



Developer Guidelines – Commercial & Multi-Dwelling Residential

Version 8 – September 2020

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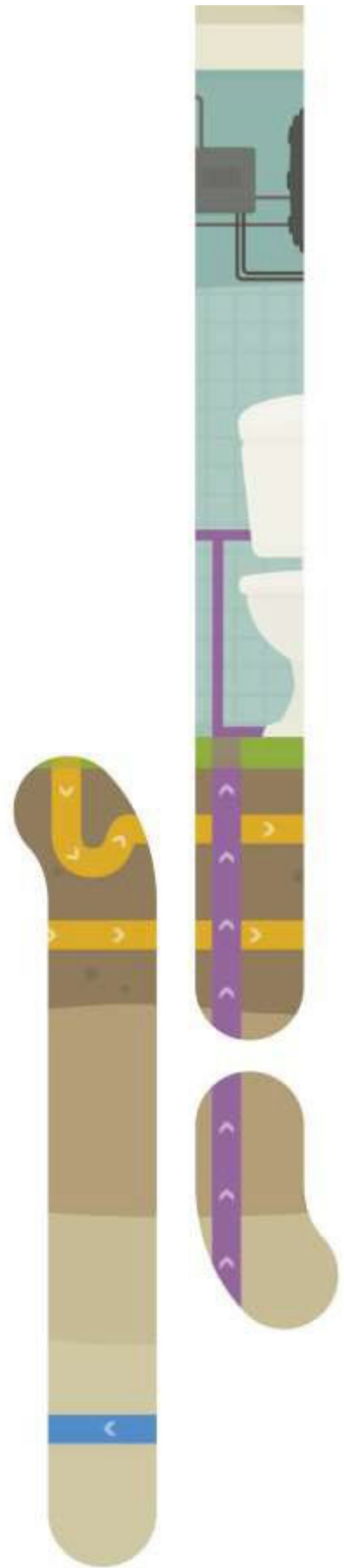


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1 Introduction

1.1 Purpose

The purpose of this document is to provide guidance for developers of lots for the purpose of residential subdivisions and/or commercial use, within Flow's areas of operation. This includes design, construction, inspection, testing and certification of on-lot infrastructure to enable connection to Flow's reticulation networks ('Utility').

1.2 Scope

This procedure shall be used by the Developer who is responsible for the construction of drinking water, recycled water and/or wastewater infrastructure (On-lot Infrastructure Works) prior to its connection to the Utility.

Examples of multi-dwelling residential developments include:

- Apartment buildings (units, flats etc.)
- Duplex housing
- Secondary dwellings ('dwelling' means a self-contained unit of accommodation used by one or more households as a home)
- Townhouses
- Villas
- Lifestyle and retirement villages (excluding catering)

Examples of Commercial developments include:

- Commercial centres
- Industrial sites
- Service stations
- Retail outlets and complexes
- Hospitality facilities (hotels, clubs, motels, restaurants etc.)
- Recreational facilities (fitness centres, community parks, swimming centres etc.)
- Entertainment facilities
- Nursing homes
- Lifestyle and retirement villages which include catering

1.3 Responsibilities

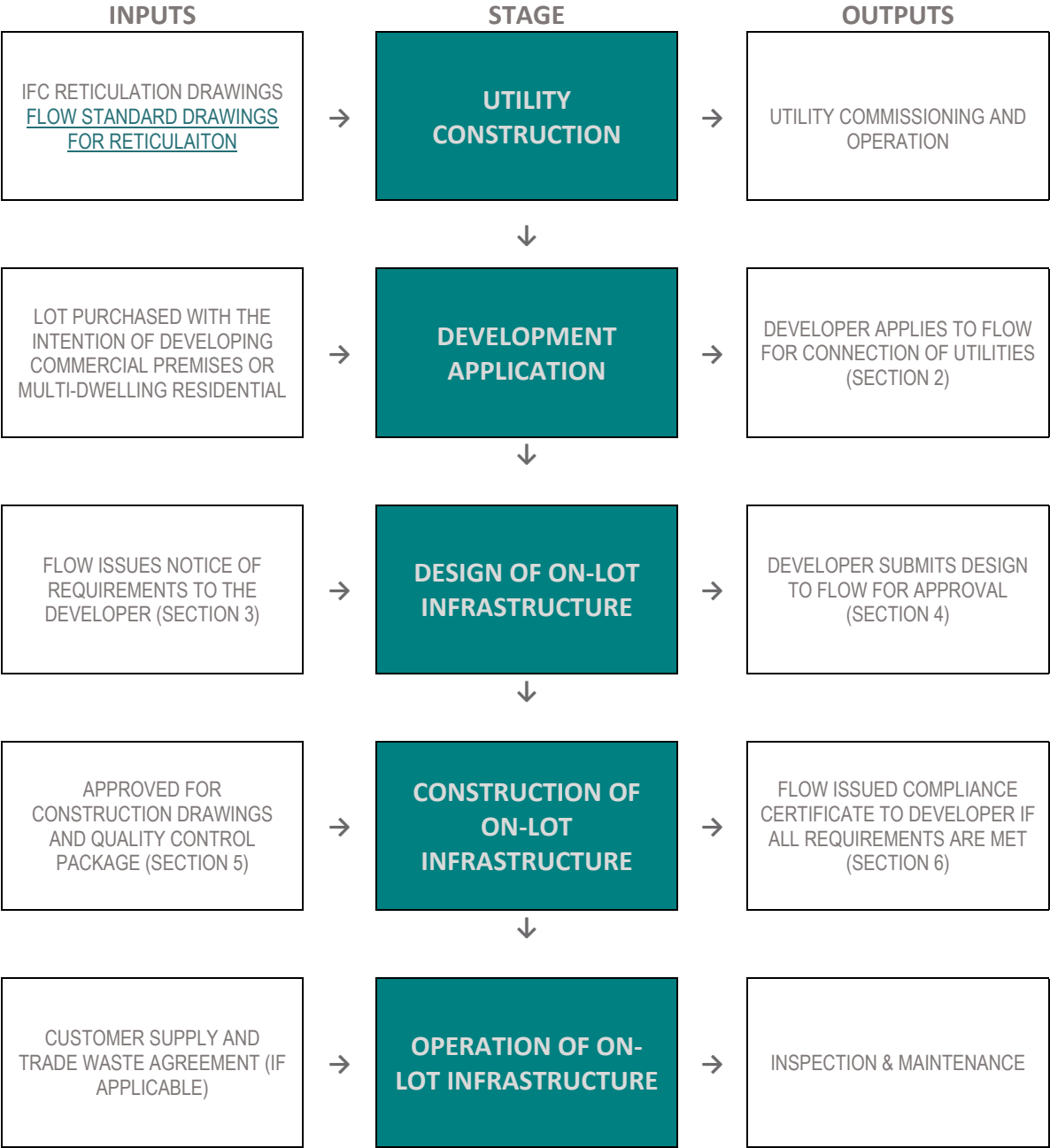
The parties responsible for the implementation of the requirements of this procedure are:

- The Developer (which for the purpose of this procedure) includes all parties engaged by or affiliated with the Developer that have a responsibility to design, supply, construct/install, test or commission the On-lot Infrastructure Works.
- Flow (which for the purpose of this procedure) includes Flow Systems Pty Ltd, its licensed network operator (a wholly owned subsidiary), quality control inspector (QC Inspector), nominee, contractor or consultant as the party responsible for all or part of Flow's responsibilities in this document.

1.4 Development Process

The diagram below provides an overview of the development process. Each stage requires key inputs to achieve the desired outputs and to progress to the next stage.

Refer to Section 7 for Responsibilities Matrix.



2 Application to Connect

Developers of multi-residential or commercial lots within Flow's area of operation must apply to Flow to connect to services. To apply for a connection to water, recycled water and/or wastewater services provided by Flow, visit our [Applications and Approvals](#) page within our [help centre](#).

Once the connection application is lodged, Flow will issue a Notice of Requirements (NOR) to the applicant, which details the prerequisites that must be met to connect to Flow services (refer Section 3).

Applicants should allow a minimum of 4 weeks from the date of application for a connection approval to be issued by Flow.

3 Notice of Requirements

Before commencing construction of the On-Lot Infrastructure Works, the Developer must receive a Notice of Requirements (NOR) from the Utility. This NOR will outline the Utility's requirements of the Developer to obtain approval to connect to the Utility. This approval will be in the form of a Compliance Certificate issued under Part 3A of the *Water Industry Competition Act 2006*. The requirements will generally include:

1. Technical Requirements, including but not limited to the provision of:
 - Design loadings and wastewater quality;
 - Detailed design drawings, subject to approval by Flow;
 - Construction records (as defined in section 4.4);
2. Administrative Requirements, including but not limited to:
 - Lot registration details;
 - Costs payable by the Developer to the Utility; and
 - Site Inspection by the Developer and the Utility;
3. Any miscellaneous requirements specific to development.

A NOR will be issued to the Developer following submission of the connection application (refer Section 2) by the Developer.

4 On-Lot Infrastructure Design

4.1 Point of Connection

Flow requires a single point of connection for each lot, irrespective of the property title. Standard residential lots are provided with:

- 1 x DN40 (32mm internal diameter) pressure sewer connection, including an isolation valve within the property boundary (boundary kit); and
- 1 x DN32 (25mm internal diameter) recycled water connection, with a minimum 15m head pressure; and
- 1 x DN25 (20mm internal diameter) drinking water connection, with a minimum 15m head pressure, in communities where Flow provide this service.

Larger parcels of land that are capable of future multi-dwelling development or commercial use (referred to as 'superlots') are usually provided with:

- 1 x DN50 pressure sewer connection, including an isolation valve within the property boundary (boundary kit); and 1 x DN32 (25mm internal diameter) recycled water connection, with a minimum 15m head pressure; and
- 1 x DN25 (20mm internal diameter) drinking water connection, with a minimum 15m head pressure, in communities where Flow provide this service.

4.2 Design of Commercial and Multi-dwelling Residential On-Lot Infrastructure

4.2.1 Drinking Water & Recycled Water

Where drinking water and/or recycled water connections are not already available to the site, or where existing connections are insufficiently sized to meet the demands of the development, the developer must apply for new connection(s) to the reticulation network. Refer to Section 2.

All meters installed must be Elster models V100 for services up to 40mm and H4000 for 50mm services and above and must be fitted with M-bus Relay PadPuls device (Pulse input counter) units for data logging. The developer will be responsible for all other aspects of the design and installation of any new connections, as per the Notice of Requirements issued by the Utility.

Fire services must be fed from the drinking water system and be metered.

All permissible uses for recycled water for the relevant scheme must be plumbed to Flow Systems' reticulated recycled water system. Permissible uses are scheme-specific and must be checked on Flow Systems' website or with Flow Systems.

Fees may apply for the review of technical information and/or designs relating new connections. Refer to Flow's [Pricing for Developers](#) page at our online Help Centre.

4.2.2 Wastewater

Design of on-lot wastewater infrastructure is based on the total wastewater load imposed on the wastewater reticulation network by the development, at the ultimate capacity. Wastewater loading and flow calculations must be reviewed and approved by Flow. Additional requirements may apply to commercial developments, based on wastewater quality/characteristics, including trade waste systems and/or in-line muncher machines, which are outlined in Section 4.2.4.

As a minimum, On-Lot infrastructure shall be designed to:

1. accommodate emergency storage equivalent to the average daily volume of sewage discharge from the development under dry weather flows; and
2. have sufficient pumping capacity for the calculated incoming flow rate.

Table 1 is provided as a high-level, early stage forecast of wastewater loadings and as such, is indicative only. It can be used along with the guidance below it to calculate the wastewater loading for a specified end use and then to determine the likely servicing option from Table 2. Potential property owners and property owners should engage suitably qualified professional hydraulic consultants, during the feasibility and detailed design phases of their project, to confirm wastewater hydraulic loadings, emergency storage requirements and suitable wastewater infrastructure servicing options.

Table 1: Indicative wastewater loadings by land use

Ref	Property Type	Unit Adopted	ET/Unit	Additional requirements	Storm Allowance (LPS)
1	Aged Care Facility (Nursing Home/Special Needs)	1 bedroom 2 bedrooms 3 bedrooms	0.5 0.75 0.85	Three-phase OGP pumps Inlet Muncher Machine	0.58
2	Bulky Goods Showroom	per 100m ² GFA	0.2		0.058
3	Car Wash Facility	Lane	1.0		0.058
4	Caravan Park	Site	0.5	Three-phase OGP pumps Inlet Muncher Machine	0.58
5	Child Care Centre	Pupil	0.05		0.058
6	Church	Amenity & Floor Area	0.6ET/public amenity & if kitchen, 0.008ET/m ² of function room area		0.058
7.1 7.2	Commercial Office – single Commercial Office – multi level	- per 100m ² GFA - Special Design	0.6	Special Design	0.058
8	Community/Welfare Facility	per 100m ² GFA	0.6ET/public amenity & if kitchen, 0.008ET/m ² of function room area	Three-phase OGP pumps	
9	Conference/Meeting Venue	per 100m ² GFA	1.6	Three-phase OGP pumps	0.058
10	Entertainment/Cinemas	Visitor	0.17	Three-phase OGP pumps	0.058
11	Gym	Amenity	0.6	Three-phase OGP pumps	0.058
12	Hairdresser/Beauty Salon	Basin	0.79		0.058
13	Hospital	Bed	1.0	Special Design	0.58
14	Hotel / Club	GFA (m ²) & Accommodation	0.01/m ² & 0.45/room	Three-phase OGP pumps Inlet Muncher Machine	0.058
15.1	Industrial Estates (including dirty trades with showers) < 2000m ²	per 100m ² GFA	0.12	Three-phase OGP pumps	0.058
15.2	2000m ² – 10000m ²				
16	Laundromat	Machine	0.4	Three-phase OGP pumps	0.058
17	Marina	Berth	0.4	Three-phase OGP pumps	0.058

18	Medical Centre	Consultation Room	0.3	Three-phase OGP pumps	0.058
19	Motel	Bedroom	0.45	Three-phase OGP pumps Inlet Muncher Machine	0.058
20	Restaurant/Café/Fast Food	Seat	0.05	Three-phase OGP pumps	0.058
21	Retail Shop (single)	per 100m ² GFA	0.6		0.058
22.1	School – Primary	Pupil/Staff Member	0.04	Additional pump (triplex) Three-phase OGP pumps Inlet Muncher Machine	0.58
22.2	– Secondary	Pupil/Staff Member	0.04		
22.3	– Tertiary	Pupil/Staff Member	0.01		
22.4	– Tertiary with accom	Pupil/Staff Member	0.1		
23	Service Station	per 100m ² GFA	0.4		0.058
24.1	Shopping Centre: > 6000m ² < 6000m ²	per 100m ² GFA	0.57	Additional pump (triplex) Three-phase OGP pumps Inlet Muncher Machine	0.058
24.2		per 100m ² GFA	0.4		
25	Supermarket	per 100m ² GFA	0.3	Three-phase OGP pumps	0.058
26	Vehicle Repair Premises	per 100m ² GFA	0.12		0.058
27	Veterinary Surgery	Lot	0.4		0.058
28.1	Warehouse – general storage – freight	per 100m ² GFA	0.01		0.058
28.2		per 100m ² GFA	0.4		

Glossary

- ET = Equivalent Tenement = 400 Litres per day
- LPS = Litres Per Second
- GFA = Gross Floor Area
- PSU = Pressure Sewer Unit
- SPS = Sewage Pumping Station

Example Loading Calculation – Primary School (ref. 21.1)

- Calculate flow from a 1,200 pupil + 50 staff primary school
- Primary school = 0.04ET per pupil/staff member = 1,250 x 0.04 = 50ET
- Average Daily Flow = 50ET x 400L per ET per day = 20,000 L/day
- Peaking Factor for Commercial Properties = 1.5
- Peak Dry Weather Flow = 20,000 x 1.5 = 30,000 L/day
- Usage Period = 8hrs
- Instantaneous Flow = 30,000/8 = 3,750 L/hr = 1.04 LPS
- Storm Allowance = 0.58 LPS
- Peak Wet Weather Flow = 1.04 + 0.58 = 1.62 LPS

Servicing Options

The Table 2 provides a list of approved servicing options.

Note: Where space permits, Flow requires a separate tank (Option A) per dwelling.

Table 2: Wastewater servicing options

OPTIONS	DESCRIPTION	Power requirements	Maximum incoming flow rate	AVERAGE DAILY FLOW	INDICATIVE SUPPLY ONLY COST [#]
Option A	E One simplex	(single phase)	0.5 LPS	400L	\$4,500
Option B	E One duplex	(single phase)	1.0 LPS	< 2,000L	\$8,000
Option C1	Aquatech 3,000L duplex OGP	(three phase)	1.5 LPS	< 3,000L	\$19,000
Option C2	Aquatech 3,000L triplex OGP	(three phase)	2.0 LPS	< 3,000L	\$24,000
Option D1	Aquatech 5,000L duplex OGP	(three phase)	1.5 LPS	3,000L - 5,000L	\$21,000
Option D2	Aquatech 5,000L triplex OGP	(three phase)	2.0 LPS	3,000L - 5,000L	\$26,000
Option E1	Aquatech 10,000L duplex OGP	(three phase)	1.5 LPS	5,000L - 10,000L	\$28,000
Option E2	Aquatech 10,000L triplex OGP	(three phase)	2.0 LPS	5,000L - 10,000L	\$33,000
Option F	Aquatech duplex/triplex OGP with custom storage tank	(three phase)	2.0 LPS	10,000L +	POA
Extra	Inlet Muncher Machine*	(three phase)			\$20,000

[#]Supply cost includes tank, pumps, controls and internal pipework/valves, are current as at September 2020 and are subject to escalation and CPI

*Flow's approved suppliers include [NOV Muncher](#) or [JWC Muffin Monster](#)

The above listed costs exclude at least the following site-specific civil costs for consideration by the developer / installer:

- Earthworks for tank
- Depth to rock
- Lifting and setting into place
- Concrete ballast at the base of the tank to anchor in place
- Connection of vent line to tank by plumber
- Conduit between control panel location and tank
- Backfilling, restoration, trafficable access hatch (if required)

As well as standard costs for any connection such as:

- Connection of sanitary draining to tank by plumber
- Connection of 40mm PE discharge line between the tank and property connection point (boundary kit)

Using Table 2, the appropriate servicing option for the school example above would be Option F – Aquatech triplex OGP with 30,000L emergency storage capacity, with an additional requirement for an Inlet Muncher Machine.

Equipment and Infrastructure Requirements

Flow Systems operate a pressure sewerage network. Connection to this network will be via a pump system. To ensure the effective operation of this network, specific requirements must be met. These include:

- The infrastructure must be designed to ensure the holding capacity is suitable for the property usage
- The following pumps are acceptable:
 - E-One submersible progressive cavity grinder type – 240/1/50
 - Aquatec OGP two stage submersible grinder type – 415/3/50
 - NOV Mono dry mounted progressive cavity pumps in combination with a macerator or Muncher machine – 415/3/50
- Hydraulic operation must not exceed 2.0 litres per second @ 60 metres total head
- Pump maximum 'no discharge head' to be 80 metres or less
- The pump control system must be compatible with, and capable of, connecting to Flow's existing telemetry system. It must also have remote monitoring and control capabilities with continuous level measurement. Flow Systems do not currently limit peak time pumping; however, it may become necessary in the future to balance flows to Flow Systems' local water centres.
- Emergency storage must be incorporated to enable enough storage for maintenance operations and repairs in a system failure situation. Flow Systems require the minimum emergency storage volume (between alarm level and overflow level) to be at least equal to the average daily property discharge volume. Emergency storage may be achieved in the main pump station wet well or combined with an offset storage tank.

Other aspects that must be considered in the design include:

- Confirm maximum depth to invert of sewer tank connection (inlet)
- Stormwater drainage locations (to ensure no ponding and/or flooding of wastewater assets)
- Venting and odour control requirements
- Zone of influence (ZOI) issues (assets, structures, retaining walls etc.)
- Access to assets for repair and maintenance
- Conduit must be installed between the sewer control panel and water meter(s)
- Ability to isolate tank from incoming sewer flows
- Emergency overflow
- Foundation checks
- Bypass line for muncher machine where installed
- Vegetation / landscaping

Fees & Charges

Refer to Flow's [Pricing for Developers](#) page at our online Help Centre. Fees may be charged for the following:

- Review of technical information and/or designs relating new connections;
- Quality Assurance inspections during installation;
- Commissioning of servicing options A and B.

4.2.3 Design Review

The design of the on-lot water and wastewater infrastructure to service the site must meet the criteria set out in Section 4.2 and be reviewed and approved by Flow Systems prior to construction of the water and wastewater infrastructure.

Plumbing drawings and BASIX / Greenstar / NABERS certificates will also be checked by Flow Systems to confirm that all permissible uses for recycled water are plumbed to receive Flow Systems' reticulated recycled water.

4.2.4 Trade waste

The primary differentiator between residential and commercial developments is the propensity to introduce trade waste to the wastewater system. Trade waste is all liquid waste generated on commercial premises and discharged to Flow's reticulation network, that is not human waste.

Design of wastewater infrastructure on commercial lots must include the treatment and management of trade waste streams, upstream of the wastewater collection tank connection. This may include the need for the inclusion of grease traps, arrestors and other infrastructure.

Click [here](#) for information about Flow's trade waste policy and requirements.

4.2.5 Wastewater Collection Tank Locations

Flow's preferred wastewater collection tank location is on the boundary of the lot closest to the main (usually the front) to enable easy access for service/maintenance and to minimise on lot the infrastructure. It must be located so that the invert of the inlet to the pressure sewer tank can allow servicing of as much of the land area (lot) as practically possible. The developer must provide a plan that shows the areas of the lot that are serviceable and/or not serviceable. Sewer connection depths for Options A& B may be increased using tank extensions – contact Enviro One Australia for details.

- Preferable location: front, lower section of lot.
- Alternative location: rear, lower section of lot – with clear service / maintenance access provided.

Flow's preference is to locate the wastewater collection tanks in non-trafficable, garden areas. Where this is not possible and the tanks are required to be located in driveways or other hardstand areas then special design requirements apply – contact Flow for approved options and requirements prior to installation.

NOTE: Non-serviceable areas on lots must be clearly identified on the detailed design drawings.

5 Infrastructure Construction and Quality Control

5.1 Installer Qualification

The Developer shall ensure that Flow is notified of the proposed infrastructure installer prior to the commencement of works. The Developer must demonstrate the proposed installer has demonstrated relevant industry experience as necessary for proceeding with the installation works. This may be demonstrated through capability statements, reference checks, documentary evidence and/or equivalent qualification with other water authorities. Installation works must not commence until the Developer demonstrates, to The Utility's satisfaction, that the installer is qualified for the works. The utilities satisfaction of an installer's experience and qualifications is not a guarantee of future performance and the Developer remains responsible for satisfactory installation of infrastructure at all times.

5.2 Inspection and Test Plans

The Developer is responsible for preparation of its own inspection and test plans (ITPs) and check sheets in accordance with its own Quality Management System.

5.3 Inspections

The Developer is responsible for ensuring that all works are constructed and tested in accordance with the relevant NOR, Standards and Flow Systems-approved drawings.

Flow will inspect the construction of the Developer Infrastructure Works to monitor compliance with the relevant NOR and the Standards and may notify the Developer of an area of those works that do not comply. This inspection regime shall not be construed as a proxy for the Developer's own quality inspection checks and any non-compliance in the Developer's works may be identified and communicated to the Developer at any time.

The Developer will ensure that the QC Inspector is given adequate notification (minimum 48 hours) and access to carry out inspections and be available for witness points identified by the ITPs.

Failure by the Developer to ensure access for the QC Inspector may result in Flow issuing a requirement for the Developer to re-excavate and expose On-Lot Infrastructure Works to allow inspection. This will be at the cost of the Developer.

5.4 Quality Control & Records

Prior to Practical Completion or the Developer's request for a Certificate of Compliance associated with the completion of the Developer's works, the Developer must provide the following "Records" to Flow:

1. Completed and signed off ITPs;
2. As-built survey, including, but not limited to:
 - Sewer Collection Tank – including RLs
 - Boundary Kits
 - Conduits (if placed at rear of lots)
 - Pipeline (if different from the design)
3. Clear, legible red-line mark-up of the IFC drawings (suitable to be used as the basis for preparation of works-as-executed drawings by Flow);
4. Evidence of testing to ensure that tanks installed are liquid retaining and compressive strength test results of concrete used;
5. Hydraulic pressure testing certificate from a qualified pipe tester for the section of discharge pipe between the wastewater collection tank and the boundary kit (1000kPa);
6. Evidence of conformance of pipe to relevant Australian standards;

7. Evidence that the drinking water and recycled water network have been tested for cross-connections in accordance with Flow's requirements.
8. Evidence that all on-lot wastewater collection tanks have been handed over by the Developer's contractor clean and free of debris and fluid;
9. Photographic record of connections for all services (complete with a sign/tablet in each photo identifying the lot to which it belongs); and
10. Photographic record of all connections in the reticulation system (mains)

5.5 Other water authorities

Connection work to another water authority's infrastructure must comply with that water authority's relevant requirements and do not form part of the Developer Infrastructure Works as defined in this document.

6 Certificate of Compliance

6.1 Relevant water supply authority

Flow may issue a Certificate of Compliance for the Developer Infrastructure Works for which it is licensed under the *Water Industry Competition Act 2006* (NSW), in accordance with the requirements of the:

1. Water Industry Competition (General) Regulation 2008 (NSW); and
2. The Developer's compliance with the Utility's requirements; and
3. NOR for the relevant lot.

And, in New South Wales, in order to satisfy section 157(2)(g) of the Environmental Planning and Assessment Regulation 2000 (NSW) for the purposes of enabling certification of subdivision.

6.2 Issue of Certificate of Compliance

The Utility may issue a Certificate of Compliance when Developer Infrastructure Works Practical Completion is achieved and all requirements set out in the NOR are satisfied.

7 Asset Responsibility

Flow's policy regarding who is responsible for the initial provision, ongoing ownership, operation and maintenance of 'on-property' infrastructure on commercial and multi-residential lots is summarised in the table below:

RESPONSIBILITY MATRIX				
ASSET	DESIGN	SUPPLY & INSTALL	OWNERSHIP*	MAINTENANCE
Phase 1 Sewer Infrastructure (all servicing options): Wastewater collection tank, property discharge line, boundary kit, conduits, connections	DEVELOPER	DEVELOPER	FLOW	FLOW
Phase 2 Sewer Infrastructure (servicing options A & B): Grinder pump, control panel & level sensor	FLOW	FLOW	FLOW	FLOW
Phase 2 Sewer Infrastructure (servicing options C - F): Grinder pump, control panel & level sensor	DEVELOPER	DEVELOPER	FLOW	FLOW
Phase 1 Water Infrastructure: Meter assembly (excluding meter), backflow prevention devices etc., conduits on-site reticulation/plumbing, connections	DEVELOPER	DEVELOPER	PROPERTY OWNER/MANAGER	PROPERTY OWNER/MANAGER
Phase 2 Water Infrastructure: Recycled Water meter only & Drinking Water meter only (where Drinking Water is provided by Flow)	DEVELOPER [#]	DEVELOPER	FLOW	FLOW

[#] Refer to Section 4.2.1 for metering specifications. The Developer to specify meter size and configuration.

* the Lot Owner will be responsible for the electricity costs to operate the on-lot pressure sewer equipment

Contact Flow on 1300 803 803 for further information or visit our [Help Centre](#) online.