

Trade Waste Flow Measurement and Sampling Installation Specification for Major Trade Waste Dischargers

This has been determined by consulting other Australian and New Zealand Water Corporation standards, in particular Sydney Water and Perth's Water Corporation and from advice from industry professionals.

Trade Waste Flow Metering

Specifications for Effluent Flow Metering

Flow meters must be industrial waste meters and installed in full pipe arrangements and must comply with the following requirements.

The preferred technologies are inline electromagnetic or ultrasonic sensors as they operate in a variety of flow conditions and velocities and are the most accurate type of meter. Other sensor types and pipe arrangements may be allowed upon consultation with Southern Water Wastewater Source Management Officers. This is in particular for the case of smaller trade waste contributors discharging 'clean' flow (flow that does not contain any large or fibrous particles and/or thick matter). In all cases cost efficiency to the discharger is high priority, but cost should not compromise the operational capacity and accuracy of all equipment.

Accuracy; Flow meters must have an accuracy of $\pm 2\%$ (or better) of flow rate and are to be sized sufficiently to comply with this accuracy at the lowest typical flows.

Measurement Range; Suggested velocity range is 0.3 to 8 metres per second [m/s].

Power Supply; Adequate power for selected flow meter (i.e. 240 Volts AC) must be available to the device which should be hard wired, to ensure that the device remains connected at all times. An emergency power supply (i.e. Lithium battery) should be connected and maintained to sustain the totalised flow measurement during mains power outages. An additional 240V AC plug (Clipsal 56 series, waterproof) must also be available at the monitoring site for extra equipment for maintenance etc.

Output Signals; The ability for the flow metering device to interact with automatic sampling equipment and data recording (telemetry) equipment must be included. 4-20mA signal is required for telemetry or other devices. External output plug must be located above ground and within two (2) metres of the sample point.

Output Pulse Rate; The output pulse rate of the flow device is to be set at one (1) pulse per 100 litres.

Output Plug; Switchcraft EN3P2MP male panel mount socket with optional protective cap. Polarity of pins must match flow meter pulse output specifications.

Chassis Mount Male socket: Part No. 221-2479
Protective Cap: Part No. 216-7537

- Visual Displays;*** Preferred LCD or LED (mechanical is an option but not ideal).
Instantaneous flow rate displayed in litres per second [L/s] (minimum one (1) decimal place)
Totaliser displays in kilolitres [kL] or the equivalent cubic metres [m³] (minimum of six (6) digit display) and capable of retaining reading in a power failure or have a back up power supply.
Note: NO external reset option and all flow units must be clearly labelled.
- Conductivity;*** The conductivity of the liquid is to be a minimum of 20 micro Siemens per centimetre [$\mu\text{S}/\text{cm}$]
- Enclosure;*** A secure external (outdoor) enclosure within reasonable proximity to the monitoring point for the electrical equipment must be provided that is sufficiently weather proof and allows for viewing of visual displays. This enclosure must be a 316 stainless steel box which is easily accessible by Southern Water (SW) staff.
- Installation;*** The installation of the full pipe flow meter should be conducted according to the manufacturer instructions. The metered section of pipe should be securely supported around the sensor to reduce vibrational effects on the sensitive equipment.
- Note that different mounting standards apply for different types of flow measuring devices and can severely affect the devices ability to operate if installed incorrectly.
- The pipe work either side of the flow meter should be such that the metered section remains full at all times (with the use of pipe bends). The sections of pipe must have a minimum length 10 x pipe diameter (ϕ) upstream and 15 x pipe diameter (ϕ) downstream before bends or as indicated by the manufacturer to achieve the required accuracy. These minimums must achieve the accuracy required.
- Sufficient room around the flow meter should be left to allow for maintenance access etc. If flow meter is installed underground it must be enclosed in a Southern Water accessible pit that also offers adequate drainage. If installed above ground it must be enclosed in 5-6mm aluminium checker plate, which is secure but allows Southern Water access.
- Isolating/Service;*** An isolating valve is to be installed at a minimum of 5 diameters upstream of the flow meter (if the valve is predominantly open) for maintenance purposes. Note that an isolating valve is not required if the flow is pumped.

Flow Meter Size; Flow meters must be sized such that the maximum measurable flow rate is equal to double the flow rate allowed by the Trade Waste Agreement and can be no less than three (3) metres per second [m/s].

Standard Pipe Sizes; Pipe sizes are to be nominally 25mm to 200mm in diameter and the meter should be sized accordingly to match the upstream and downstream internal diameters. Consideration should be made to ensure that the pipe diameter will allow flows that comply with the meters maximum/minimum flow limits.

Calibration; Three stages of calibration are required for every new flow meter installation;

- (i) Pre delivery calibration, to be conducted by the manufacturer and verified as a minimum, by a 3 point calibration certificate from the factory.
- (ii) Each meters flow and programming parameters should be configured to the required values.
- (iii) Annual in-situ calibration verification to be conducted by the manufacturer's agent or nominated qualified person, to provide a pass/fail certificate indicating the meters compliance to the original calibration standard.

Maintenance; Meters should be maintained in a way and at intervals to ensure accuracy is consistent over time; manufacturers/suppliers should be consulted on such requirements for particular applications. This ensures that volumetric charges accurately reflect the trade waste volumes discharged to sewer. Appropriate maintenance may include; removal of accumulated material from the surfaces of the flowmeter and surrounding conduit. The flow meter shall be capable of calibration verification without removal of the flow meter head.

To avoid the build up of grit in low flow velocity cases, routine flushing of the metered section is required.

Trade Waste Sampling/Monitoring Point

A sample point for Trade Waste monitoring purposes is defined as the location within a given industrial site that contains all the required equipment to monitor the site's effluent and is configured in such a way to provide a representative trade waste sample that does not include any domestic waste from the site.

Ideally at appropriate locations, two sample points (one before pre-treatment and one after) will be installed, primarily to provide feedback on pre-treatment performance and compliance with trade waste quality requirements.

Key considerations for choice of sample/monitoring point are location, connection, security and accessibility.

Location; All discharge points must be directed through a single point for monitoring, located within the property boundary. Sample points must be located immediately upstream and downstream of pre-treatment and/or as close as possible to the trade waste source; the downstream sample point must also be within a maximum of 2000mm of the flow meter. The chosen location should avoid strong electromagnetic fields and sources of excessive vibrations especially when an electromagnetic flow measurement device is being installed.

A (fresh water) hose must be supplied and must easily reach the both sample points and the flow meter.

Connection; The connection from the trade waste stream to domestic sewer must be downstream of the monitoring point.

Security; All equipment must be protected against accidental and/or deliberate damage.

Accessibility; Monitoring point and all monitoring system components must be easily accessible (including easily accessed by SW staff). It is suggested that the location should not be in car parks or drive ways but should allow vehicle access for maintenance etc.

General requirements for a monitoring point include;

Power Outlet; Power (240V AC power outlet) for the automatic sampling machine must be easily accessible (within two (2) metres of sample point and above ground).

pH Sensor & Visual Display; Sensor and display to have a minimum range of 1-14 pH units and the sensor to have an accuracy of 0.3 pH units. Ability to connect to data logger/telemetry is required and the sensor must be separate from any monitoring system that controls dosing to adjust pH.

Temperature Sensor & Visual Display; A minimum range for the sensor and display of 0 - 80°C and the display must read in degrees Celsius.



Conductivity;

The conductivity of the liquid is to be a minimum of 20 micro Siemens per centimetre [$\mu\text{S}/\text{cm}$]

Data Logger/Telemetry;

Data logging and telemetry facilities are required at sites that are considered to be high risk.