UrbanUtilities

# Fire Service Metering

Approved Equipment Updates

# SEQ Water Supply Standards

## SEQ Water and Sewerage Design and Construction Code ("SEQ Code")

- **Amended circa ~2014 to measure Fire System testing/compliance volumes**
- **Response to need to manage SEQ's water use efficiency**

### 8.8.12 Metering for Fire Services

All new fire services shall be metered in accordance with the *SEQ-SP* fire service metering policies and standards. Existing fire services, where significant alterations or renovations are proposed that require a Water Agency's Approval under the SEQ-SP's Connections Policy shall also be metered in accordance with the SEQ-SP fire service metering policies and standards. Fire services include any services supplying water to sprinkler, hydrant or hose reel systems, either separately or in any combination.

The metering arrangement to be used is dependent on the particular application. Consult individual SEQ-SPs for details of typical metering arrangements set out in their fire service metering policies and standards. Fire and domestic services shall be metered separately except for townhouse style community title scheme master meters, combined hose reel and domestic services designed in accordance with AS 2441 or where otherwise approved by the SEQ-SP.

The property service for a sprinkler system may branch off a property service used for other purposes on the service provider side of the customer connection point, avoiding the need for a separate water main connection for the sprinkler system. In such an arrangement, the sprinkler branch shall not supply any service other than sprinkler systems, and sprinkler systems shall only be supplied from the sprinkler branch. However, for multistorey buildings greater than two stories in height, the sprinkler branch may also supply hydrant and hose reel systems in accordance with AS2118.6 (but not domestic systems).

Where water delivered to a fire sprinkler system in accordance with Australian Standards Automatic Fire Sprinkler Systems AS2118.1 or AS2118.6 is proposed to pass through a mechanical meter, a performance based solution document endorsed by a registered professional engineer of Queensland (RPEQ) is to be submitted to the relevant council's plumbing services group for approval. This document is not required for non-mechanical meters such as Magflow or other meters with full bore flow and negligible headloss.

# SEQ Code
# Accepted Infrastructure Products and Materials (IPAM)

**October 2019: New Smooth Bore Electronic Meter (Ultrasonic) accepted for use**

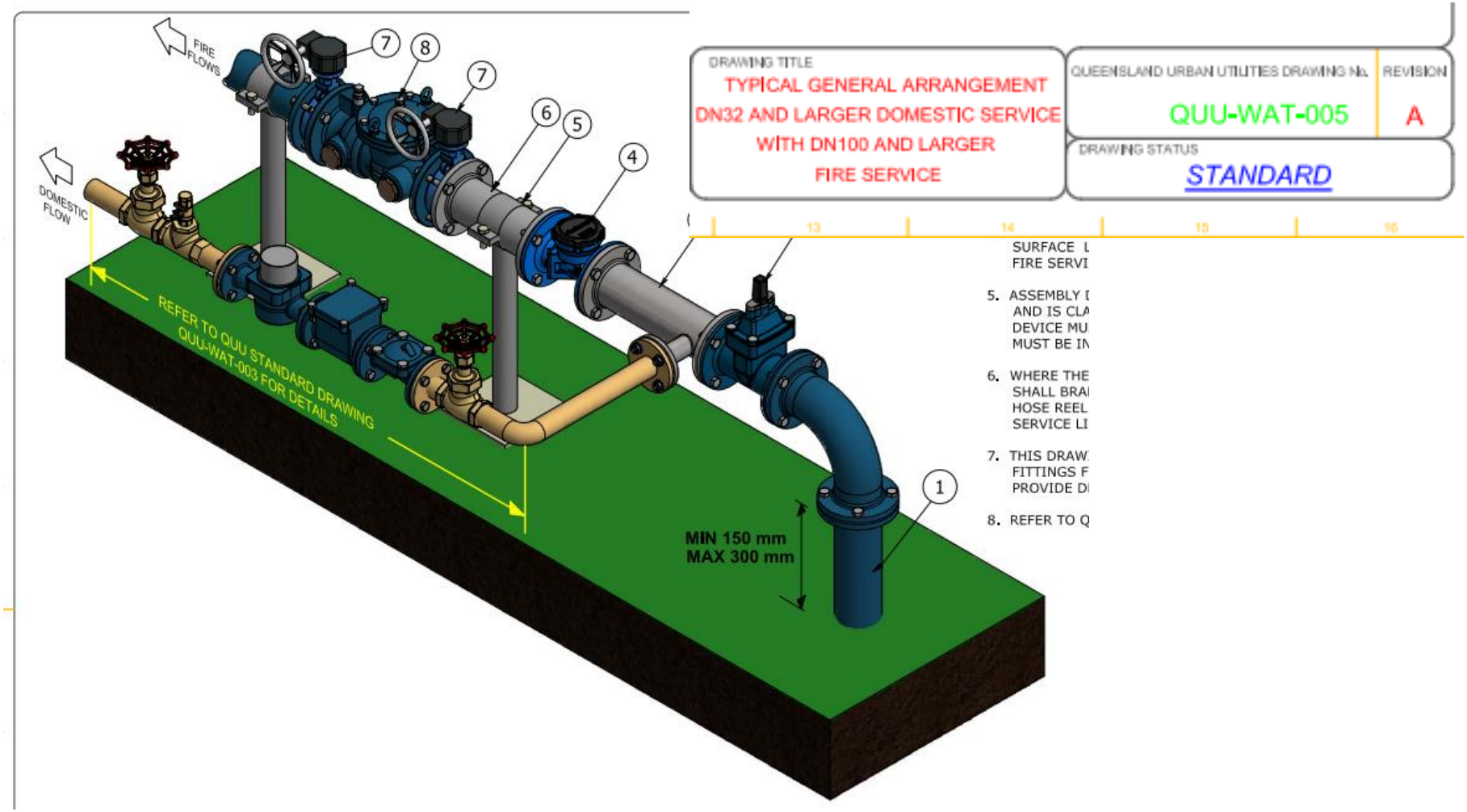
## SEQ WATER SUPPLY AND SEWERAGE DESIGN AND CONSTRUCTION CODE

| | A | B | C | D |
|---|---|---|---|---|
| 1 | **Product** | **WSAA Product Specification No. with Service Provider Specific Requirements (Version 7.4 July 2021)** | **Manufacturer / Supplier** | **Trade Name** |
| 748 | Flowmeters | **No WSA PS**<br>1 - Flange to AS4087 Figure 5<br>2 - PN16 | Arad Ultrasonica / RMC | Octave |
| 749 | | | Siemens Eletromagnetic | Siemens Mag 8000 Advanced |
| 750 | | | Siemens Ultrasonic | Siemens |
| 751 | | | E & H Electromagnetic | E & H Promag W400 |
| 752 | | | E & H Ultrasonic | E & H |
| 753 | | | Emerson | Emerson |
| 754 | | | ABB | WaterMaster<br>AquaMaster |

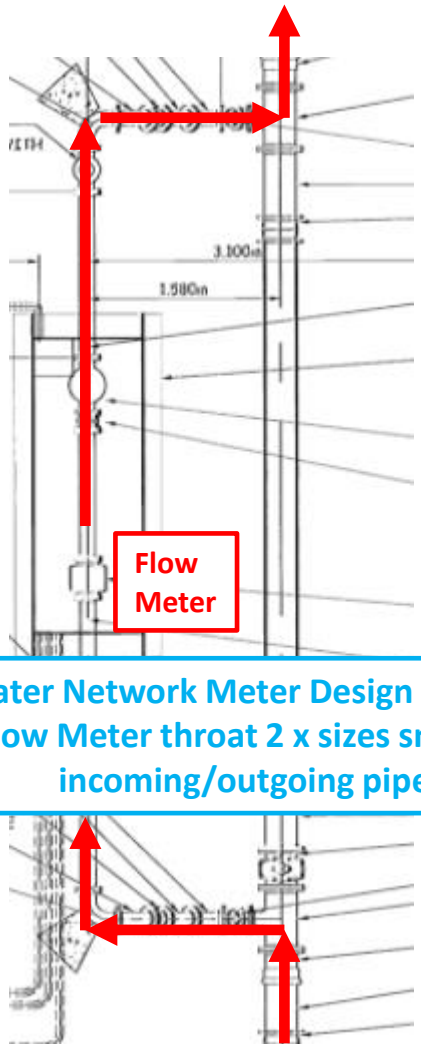
# Typical Compliant General Arrangement

## For Urban Utilities Service Area



# Water Meter Throat Sizing




Eg. Water Network Meter Design used Circa 2007
Flow Meter throat 2 x sizes smaller than incoming/outgoing pipework

Water Service Meters / Water Network Meters typically require smaller throats to create a small zone of high velocity water to measure accurately

**Appropriate Streamlining keeps hydraulic losses to very small values**

**WATER METER SIZING**

- THE WATER METER SHALL BE APPROPRIATELY SIZED BY THE DESIGNER FOR THE TYPE OF DEVELOPMENT, INTENDED PURPOSE AND REQUIRED FLOW RATES.
- THE METER AND ASSOCIATED ASSEMBLY SHALL NOT BE OVERSIZED FOR THE FLOW RATES TO BE METERED. THE METER SELECTED MUST HAVE A MINIMUM FLOW REGISTRATION FLOW RATE OF Q1<MINIMUM FLOW ANTICIPATED THROUGH THE METER, WHERE Q1 IS DEFINED BY NMI R49 AND LISTED ON THE METER MANUFACTURER'S DATA SHEET(S).
- THE METER SHALL BE SIZED TO ACCURATELY MEASURE THE MAJORITY OF THE VOLUME TO BE METERED. THE METER SELECTED MUST GENERATE WATER VELOCITIES WHEREBY 95% OF THE VOLUME ANTICIPATED THROUGH THE METER GENERATE OCCUR AT VELOCITIES BETWEEN THE METER'S Q2 AND Q3 ACCURACY BAND, WHERE Q2 AND Q3 ARE DEFINED BY NMI R49 AND LISTED ON THE METER MANUFACTURER'S DATA SHEET(S).
- THE METER ASSEMBLY SIZING GUIDE PROVIDED IN THIS SET OF DRAWINGS IS FOR REFERENCE ONLY. CORRECT METER ASSEMBLY SIZING IS THE RESPONSIBILITY OF THE HYDRAULIC ENGINEER.

# Arad Octave – Ultrasonic Water Meter

**Packaging improvement**
- Internal streamlining curved transitions to Meter Throat incorporated into the Meter Body

# Ultrasonic Meter – Metrological/Hydraulic Performance

- As per other SEQ IPAM Meters, tested and certified to the Australian National Measurement Institute standard NMI R49 (NMI R49 based on international metering standard OIML R49)
- Australian Pattern Approval certifying R49-1 *Pressure Loss Class* first issued in 2015 and subsequently amended Feb 2019
- Requires hydraulic testing by an accredited facility Eg. NATA accredited laboratory

Australian Government
Department of Industry, Innovation and Science

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

**Certificate of Approval**

**NMI 14/3/29**

Issued by the Chief Metrologist under Regulation 60 of the National Measurement Regulations 1999

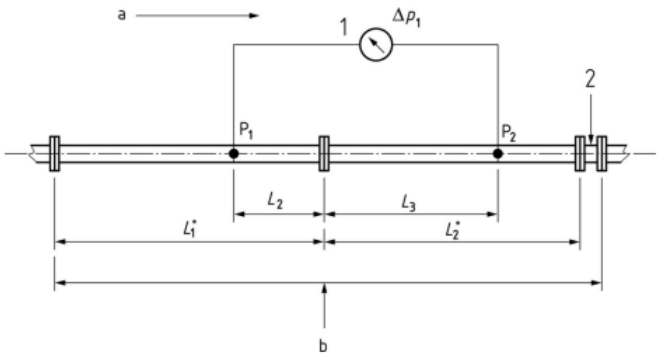
 

# Arad Octave Ultrasonic Meter – Hydraulic Performance

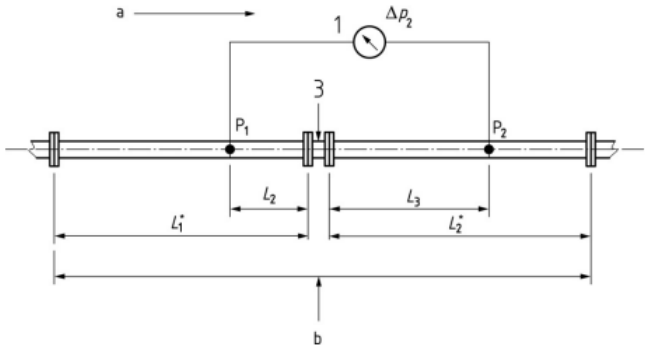
## NMI R49-2 specifies the following test arrangement for Pattern Approval certification

- Step 1: Measure the Pipe pressure loss in the Test Pipe Section
- Step 2: Measure the Pipe + Meter Pressure loss in the Test Pipe Section
- Step 3: Calculate Meter Pressure Loss by (2) – (1)

Measure the pressure loss for the pipe lengths at the previously determined flow rate $Q_t$.




a) Pipe pressure loss




**7.9.4 Calculation of the actual $\Delta p$ of a water meter**

Calculate the pressure loss, $\Delta p_t$, of the water meter at $Q_t$ by making the subtraction

$$\Delta p_t = \Delta p_{m+p} - \Delta p_p$$

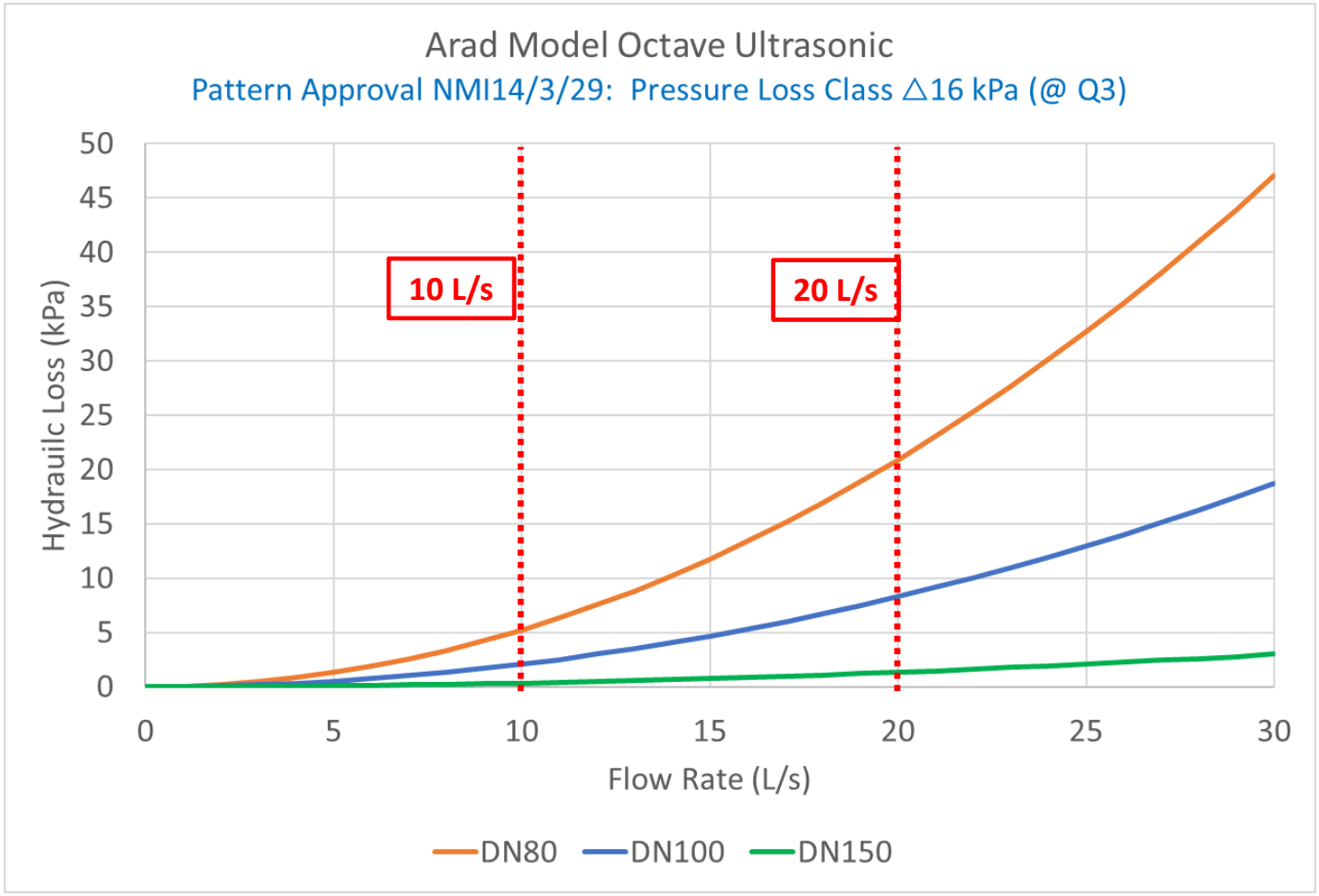
where:

$\Delta p_{m+p}$ is the measured pressure loss at $Q_t$ with the meter in place;

$\Delta p_p$ is the pressure loss measured without the meter at $Q_t$.

# Arad Octave Ultrasonic Meter – Hydraulic Performance

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