QUEENSLAND UrbanUtilities

PRIVATE FIRE SYSTEMS GUIDELINE

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This guideline provides an overview of Queensland Urban Utilities' responsibilities in the design and supply of private fire systems. It is recommended for builders, designers, installers, developers, property owners, fire system managers and maintenance contractors for building classifications which require Prescribed Fire Safety Installations under Queensland legislation.

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1. OVERVIEW

Queensland Urban Utilities provides drinking water and sewerage services to its customers.

Queensland Urban Utilities is a drinking water and sewerage service provider registered with the Queensland Department of Energy and Water Supply.

Our drinking water and sewerage services are regulated, and provided via infrastructure networks designed to meet technical standards applicable to our network and provide domestic grade services to our retail customers.

In addition to providing regulated services (subject to approvals, network capacity and service reliability constraints), we permit water to be drawn from our water network for private fire systems. This permission provides for more economic building construction, by providing access to a water source that is acceptable for achieving building standards compliance. Private fire systems are generally supplied by a combination of on-site water sources (such as tanks) and utility water mains, where available.

Property owners are responsible for the design, installation and maintenance of water supply to private fire systems (and typically engage hydraulic designers to do this on their behalf).

Queensland Urban Utilities provides customers with water services suitable for supply to domestic fixtures, and does not design, assess, maintain or ensure the suitability of water supply to private fire systems.

Private fire systems, including private hydrants, sprinklers and hose reel systems, are regulated by the *Queensland Building Act*, the *Queensland Development Code* (QDC) and relevant technical standards prescribed by the *Building Code of Australia* (BCA).

Building designers and property managers are responsible for engaging hydraulic designers to design, install, and maintain water supply for private fire systems that meet the minimum performance levels required by the relevant building standards or codes for the life of the fire system.

Private fire systems can be supported by available capacity in Queensland Urban Utilities' drinking water network. This can reduce on-site requirements, such as the need for on-site tanks or pumps. However, the available capacity of our network can vary over time due to changes in the operation of our network and customer demand.

The minimum flow and pressure requirements for private fire systems mandated by Building Codes Queensland generally exceed the design and operation of Queensland Urban Utilities' network. We do not guarantee minimum flows or pressures for private fire systems. Use of our drinking water network to supply a private fire system is at the risk of the building designer or property manager.

We can provide advice to hydraulic designers on design and connection options for using our network to supply a private fire system via a Services Advice Notice.

2. CONNECTIONS TO QUEENSLAND URBAN UTILITIES' NETWORK

2.1 Connecting to our network (Water Approval Process)

Queensland Urban Utilities is the assessment manager for water and sewerage servicing-related aspects of development within our service area.

Assessments are undertaken in accordance with a legislated 'Water Approval Process'. A Water Approval is required where the demand on the water or sewerage network changes as a result of development activities, or where an existing connection is altered in some way.

Water Approval applications for new or altered connections are assessed against Queensland Urban Utilities requirements, including but not limited to the following standards and guidelines:

- SEQ Water and Sewerage Design and Construction Code (SEQ Code)
- Queensland Urban Utilities Customer Charters
- Water Netserv Plan (Part A) - Connections Policy

For more information visit www.urbanutilities.com.au/developmentservices

2.2 Requirements of new water connections and private fire systems

A Water Approval is required where an applicant proposes to connect a private fire system to Queensland Urban Utilities' drinking water network.

The design of new or altered connections to the water network must be in accordance with the SEQ Code. Our initial assessment of a connection application does not:

- approve the design of the connection or its suitability to service a private fire system , nor check for compliance with relevant building legislation, codes and standards; or
- guarantee that the drinking water network will deliver a particular flow rate or pressure to a private fire system.

The design and compliance of private fire system water supply is provided by building industry design and certification processes and legislation. Applicants, supported by their consultants and certifiers, are responsible for ensuring that private fire system water supply is fit for purpose, compliant with relevant building standards, and will provide the required flow rates, volumes and pressures.

2.3 Seeking advice from Queensland Urban Utilities on private fire systems

Although we do not assess the compliance of private fire systems against building codes and standards, we can provide advice on the performance of the drinking water network, including available flow and pressure.

2.3.1 Services Advice Notices

At any time in the development or building design processes you can request a Services Advice Notice to gain information to evaluate the feasibility of a development, including hydraulic information for the design of private fire systems.

Hydraulic network modelling

We can provide an approximation of the expected hydraulic performance of the drinking water network at a proposed point of connection. This assists in determining an appropriate minimum 'design' mains residual pressure.

We provide this data in the form of a theoretical flow and pressure curve derived from a hydraulic computer model. This modelling reflects the operation of the network, and generally accounts for factors that cause pressure variation under field conditions.

However, there are limitations to the accuracy of theoretical flow and pressure advice, such as hydraulic losses across hydrant or service connection pipework, valves and fittings. Applicants and their hydraulic designers are responsible for independently verifying the theoretical network performance provided in a Services Advice Notice (via field testing and hydraulic analysis), and assessing the limitations of the drinking water network.

AS2419.1 Appendix F: Determination of Water System Supply Pressure sets out methods for determining residual pressures in a water supply system, and can be referenced where we can only supply limited information about our network.

Note: We recommend comprehensive testing and hydraulic analysis of the private fire system throughout the building process. Under the building standards, a building must pass on-site commissioning flow and pressure performance tests before building certification can be issued and before the Queensland Fire Service will permit occupancy. Failure to meet these requirements can result in significant project completion delays and unscheduled costs to rectify the water supply design performance.

Alternative infrastructure arrangements

We can provide 'in principle' advice if you propose to reconfigure or alter our network in order to satisfy hydraulic requirements for private fire systems. Refer to section 3.6 for more information.

2. CONNECTIONS TO QUEENSLAND URBAN UTILITIES' NETWORK (CONTINUED)

2.3.2 Application assessment – Requests for Information

When assessing applications for new or altered water connections, we do not consider:

- whether the water mains will provide the necessary hydraulic performance to meet flow or pressure requirements specific to a building or facility.
- whether a new or modified connection will provide the hydraulic performance required by the private fire system.

However, Queensland Urban Utilities may issue the applicant a Request for Information (RFI) if the assessment identifies that:

- a development is likely to require a private fire-fighting system, or
- the applicant is proposing to connect to a reticulated water main with limited hydraulic capacity (such as small diameter mains, or in areas with restrictive topography).

An RFI (see Appendix 1 for an example) is intended only as a courtesy to applicants - to prompt identification of potential design constraints affecting the design of private fire systems early in the development process.

2.3.3 Advice for fire systems that have failed to meet performance requirements

Following the installation of a new or altered water connection compliant with the SEQ Code (and payment of all applicable charges), we will issue a Connection Certificate to confirm that civil works were completed in accordance with Water Approval conditions. A Connection Certificate is not a validation that a private fire system is performing correctly, fit for purpose or compliant with relevant building legislation, codes and standards.

In accordance with Queensland building legislation, most private fire systems are subject to private building commissioning and certification performance tests, and regular maintenance compliance checks

If the private fire system does not meet performance requirements, qualified building hydraulic services providers should be engaged to undertake a rigorous assessment to identify the cause of performance deficiencies and rectification. Industry providers or associations (such as the Association of Hydraulic Consultants of Australia) may be contacted to find an appropriate hydraulic services provider.

As Queensland Urban Utilities does not design, install or maintain private fire system water supplies, we do not directly resolve performance issues with private fire system performance. Building designers and property managers should seek resolution of any private fire system flow or pressure issues by sourcing the services of a building hydraulic services provider specialising in this work.

We can assist the consultant in identifying solutions which may help the private fire system achieve compliance via a Services Advice Notice (section 2.3.1).

If the consultant recommends network infrastructure works to increase the available flow or pressure from the network connection point, a Water Approval from Queensland Urban Utilities is required.

3. DESIGN CONSIDERATIONS FOR PRIVATE FIRE SYSTEMS

3.1 Customer service standards – flow and pressure

Our Residential and Commercial Customer Charters outline the hydraulic performance of water supply in most urban areas at the connection to the property as:

- water pressure: not less than 21 metres head of water in all other areas.
- water flow: 25 litres per minute in all areas except those designated as trickle feed.

To determine the theoretical flow and pressure available at a proposed point of connection, applicants should request a Services Advice Notice (see section 2.3).

The hydraulic performance of the drinking water network changes over time in response to customer demands and operational changes. In addition, we periodically adjust and reconfigure the network as part of normal operation, maintenance and optimisation activities.

Our network is not planned, built, operated or configured to provide specific flows or pressures to hydraulic systems with specialised and variable water supply requirements such as private fire systems.

Whilst we attempt to minimise customer impacts where possible, the water supply network's characteristics may change at any time. Due to the variable nature of the network, developers and their hydraulic consultants are responsible for carefully assess their technical assumptions and reliance on the network as part of the on-site supply, when designing and commissioning private fire systems.

3.2 Field tests of the drinking water network

Field testing to ascertain actual network performance is strongly advised.Third party contractors must obtain a Network Access Permit to undertake testing on our water infrastructure, including street hydrants.

We maintain a list of independent contractors with pre-approvals to conduct tests that require access to our street hydrants. They can be engaged to conduct off-site testing for private fire system water supply design, investigation or compliance purposes.

Visit our website for the list of pre-approved contractors: www.urbanutilities.com.au/development-services/help-and-advice/find-a-contractor

Queensland Urban Utilities can assist investigations by providing technical advice regarding off-site test results and potential supply augmentation solutions. We cannot assist consultants, or their clients, when only on-site test measurements are made, as the hydraulic losses through the various valves, fittings and fixtures between the water main and private fire system makes network supply pressures impossible to verify accurately.

3.3 Drinking water network design standard - SEQ Code

The SEQ Code is the technical standard for the design and construction of drinking water supply infrastructure. To ensure commonality across the SEQ region, we plan and design new drinking water network infrastructure to these standards.

The SEQ Code is a design standard used specifically for sizing and specifying new works, and is not a customer service standard. In-service connection performance standards for customers are separately published in the Queensland Urban Utilities Residential and Business Customer Charters.

3.4.1 Reference to private fire systems

The SEQ Code notes that South East Queensland water service providers do not:

- evaluate the efficacy of private fire systems or ensure their compliance with relevant building legislation, codes and standards
- guarantee a particular flow or pressure to a customer service connection being used to supply a private fire-fighting system.

3. DESIGN CONSIDERATIONS FOR PRIVATE FIRE SYSTEMS (CONTINUED)

3.5 Drawing from Queensland Urban Utilities' water network to supply a private fire system

We plan and design the drinking water network in accordance with the SEQ Code (see *Table 4.1 of the SEQ Code*). The Code specifies the town mains capacity desired to provide a general level of water supply for wide areas (comprising a mixture of development types that develop and change over several decades), but does not specify design flows or pressures for individual water services, nor specify design criteria targeted at achieving or maintaining building private fire system performance compliance.

The SEQ Code prescribes design criteria for new works as follows:

- a minimum pressure in the Queensland Urban Utilities mains of 22 metres head (~216 kPa) for standard supply areas
- 12 metres head (~118 kPa) for low pressure supply areas, under domestic supply network load conditions.

To service a private fire system, hydraulic designers can incorporate on-site solutions, such as water tanks or pumps, and off-site water mains or service connection infrastructure.

Designers should evaluate the risk of direct mains draw as the flow or pressure availability from the town mains may change over time. Building fire system designs with on-site fire tanks, or the provision for possible future on-site tanks, are generally less prone to building compliance issues and costly building retrofits over the lifetime of the building

3.6 Upgrades to the drinking water network to improve available flow and pressure

Our Water Netserv Plan - Connections Policy acknowledges that infrastructure augmentation of Queensland Urban Utilities' network mains is an option for achieving the performance requirements of private fire systems. In certain areas within our drinking water network, an upgrade to our infrastructure (typically increased pipe sizes and/or duplicate pipes) can be a cost effective and efficient alternative to on-site pumps and tanks.

When issuing a Water Approval, we will condition water main upgrades where a proposed development triggers an upgrade as per the SEQ Code Design Criteria. We do not condition water main upgrades in order to satisfy the performance of private fire systems. However, building designers or property managers (with advice from hydraulic consultants) may elect to upgrade town mains as an alternative to installing private fire-fighting assets.

We can assist with advice (via a Services Advice Notice, see section 2.3.1) on the potential suitability of infrastructure upgrades to help applicants satisfy relevant building legislation, codes and standards for private fire systems. However, the provision of such advice is for information purposes only. Where applicants rely on infrastructure upgrades to ensure compliance, applicants and their hydraulic consultants are responsible for validating and accepting the suitability of infrastructure upgrades as an alternative to private tanks and pumps.

Appendix 1 – request for information example

APPLICATION FOR WATER APPROVAL	
DEVELOPMENT SERVICES – REQUEST FOR INFORMATION	
Note on fire systems reliant on Queensland Urban Utilities' Town Mains	Please note that Queensland Urban Utilities does not guarantee minimum flow or pressure to private fire-fighting systems (or meet private fire-fighting requirements). Our Customer Charters outline a minimum of 210 kPa static pressure, and a minimum flow rate of 25 litres per minute, at the connection to each serviced property. While the available flow and pressure in the majority of Queensland Urban Utilities' drinking water network significantly exceeds the minimum Customer Service Standards, the additional capacity is circumstantial and not guaranteed. Due to changing operational circumstances, the available flow and pressure in every Queensland Urban Utilities town main may vary over time. Applicants and their hydraulic service designers are advised to make suitable provision during the design process (acknowledging that the hydraulic performance of town mains may change over time) to ensure that private fire systems are compliant with applicable standards.
Note on fire system design	The field performance of water mains (in particular, cast iron mains) can be variable. For design purposes, field testing to ascertain actual mains performance is strongly advised.
Request For Information	If this development is reliant on a private fire-fighting system, please confirm (in writing) that either: (a) the internal hydraulic design will be completed at a later date, and will incorporate the limitations of the water supply QUU network; or (b) field investigations into the QUU drinking water network have been undertaken, and any hydraulic design assumptions relating to the private fire-fighting system have been validated.