

GREEN SQUARE TOWN CENTRE WATER METERING SPECIFICATION

BULK AND SUB-METERING

Overview

This schedule outlines the specifications for metering non-potable water usage across the Green Square Town Centre development. In addition to customer billing purposes, water usage information needs to be collected in order for Green Square Water to manage water use across the development, identify issues such as leakage or anomalous consumption, and determine and respond to water demand requirements as they change seasonally or otherwise.

This document is intended to define the allowable metering configurations by Green Square Water in relation to the design and installation of non-potable water metering infrastructure and associated telemetry equipment for non-potable water throughout the buildings and common areas within the Green Square Town Centre. It is not a requirement for any developer within the Green Square Town Centre to install sub-metering downstream of the lot's bulk meter. If, however a developer chooses to install sub-metering this document outlines Green Square Water's specifications for doing so

1. Principles

The following principles will be adhered to in the application of these metering specifications:

- Green Square Water is responsible for the approval of the proposed metering and telemetry configurations for each development stage/building.
- Any proposed departures from the specifications set out in this document must be submitted to Green Square Water for review and approval prior to installation.
- Green Square Water requires unimpeded access to all water meters and any associated telemetry equipment for operations and maintenance purposes.
- The responsibility for supplying, installing, testing and commissioning all water meters and meter data management/telemetry wiring/data cabling (including internet communications links) for all new buildings shall be borne by the Developer.
- The responsibility for supplying, installing, testing and commissioning all data management/telemetry hardware (eg. floor controllers) shall be borne by Green Square Water.
- Green Square Water will be responsible for the ongoing operation and maintenance of the relevant water meters (ie. all meters provided for the sole benefit of Green Square Water) as well as the associated meter data management/telemetry hardware and cabling where the telemetry hardware and cabling is provided for the sole benefit of Green Square Water.

2. Metering

Water metering specifications across the Green Square Town Centre fall into three primary categories as follows:

- Bulk meters to measure non-potable water usage across each building in the development.
- Common property sub-meters to measure non-potable water usage of end uses that are provided for the shared benefit of common property users, eg. irrigation of gardens and public/open spaces, swimming pools etc.
- Individual sub-meters to measure non-potable water usage of end uses that are provided for the sole benefit of an individual strata/stratum lot, eg. apartments and retail lots.

2.1. Bulk Meters

- The bulk recycled water meter to be installed at each site: *Elster pulse meter V300 KG 2000 (red switch type)* to suit the relevant recycled water pipe size.
- The bulk recycled water meter is to be installed by the Developers plumber or hydraulic contractor in accordance with the manufacturer's instructions and using equivalent standards as required by Sydney Water for the bulk potable water meter.
- The meter must also include a 5 meters long *reed switch pulse cable* (T140-PG100 pulse probe unit) provided by Elster. See Section 1.3 for installation requirements.
- Each separate lot within the Green Square Town Centre is individually fed with non-potable (non-potable) water from Green Square Water's non-potable water treatment plant and as such, is to be individually metered via a bulk non-potable water meter.
- The bulk non-potable water meter for each building is to be an Elster pulse meter to suit the relevant non-potable water pipe size (ie. Elster V100 PSM-T for pipes up to 40mm and Elster H4000 for 50mm and above), and is to be supplied by Green Square Water. Where the Elster V100 PSM-T meter is used, they will be factory specified with 5 x 3 number wheel counters for generating 1 Pulse/5L.
- The bulk non-potable water meters are to be installed by the Developer's plumber or hydraulic contractor in accordance with the manufacturer's instructions Sydney Water's Water Meter Installation Guide (refer to www.sydneywater.com.au).
- Each bulk meter is to be fitted with a voltage-free pulse output probe (as per the manufacturer's instructions) and continuously wired back to the nearest Floor Data Management Unit (Floor DMU) for connection to Green Square Water's remote telemetry hardware in accordance with section 4.3.1 Pulse Meter Cabling.
- Each bulk non-potable water meter is to be securely tagged using a durable fixing (eg. brass or other corrosion resistant metal) to identify the individual water usage fixture (eg. "Building 8 – Bulk RW") associated with the specific water meter.
- Each bulk meter for non-potable water must be clearly identified and colour coded lilac to distinguish from the potable cold water service.

2.2. Common property sub-meters

- Common property sub-meters for the non-potable water distribution networks are required on any non-potable water pipelines that branch off to separately supply non-potable water to any other existing or future strata/stratum lots.
- All common property sub-meters are to be an Elster pulse meter to suit the relevant pipe size (ie. Elster V100 PSM-T for pipes up to 40mm and Elster H4000 for 50mm and above).
- All common property sub-meters are to be supplied by the Developer. Where the Elster V100 PSM-T meter is used, they are to be factory specified for 5 x 3 number wheel counters for generating 1 Pulse/5L.
- All common property sub-meters are to be installed by the Developer's plumber or hydraulic contractor in accordance with the manufacturer's instructions and using equivalent standards as required for the bulk meters as set out in section 3.1 Bulk Meters.
- Each common property sub-meter is to be fitted with a voltage-free pulse output probe (as per the manufacturer's instructions) and continuously wired back to the nearest Floor DMU for connection to Green Square Water's remote telemetry hardware in accordance with section 4.3.1 Pulse Meter Cabling.
- Each common property sub-meter is to be securely tagged using a durable fixing (eg. brass or other corrosion resistant metal) to identify the individual water usage fixture (eg. "Building 5A – Irrigation")

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associated with the specific sub-meter. Each common property sub-meter for non-potable water must be clearly identified and colour coded lilac to distinguish from the potable cold water service.

2.3. Individual (strata/stratum lot) sub-meters

- Each individual residential strata lot (apartment) within each building shall be individually fed with non-potable water and as such, is to be individually metered.
- Each individual retail strata/stratum lot (as applicable) shall be individually fed with non-potable water and as such, is to be individually metered.
- All individual strata/stratum lot non-potable water sub-meters are to be an Elster V100 PSM-T pulse meter (factory specified with 4 x 4 number wheel counters for generating 1 Pulse/0.5L), to be supplied by the Developer.
- All individual strata/stratum lot sub-meters are to be installed by the Developer's plumber or hydraulic contractor in accordance with the manufacturer's instructions and using equivalent standards as required for the bulk meters and common property sub-meters as set out in sections 3.1 Bulk Meters and 3.2 Common Property Sub-Meters.
- Each individual strata/stratum lot sub-meter is to be fitted with a voltage-free pulse output probe (as per the manufacturer's instructions) and continuously wired back to the nearest Floor DMU for connection to Green Square Water's remote telemetry hardware in accordance with section 4.3.1 Pulse Meter Cabling.
- Each individual strata/stratum lot sub-meter is to be securely tagged using a durable fixing (eg. brass or other corrosion resistant metal) to identify the individual lot associated with the specific sub-meter.
- Each individual strata/stratum lot sub-meter for non-potable water must be clearly identified and colour coded lilac to distinguish from the potable cold water service.

2.4. Meter Location

All non-potable water meters must be located within common areas of the development in accordance with the following requirements:

- Be in a location that allows unimpeded visibility and access for operations (including manual meter reading) and maintenance.
- Be located at a height (bottom of meter) between 1000mm and 1500mm (or as near as practicable to these heights) above floor level.
- Be in a location that provides adequate protection to the meters from physical damage (deliberate or accidental).
- Be in a location that is dry, well ventilated and minimises the impact of water leakage (ie. any area where water meters are installed is to be designed as a wet area in case of leaks during the servicing or replacement of meters).
- Be located in a non-metallic enclosure, cupboard or room (eg. dedicated hydraulics riser or utility meter room).
- Located upstream of all recycled water connection/service points.

Installed where there is an adequate 3G coverage with Telstra. Where not possible a repeater device may be required to carry the 3G signal to the vicinity of the meter. To be approved by Green Square Water prior to installation.

- Water meters must not be located in any of the following locations:
- Within individual dwellings (eg. apartments).

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- Within a pit, roof cavity or ceiling space.
- In a lift shaft or lift motor room.
- In a fire stairwell or fire isolated passageway.
- In a position exposed to excessive vibration or sudden/excessive temperature variations.
- In an area that also contains material which may corrode the meter.

2.5. Meter Installation – Reed Switch Pulse Cable

The reed switch cable is the T140-PG100 pulse probe unit for Elster bulk water meters. The cable must be connected to the reed switch pulse meter output of 10 litres/pulse as described in the paragraph 1.1.2. It is to be securely rolled up and temporary taped close to the bulk water meter.

A magnetically operated (reed switch) pulsed output, facility is provided, by the retrofitting of a dedicated 'dovetail' pulse unit to the copper can counter. The pulse unit is fitted with a 100 Ω series resistor to protect the reed switch from power surges and is usually provided with a 5 metre length of cable, terminating in a sealed flying lead.

The volt free switch closure is generated by the rotation of integral magnets, set within the circumference of the counter. There are three options available: 1:1 optical, 1:10 reed and 1:1000 reed. The pulse frequencies at the various slot positions correspond to the markings on the dial face.

Installation of the Reed Switch

There are two opposing screws holding the shroud in place. Remove these and lift the shroud clear from the counter assembly. This will expose the plastic sensor holder surrounding the copper can counter. Select the appropriate pulse position as detailed on the dial face and remove the plastic closure panel from the holder, exposing the copper can.



Hold the reed switch pulse unit at cable entry point in a vertical position and clip into place by locating the front dovetail edge, under the locating lug, applying pressure towards the counter, until the rear dovetail edge, snaps under the sensor holder. The pulse unit is now self-positioned with the internal magnet (1:10 reed). Run the cable anti-clockwise inside the yellow base ring, to the most convenient exit slot, ensuring the small cable restraint is enclosed within the base ring. Re-fit the shroud with the two screws.

3. Telemetry and Automatic Meter Reading (AMR)

Green Square Water collects data monthly to bill the building managers for their recycled water use. AMR technology is required for automatic collection of meter data for this purpose.

3.1. Infrastructure Requirements and Location

The telemetry device must be installed in a secure enclosure (such as a lockable cabinet) close to the bulk recycle water meter. Similar to the bulk meter, the cabinet must be installed in a position protected from weather, damage and vandalism.

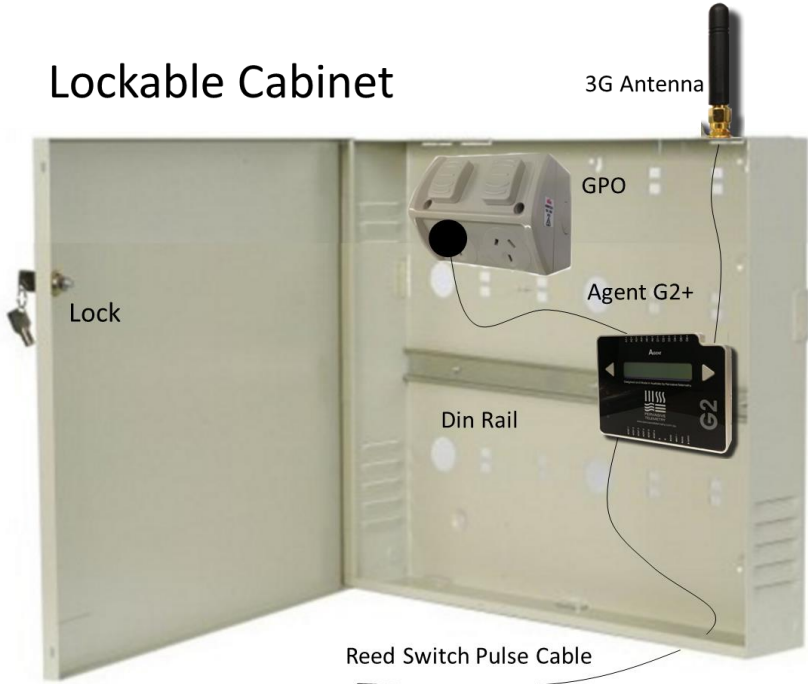


Figure 1 –
3G Solution

Lockable Cabinet

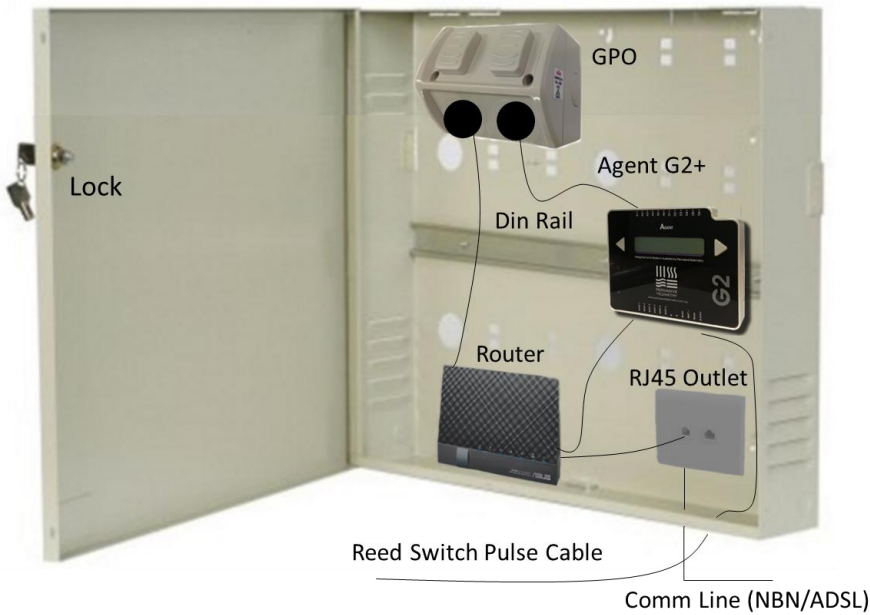


Figure 2 –
Ethernet Solution

The lockable cabinet need to have the following characteristics:

- H300mm x W300mm x D150mm (minimum)
- Din rail mounted in the cabinet to lodge the telemetry device as shown in Figure 1.
- Double 240V 10A GPO with RCD protection. The GPO is to be connected to secure electrical panel in order to avoid energy supply interruption
- Two 15mm holes drilled on the right and left bottom for reed switch pulse cable and antenna extension
- Two sets of keys
- In case there is not 3G signal/coverage, a Single RJ45 CAT5E/6 data outlet tested and labelled with destination details
- Communication line from building communication room. It is a Cat 5e/6 data cable terminated via RJ45 modular plug as shown in Figure 2)
- The maximum distance between the bulk recycled water meter and the telemetry cabinet must be 3m

3.2. Pervasive Telemetry (Agent G2+)

The telemetry device required is an Agent G2+ provided by Pervasive Telemetry. The device must be tested and commissioned with the assistance of a Pervasive Telemetry technician prior to handing over the asset to Green Square Water. This assures that the inputs work as required. Note: the meter and reed switch must be installed and 240V power outlet must be available for commissioning.

The telemetry device is to be set up as follows:

- Pulse / Litres: 10.0
- Logging Interval: 5 minutes
- Connect Interval: 24 Hours
- Alarms1: Zero litre/second for two days
- Alarms2: No connection for two days
- Data presentation email: send a monthly data report (pdf) to mdm@flowsystems.com.au Data presentation ftp: send a monthly data file (csv) to the following ftp server.

3.3. Installation of Agent G2+ device

The recycle water bulk meter is connected to the Agent G2+ via the reed switch pulse cable (also known as “T-Probe”) as per Section 1.3. The cable must be secured to the pipeline using cable-ties and feed through a hole drilled in the security cabinet. The Agent G2+ is to be located inside the security cabinet.

The reed switch cable supplied by Elster has 4 x 7 / 0.3mm core cables, RED, BLUE, BLACK and YELLOW in colour. The RED and BLUE core cable are required only.

- The BLACK and YELLOW core cables may be cut and discarded. The RED core cable must be connected to the telemetry device Agent G2+ digital input labelled D1.
- The BLUE core cable must be connected to the ground input labelled GND (Ground).
- The telemetry device Agent G2+ is to be plugged to one of the two GPO available.

The link between bulk water meter and the telemetry device via the reed switch cable must be tested on site, verifying that the Agent G2+ is receiving the pulse (flow measurements) for the bulk meters. In particular, the telemetry device should display a litre/second value higher than zero when recycled water is flowing through the bulk meter. This can be tested by opening the closest recycled water tap.

4. Documentation

4.1. Metering Schematic

Prior to achieving Developer Works Practical Completion for a particular new stage/building, the Developer is to provide Green Square Water with an “as-built” metering schematic (in CAD format or equivalent) for the relevant building.

4.2. Meter Register

Prior to achieving Developer Works Practical Completion for a particular new stage/building, the Developer is to provide Green Square Water with a completed meter register (in MS Excel format) for the relevant building.

The completed meter register is to be populated with the “as-built” meter information as per the sample format provided in Attachment A (Meter Register Sample Format).

ATTACHMENT A Meter Register Sample Format

Community	Lot	Meter Serial No.	Meter Service Type	Meter Type	Meter Make	Meter Model	Size	Metered area location (Lot#/Apartment#/common area facility eg. pool/irrigation)	Meter location (description)	Meter installation date
Green Square Town Centre	Lot 15	BTEB1845	Bulk Meter (Authority)	Non-potable Water	Elster	V4000	80mm	Lot 15 (whole lot)	Lot 15 Level B0 Water Meter cupboard	xx/yy/zzzz
Green Square Town Centre	Lot 15	BTEB1847	Common Property Sub-Meter	Non-potable Water	Elster	V100 PSM-T	40mm	Lot 15 (irrigation)	Lot 15 Level B0 Water Meter cupboard	xx/yy/zzzz
Green Square Town Centre	Lot 15	BTEB1848	Individual Residential Lot Sub-Meter	Non-potable Water	Elster	V100 PSM-T	25mm	Lot 15 Level 4 Apartment 11	Lot 15 Level 4 Hydraulic Riser cupboard	xx/yy/zzzz
Green Square Town Centre	Lot 15	BTEB1850	Individual Residential Lot Sub-Meter	Non-potable Water	Elster	V100 PSM-T	25mm	Lot 15 Level 4 Apartment 12	Lot 15 Level 4 Hydraulic Riser cupboard	xx/yy/zzzz
Green Square Town Centre	Lot 15	BTEB1851	Individual Retail Lot Sub-Meter	Non-potable Water	Elster	V100 PSM-T	25mm	Lot 15 Retail Lot 5	Lot 15 Ground Floor Retail Water Meter cupboard	xx/yy/zzzz