

Fire safety guideline

## Fire hydrants for minor residential development



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Fire Safety Branch  
**Community Safety Directorate**



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## 1 Purpose

The purpose of this document is to provide guidance on the provision of vehicular access to minor residential developments for firefighters and water for firefighting in the instance of a fire occurring within the development.

## 2 Scope

This guideline details Fire & Rescue NSW (FRNSW) recommendations for:

- a) providing vehicular access for FRNSW fire appliances
- b) providing water to allow firefighting operations to be undertaken
- c) installing a fire sprinkler system in dwellings not readily accessible to firefighters.

## 3 Application

This guideline applies to new residential development comprising solely of class 1 and class 10 buildings, as per the *National Construction Code (NCC) Series Volume Two*, within any fire district.

Where a minor residential development contains any other classification of building the provisions of *NCC Series Volume One* are to be applied to those building classifications, including any requirements for fire hydrant coverage as required by Australian Standard *AS 2419.1 Fire hydrant installations – System design, installation and commissioning*.

This guideline assists land owners, developers and urban planners/designers to plan minor residential development giving appropriate consideration to the needs of FRNSW to undertake firefighting operations during a fire emergency.

This guideline has been developed in the public interest, and is intended to be used by any consent authority considering a development application for minor residential development (refer to section 79C(1)(e) of the *Environmental Planning and Assessment Act 1979*).

**Note:** Under section 80A of the *Environmental Planning and Assessment Act 1979*, the consent authority may impose requirements from this guideline on the owner/developer as a condition on the development consent.

## 4 Definitions

The following definitions apply in this document:

**Carriageway** — means any public road, private access road, shared traffic zone, laneway, accessway or the like, whether having a sealed surface layer or not, that is specifically designed for the carriage of vehicles.

**Dwelling** — means a building, or group of attached buildings, that is privately owned to be occupied as a place of residence or abode (e.g. a house, townhouse or villa).

**Fire appliance** — means a purpose designed emergency vehicle that provides firefighting, rescue and hazmat capability at an emergency incident.

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## Fire hydrants for minor residential development

**Fire district** — means an area to which the *Fire Brigades Act 1989* applies in relation to fires and contributions to costs. Fire districts are constituted by the Governor under Section 5 of the *Fire Brigades Act 1989* by order published in the NSW Gazette.

**Fire hydrant** — means an assembly installed on a mains water or private water pipeline, which provides a valved outlet to permit a supply of water to be taken for firefighting.

**Fire hydrant, feed** — means a fire hydrant used to supply water to a fire appliance.

**Fire hydrant, private** — means a fire hydrant installed on a water pipeline which is owned and maintained by private lot owners, and is used to supply water to a fire appliance.

**Fire hydrant, street** — means a fire hydrant installed on a mains water pipeline which is owned and maintained by the relevant water supply authority, and is used to supply water to a fire appliance.

**Mains water** — means a continuous pressurised supply of water through a pipe network, usually below ground, providing potable or recycled water for domestic use.

**Minor residential development** — means any development that involves the subdivision of new or existing land into separately titled lots for private dwelling ownership and where not all dwellings have direct frontage onto a public road. This can include battleaxe block style housing involving a single dwelling, or multi-dwelling estates under strata or community titles.

**Pinch point** — means a narrow point of passage for a fire appliance around an immovable object (e.g. gate, barrier, bollard, pylon, utility pole, tree, drain, existing structure).

**Turning circle radius** — means the minimum arc radius that provides wall-to-wall clearance for a fire appliance turning at full steering lock (e.g. to negotiate corners or turnaround areas).

**Water supply authority** — means an authority recognised under the *Water Management (General) Regulation 2011* to supply water to consumers.

## 5 Background

When fire occurs, it is life-critical to get firefighters and equipment as close to the affected dwelling in the shortest time possible. A typical dwelling (e.g. house) with direct frontage to a public road is generally accessible during a fire emergency.

However, minor residential developments often present firefighters with unique challenges which may include:

- locating the affected dwelling if it is hidden behind another, remote from the street access, or nestled amongst a cluster of dwellings in close proximity to each other
- life-critical delays to firefighting operations if firefighters are required to traverse longer distances between the fire appliance (i.e. equipment) and the dwelling
- fire appliance access to dwellings remote from the public road when the private carriageway does not provide appropriate access
- greater potential for fire spread between dwellings located in close proximity.

For typical dwellings, firefighting operations also involve the fire appliance drawing water from the nearest street fire hydrant connected to the mains water supply. The nearest street fire hydrant may not be suitable for certain minor residential developments. Developments should therefore offer either equivalent water supply provisions for firefighting, or an alternative water source to assist with fire suppression activities.

## 6 Access for fire appliance

- 6.1 Minor residential development should ensure no part of any dwelling is more than 90m from a carriageway that can be readily accessed and traversed by a fire appliance (see Figure 1 and Figure 2).

**Note:** The 90m distance is equivalent to three lengths of standard 30m firefighting hose being connected to the fire appliance.

- 6.2 The carriageway should be constructed to support a fire appliance weighing up to 15 tonnes, including being sealed with guttering and drainage. The carriageway is required to have:
- an unobstructed width of 4.0m, including from any parked vehicles (see Figure 2)
  - a pinch point providing a minimum clearance of 3.0m and is not longer than 30m
  - a minimum 3.5m clearance from any overhanging obstructions
  - a gradient no greater than 1:6
  - a turning radius of not less than 10m (see Figure 3 and Figure 4).

**Note:** For further information refer to FRNSW [Guidelines for emergency vehicle access](#) which is available at [firesafety.fire.nsw.gov.au](http://firesafety.fire.nsw.gov.au).

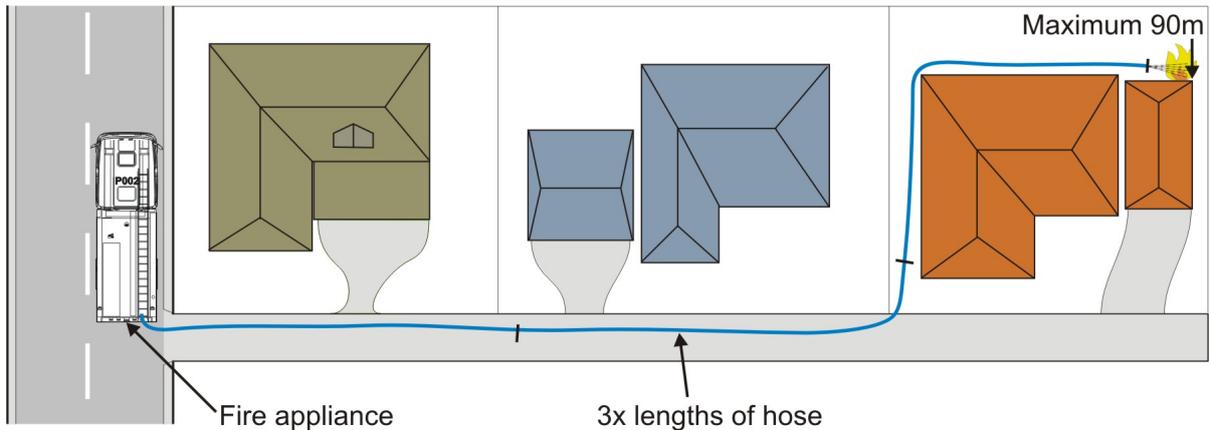


Figure 1 Example of 90m hose coverage from a public road

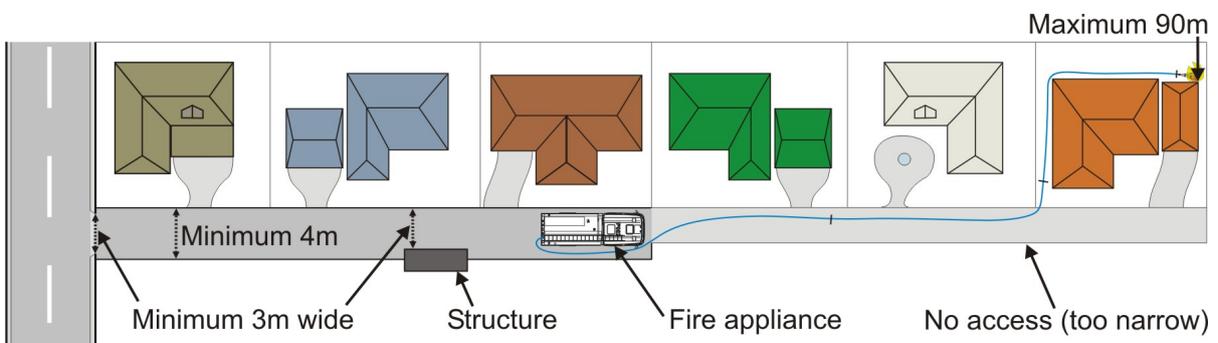


Figure 2 Example of 90m hose coverage from an accessible private carriageway

- 6.3 Any private carriageway longer than 120m from the public road is to include suitable turnaround provisions for a fire appliance, which can include a cul-de-sac turning area (see Figure 3), three-point turning bay, or continuous ring-road (see Figure 4).
- 6.4 If local area traffic management principles are to be adopted within the development, any traffic control devices installed must not prohibit access for fire appliances.

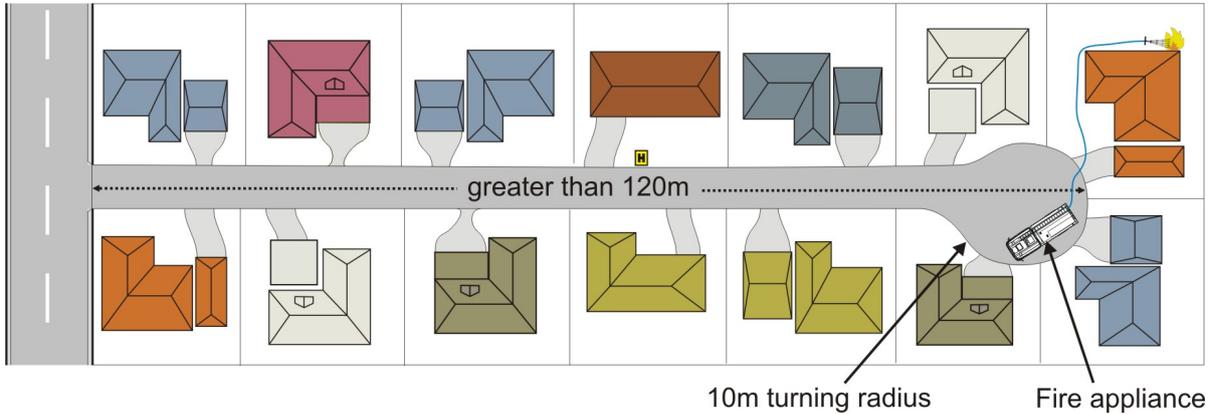


Figure 3 Example of cul-de-sac turning area for fire appliance

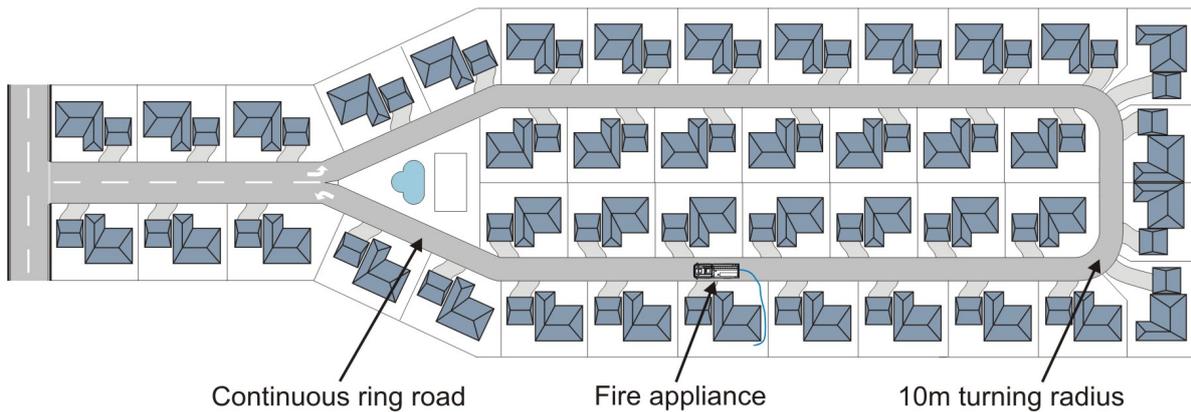


Figure 4 Example of a continuous ring road around a community estate

## 7 Water for firefighting

### 7.1 Street fire hydrants

- 7.1.1 In areas where FRNSW are available to attend a building fire, the appropriate water supply authority is required to provide fire hydrants in accordance with Subdivision 4 of the *Water Management (General) Regulation 2011*. These are generally provided below ground on the mains water supply every 120m along the public road, and are known as 'street fire hydrants'.
- 7.1.2 If the water supply authority does not have a street fire hydrant within 60m of the entrance to the development (60m being midway between 120m spaced hydrants), a request should be made to the water authority to have a street fire hydrant installed on the mains water supply near the entrance of the development.

**Note:** Any request made to the water supply authority to have a street fire hydrant installed will most likely be at the expense of the development owner.

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7.1.3 Where access is midway between two street fire hydrants (i.e. 60m), a fire appliance positioned at the entrance should still be able to connect to the street mains water supply using two (2) lengths of hose (see Figure 5).

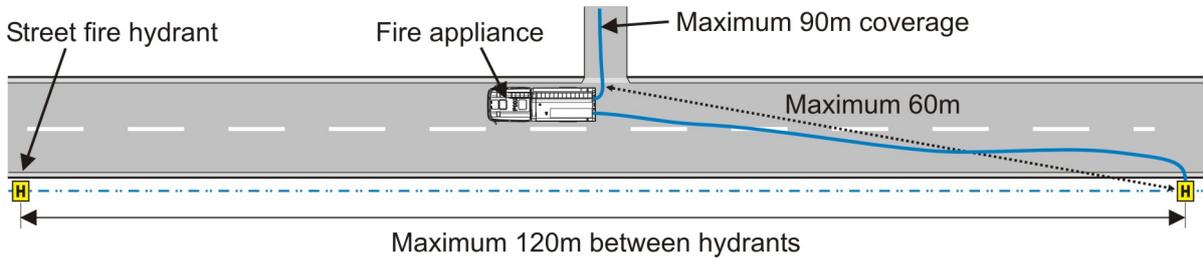


Figure 5 Street fire hydrants installed along public road by water supply authority

7.1.4 If the minor residential development will have a private carriageway providing fire appliance access as per section 6, the distance from a fire appliance on the carriageway to the nearest street fire hydrant should not exceed 60m (see Figure 6).

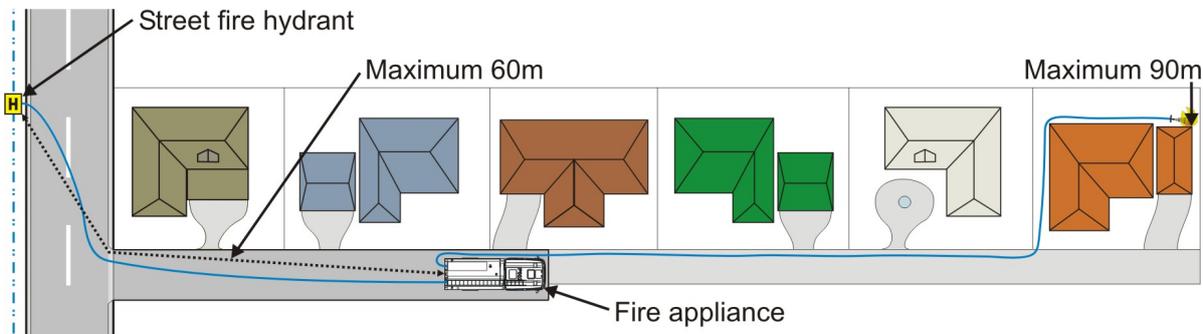


Figure 6 Example of street fire hydrant used by fire appliance on private carriageway

7.1.5 An additional street fire hydrant can be installed at the intersection of the private carriageway and public road, therefore allowing the carriageway to be up to 60m long without a private fire hydrant needing to be installed (see Figure 7).

**Note:** If fitted, the additional street fire hydrant will be owned and maintained by the water supply authority.

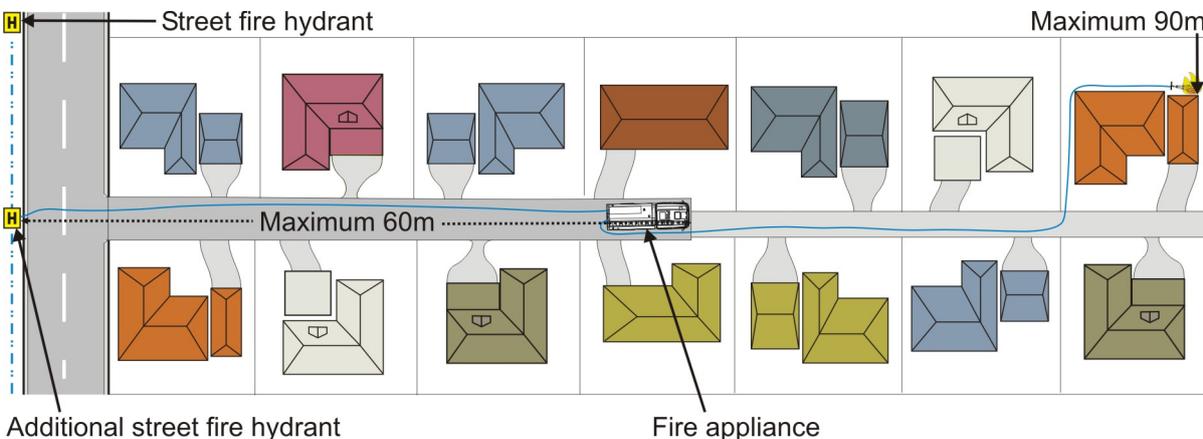


Figure 7 Example of additional street fire hydrant for maximising carriageway length

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7.1.6 Where a street fire hydrant requires firefighters to close the public road in order to use the hydrant (i.e. located on the opposite side of the road to the development), FRNSW are to be consulted about the suitability of using that street fire hydrant.

**7.2 Private fire hydrants**

7.2.1 If a private carriageway provides fire appliance access as per section 6, and the distance from the nearest street fire hydrant to the fire appliance can exceed 60m, then private fire hydrants should be installed (see Figure 8).

**Note:** Private fire hydrants should provide FRNSW with a water supply to undertake firefighting operations in the absence of any street fire hydrant.

7.2.2 A private fire hydrant should be installed not more than 60m from the public road, then not more than 120m apart along the private carriageway (see Figure 8).

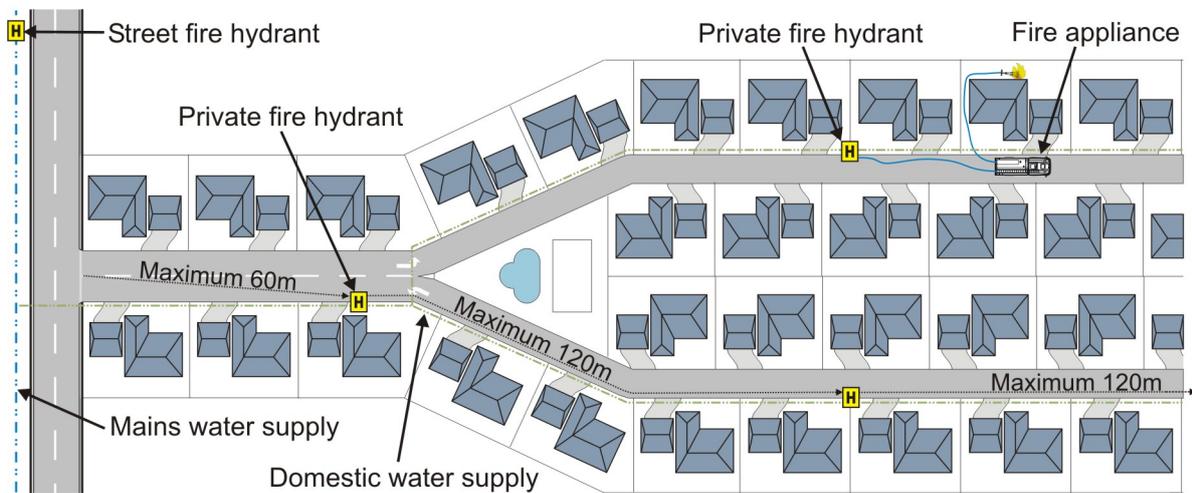


Figure 8 Private fire hydrants installed on domestic water supply

7.2.3 Private fire hydrants should be connected to the domestic water supply pipe for the development, with the supply pipe having a nominal size of not less than DN 100 to allow sufficient water pressure and flow for firefighting operations.

7.2.4 The most hydraulically disadvantaged fire hydrant should be able to deliver at least 10 litres of water per second at 150kPa residual pressure when at the water supply authority’s expected 95<sup>th</sup> percentile performance. When this flow rate cannot be achieved, FRNSW should be consulted.

**Note:** Significant hydraulic loss will occur at the domestic supply connection point, which is to be fitted with a backflow prevention device in accordance with the water supply authority’s requirements. A hydraulic consultant or fire services engineer may need to be engaged to calculate the appropriate diameter, length and arrangement of the domestic water supply pipe.

7.2.5 The domestic water supply pipe should run adjacent to the carriageway so that private fire hydrants are installed in positions readily accessible at all times. Appropriate fire hydrant locations include at carriageway intersections and corners, adjacent to kerbs, within footpaths or in front of lot boundaries (i.e. fence line).

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- 7.2.6 When planning the location of private fire hydrants consideration should be given to ensuring that they cannot be parked over by vehicles (e.g. barriers, bollards) and do not obstruct traffic flow when in use.

**Note:** Traffic control devices such as pedestrian refuges, slow points and islands can be used as suitable fire hydrant locations.

- 7.2.7 The private fire hydrants installed should be below-ground spring hydrant valves complying with Australian Standard AS 3952-2002 (R2015): *Water supply - Spring hydrant valve for waterworks purposes* (see Figure 9).

**Note:** Spring hydrant valves are used with a standpipe which is carried on all fire appliances.

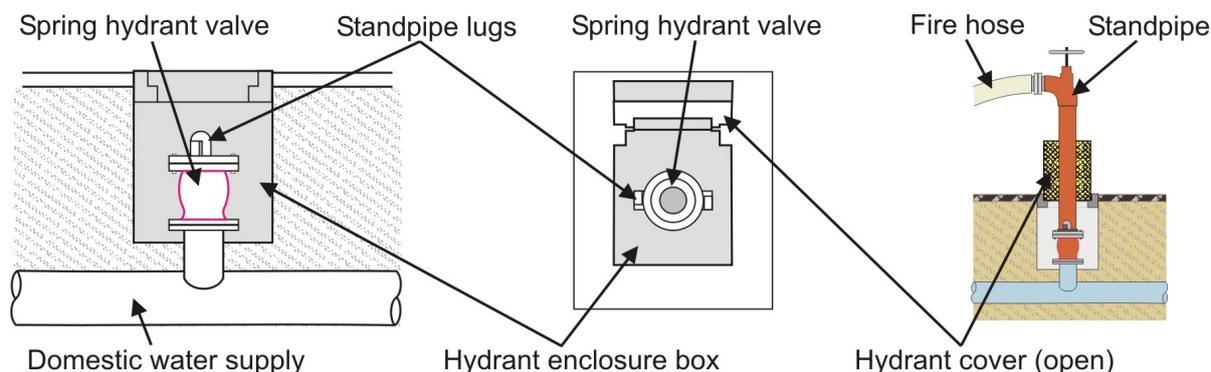


Figure 9 Spring hydrant valve connected to domestic water supply

- 7.2.8 If there is any potential for below-ground hydrants being parked over by vehicles, a single head above ground fire hydrant valve should be fitted instead.
- Note:** Above ground fire hydrants are prone to being easily damaged, tampered with, and improperly used by residents. Appropriate measures should be implemented to mitigate these risks (e.g. barriers, bollards, '003' key lock).
- 7.2.9 Spring hydrant valves should be covered by a yellow hydrant cover plate for easy identification. The cover plate is to be securely mounted (e.g. within a concrete block) for stability. The cover plate must not be marked as the water supply authority.
- 7.2.10 A blue 'cat eye' reflective road marker is to be fitted on the carriageway opposite each private fire hydrant to assist firefighters locate the hydrant. The reflective marker is to be fitted 25mm off the carriageway centre line on the side the hydrant is located.
- 7.2.11 A hydrant identification plate (e.g. H, HP, HR) is to be fitted to a white marker post adjacent to each private fire hydrant. The marker post is to be securely mounted (e.g. concrete block), made of metal, white, and protrude at least 1m above the ground.
- 7.2.12 Private fire hydrants are the responsibility of all owners within the development (i.e. all strata/community title holders), therefore all owners are responsible for ongoing maintenance and repairs necessary for any private fire hydrant.

Refer to the relevant water supply authority's policy on connections for servicing obligations under strata or community titles. Any servicing conditions should be included in the strata or community title management statement.

7.2.13 The consent authority is to consider imposing a condition of consent that requires owners/title holders to arrange the inspection and maintenance of private fire hydrants, scheduled at intervals not greater than one year apart.

### 7.3 Home fire sprinkler system

7.3.1 If the most disadvantaged point of any dwelling within minor residential development is unable to be reached by a 90m hose lay (i.e. three lengths of hose), the dwelling is to have an automatic home fire sprinkler system installed to provide effective control of the fire while firefighting crews gain access (see Figure 10).

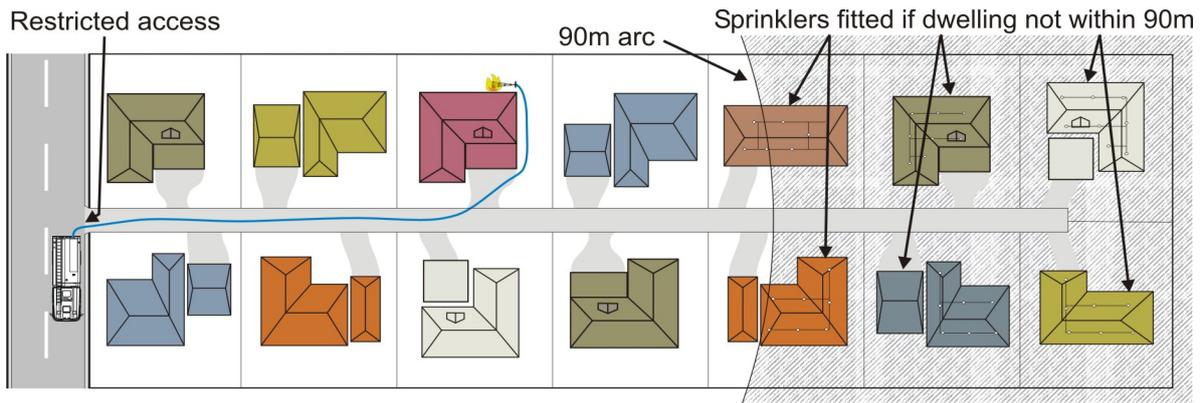


Figure 10 Home fire sprinkler system

7.3.2 The current standard for home fire sprinkler systems is Australian Standard AS 2118.5-2008 Automatic fire sprinkler systems Part 5: Home fire sprinkler systems.

7.3.3 Even when a dwelling is fitted with a home fire sprinkler system, consideration should still be given to potential impacts to firefighting operations, including:

- a) providing limited vehicular access of not less than 3.0m wide where possible
- b) ensuring the distance from the fire appliance to the furthestmost dwelling does not exceed 210m to avoid excessively long hose lays
- c) providing an accessible static water source with a minimum of 10,000 litres for firefighting use (e.g. water tank with 38mm Storz connector, dam, swimming pool)
- d) increasing the minimum separation between dwellings to ensure fire cannot spread to other dwellings in the absence of firefighting intervention.

**Note:** These considerations may be particularly applicable in semi-rural settings where larger acreage may undergo subdivision (see Figure 11).

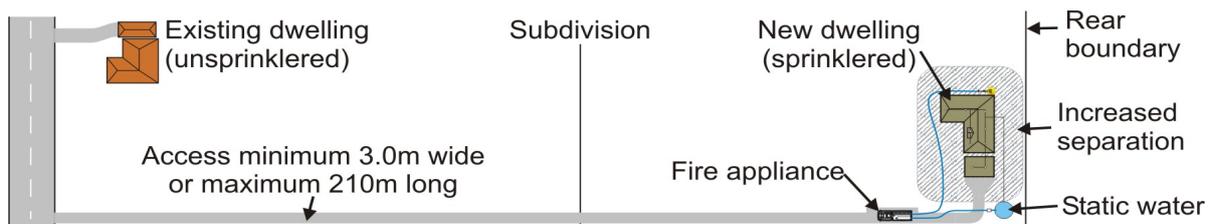


Figure 11 Example of remote dwelling in subdivided lot

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