



Legionella
Management
Advisory Group

ALTERNATIVE SOLUTION

WARM WATER PIPING SYSTEM



The Plumbing Code of Australia (PCA) sets the requirements for an Alternative Solution based on existing or new innovative building, plumbing and drainage products, systems and designs;

“Alternative Solution means a Plumbing or Drainage Solution which complies with the Performance Requirements other than by reason of satisfying the Deemed-to-Satisfy Provisions”.

It is up to the relevant Local Authority who conducts an assessment against an Alternative Solution for a proposed Warm Water piping system to determine that the proposed solution, complies with the Performance Requirements outlined in the PCA.

The PCA states that an Alternative Solution must achieve the Deemed-to-Satisfy Provisions, which are deemed to satisfy the Performance Requirements. Additionally, a functional statement is required as part of the Alternative Solution, the statement shall describe how the proposed Warm Water Piping System solution achieves the objectives of the Performance Requirements.

General Submission Requirements

In order for Local Authority to consider an Alternative Solution for a proposed Warm Water Piping System. It must first have all of the relevant information required to allow the Local Authority the ability to determine the submission.

As a general guide a submission shall incorporate the following elements:

1. Proposed location of the Warm Water Piping System Alternative Solution
2. The qualifications of the person who has designed the proposal, including relevant experience in designing a Warm Water Piping System Alternative Solution.
3. Details of the proposed Warm Water Piping System Alternative Solution, including all relevant design plans, product specifications, and other supporting documentation.
4. Details of the relevant Performance Requirements.
5. The Assessment Method or methods used to establish compliance with the relevant Performance Requirements.
6. Details of any **Expert Judgment** relied upon including the extent to which the judgement was relied upon, and the qualifications and experience of the expert who has provided the judgment.
7. Details of any tests or calculations used to determine compliance with the relevant Performance Requirements.
8. Details of any Australian Standards or other information which the proposed Warm Water Piping System Alternative Solution is relied upon.
9. Provide a copy of the Building Maintenance Schedule including monitoring processes, training of employee’s on maintenance of the proposed system, and Water Risk Management Plan.
10. Provide a copy of the Commissioning procedure and, or Disinfection Procedure.

11. Provide a copy of the Water Quality Test (to be carried out by a qualified NATA third party).
12. Please note: some Local Authorities may have an application submission form that must be completed and submitted with your proposed Warm Water Piping System Alternative Solution.
13. The above points should only be considered as a general guide, it is recommended that applicant's first check with relevant Local Authority to confirm the specific requirements and documents required to be submitted in order for their Alternative Solution to be considered.

The submission shall also list the Performance Requirements of the proposed product and, or design related to the specific site installation requirements. Supporting documents shall include a hydraulic services design plan in accordance with the relevant Local Authority requirements.

This includes, providing the demonstrated relevant evidence and qualifications of the Registered Practising Engineer Queensland (RPEQ) and, or licenced Hydraulic Designer, (as per QBCC Licence Contractor requirements). Submissions for a Warm Water Piping System Alternative Solution shall be addressed to the relevant Local Authority and incorporate the specific requirements outlined within Appendices of this document.

Maintenance Log for Warm Water Valve

WARM WATER PERFORMANCE CHECKING AND MAINTENANCE LOG										
DATE	WARM WATER TEMP CHECK		DIFFERENTIAL PRESSURE CHECK	COLD WATER SUPPLY FAILURE TEST	HOT WATER SUPPLY FAILURE TEST	STRAINERS CLEANED	UV HOURS RUN	UV TUBE(S) CLEANED/REPLACED	OTHER CHECKS/ COMMENTS	NAME & SIGNATURE
	At furthest outlet and max flow	At nearest outlet and min flow								
				Max Temp after cold shut	Max Temp after hot shut					
				Confirm flow stops	Confirm flow stops					
				Max Temp after cold opened	Max Temp after hot opened					
				Stabilised Temp after cold opened	Stabilised Temp after hot opened					

WARM WATER PERFORMANCE CHECKING AND MAINTENANCE LOG										
DATE	WARM WATER TEMP CHECK		DIFFERENTIAL PRESSURE CHECK	COLD WATER SUPPLY FAILURE TEST	HOT WATER SUPPLY FAILURE TEST	STRAINERS CLEANED	UV HOURS RUN	UV TUBE(S) CLEANED/REPLACED	OTHER CHECKS/ COMMENTS	NAME & SIGNATURE
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				Confirm flow stops	Confirm flow stops					
				Max Temp after cold opened	Max Temp after hot opened					
				Stabilised Temp after cold opened	Stabilised Temp after hot opened					

Appendices

Appendix A - Specific requirements incorporated within a Warm Water Piping System Alternative Solution application.

1. Design Plans:

1. Site plan showing the location (property details), including dimensions, of each connection point to the service provider's water supply connection point and the relevant backflow prevention device.
2. The location of the proposed Warm Water Piping System, including its physical location, e.g. existing buildings or structures.
3. Detailed design of the proposed Warm Water Piping System design including pipe sizes, valves and backflow devices, etc.
4. Specifications of the building maintenance manual against the proposed Warm Water Piping System.
5. The proposed outlet temperatures at the last fixture e.g. basin, shower etc.
6. Hot water (55°C) supply to the proposed Warm Water Piping System.
7. The proposed supply and return temperatures from the proposed Warm Water Piping System.
8. The provisions for isolating, draining, physical cleaning, and disinfection of the system. Please note: UV systems should *NOT* be regarded as a primary disinfection process (enHealth Guidelines 2015).
9. Components listed against how the water quality will be achieved and maintained e.g. TMV, treatment system, etc.
10. Consideration of the assessed risk of the intended system users and justification that the overall risk (thermal and microbiological) is reduced by the proposed system.

Please note: in Queensland proposed designs shall comply with QBCC licencing requirements. A QBCC Hydraulic Services Designer Contractor's Licence is required to carry out design work where the contract value is more than \$1,100.

- *A person or company holding a current QBCC contractor's licence,*
- *A Registered Professional Engineer (RPEQ) with demonstrated relevant experience in designing Warm Water systems who is able to provide previous design experience.*

Appendix B - Supporting Alternative Solution submission letter to the Local Authority:

- Details of any tests and calculations used to determine compliance with the relevant Performance Requirements.
- Relevant Australian Standards used to determine the Deemed-to-Satisfy Performance Requirements.
- The reason why the Alternative Solution is required, e.g. new product, site outside of scope in relation to available Australian Standards.
- Supporting documentation of recognised approving bodies e.g. SAI Global / Standards Australia.
- Performance Requirements of the product / design related to an Australian Standard.

Appendix C - Alternative Solution - Points to Consider

Warm Water Piping Systems can present an elevated risk for microbial colonisation of the system. This is because, 'systems are designed to deliver water at temperatures conducive to the colonisation and growth of known and reportable microbial opportunist pathogens' (Legionella, Mycobacteria, Pseudomonas).

Delivery of water at temperatures of 45⁰C and less through a recirculating system will inevitably result in losses in thermal control. Drops in temperature during circulation equates to increases in microbial growth rates. In a complex water system temperature monitoring at the delivery and return points of the proposed Warm Water Piping System may not detect such thermal losses. The design must, therefore incorporate thermal efficiency of the system, e.g. minimise long runs / length of loops.

The installation of UV disinfection systems, though mandated in some jurisdictions, adds to the risk of microbial colonisation by effectively removing any residual disinfectant (Chlorine, Monochloramine) provided by the incoming water supply.

Depending on configuration for the proposed Warm Water Piping System, consideration should be given against the hot water temperatures never raising above 50⁰C. Also the requirements of the PCA for hot water storages above 60⁰C is an effective control barrier for minimising the ingress of pathogens from the potable supply. This temperature requirement is not applied to instantaneous heaters of solar / heat pump systems.

The design and installation of systems using instantaneous / solar / heat pump technologies may, depending on configuration, effectively by-pass this significant control point. In many instances hot water supplied to the system never reaches a temperature that would be disinfectant for incoming microorganisms.

This can be particularly true of instantaneous heaters where water temperatures raised above 50⁰C may only remain at that temperature for a very short time before tempering to the ideal growth range for bacteria.

Solar storages are not required to maintain water at PCA levels (60⁰C). Build-up of sediment at temperatures within microbial growth ranges is an obvious elevated risk unless they are well maintained and monitored. Failures of infrastructure downstream of the devices (boosters) may go unnoticed.

Taking into account the above considerations, an effective Warm Water Piping System Alternative Solution/Design should address the following key points:

- Provision of hot water to the system outside the growth range of likely pathogens (i.e. 60°C+).
- Installation and design parameters that control heat loss during delivery of Warm Water Piping System.
- Effective disinfection that considers both water supply and the whole Warm Water Piping System.
- Temperature / maintenance parameters for storages associated with the Warm Water Piping System

Appendix D - *The Decision Process (Queensland)*

In accordance with the provisions of the *Plumbing and Drainage Act 2018* and the *Plumbing and Drainage regulation 2019*, a Local Authority must provide the applicant with the reasons for their decision, this may be to explain why a request to consider a Warm Water Piping System Alternative Solution was approved, or refused by the Local Authority.

Appendix E - *Process for appeals against decision (Queensland)*

If an applicant is dissatisfied with the decision of the Local Authority to reject or impose conditions on the proposed Warm Water Piping System, the applicant is entitled to appeal the decision to a Building and Development Tribunal. Please note: Legal representation is not permitted.

An appeal against a Local Authority decision must be lodged within 20 business days after the day the applicant has received the decision notice from the Local Authority. Please note: if an appeal is lodged outside this timeframe, the matter is not able to be considered by the Appeals Tribunal in relation to Local Authority's decision.

Apply for appeal or declaration - How to apply

To lodge an application for an appeal or a declaration with the Development Tribunals:

- Submit a [Form 10—Notice of appeal/application for declaration \(PDF, 133KB\)](#)
- Pay the [fee](#) (speak to the Registrar about the applicable fee)
- Submit the application via:
 - Email: registrar@hpw.qld.gov.au
 - Post: GPO Box 2457 Brisbane QLD 4001
 - In person (speak to the registrar about the current registry location).

Include all relevant documents with your application, including site plans, council and private certifier notices, photos and any relevant council correspondence.