Standards Alert

Deemed-to-comply (DTC) drawings for flowmeter chambers are now available.

Flowmeter chambers are a requirement of Instrumentation & Control (I&C) Standards to:

- Increase the reliability and useful life of flowmeters
- Provide safe access to the flowmeter for operation and maintenance
- Reduce lifecycle cost and carbon footprint.

The DTC drawings provide a pre-approved solution that streamlines and reduces the cost of design and construction.

Why have the drawings been updated?

This is the second version of the DTC drawings – Flowmeters. The original version was published in 2015. At that time, flowmeters were designed for a direct buried installation with no chambers and a “run to fail” maintenance strategy.

Subsequently, business operational requirements have increased flowmeter criticality. I&C Standards have been revised to reflect chamber installations based on lessons learnt that buried flowmeters are difficult and expensive to maintain and have a lower Mean Time Between Failure due to installation conditions.

Chamber-installed flowmeters are easier to access for maintenance, condition assessment and recovery from failure.

Services congestion and space constraints make it increasingly difficult to excavate for maintenance or replacement. Such safety risks can be engineered out by installing flowmeters in chambers.

Moreover, in a prolonged excavation, critical data for identifying leakage points can be compromised or lost. This loss of information can significantly hinder the ability to address leaks effectively, potentially leading to increased costs, operational and environmental concerns.

The new DTC drawings now include full chamber installations for magnetic and ultrasonic flowmeters.

What has changed from the previous version?

Key changes from the previous version include:

- Removal of buried flowmeter installation designs from DTC
- Full chamber installation designs with gatic or lightweight covers for:
    - DN100 – DN750 magnetic flowmeters
    - DN600 – DN750 ultrasonic flowmeters

How do these changes impact users and what are the key benefits?

It is projected about 230 new flowmeters installation/ renewal in the next five years. There is no mandatory requirement to use DTC drawings. Designers are free to develop their own designs in compliance with Sydney Water’s standards.

Should the DTC (chamber-installed flowmeters) be used, some of the key benefits include:

- Lower net present cost (NPC) due to reduction in maintenance costs and complexities, with NPC turning positive between year 15 and year 20

	Net Present Cost[1]	
	Buried Flowmeter	Chamber-installed Flowmeter
Capital cost	$ 60,000	$ 135,000
Maintenance cost to maintain/ replace flowmeter[2]	$ 188,453	$ 34,314
Total	$ 248,453	$ 169,314

Notes:

1) Based on DN300 flowmeter over 100 years (life span of the concrete chamber) at 4.2% discount rate

2) A buried flowmeter has a lower service life (10 years) than a flowmeter in a chamber (minimum 15 years).

- Lower greenhouse gas emissions for each flowmeter over 100 years

	Approximate Greenhouse Gas Emissions	
	Buried Flowmeter	Chamber-installed Flowmeter
tCO2e	85	10

- Enhances operation (e.g. flow validation) and maintenance through safe access to the flowmeter
- Increases the asset life of the flowmeter by at least 50% (from 10 years to minimum 15 years) by installing the flowmeter in a chamber
- Improves asset reliability by:
    - Minimising cabling issues caused by soil settlement and facilitates simple cable replacement
    - Providing resilience to lightning strikes through better earthing mitigation
    - Facilitating regular and detailed condition assessment grading without extensive excavation, focussing on proactive maintenance over reactive maintenance
- Provides reliable data to detect pipe leakage, meet environmental standards, contributing to long-term sustainable water management
- Standardises flowmeter layout and arrangement across Sydney Water's facilities
- Streamlines the design, construction, installation, commissioning and handover
- Allows for contingency arrangements to be put in place for critical failures

When do these changes become effective?

- For projects where detailed design has commenced, the current project-specific designs can continue to be used.
- For projects where detailed design has not yet commenced, a flowmeter chamber must be included in the scope of work as per I&C Standards. Though use of DTC designs is not mandatory and alternate complying chamber designs are acceptable, these DTC drawings are available to reduce design time.

Where can I find the new version?

- iConnect
- SWDelivery Portal
- Sydney Water website

How can I provide feedback?

If you have any feedback on the DTC drawings, please email nana.keong@sydneywater.com.au.