Chapter 4

SITE PLANNING & EXTERNAL FIRE FIGHTING PROVISION

4.1.1 GENERAL

The purpose of this Chapter of the Code is to make provision for space around buildings to enable effective mounting of rescue and external fire fighting operations.

(No illustration)

4.2 PROVISION FOR EXTERNAL ACCESS TO BUILDING FOR FIRE FIGHTING AND ACCESSIBILITY OF SITE TO FIRE FIGHTING APPLIANCES

4.2.1 Introduction

Accessway shall be provided for accessibility of site to fire fighting appliances. To permit fire fighting appliances to be deployed anywhere within the accessway, it shall have a minimum width of 6m throughout. Access openings shall be provided along the external walls of buildings facing the accessway for access into the building for fire fighting and rescue operations.

(No illustration)

4.2.2 **ACCESSWAY FOR FIGHTING APPLIANCES**

(a) (i) Provision of accessway

For buildings under purpose group I, accessway will not be required, irrespective of the building height. However, in cluster housing developments, (Cluster housing is landed housing with shared communal facilities), fire engine access road with a minimum 4m width shall be provided for access by pump appliance to within a travel distance of 60m from every point on the projected plan area of any building in the housing developments.

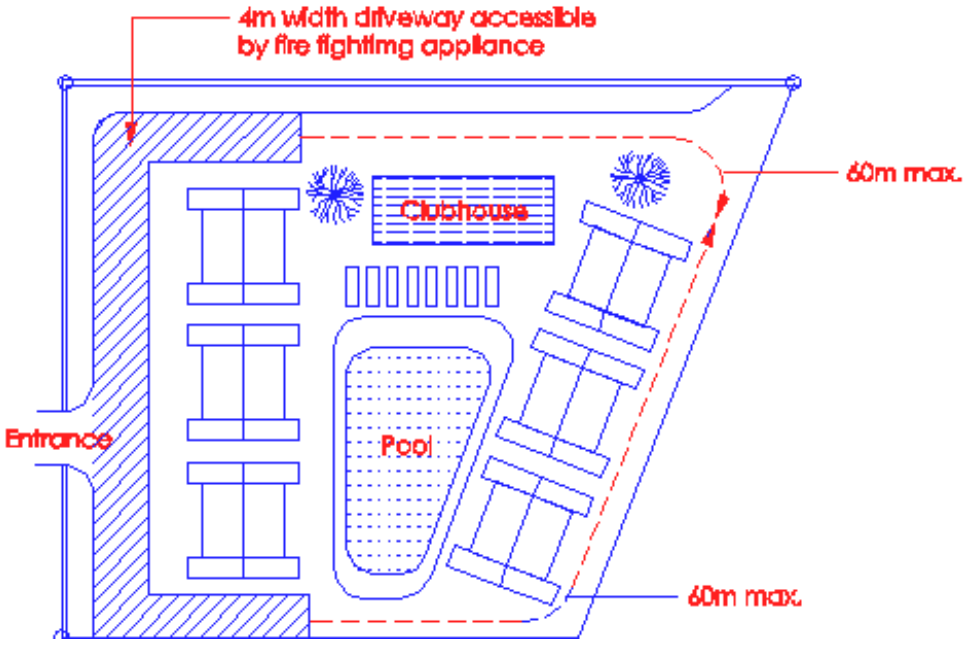


Diagram 4.2.2(a)(i)

The measurement of the travel distance shall be the line of travel located outside the building, and shall not traverse across open sided porches or 1st storey void deck. The travel distance is the distance that a fire fighter would traverse while carrying a portable ladder or equipment.

4.2.2 (d) (v) Turning facilities

Dead-end and fire engine access road shall not exceed 46 m in length or if exceeding 46 m, be provided with turning facilities as shown in Diagram 4.2.2(d)(v).

(vi) The outer radius for turning of fire engine access road shall comply with the requirements as shown in Diagram 4.2.2(d)(vi).

Turning Facilities for Pumper Appliances (24 tonnes)

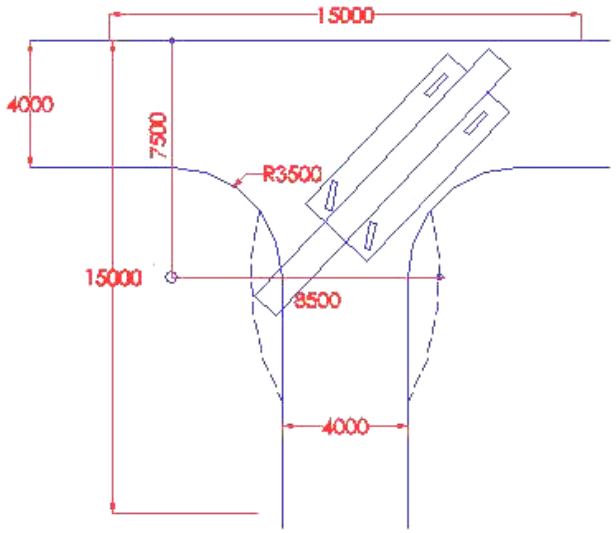


Diagram 4.2.2 (d)(v)

U-Turn Radii of Pumper Appliances(24 tonnes)

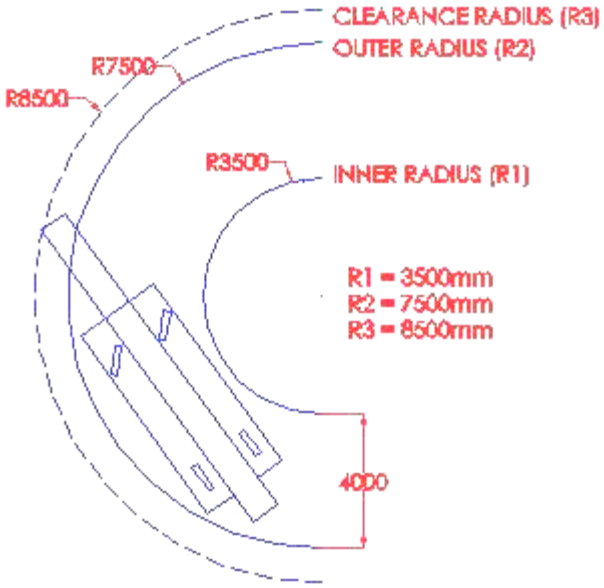


Diagram 4.2.2 (d)(vi)

(vii) Overhead clearance

Overhead clearance of fire engine access road shall be at least 4.5 m for passage of fire fighting appliances.

(No illustration)

(viii) Public road

Public roads can serve as accessway provided the location of such public roads is in compliance with the requirements of distance from access openings.

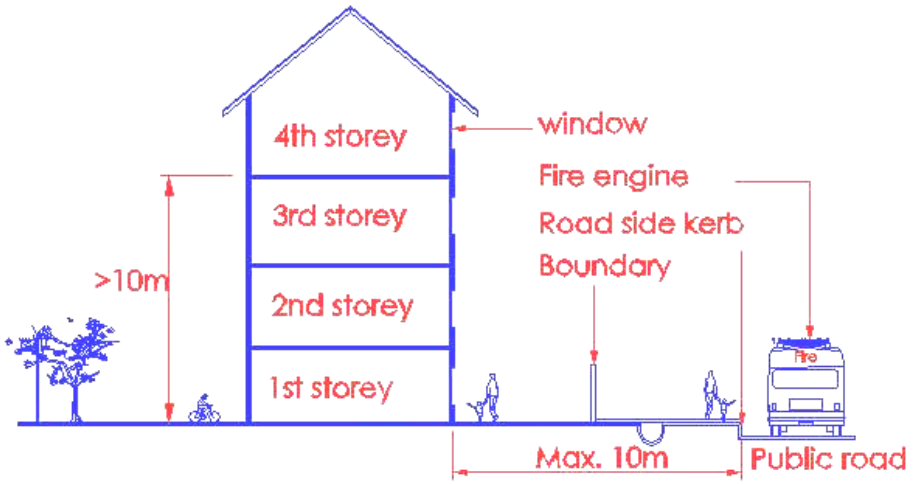


Diagram 4.2.3(b)(viii)

Elevation of building to the edge of road kerb shall not exceed 10m, in order to permit external fire fighting and rescue from the fire appliance parked on public road.

(ix) Obstruction

Fire engine access road shall be kept clear of obstruction

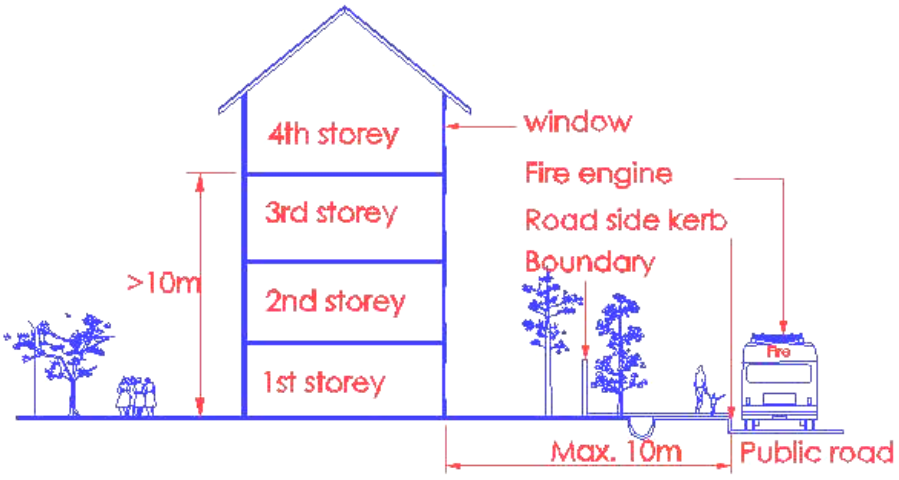


Diagram 4.2.3(b)(ix)

Trees causing obstruction to external rescue and fire fighting.
Note : There is no requirements to provide fire engine access and accessway to buildings under purpose group I.

(g) The provision of access openings shall not be applicable.

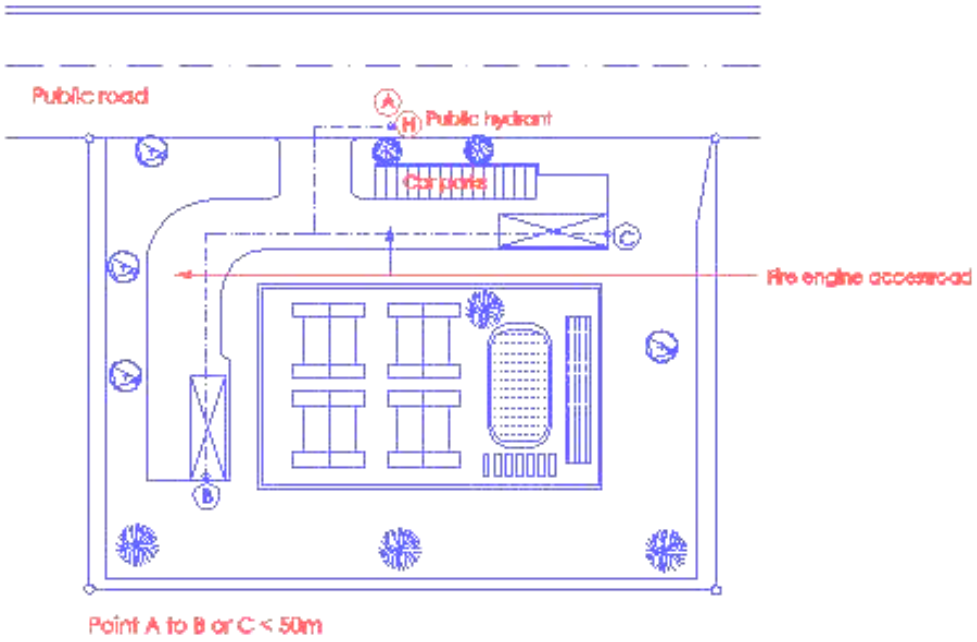
(No illustration)

4.4 PRIVATE FIRE HYDRANT

4.4.1 REQUIREMENTS

(a) Private fire hydrant

Every part of a fire engine access road in a private lot shall be within an unobstructed distance of 50m from a hydrant. Where a public hydrant conforming to such requirement is not available, private hydrant(s) shall be provided (see diagram 4.4.1(a)).



The distance of 50m is measured horizontally along the access road.

Diagram 4.4.1(a)

(b) In situations where more than one private hydrants are required, the hydrants shall be located along the fire engine access road such that every part of the fire engine access road is within an unobstructed distance of 50m from

any hydrant (see diagram 4.4.1(b)).

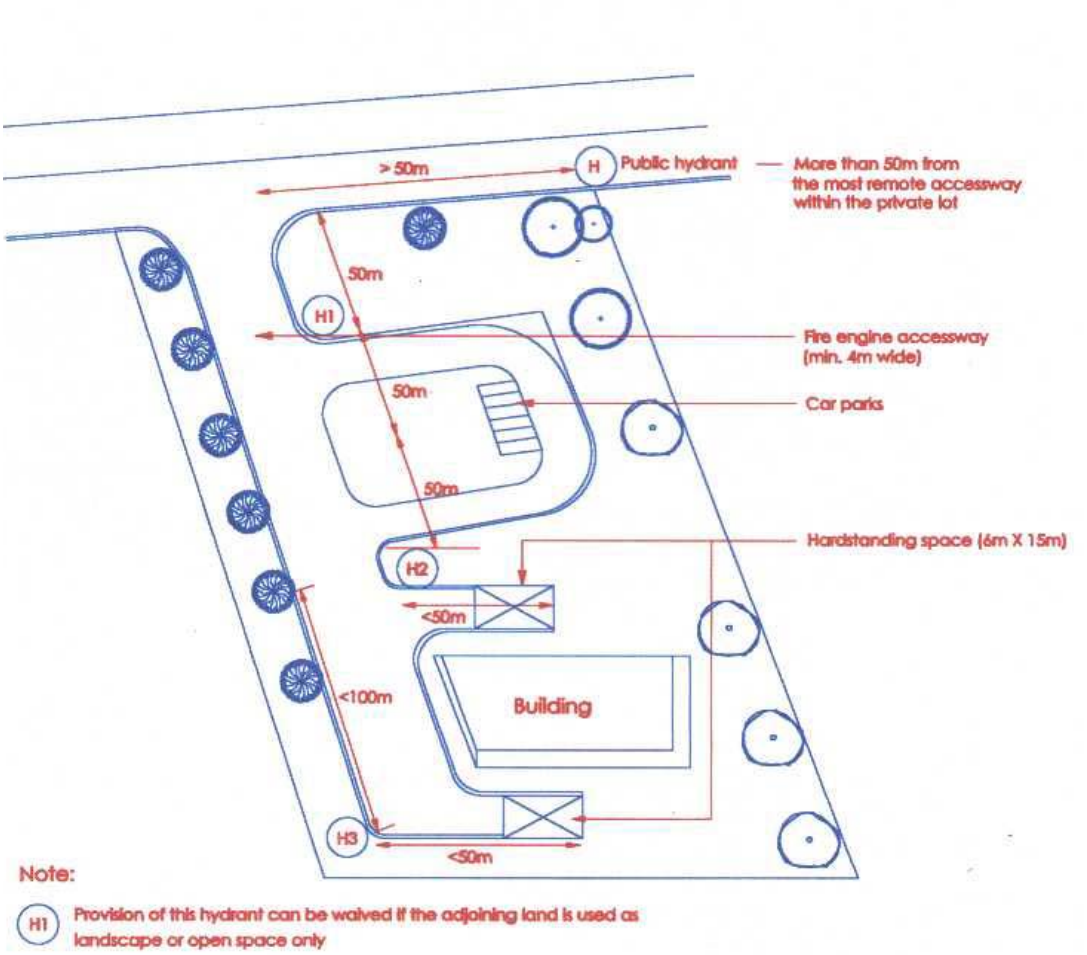


Diagram 4.4.1(b)

Hydrant H1 is not required if the adjoining land is maintained as open space. However, if the land is later developed for houses, provision of hydrant would be required.

(c) Siting and types of fire hydrants shall comply with the requirements stated in SS CP 29: Code of Practice for Fire Hydrant Systems and Hosereels.

4.4.2 WATER SUPPLY FOR PRIVATE HYDRANT

Water supply for private hydrant

Provision of water supply for private hydrant system where required by this Code shall comply with one of the following requirements:

(a) Private fire hydrants installed at reduced level 125 m and below can receive direct supply from public water mains provided :

(i) The nominal bore of the hydrant pipe and the bulk water meter shall not be less than 150mm in diameter; and

(ii) The running pressure/flow at the hydraulically most unfavourable hydrant of the private hydrant system shall comply with the following :

* Running pressure >= 0.9 x (running pressure of the nearest public hydrant – pressure drop across the bulk water metre); and

* Flow Rate >= 0.9 x water flow of the nearest public hydrant or >= total flow demand (as required in Table 4.4.2) of the private hydrant system, provided the running pressure at the remotest private hydrant is greater than 2 bars.

Note :

(i) In calculating the frictional loss for the private hydrant system, the design flow rates shown in Table 4.4.2 shall be used.

(ii) Pressure drop across bulk water metre shall not be more than 1bar.

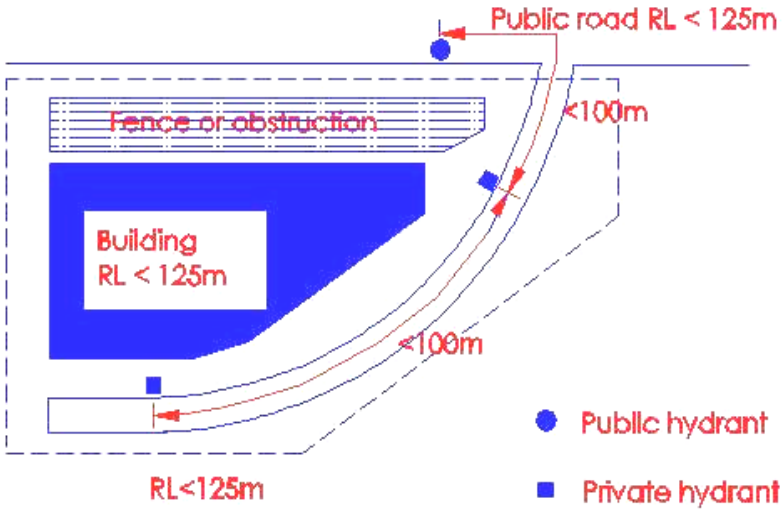


Diagram4.4.1(a)

There is a need to differentiate at RL 125m as public mains located at above RL 125m would not be able to provide the required water pressure. It is important that hydrants annotated in building plan should be given their respective reduced levels.

1. *Private hydrants that are sitted at RL< 125 are allowed to take the water supply from public watermains, which likewise should not be located above RL 125.*

2. *There is a need to observe the RL > 125m as the public watermains located at above RL 125m would not be able to provide the required pressure and flowrate for fire fighting purposes.*

It is therefore important that private hydrants and the supply public watermain annotated in buildings plans should be given their respective reduced levels.

4.4.2 (b) (i) Where there is only one private hydrant in the plot that is located above reduced level 125m; and

(ii) this hydrant is not the sole hydrant within 50m from any breeching inlet(s) feeding into fixed water based fire fighting system(s) including automatic sprinkler systems, dry riser systems, and wet riser systems for the building(s) standing on this plot of land;

this hydrant can be in the form of a "dry" hydrant. A "dry" hydrant shall be connected to a 150mm diameter dry pipe, which shall be connected at the other end to a four-way breeching inlet. This breeching inlet shall be within 18m from any accessway or vehicular access having minimum 4m width and within 50m from any wet hydrant, private or public.

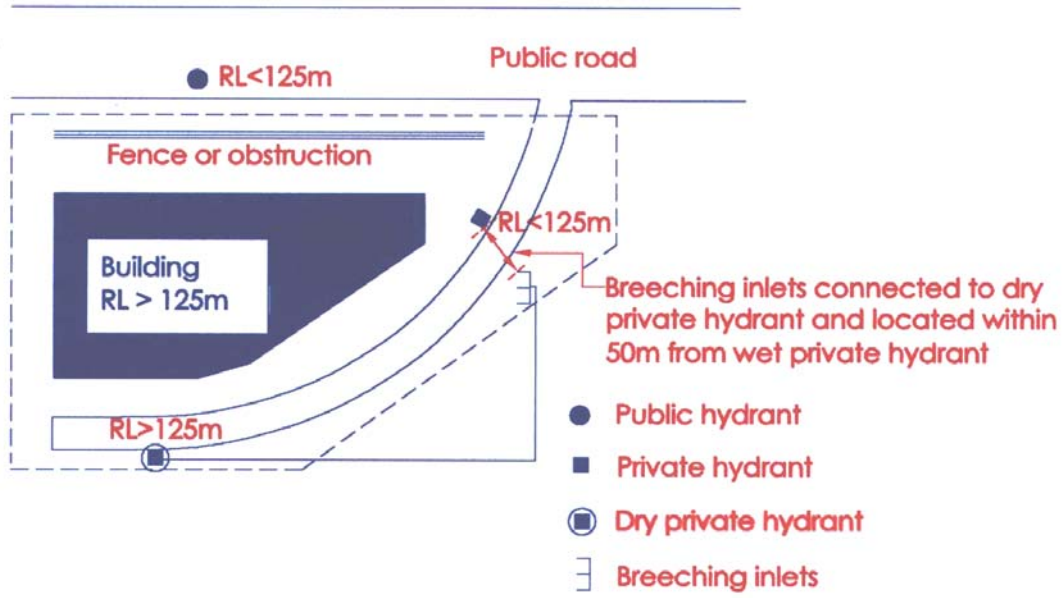


Diagram 4.4.2(b)

"Dry" hydrant is equivalent to the provision of dry rising main. Care should be taken to prevent accidental damage by vehicle etc to the horizontal run of the pipe aboveground.

The dry pipe should be differently identified on site. The provision of dry hydrant is a relaxation as all hydrants as required to be fed with water at all times. This is allowed as the fire fighters could use other hydrants located below RL 125 which are within 50m from the breeching inlets.

(c) Where more than one private hydrants are located above reduced level 125m within the same plot, storage and pumping arrangements of water supply to these specified hydrants shall comply with those for wet rising mains stipulated in SS CP 29 and Table 4.4.2 – Water Supply & Storage Requirements For Private Hydrant. The water supply for hydrants shall be as follows:

Table 4.4.2 – Water Supply & Storage requirements For Private Hydrant

Purpose Group/Requirement	Purpose Group I
Minimum running pressure	2 bars
Minimum flow rate	27 L/s
Minimum duration	45 mins

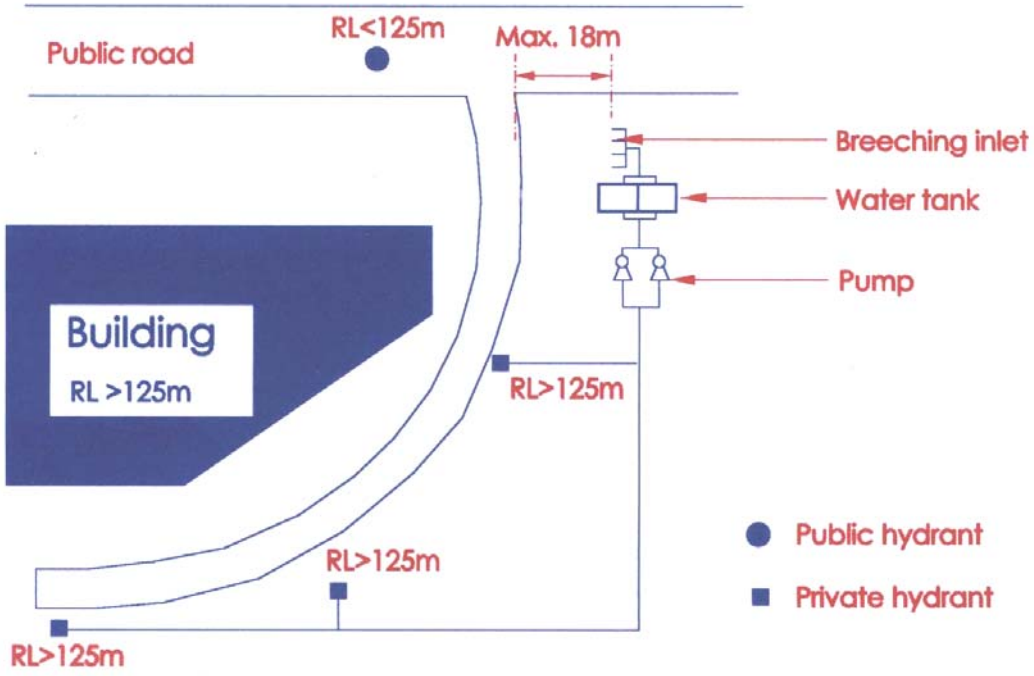


Diagram 4.4.2(c)

4.4.3 Protection of hydrant mains in buildings

All hydrant mains which pass through a building shall have its full length within the building protected with fire resistance construction complying with cl.3.8.7 (c) of at least the same fire resistance as the element of structure, provided the following requirements are complied with :

(a) The hydrant mains shall be located in common circulation areas, such as carparking spaces and driveways; ie they shall not pass through private or confined spaces;

(b) No services (except sprinkler pipes) shall be located above or crossing over the hydrant mains;

(c) The hydrant mains shall be located away from explosion risk areas; and

(d) The protective enclosure to the hydrant mains shall be labelled with the words "HYDRANT MAIN" of minimum 50mm height at suitable intervals.

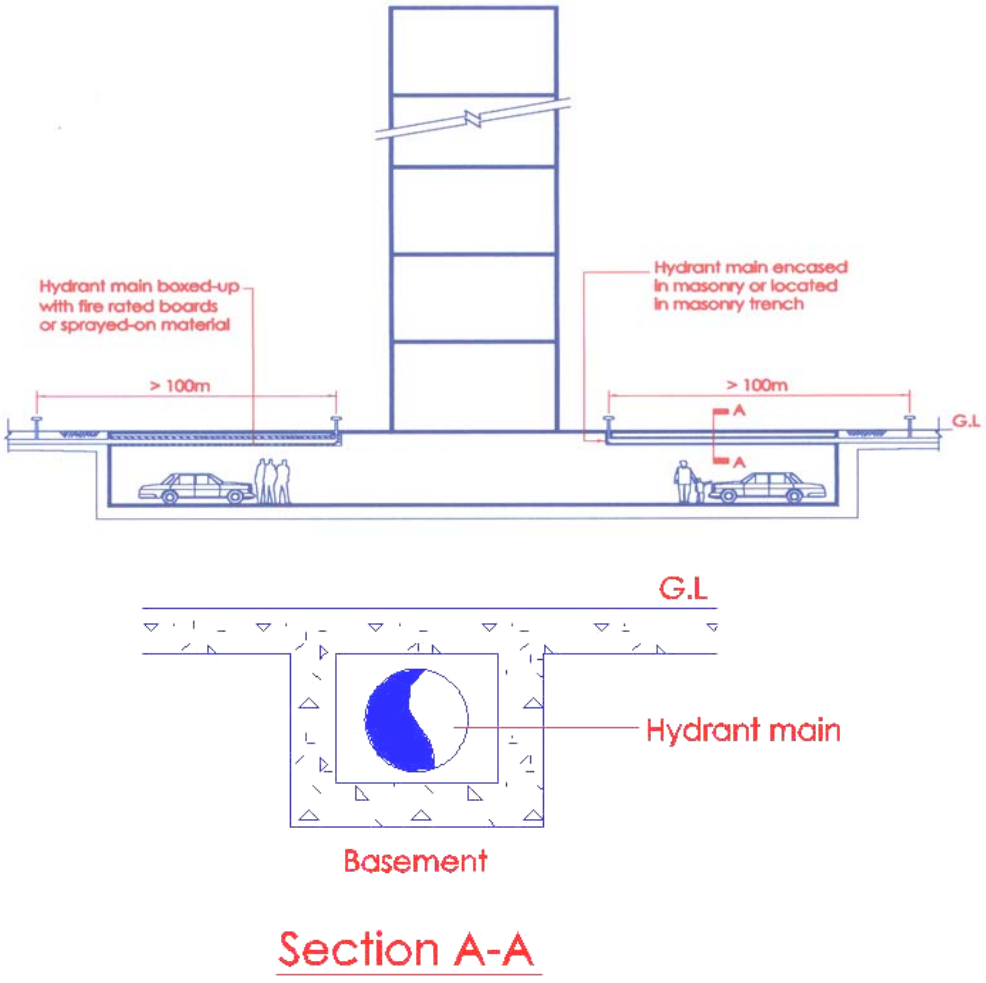


Diagram 4.4.3

Hydrant main supplying water to hydrant shall be appropriately protected to prevent any damage arising from fire or mechanical impact from moving objects or the carrying out of addition/alteration works within the building. Watermain, which is damaged, would affect the water supply to the hydrant. This would in turn affect the fire fighting operation in an emergency. Hydrant main protected with dry protection e.g. boxed-up with fire rated boards or sprayed on materials shall only be allowed to be routed or located in basement or floor protected by sprinkler system.