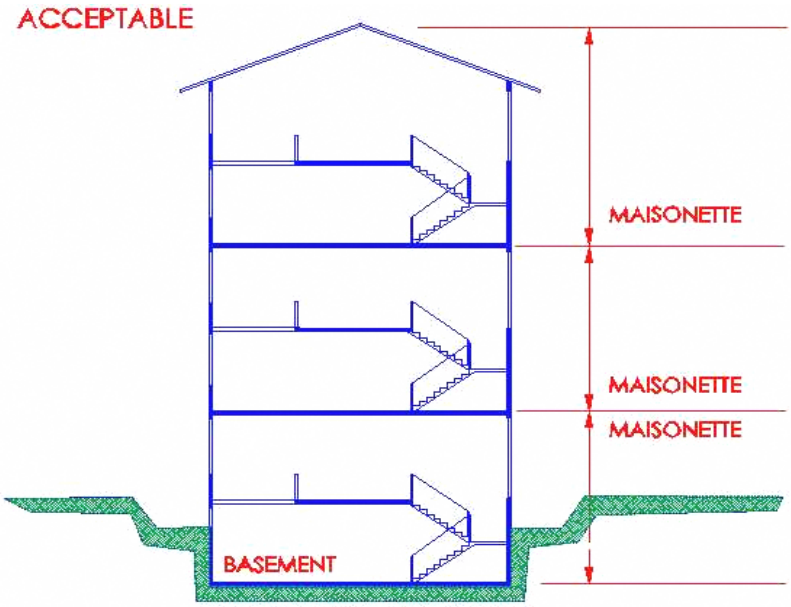


Diagram 6.4.1 (d)(i) - 1

Purpose Group II buildings, with basement storey solely used for residential usage, as shown in diagram 6.4.1 (d)(i) – 1, may be exempted from sprinkler provision. This is on condition that the area of basement does not exceed 100m^2, and is in accordance with Cl.3.2.5(c)(ii).

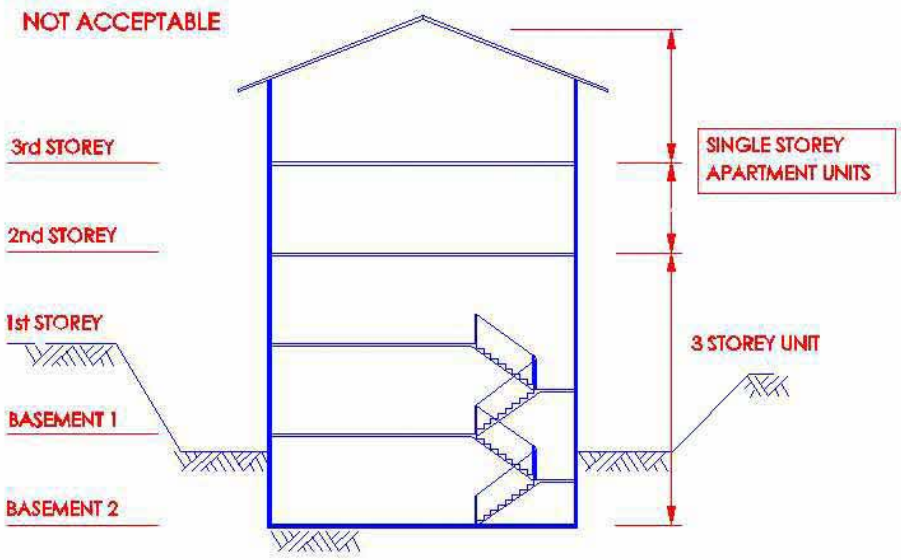


Diagram 6.4.1 (d)(i) - 2

However a residential building with 2 basements and 1st storey forming one residential compartment (diagram 6.4.1 (d)(i) –2), is unacceptable, regardless of sprinkler provision. Cl.3.2.5(c)(ii) and 3.2.5(d) stipulate that for any compartment below pavement level, no compartment shall exceed 100m² and comprise more than one storey respectively.

6.4.1 (d) (ii) Exemption

Where the basement storey is effectively cross-ventilated such as to avoid smoke logging conditions, the basement storey may be exempted from the requirements of provision of an automatic sprinkler system.

(No illustration)

(d) (iii) Basement carpark

In the case of residential development located over basement carpark, relaxation on the provision of these sprinkler system and smoke purging systems to the basement carpark may be granted by the Relevant Authority if the following conditions are satisfactorily fulfilled:

(a) basement carparking shall consist of one level only

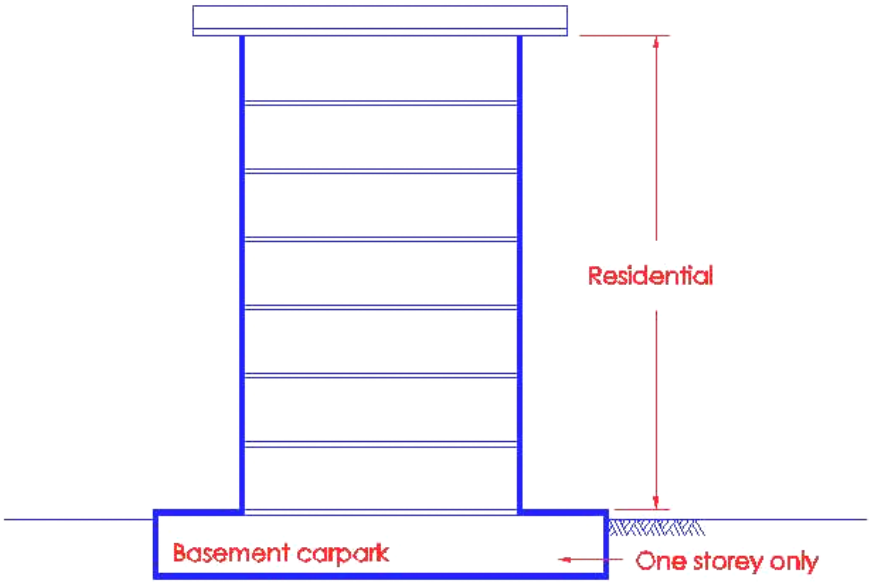


Diagram 6.4 1 (d)(iii)(a)

(b) external openings shall be provided to achieve effective cross-ventilation by means of evenly distributed vertical openings along the perimeter walls and evenly distributed voids over the basement in such manner that:

(i) no point within the basement is more than 12m from any vertical opening or void for spaces that are in between two openings or voids;

(ii) no point shall be more than 6m from any opening or void for spaces that are ventilated by such opening or void on only one side; and

(iii) such vertical openings shall be at least 600mm in height;

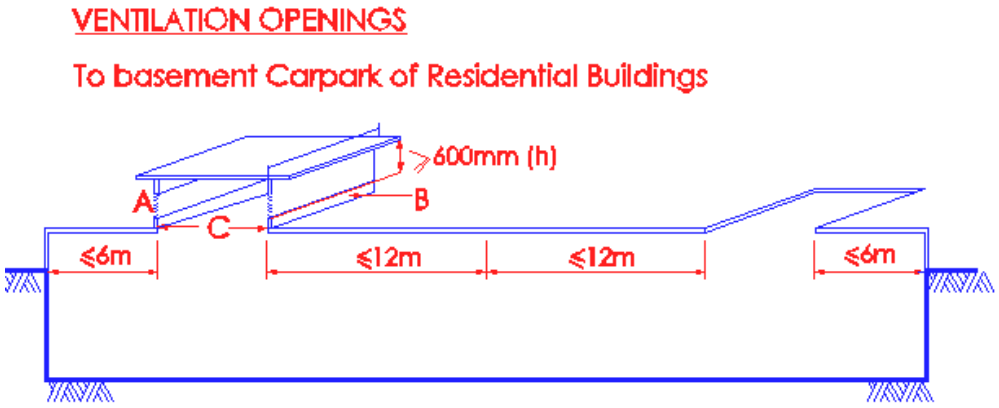


Diagram 6.4.1(d)(iii)(b)

(i) Area between two voids/ vertical openings – no point from the edge of such openings or voids shall be more than 12m from such voids/ openings.

(ii) When the opening or void is only on one side, no point shall be more than 6m from the edge of such opening or void.

(iii) The clear height (h in diagram 6.4.1 (d)(iii)(b)) of vertical openings, A & B, shall be at least 600mm in height.

(iv) The lesser of areas, A+B, or C, of the ventilation opening shall be considered as the effective area of ventilation.

(c) total aggregate area of these voids and vertical openings shall be not less than 20% of the total basement floor area;

Effective cross-ventilation to Basement Car park

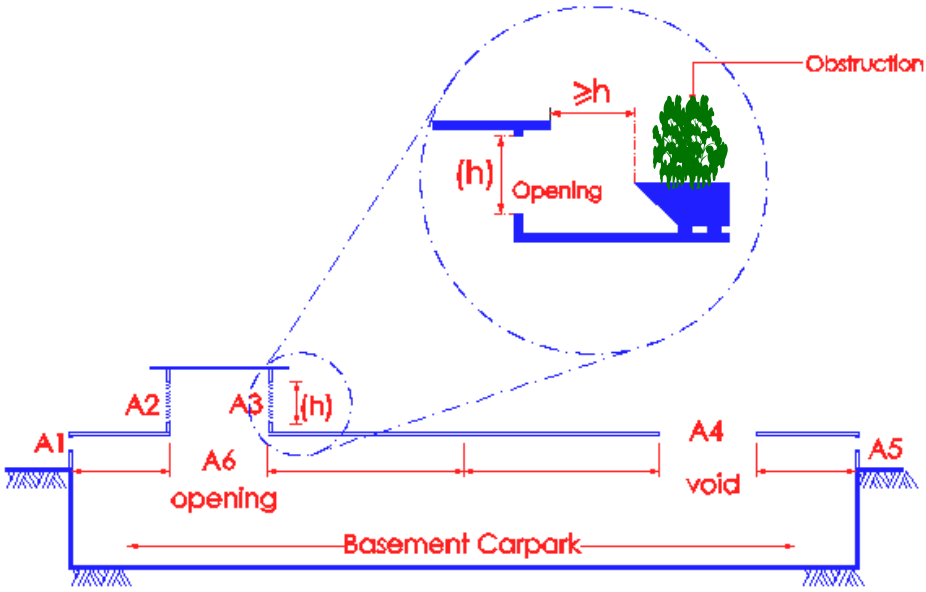


Diagram 6.4.1 (d)(iii)(c)

Total aggregate area of voids and vertical openings shall not be less than 20% of the floor area.

i.e. 20% of A < A1 + { lesser of (A2 + A3) or A6 }+ A4 + A5

(where A is the area of basement, and A1 to A6 are areas of ventilation openings)

(d) automatic fire alarm system shall be provided to the basement carparks with extension of alarm bells to the common/lobby areas of the upper storeys in accordance with cl.6.3.1(a) and (b)(ii).

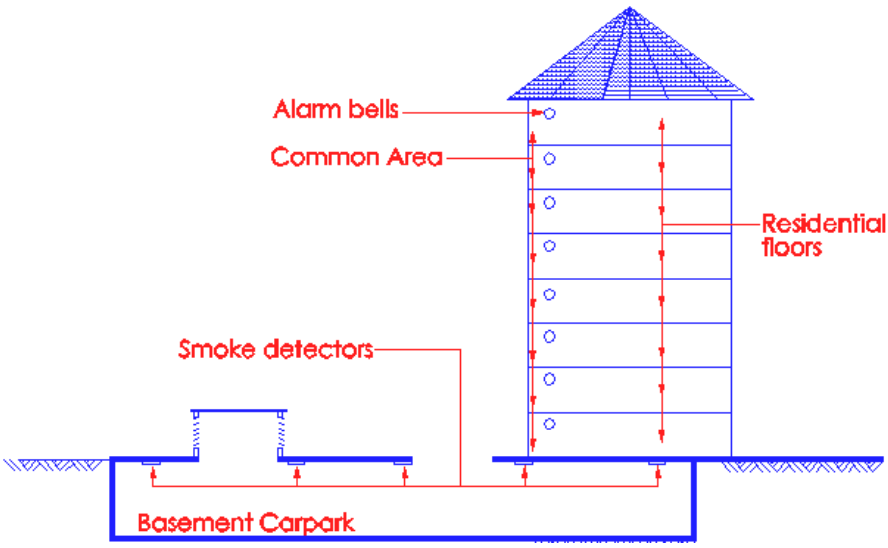


Diagram 6.4.1 (d)(iii)(d)

Basement shall be provided with automatic fire alarm system. The alarm bells of the system shall be extended to the common / lobby areas of the upper storeys.

6.4.1 (e) Exemption of sprinkler protection

The following areas are exempted from sprinkler protection in a sprinklered building :

(i) Canopies/Car porches

(a) Such areas are used solely for the purpose of passengers pick-up and drop-off point; and

(b) There shall be no commercial activities or storage within these areas; and

(c) Cut-off sprinklers and fire rated wall are not required to be provided to separate the sprinklered and non-sprinklered areas.

(ii) External corridors not exceeding 4m in width, provided there is no commercial activities or storage within these areas.

(iv) External open-sided linkways not exceeding 5m in width, provided there is no commercial activities or storage within these areas.

(No illustration)

6.4.2 Installation

Installation of the sprinkler system and its associated water supply, control and testing requirements shall comply with the SS CP 52 Code of Practice for Automatic Fire Sprinkler System.

(No illustration)

(a) Sprinkler system to maisonette or apartment units under purpose group II is not a requirement. However, where basement carpark cannot comply with the requirements of Cl.6.4.1 and Cl.3.2.5, sprinkler system shall be provided as illustrated under Purpose Group VIII.

(b) Building owners are also at liberty to provide the sprinkler system as an added fire safety. The system could be used as a trade-off for extended travel distances and other fire safety requirements at the discretion of the Relevant Authority.

6.4.3 Connection to fire station

The sprinkler system shall be electrically monitored so that on the operation of any sprinkler head, the fire signal is automatically transmitted to a fire station through an approved alarm monitoring station.

(No illustration)

6.4.4 Special Purpose Rooms

(a) Where a building is required to be provided with an automatic sprinkler system under this Code, parts of the building which are used for purposes stipulated in Table 6.4A shall be compartmented in accordance with columns 3(a) and 3(b) of the table. Exemptions of sprinkler provision for such rooms or spaces are indicated (Ex) in column 3(c) of the table.

(No illustration. See Table 6.4A).

(b) Where a building is not required to be provided with an automatic sprinkler system under this Code, special purpose rooms stipulated in Table 6.4A shall be compartmented in accordance with columns 2(a) and 2(b).

(No illustration. Table 6.4A)

6.6.1 Hoistway ventilation

Lift hoistways shall be vented in accordance with the SS CP 2 Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts.

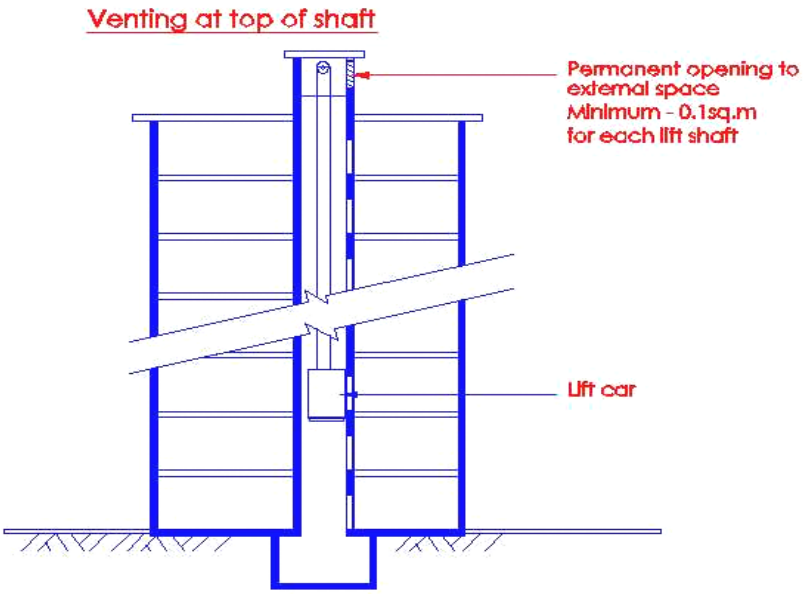


Diagram 6.6.1 – 1

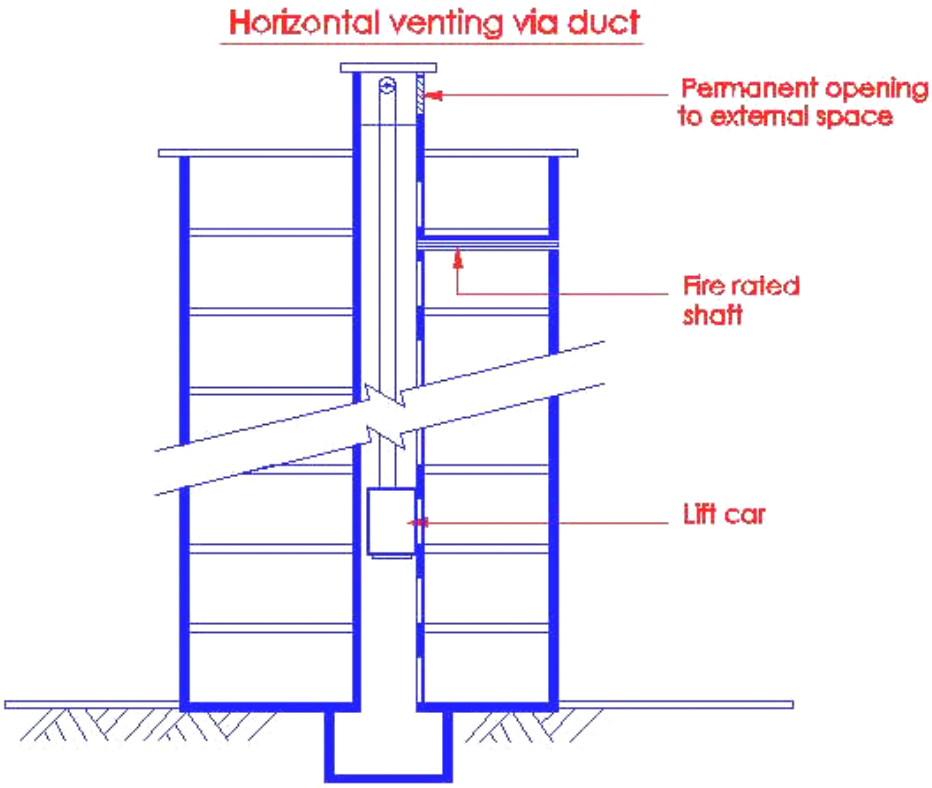


Diagram 6.6.1 – 2

If the duct is not to be fire rated, fire damper shall be provided at the wall of the lift shaft at location indicated as 'D' in diagram. The provision of duct to ventilate the lift shaft is not applicable to fire lift shafts. The vents or ducts serve to provide exhaust ventilation of the shaft.

6.6.2 Emergency power supply

(a) Emergency power supply for lighting, ventilation and alarm systems for all passenger lifts shall comply with the requirements in SS CP 2 Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts.

(No illustration)

Emergency power supply (EPS) from a separate rechargeable source shall be provided for all passenger lifts. This emergency supply shall comply with SS 209. EPS for lighting, ventilation and alarm system for the lift cars is to allow the passengers in the lift car to activate the alarm bell for help, and to ensure adequate lighting/ventilation while they wait for rescue during a power failure.

Emergency Operation of Lift

1 In the event of power failure in buildings

In the event of power failure power interruption, the supply to the lift(s) shall be automatically switched over to emergency power supply and

1.1 Where standby generating system is installed, the lift(s) shall be brought to the designated floor commencing with the fire lift(s), and park there with their door(s) remaining open until all lift(s)have been brought down to the designated floor. Thereafter, one or more lift may resume operation depending on the capacity of the emergency generating plant.

1.2 Where standby generator system is not required, it is advisable to install an Auto rescue Device (ARD). The lift(s) shall be brought to the nearest lift landing and shall park there with their door(s) remaining open.

1.3 The provision of Auto Rescue Device will help to prevent occupants from being trapped in the lift during an emergency.

2 In the event of fire in buildings

In the event of fire when one or more of the fire detection devices or manual fire alarm call point is activated, the lift(s) shall be brought to the designated floor and shall park there with door(s) remaining open. The lift(s) shall automatically be rendered inoperative after it has been brought to the designated floor

3 In the event of power failure and fire in buildings

In the event of power failure and fire, the operation of the lift(s) shall be in accordance with para(2) and the power supply shall be from the "mains failure" generating plant. In building, where standby generating plant is not provided, lifts shall be brought to the nearest landing in accordance with para(1.2).

Footnote: where lifts serve basement occupancies, homing of lifts to designated floor by generator supply is required.

6.6.2 (b) Buildings which require the provision of standby generating plant for special emergency operations.

Provision for special emergency operation for lifts shall comply with the requirements in SS CP 2 for the following :

(ii) Buildings under Purpose Group II exceeding the habitable height of 60m;

(iii) Buildings under Purpose Group II where the passenger lifts serve the upper storey residential floors and the non-residential basement;

(iv) Mixed developments where the passenger lifts serve both the residential and non-residential floors;

(vi) All basement occupancies.

6.6.3 Provision of Fire Lift

(a) In any building or part thereof, in which the habitable height exceeds 24m, or the depth of the basement is more than 9m below the average ground level, there shall be provided at least one fire lift, which shall be contained within a separate protected shaft or a common protected shaft containing other lifts subject to such other lifts being served at each storey by the fire fighting lobby, which is required by the provisions of Cl.2.2.13(b) of this Code.

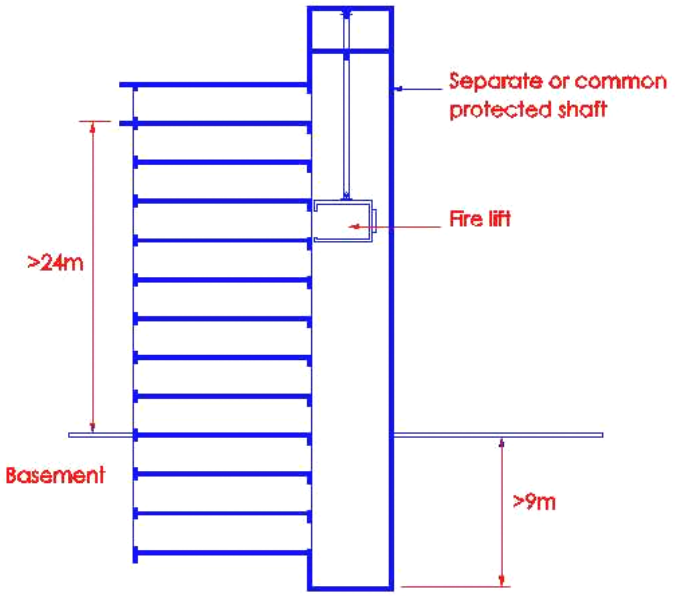


Diagram 6.6.3 (a) –1

Situations requiring fire lift

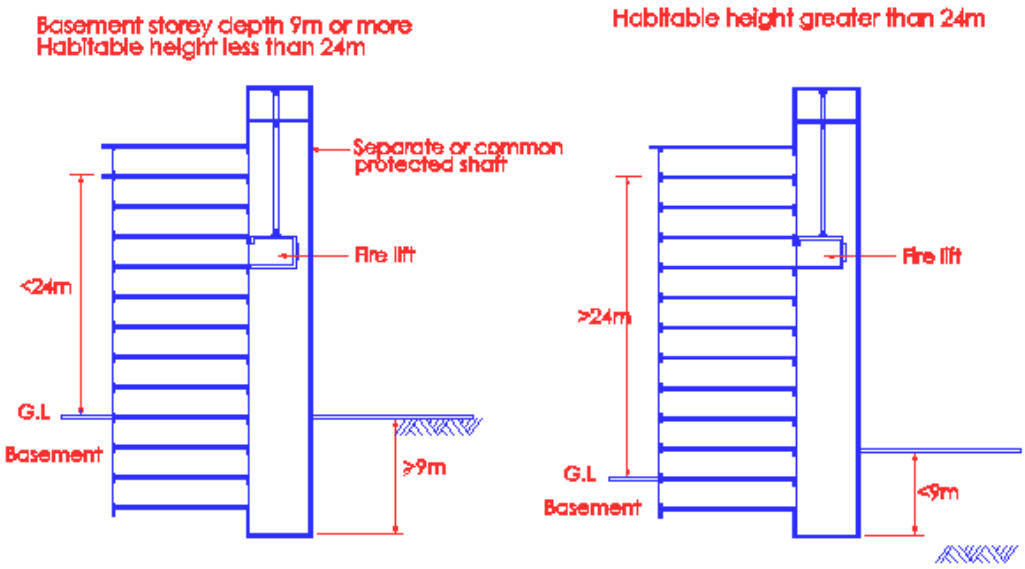


Diagram 6.6.3 (a) - 2

(1) Fire lift is now also required to serve the basement floors if the depth of the basement is more than 9m below the average ground level.

(2) It is not necessary for basement floors and non-basement floors to be served by the same lift.

(3) In figure 6.6.3(a) – 2 above, the fire lift is required to serve the basement. See subclause 6.3.3(b)

(b) Access for fire lift

A fire lift shall have access to every habitable floor above or below the designated floor and shall be adjacent and accessible to an exit staircase and be approached by a fire fighting lobby at each storey.

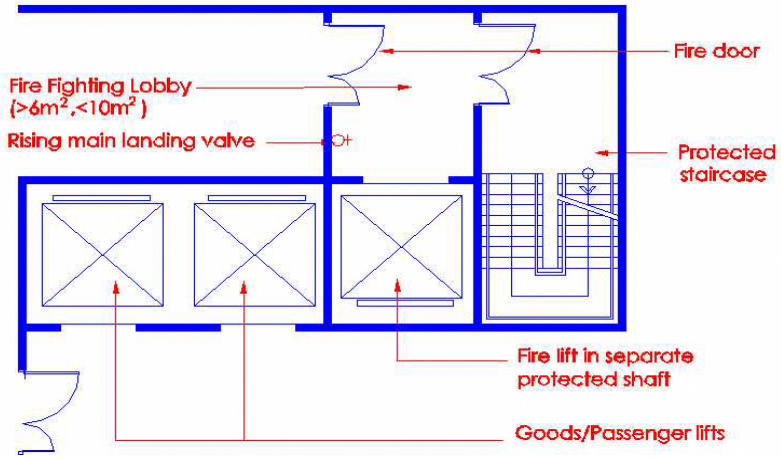


Diagram 6.6.3 (b) – 1

b) Fire lift in a common lift shaft

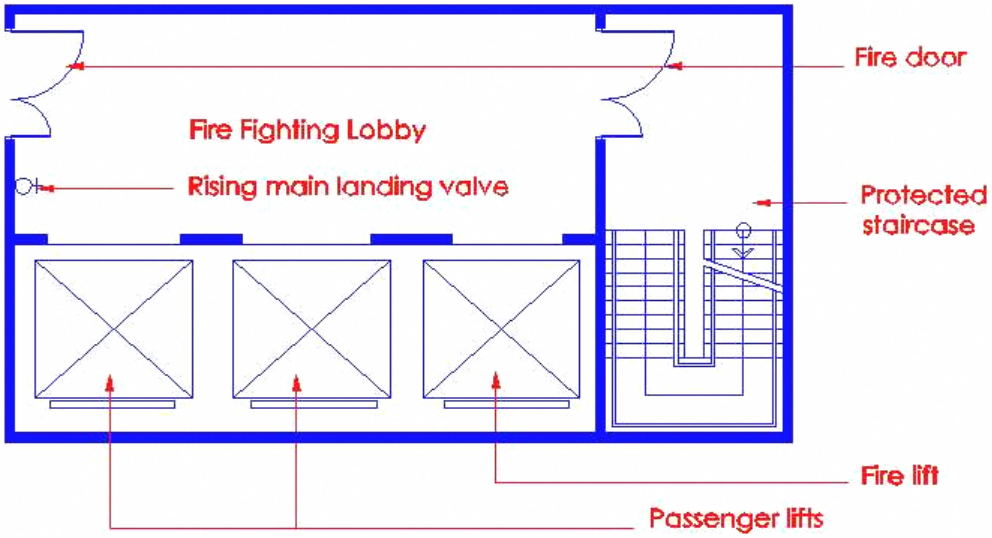
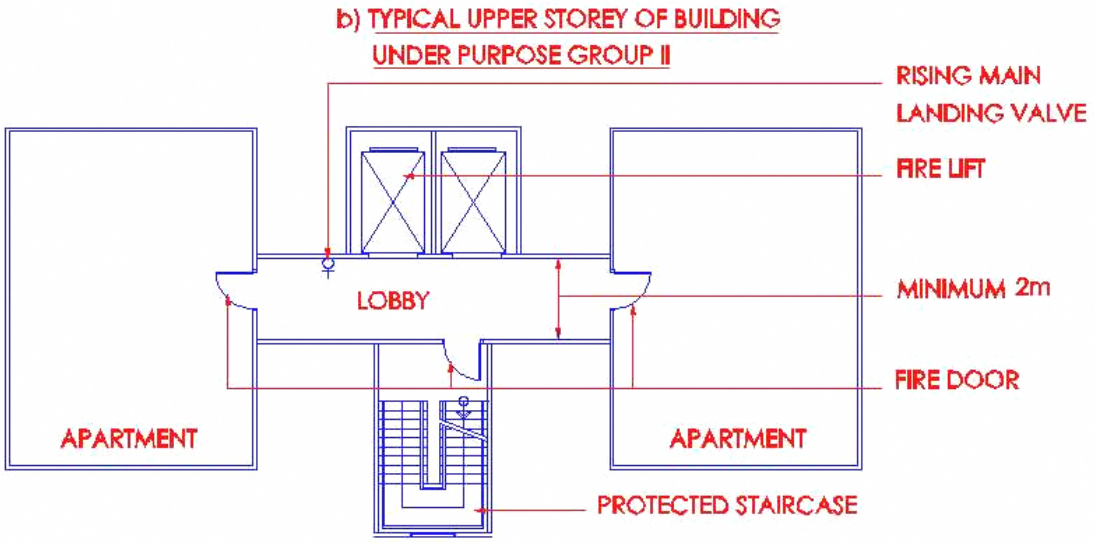


Diagram 6.6.3 (b) – 2



Fire lift is located in a protected shaft.

Diagram 6.6.3 (b) - 3

The Fire fighting lobby as shown in all the three situations above, shall be served by a protected staircase located adjacent to it, and directly accessible from it.

Where a fire lift is provided to the upper storeys of a building with basement storey(s), the lift shall be extended to serve the basement storey(s).

(c) Operational feature

Fire lift shall be provided with an operational feature that would enable firemen to cancel first or earlier call which had been inadvertently made to the fire lift during an emergency.

(No illustration)

The operational feature is to allow a fire fighter to have full control of the fire lift in a fire emergency to convey fire fighters and equipment to any floor level as would be required of their operations in mitigating the fire incident.

FSSD's circular dated 20 Jan 2003:

By-pass switch

Clause 6.6.3(c) of the Fire Code requires the lift to be provided with an operational feature to enable fire fighter to cancel first or earlier call which had been inadvertently made to the fire-lift during an emergency. This operational feature could be built into the lift control system or alternatively a separate by-pass switch could be provided. Therefore, if the operational feature is built into the lift control, it is not mandatory to provide a separate by-pass switch.

Telephone hand-set

Clause 8.2.1(b)(v) of the Fire Code requires two-way emergency voice communication system to be provided between the Fire Command Centre and the fire lift. Clause 6.1 of the SSCP 25 : 1999 further states that the two-way voice communication system shall consist of the main telephone handset and selector switches at the control console and the other remote handsets installed at various designated locations. In view of the adequacy of the lift intercom system, please be informed that with immediate effect, FSSD will accept the lift intercom system in-lieu of the hand-set provided it complies with clause 9 of SSCP 25 : 1999 on 'Installation and Power Supply'.

6.6.3 (d) A lift mainly intended for the transport of goods shall not be designated as a fire lift.

(No illustration)

It is common to find goods being stacked in lobby outside goods lifts. This would affect the fire fighters while carrying out fire fighting operations during emergencies.

6.6.3 (e) Installation standards

The installation of the fire lift shall be in accordance with SS CP 2 Code of Practice for Installation, Operation and Maintenance of Electric Passenger and Goods Lifts.

(No illustration)

(f) Power supply

The power supply to the lift shall be connected to a sub-main circuit exclusive to the lift and independent of any other main or sub-main circuit. The power cables serving the lift installation shall be routed through an area of negligible fire risk.

(No illustration)

The above clause makes it clear that power supply to the fire lift should be independent of other main, or sub-main, circuit serving accommodation areas or other services.

6.6.4 Homing of lifts

(a) Homing of lifts for buildings which are required to be provided with fire alarm system.

In a fire emergency when any one of the fire detection devices or fire alarm systems is activated, all the passenger lifts shall be brought to the designated floor (usually) 1st storey) and park there with the lift landing doors remaining opened.

(b) Homing of lifts for buildings which are required to have standby generating plant.

In the event of power failure or power interruption in the building, the supply to the lifts shall be automatically switched over to the emergency power supply from the generating plant and the lifts shall be brought to the designated floor and park there with the lift landing doors remaining open until all the lifts have been brought down to the designated floor. Thereafter, one or more lifts may resume operation depending on the capacity of the emergency generating plant, in addition to the fire lift. Normal operation of the lift shall be automatically reset on the return of normal power supply.

6.6.4 (c) Homing of lifts for buildings which are not required to have standby generating plant.

All passenger lifts, including hydraulic lifts, shall be provided with Automatic Rescue Device (ARD). The ARD shall permit the lifts to move and park at the nearest lift landing floor with the lift/landing doors in the opened position in the event of power failure. Homing any of the lifts to a basement storey is not permitted.

(d) Homing of lifts for Mixed developments comprising residential and non-residential components

(i) All passenger lifts which serve the residential and non-residential floors shall be required to home to the designated or alternative designated floor in the event of power failure and / or fire. The lifts shall be provided with secondary power supplies from standby generating plant of sufficient capacity.

(ii) Where the passenger lifts serve only the residential floors and by-pass the non-residential floors in a protected shaft, the lifts shall be required to be installed with Automatic Rescue Device (ARD), provided the habitable height of the highest floor does not exceed 60m.

(iii) Where the passenger lifts serve the upper residential floors and the basement non-residential floor/s, including car parks, the lifts shall be provided with emergency power supply from standby generating plant for homing to the designated floor when there is a power failure in the building. In a fire emergency, the passenger lifts shall be brought to the designated floor when any of the fire alarm system in the basement non-residential floor/s is activated.

6.6.4 (f) Hydraulic lifts.

Where a hydraulic lift serves two upper storeys only, the lower of which has a final exit leading to the exterior space, the provision of an alternative power supply or ARD is not required, provided the lift car is arranged to lower itself to the 1st storey by gravity during power failure mode.

(No illustration)

TABLE 6.3A
PROVISION OF FIRE ALARMS ACCORDING TO PURPOSE GROUP, HEIGHT & SIZE OF THE BUILDING

A Purpose group & No of storeys of building	B Total floor area (per storey in sq m) in excess of which alarm must be provided	C Type of Alarm
III (Institutional)		
(i) Schools & others		
a - Single storey building	NL	-
b - Building of 2 to 4 storeys	400.‡	(m)
c - Building of more than 4 storeys	NR	(m)+
(ii) Health care occupancy with stay-in facilities		
a - Single storey building	NR	(m)
b - Building of 2 to 4 storeys	NR	(a)
c - Building of more than 4 storeys	NR	(a)
(iii) Health care occupancy without stay-in facilities		
a - Single storey building	NL	-
b - Building of 2 to 4 storeys	200.‡	(m)
c - Building of more than 4 storeys	NR	(a)
(iv) Dormitories/Hostels		
a - Single storey building	NR	(m)
b - Building of 2 to 4 storeys	NR	(m)
c - Building of more than 4 storeys	NR	(a)
IV (Office)		
a - Single storey building	400*	(m)
b - Building of 2 to 4 storeys	200.‡	(m)
c - Building of more than 4 storeys	NR	(a)
V (Shop)		
a - Single storey building	400*	(m)
b - Building of 2 to 4 storeys	200.‡	(m)
c - Building of more than 4 storeys	NR	(a)
VI (Factory)		
a - Single storey building	400*	(m)
b - Building of 2 to 4 storeys	200.‡	(m)
c - Building of more than 4 storeys	NR	(a)
VII (Place of Public Resort)		
(i) With stay-in facilities:		
a - Single storey building	NR	(m)
b - Building of 2 to 4 storeys	NR	(a)
c - Building of more than 4 storeys	NR	(a)
(ii) Without stay-in facilities:		
a - Single storey building	400*	(m)
b - Building of 2 to 4 storeys	200.‡	(m)
c - Building of more than 4 storeys	NR	(a)
VIII (Storage)		
a - Single storey building	2000*	(m)
b - Building of 2 to 4 storeys	1000.‡	(m)
c - Building of more than 4 storeys	NR	(a)

* Single storey building with area less than indicated is not required to be provided with alarm system unless otherwise specified by the Relevant Authority.

\+ Where used for sleeping accommodation, automatic alarm system may be required by the Relevant Authority.

.‡ The total floor area per storey shall not exceed that as stated in Cl.6.3.1(c).

NL = no limit (m) = manual type

NR = not relevant (a) = automatic + manual type

Remarks: (1) When there are 2 or more purpose groups in a building, the strictest requirement for any one of the purpose groups shall be applicable to the whole building.

(2) Where purpose group II forms part of a mixed use building, Cl.6.3.1(b)(i) shall be followed.

Table 6.4A: Compartmentation requirements for special purpose rooms in buildings

Usage (1)	Non-sprinkler protected building (2)		Sprinkler protected building (3)		
	Compart-mentation (2a)	Door rating (2b)	Compart-mentation (3a)	Door rating (3b)	Sprinkler (3c)
Store room[1]	1 hr	1 hr	1 hr	1 hr	S
AHU room	N	N	N	N	S
Kitchen[2]	1 hr	1/2 hr	1 hr	1/2 hr	S
Boiler room (oil fired)	4 hr	4 hr	4 hr	4 hr	S
Low voltage Switch room	B	B	B	B	Ex
High voltage Switch room	B	B	B	B	Ex
Transformer room (oil type)	4 hr	4 hr	4 hr	4 hr	Ex
Oil Tank room	4 hr	4 hr	4 hr	4 hr	S
Generator room	4 hr	4 hr	4 hr	4 hr	S
A/C Plant room	B	B	B	B	S
Electric Lift motor room	B	B	B	B	Ex
Hydraulic Lift motor room	B	B	B	B	S
Essential Fan room	B	B	B	B	S
Electrical room	B	B	B	B	Ex
Emergency lighting battery room	2 hr	2 hr	2 hr	2 hr	Ex
Sprinkler/Wet Riser Tank room	B	B	B	B	S
Fire Pump room	B	B	B	B	S
Fire Command centre	2 hr	2 hr	2 hr	2 hr	S
MDF room	N	N	B	B	Ex
			N	N	S
PABX room	N	N	B	B	Ex
			N	N	S

Compartmentation and door rating in this table are specified in one of the following ways:

N = no specific requirement on compartmentation
B = compartmentation and door rating of the special purpose room shall not be less than the fire resistance of the elements of structure of the building where the room is located

The fire resistance rating stipulated in this table shall be the minimum and the Relevant Authority has the discretion to require higher rating.

Requirement for sprinkler in the special purpose rooms is specified in one of the following ways:

S = Sprinkler system has to be extended into such rooms.
Ex = Sprinkler system is exempted from the corresponding area provided the area is fitted with an automatic fire alarm system installed according to SS CP 10.

---

1 Requirements stated herein apply to store room with area exceeding 10 m^2

2 Requirements stated herein apply to kitchens in hotel, restaurant, coffee house or other similar places where the preparation of food is required. However, special considerations will be given to the followings:
(a) kitchens where `open flame' cooking appliances are NOT used, or
(b) kitchens where all the cooking facilities are fitted with approved extinguishing systems.