

Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots



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Glossary of Terms

In this document, the terms are limited to the meanings described below.

Building:	A building is a fixed structure that is wholly or partly enclosed by walls or is roofed.
Structure:	For this document refer to definition of a Building.
Fire Truck:	A vehicle used to combat a fire. A typical fire truck (a pumper) is approximately 2.5m wide, 7.7m long and it is typically used in urban residential areas. Further specifications of fire trucks and larger trucks are available from the QFES if design solutions are required for specific situations.
Hydrant:	An assembly installed on a branch from a water pipeline, which provides a valved outlet to permit a supply of water to be taken from the pipeline for fire fighting. These include above and below ground hydrants.
QFES:	Queensland Fire and Emergency Services.
Material Change of Use:	As per the Planning Act 2016
Reconfiguration of a Lot:	As per the Planning Act 2016
Reticulated Water Supply:	Is a permanent infrastructure provided to deliver treated water to lots from an Urban Utility Authority through a system of pipes, mains, control valves etc. for household or industrial use. It will supply uninterrupted water at a positive pressure for fire fighting purposes.
Road or Carriageway:	Construction which is specifically designed for all vehicle travel (may or may not include a sealed top surface layer).
A Constructed Road:	For the purpose of defining widths, includes the part of the road reserve set aside for traffic and also includes roll-over kerbs but does not include the remaining part of the road reserve.
Trafficable Width:	Refers to that width of the constructed road that is unimpeded by encroachments such as street furniture or landscaping, and is available for free movement of fire trucks.



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1. Scope

For applications seeking development approval for material change of use or reconfiguring a lot for the purpose of building, where streets and common access ways are proposed regardless of building classification.

Where reticulated hydrant systems and vehicle access are not currently required under the **Planning Act 2016** (PA), the **Building Act 1975** or National Construction Code (NCC) the measures in this document should be adopted.

Australian Standard (AS) 2419.1 2005 Appendix B is a minimum standard of design and performance for the State of Queensland. In a local government authority where a local water authority specifies a design and performance criteria above the requirements of AS 2419.1 2005 Appendix B, the local water authority requirements will be adopted.

For the installed reticulated hydrant systems the minimum water flow rate and pressure is to be 10 L/S @ 200 Kpa as per AS 2419.1 2005 Table 2.2 (for buildings with Class 2-9 only). In a local government authority where a local water authority specifies a flow rate and pressure above the requirements of AS 2419.1 2005 Table 2.2, the local water authority requirements will be adopted.

For fire truck access, a minimum width and height clearance for roadways is required. Constructed roads must comply with Government legislation such as the “Road Planning and Design Manual”.

2. Introduction

Queensland Fire and Emergency Services (QFES) is the primary provider of fire and rescue services throughout Queensland. QFES is responsible for community safety, the protection of people, property and the environment from fire and chemical incidents and, in conjunction with other agencies, the rescue of people trapped in vehicles, buildings and other emergency situations.

The loss of life and property damage by fire in residential, commercial and industrial premises is a major concern to QFES, and for this reason, these lot reconfigurations need to be designed to provide ready access for fire trucks, whilst providing a fire fighting water supply from a hydrant system.

Water supply and access requirements for material change of use or reconfiguring a lot within this document are a planning tool and advice for building and developer applicants, it is not the intent of this document for land development applications to be referred to QFES. They outline fire safety requirements to enable QFES to efficiently manage fire incidents.

This document reflects Queensland Government policy of promoting sustainable development that achieves economic, social and environmental objectives, including safety. The provisions are flexible allowing planners and designers to economically achieve safety objectives without compromising aesthetics or amenity.

3. Where Do These Guidelines Apply?

These guidelines apply to all material change of use or reconfiguration of a lot that will include streets and common access ways within a common private title in areas serviced by reticulated water within Queensland, for residential buildings, both attached and detached commercial or industrial buildings that are not covered in other legislation or planning provisions.

For example, this would apply to planned townships or reconfigurations regardless of current fire service intervention.

4. Water Supply Specification

Installed reticulated hydrant systems are to be located on roadways or access ways for all material change of use and reconfigured lots for fire fighting purposes as per AS 2419.1 2005 Appendix B that provides a minimum standard for hydrant intervals. In a Local Government Authority where a local water authority specifies a design and performance criteria above the requirements of AS 2419.1 2005 Appendix B, the local water authority requirements will be adopted.

For the installed reticulated hydrant systems the minimum water flow rate and pressure is to be 10 L/S @ 200 Kpa as per AS 2419.1 2005 Table 2.2 (for building Class 2-9 only). In a Local Government Authority where a local water authority specifies a flow rate and pressure above the requirements of AS 2419.1 2005 Table 2.2, the local water authority requirements will be adopted.

4.1 Hydrant Provision:

Hydrant Provision	
Expectation	Acceptable Outcomes
Where reticulated water is available, operable hydrants are to be provided.	Hydrants above or below ground should be provided and maintained to the minimum required performance standard as per AS 2419.1 2005.

Rationale:

Firefighters use water as a prime extinguishing medium for structure fires. Reticulated water mains have hydrants placed at regular intervals to enable firefighters to connect into the reticulated system. The water is pressurised by pumps in the fire truck and delivered via hoses to the fire.

Figure 1 illustrates hydrant locations on reticulated water mains.

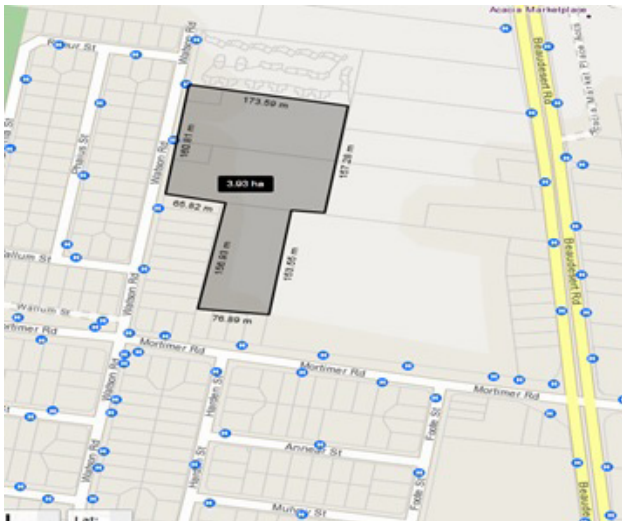


Figure 1 – Reticulated Hydrant System



Figure 2 – Use of Hydrant System

4.2 Hydrant Markers

Hydrant Markers	
Expectation	Acceptable Outcomes
Hydrants are suitably identified so that firefighters can locate them at all hours.	Blue cats eyes are preferred for sealed roads. Marker posts at the fence line should be used to identify hydrants where there is an unsealed road as road (HR) or path (HP) hydrants. The Figures 3-6 are examples of marker locations.

Rationale:

Firefighters need to quickly locate water supplies in emergencies. Hydrant indicators need to be visually identifiable from both directions by the approaching fire truck crews and must identify the location of the hydrant.



Figure 3 – Hydrant Markers

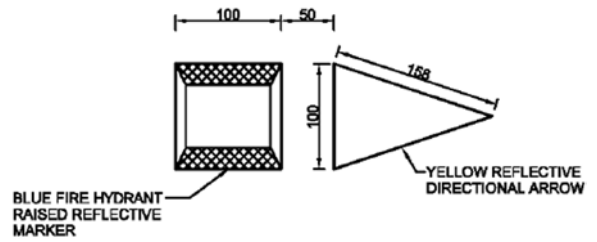
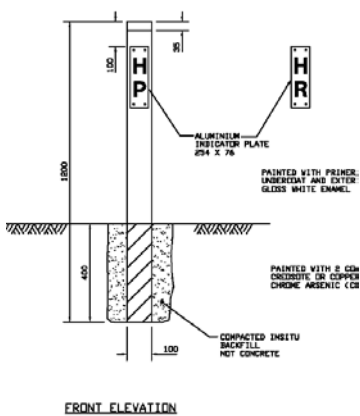


Figure 5 – Marker/directional arrow spacing detail



- INDICATOR PLATES**
- 254 x 76 aluminium indicator plate.
 - Fix top and bottom with galvanised clouts.
 - HP indicates hydrant located in footpath.
 - HR indicate hydrant located in road carriageway.

Figure 4 – Hydrant marker posts

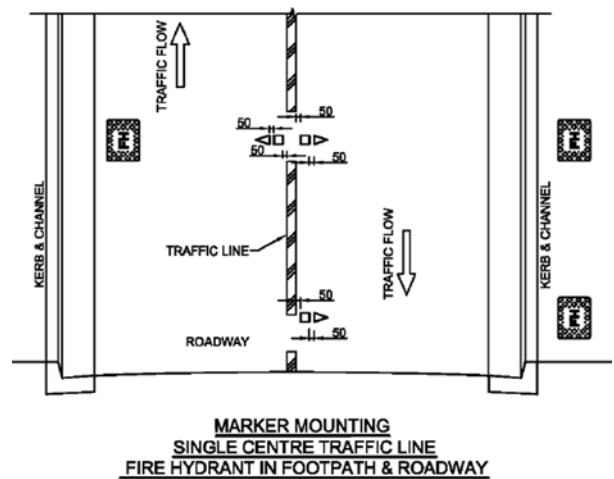


Figure 6 – Location of cats eyes on a sealed roadway

4.3 Hydrant Location

Hydrant Location	
Expectation	Acceptable Outcomes
Hydrants are located in positions that will enable firefighters to access water safely, effectively and efficiently.	<p>Residential Streets and Accessways</p> <p>Above or below ground fire hydrants should be provided at not more than 120m intervals along residential streets and at each street intersection. Above ground fire hydrants may be single outlet.</p> <p>Commercial and Industrial Streets and Accessways</p> <p>Within streets serving commercial properties such as factories, warehouses and offices (building classes 2-9 not requiring hydrants by NCC), above or below ground fire hydrants should be provided at not more than 90m intervals and at each street intersection. Above ground fire hydrants should have dual valved outlets.</p>

Rationale:

Upon arriving at a structure fire, firefighters site the fire truck with considerations to safety, access to the fire, other responding trucks and accessible water supply for fire fighting purposes. Firefighters have an expectation that fire hydrants will be located on reticulated water systems no more than 120m apart as per AS 2419.1 2005, Appendix B. QFES equipment, procedures and the training of personnel is based on this preferred standard of fire hydrant placement and associated access requirements.



Note: Hydrants should be located at each intersection. With this in mind hydrant interval distances should not exceed 120 metres.

Figure 6 – Hydrant System design to minimum standards

5. Vehicle Access Requirements

Fire service vehicular access is to enable the service to intervene to fight the fire, assist with evacuation and stop the spread of fire to another building.

A minimum roadway clearance of 3.5m wide by 4.8m high is required for a fire truck. Constructed roads must comply with Government legislation as specified in the “Road Planning and Design Manual”.

5.1 Road Width and Height

Road Width and Height	
Performance Outcomes	QFES Acceptable Outcomes
Roads are wide enough for fire trucks to gain access to a safe working area close to dwellings and water supplies whether or not on-street parking spaces are occupied.	Constructed roads must be as specified in the “Road Planning and Design Manual”.

5.2 Road Construction

Road Construction	
Performance Outcomes	QFES Acceptable Outcomes
Roads must be constructed to facilitate the safe passage of a laden fire truck in all weather conditions.	Roads must be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width as specified in the “Road Planning and Design Manual”.

For specific details on QFES fire trucks, please refer to appendix 1 or contact QFES. Contact details for specific areas are available at www.qfes.qld.gov.au/buildingsafety/Pages/default.aspx.

5.3 Road Grades

Road Grades	
Performance Outcomes	QFES Acceptable Outcomes
Grades of roads must facilitate the safe passage of fire trucks.	The average grades, dips, and exit angles must be addressed as specified in the “Road Planning and Design Manual”.

Rationale:

Steep slopes affect the free movement of trucks and hinder safe fire fighting. Severe short dips may limit access due to the overhang of the body from the wheels.

5.4 Turning Bays

Turning Bays	
Performance Outcomes	QFES Acceptable Outcomes
Provision is made for fire trucks to turn at the end of dead end roads.	Constructed roads more than 60m in length from the nearest intersection must have a turning circle with a minimum radius of 8m (including roll-over kerbs if they are provided). Other solutions using T or Y heads of specified dimensions are also appropriate. See figure 2 in the “Road Planning and Design Manual” .

Rationale:

It is dangerous for emergency vehicles to be required to reverse along roads for excessive distances in urban areas. Turning is normally carried out after the incident is under control when emergency movement is not required. Even then, large trucks reversing in residential areas create safety concerns. Fire trucks occasionally need to seek an alternative route necessitating a 180 degree turn in emergency conditions. Using a three point turn, fire trucks require a turning circle radius of 8m to turn safely. Alternative designs using specified T or Y heads are also appropriate. This area needs to be clear of obstructions.

Turning Examples

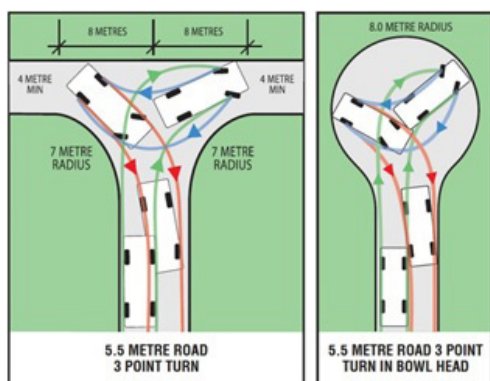


Figure 7 – Vehicle Turning Provisions

Appendix 1

Vehicle		Dimensions (in metres)										Tyres			Weights (in kilograms)				OEM Weights (in kilograms)				Turning Circle (in metres)	
Vehicle Description	Height	Head Clearance (H1)	PO	LA	DA1	DA2	RO	UR	Total Length	W	Tyres		Weights (in kilograms)				OEM Weights (in kilograms)				Turning Circle (in metres)			
											W	W	AL-F	AL-1	AL-2	Gross Mass	F	L1	L2	Gross Mass	F	L1	L2	Wallo to Wall
1 Urban Pumper - Medium (Type 1 - U1M2) Soma P200	3.100	3.800	1.865	4.300			2.470	6.770	8.215	2.510	1.250	305/70R22.5	6.500	3000	15000	15000	7100	13500	18600	16.5	15.2			
2 16m Telescop. Aerial Pump (Type 4A - U1P4M) (Type 2 - U1P4M2) (Type 1 - U1P4M1) (Type 3 - U1P4M3)	3.700	4.100	1.225	5.720			2.100	7.820	9.045	2.450	1.225	11R22.5	6.000	9000	15000	15000	6300	10400	16000	23.0	22.0			
3 4x2 Pumper / Tanker - Light (Type 1 - U1P4M2) (Type 2 - U1P4M1) (Type 3 - U1P4M3)	3.000	3.200	1.195	4.250			2.055	6.385	7.580	2.440	1.220	11R22.5	3.300	7700	11000	11000	3100	7700	11000	19.8	17.4			
4 4x2 Pumper / Tanker - Medium (Type 2 - U1P4M2) (Type 1 - U1P4M1) (Type 3 - U1P4M3)	3.500	3.500	1.245	4.280			2.055	6.335	7.580	2.440	1.220	11R22.5	5.100	9000	13500	13500	5100	9000	13500	22.1	19.6			
5 4x2 Pumper Tanker - Medium (Type 2 - U1P4M2) (Type 1 - U1P4M1) (Type 3 - U1P4M3)	3.226	3.500	1.440	4.600			2.144	6.744	8.134	2.450	1.225	305/70R22.5	6.000	9000	15000	15000	6000	9000	15000					
5a 4x2 Pumper Tanker - Medium (Type 2 - U1P4M2) (Type 1 - U1P4M1) (Type 3 - U1P4M3)	2.910	3.500	1.365	4.500			2.110	6.410	8.100	2.470	1.235	305/70R22.5	6.000	9000	15000	15000	6000	9000	15000	23.0	20.0			
5b 4x2 Pumper Tanker - Medium (Type 2 - U1P4M2) (Type 1 - U1P4M1) (Type 3 - U1P4M3)	3.100	3.600	1.600	4.610			2.310	6.940	8.540	2.470	1.235	305/70R22.5	6.000	9000	15000	15000	6000	9000	15000	18.1	16.0			
5c 4x2 Pumper Tanker - Medium (Type 2 - U1P4M2) (Type 1 - U1P4M1) (Type 3 - U1P4M3)	3.200	3.600	1.600	4.800			2.340	7.140	8.600	2.500	1.250	305/70R22.5	4.700	9000	13900	13900	4700	9000	13900	22.3	20.7			
6 Hydraulic Medium Telescopic Ladder (Type 6 - U1A20) Soma P134 (8x4)	3.750	4.300	1.370	5.900			1.350	2.890	10.140	2.450	1.225	275/70R22.5	10.500	18200	28700 (ATC)	14200	9200	9000	33000	30.7	29.1			
7 Hydraulic Medium Telescopic Ladder (Type 6 - U1A20) Soma P145 (8x4)	3.600	4.180	1.488	4.088			1.360	2.885	7.644	2.500	1.250	275/70R22.5	7.000	14650	21650 (ATC)	8000	10500	10500	26000					
7a Hydraulic Medium Telescopic Ladder (Type 6 - U1A20) Soma P130 (8x4)	3.700	4.180	2.100	4.900			1.355	2.860	8.805	2.500	1.250	305/80R22.5	11.000	20246	33800 (ATC)	16000	12000	13000	40000	23.0	22.0			
8 Urban Pumper - Light (Type 1 - U1M2) Mercedes Atego	2.900	2.900	1.440	4.160			2.820	6.420	7.860	2.500	1.250	305/70R19.5	6.000	9000	15000	15000	6100	10500	16000	19.4	17.1			
9 Urban Pumper - Medium (Type 1 - U1M2) Soma P160 (8x4)	2.960	3.150	1.750	4.500			2.810	6.600	8.350	2.500	1.250	275/70R22.5	6.000	9000	15000	15000	7100	11500	18600	18.4	16.8			
10 Urban Pumper Tanker - Heavy (Type 2 - U1M2) Soma P160 (8x4)	3.064	3.150	1.613	4.520			2.864	8.144	9.757	2.450	1.225	305/70R22.5	6.000	16050	22500	22500	7100	9500	26000	26.8	19.2			
11 4x4 Pumper / Tanker Light (Type 2 - U1M2) (Type 1 - U1M1) (Type 3 - U1M3)	2.700	3.129	1.270	4.200			1.800	6.000	5.900	2.450	1.225	8.25R20	3.170	6810	10000	10000	3170	6800	10000	17.4	15.2			
12 4x4 Pumper / Tanker Medium (Type 2 - U1M2) (Type 1 - U1M1) (Type 3 - U1M3)	3.300	3.300	1.560	4.250			2.264	6.514	7.600	2.460	1.230	275/70R22.5	5.400	9000	13000	13000	5400	9000	13000	20.5	18.0			
13 Hammet Tender Light (Type 8 - U1A21) Mercedes Sprinter Van	2.610	2.800	0.899	4.025			1.625	5.650	6.589	1.988	0.994	195/70R15	1.790	3000	4460	4460	1790	3000	4490	14.3	13.6			
14 Hammet Tender Heavy (Type 8 - U1A21)	3.500	3.500	1.613	5.527			1.350	2.265	9.142	2.440	1.220	275/70R22.5	6.000	16000	22500	22500	7100	9500	26000	24.2	21.8			
15 Hammet Tender Medium (Type 8 - U1A21)	3.600	3.700	1.700	5.380			2.240	8.320	10.020	2.500	1.250	305/70R19.5	6.000	10000	16000 (ATC)	16000 (ATC)	6100	10500	16000	24.2	21.8			
16 Rescue Tender Light (Type 5 - U1M1)	2.640	2.800	0.950	4.600			1.900	6.500	6.600	2.400	1.200	225/70R16.5	2.790	6150	8650	8650	2730	6150	8650	16.5				
17 Rescue Tender Medium (Type 5 - U1M1)	3.100	3.800	1.750	4.180			2.270	6.450	8.100	2.500	1.250	305/70R19.5	6.000	9000	15000	15000	6100	10500	16000	16.5	15.2			
17a Rescue Tender Medium (Type 5 - U1M1)	3.200	3.800	1.700	4.300			2.480	6.790	8.480	2.500	1.250	305/70R19.5	6.000	9000	15000	15000	7500	11500	16000	16.5	15.2			
18 Urban Incident Support Vehicle - Command	3.800	3.900	1.440	4.160			2.640	6.800	9.150	2.500	1.250	305/70R19.5	6.000	9000	15000	15000	6100	10500	16000	19.4	17.1			

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