SEQ Water Supply and Sewerage Design & Construction Code (SEQ WS&S D&C Code)

DESIGN CRITERIA

1 July 2013

Document History

Version	Description	Date
1.0	Initial Publication	1 July 2013

References

Reference	Title
The Act	South-East Queensland Water (Distribution and Retail Restructuring) Act 2009
DEWS Guidelines	The Department of Environment and Resource Management "Design Criteria for Water Supply and Sewerage", April 2010
SEQ WS&S D&C – Water Supply Code	Water Supply Code of Australia (WSA 03-2011) (incl SEQ Amendments), Water Service Association of Australia (WSAA)
SEQ WS&S D&C – Sewerage Code	Sewerage Code of Australia (WSAA 02-2002) (incl SEQ Amendments), Water Service Association of Australia (WSAA)
SEQ WS&S D&C – Sewage Pumping Station Code	Sewage Pumping Station Code of Australia (WSAA 04-2005) (incl SEQ Amendments), Water Service Association of Australia (WSAA)
SEQ WS&S D&C – Vacuum Sewerage Code	Vacuum Sewerage Code of Australia (WSAA 06-2008) (incl SEQ Amendments), Water Service Association of Australia (WSAA)
SEQ WS&S D&C – Pressure Sewerage Code	Pressure Sewerage Code of Australia (WSAA 07-2007) (incl SEQ Amendments), Water Service Association of Australia (WSAA)
SEQ WS&S D&C – Asset Information Specification	SEQ WS&S D&C Asset Information Specification

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Part A – General Principles

1 Introduction

1.1 General

Provision of effective water supply and sewerage services underpins environmental, economic and public health outcomes for all of South East Queensland (SEQ). The ongoing expansion of the region means that it is essential that the industry participants have a clear understanding of the processes and key parameters to be applied in development of sustainable water supply and sewerage networks.

1.2 Statement of Context

In undertaking the design and construction of water services infrastructure, it is imperative that participants understand the context within which such infrastructure needs to function. As water service systems typically involve complex interconnections and controls it is often necessary to undertake a review of the needs of the broader system to which the infrastructure will be connected (this is particularly true for larger scale developments). This broader review is referred to nationally by the term "Systems Planning". In simple terms:

- **Systems Planning** provides the context for connection of proposed infrastructure. This may include defining boundary conditions or other network constraints which need to be reflected in the subsequent design;
- Development of a **Concept Plan** provides further scoping (including determination of the scale, location and general arrangement of key items of infrastructure);
- **Hydraulic modelling** which reflects the known (calibrated) performance the network (both that proposed and the existing assets); and
- The outcomes of such Systems Planning and Concept Planning then provide critical inputs necessary to fully inform the **detail design process**

The overall objective of this process (from System Planning to Detailed Design) is to provide a system that meets the Water Agency's obligations under its operating licence and customer contract[1].

This guideline is an essential element of the SEQ WS&S D&C Code in that it contains material that informs all developers (big and small) on how to accommodate all aspects of water services infrastructure in their development.

1.3 Objective and Application:

The objective of this guideline is to establish the key criteria to be applied in the design of water supply and sewerage reticulation infrastructure to meet current and future needs of the SEQ region. Adoption of these criteria across the region should ensure application of consistent strategic thinking in the process.

These guidelines have been developed by the SEQ Water Service Providers (SEQ-SPs) for **application to non-trunk distribution networks and have not been developed for the bulk components of the water grid**.

[1] WSAA, WSA03-2011-3.1, "Water Supply Code of Australia, Third Edition", Clause 1.2.1

1.4 Design Criteria and Service Standards

It is important to clearly understand the intent and application of the design criteria contained within this guideline. In all instances, the criteria provided relate to future additions to the water/sewer distribution networks within SEQ and are not to be confused with existing customer standards of service.

Customer standards of service reflect the standards being achieved within the existing networks. Such service standards need to accommodate a very wide range of asset, customer, and geographic differences. These outcomes reflect existing constraints within the network.

In addition, the Desired Standards of Service, referenced in the water businesses Netserv Plans, may reflect an aspirational standard of service relevant to the provision of trunk infrastructure.

The criteria applied in this guideline relate to the provision of new, non-trunk distribution assets only. As such, the criteria reflect the businesses desire for service improvement and may be set at a standard different to existing service outcomes. Over time, these criteria may align with the service standards. The relationship between these Design Criteria, the Customer Standard of Service and the Desired Standard of Service contained within the Netserv Plan is summarised in Table 1 below.

Table 1 - Design Criteria, Netserv and Customer Service Standards,

Document	Business Driver	Scope
SEQ WS&S Design Criteria	Defines the technical parameters relevant to the provision of NEW, smaller scale water supply and sewerage distribution assets.	Primarily applies to **NEW distribution assets** only
Netserv Plans	Outlines the businesses process for accommodating regional growth. Includes a statement of Desired Standards of Service (DSS) for new TRUNK infrastructure	Primarily applies to the determination of **TRUNK assets required to service growth**
Customer Service Standards/Customer Charter	Defines the service provided to existing customers at the point of delivery	Relates to the actual **performance of the existing network**

As far as practical, these guidelines have sought to consolidate key criteria used by the SEQ Service Providers (SEQ-SPs). In some instances, standardisation of criteria is neither practical nor possible. Such differences may arise through differences in licence requirements and/or from the statutory obligations of the service providers to apply actual measured figures as the basis of their design of future networks. In these cases, different parameters may be specified for different service areas. These differences are clearly marked in the separate Water Supply and Sewerage Design Criteria tables.

1.5 Document Hierarchy

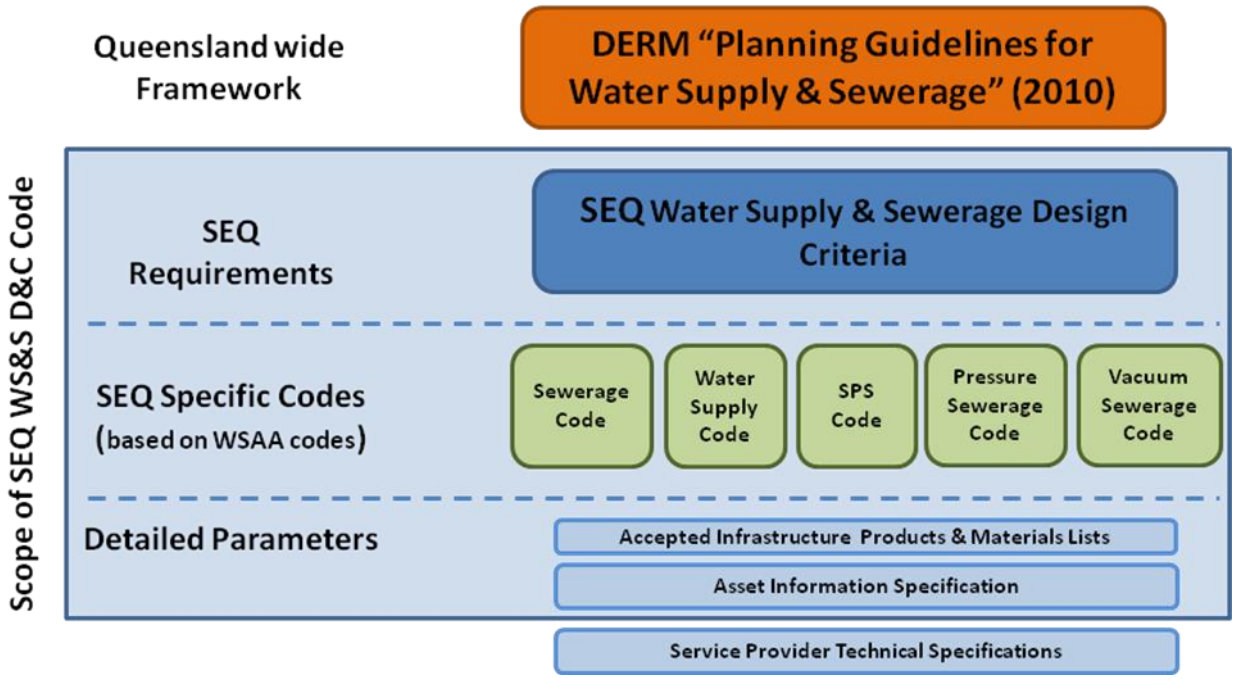
This document has been developed to compliment other relevant frameworks. In particular, the "Planning Guidelines for Water Supply and Sewerage" developed by the Queensland State Government[2] provides an overarching framework to which this, more detailed document will refer. In effect, the States guideline provides the generic framework for all of Queensland, while these guidelines provide more detailed advice on the specific parameters to be applied in the design of SEQ water services distribution infrastructure. To avoid the risk of confusion, these guidelines do not elaborate on many of the principles contained within the States document. It is assumed that competent designers are aware of the States framework and how the (more detailed) design criteria contained within this guideline build on the States generic framework.

[2] The Department of Environment and Resource Management " Design Criteria for Water Supply and Sewerage", April 2010

This guideline is also developed to be consistent with the various, nationally accepted WSAA codes[3]. The WSAA codes (SEQ WS&S D&C Code) provide specific guidance at the network and asset level. The expectation underpinning these guidelines is that individual projects will be constructed to meet water service providers' specifications as contained in the WSAA codes and project level contract documentation.

The relationship between the states guidelines, the SEQ Water Supply and Sewerage Design Criteria, the WSAA codes and project specifications is summarised in Figure 1.

Figure 1 – Document Hierarchy



In the event of contradiction between these four (4) levels of documentation, the project specific technical specification will take precedence on construction matters. Otherwise, the provisions of THIS guideline will take precedence over all other documents.

1.6 Structure of the Document

This guideline has been designed to assist users "step through" the process. In particular:

Part A – General Principles: Has been developed to provide a very broad overview of key objectives and highlight how these guidelines "fit in" with other key documents. This section of the guideline is relatively "generic" and is equally applicable to either water supply or sewerage services;

Part B – Water Supply Network Infrastructure: Provides an overview of the design criteria which will drive the development and operation of drinking water supply and non-drinking water networks;

Part C – Sewerage Network Infrastructure: Provides an overview of the design criteria which will drive the development and operation of the sewer collection and transportation network;

Appendix A – Contains a copy of the landuse demand tables sourced from the Planning Schemes of each Council at the time of publication.

[3] In the context of these guidelines, references to the WSAA codes should be read to mean the SEQ WS&S D&C amended version of the national code

2 Objectives

2.1 Overview

This section of the guideline provides an overview of the purpose and outcomes from all design activities. In particular, it summarises those generic principles that cover the efficient design of both water supply and sewerage network infrastructure. Criteria specific to either water or sewerage network infrastructure are contained in sections B and C of the guideline respectively.

The objectives of all water services network design undertaken within South East Queensland will be to:

- Ensure provision of sufficient and sustainable distribution networks which serves growth anticipated within the region and delivers the defined outcomes identified for each area;
- Ensure sound asset management including a holistic evaluation of options for delivering the defined outcomes (including consideration of operations, asset condition/performance, concurrent programs and non-asset solutions);
- Determine the optimal strategy that delivers the defined outcomes at the lowest financial, social and environmental (triple bottom line) cost;
- Take into account the requirements of Water Sensitive Urban Design (WSUD) as well as align with and support the Total Water Cycle Management Planning processes undertaken by the relevant Councils; and
- Communicate the outcomes of the process to decision makers through development of consistent and coherent reports.

2.2 Key Principles

As a general guide, design of all water services distribution network infrastructure within SEQ needs to take into account the following core principles:

- **Regulatory framework**[4] – planners must be aware of the regulatory framework and its potential impact on options and implementation programs relating to the provision of water supply and sewerage services. The regulatory framework includes legislative drivers relevant to the water services businesses as well as quasi regulatory requirements applied by local governments within the SEQ water service area;
- **Planning and design process** – planning and design should follow an iterative process which seeks to balance infrastructure, operation and maintenance, financial, and environmental aspects to achieve the defined outcomes;
- **Option Analysis** –design should include a comprehensive and rigorous identification of all options to meet the defined outcomes. These options are to include non-asset solutions; and
- **Stakeholder involvement** - key stakeholders should be identified and involved at all stages of the process.

[4] Refer to the Department of Environment and Resource Management "Planning Guidelines for Water Supply and Sewerage" for a comprehensive summary of key elements of the regulatory framework

2.3 Key Elements of the Process

The design process needs to reflect the following key elements;

- Identification of outcomes required by all stakeholders;
- Identification of the service need and service objectives;
- Determine the scope of the planning and design to be undertaken (i.e. Strategic/Master Planning for larger development leading to; Concept Design/Feasibility; Detailed Design etc);
- Identification of the temporal framework for the design solution (long term, medium term, short term);
- Identification of options , undertaking option analysis and providing an objective demonstration of the rationale for selection of a preferred option; and
- Development of an implementation strategy.

Further detail on these key elements is provided in Chapter 3 of the States Guideline.

2.4 Principles for Network Modelling

The elements cited above outline the scope of the process to be undertaken. However, it is imperative that all network modelling retains a clear understanding of the principles which will drive that process. It is essential that all network modelling consider the following:

- The desired outcomes of modelling work should be established before commencing the modelling process (including a clear statement of the anticipated outcomes and the extent/detail of modelling required to provide sufficient clarity on how those outcomes may be achieved);
- Modelling outputs should be verified against actual system performance (e.g. verification from operational staff or calibration of the model using “real world” outcomes including but not limited to flow data from existing DMA/PMA meters, reservoir meters trunk meters and large customer meters as well as pressure data from data loggers on PRVs and reservoir level monitors). Calibration should be applied where data from the existing network is available and will be mandatory on all larger projects. However, on smaller modelling projects, anecdotal checking of modelling outcomes with operational staff may be sufficient; and
- Operational staff should be involved in the process.

2.5 Lowest Lifecycle Costing

Key outcomes of the process is to maximise the efficiency and capability of the existing network, maximise utility and service outcomes for customers, integrate with the asset augmentation / renewal/rehabilitation program of the relevant Service Provider and minimise the impact on the environment. To achieve these outcomes, the designer shall provide to the relevant service provider a report which includes a detailed assessment of the lifecycle cost of a range of alternative options together with a recommendation on the preferred solution. The matters to be addressed in this report will include but are not limited to:

- Summary of alternative design options which provide “fit for purpose” outcomes;
- Scope of assets and acceptable maintenance regimes for alternative options;
- Summary of the costs of each option (both initial capital investment and ongoing operational costs);

- Assessment of the impact of each alternative option on service outcomes and the environment; and
- Rationale supporting the proposed solution which best meets all requirements of this guideline.

It is recommended that the lifecycle costing process be undertaken with the involvement of the operations staff of the relevant Service Provider and be consistent with nationally recognised standards contained within AS 4539 and the requirements of the Queensland Competition Authority (specifically section 26 of the QCA Act and as may be prescribed in any future price oversight framework developed by the authority).

Lifecycle cost estimate parameters used in the assessment must be verified with the relevant water service provider before final adoption. In the absence of guidance from the water service provider, the following design criteria shall apply:

- **The term** of the lifecycle analysis will not be less than fifty (50) years;
- The **discount rate** to be used in the lifecycle analysis shall be determined as follows:
    - The nominal weighted average cost of capital (WACC) as set by the Queensland Competition Authority (QCA).
    - This nominal rate may be adjusted to a REAL rate by selecting the mid point of the Reserve Bank of Australia's target for long term inflation.
- **Cost escalation** to be the ten (10) year average of the Roads and Bridge Construction Index, Queensland (ABS Catalogue 6427; index No 3101; Series ID; A2333727L)
- **Energy Cost** (at pump stations) shall be estimated using the most recent gazetted price per kilowatt hour for Tariff 22 – General Supply: "All Consumption". Load factor between peak and off peak hours shall default to 0.5 if no energy consumption figures are available.
- **Annual Maintenance** Cost of 0.5% of the capital cost of all gravity trunk sewers;
- **Annual Maintenance** Cost of 0.65% of the capital cost of all water mains and rising mains;
- Reservoir **Annual Maintenance** Cost of 0.25% of the capital cost of each Reservoir
- Pump Station **Operation and Maintenance Costs** (excluding energy costs) is to be based on the total installed power at the pump station where:
    - Annual O&M Cost = 3% of the capital value + 35 x Total Installed kW (e.g. for a $1m pump station containing two 30 kW Pumps, the annual O&M Cost = $30,000 + 35x60 = $32,100 pa (excluding energy costs))

2.6 Carbon Footprint

In addition to the lifecycle costing estimate determined above, it is important that the process encompass a broader (holistic) assessment of all of the business's activities and targeted outcomes. All designs shall include estimation of the carbon footprint of each of the proposed options in a format agreed with by the relevant service provider.

2.7 Exclusions

Small isolated communities such as North Stradbroke Island and Southern Moreton Bay Islands may operate more effectively using design criteria other than those contained below. Where this applies, the appropriate criteria will be supplied by the relevant SEQ-SP on application.

Part B – Water Supply Network Infrastructure

3 Overview

This section of the guidelines provides a summary of those design criteria which are specific to Water Supply Network Infrastructure. To ensure ease of use, key Water Network Design Criteria for each water service provider are summarised in Section 4. These criteria define the specific inputs to be used while subsequent discussions provide further explanation on HOW these design criteria are to be applied when undertaking detailed network modelling and design.

In most cases, the design criteria provided below have been based on analysis of historical data as well as consideration of trends forecast in the South East Queensland Water Strategy.

4 Design Criteria – Water Supply

4.1 Key Criteria

The key criteria relevant to each water distribution/retail network are summarised in Table 4.1 – Single Supply (Drinking Water only) network, and Table 4.2 – Dual Supply Network. Designers should be aware of the key differences in the operational strategies of the water service providers within SEQ (refer Sections 6.0 and 8.0).

Table 4.1 - Water Network Design Criteria – Single Supply (Drinking Water Only) Network

No	Parameter	Gold Coast	Logan	Redland	Queensland Urban Utilities	Unitywater
A. Drinking Water – Conventional (Single Supply Zone)						
A1	**Average Day Demand (AD) per EP, excluding NRW (Note: EP/ET conversion rate provided in separate tables from Water Service Provider)**	220 L/EP/d	230 L/EP/d			
A2	**Estimated Non-Revenue Water (NRW)**	20 L/EP/d	30 L/EP/d			
A3	**Peaking Factors**	**Residential (single det.)** / **Multi-Residential** / **Commercial /Public** / **Indus.** / **Tourist** / **Open Space**	**Low and Med Density Res**		**High Density Res**	**Commercial/Industrial**
	MDMM/AD	1.75 / 1.27 / 1.06 / 1.06 / 1.76 / 1.15	1.5		1.5	1.5
	PD/AD	2.12 / 1.45 / 1.12 / 1.12 / 2.51 / 1.37	2		2	2
	PH/PD	2.84 / 2.05 / 2.07 / 1.38 / 2.40 / 1.75	2		1.75	1.4
	PH/AD	6.03 / 2.97 / 2.32 / 1.54 / 6.03 / 2.40	4		3.5	2.8
A4	**Pressure**					
	minimum SERVICE pressure (at PH on PD with Reservoirs at MOL) with no flow through service, Urban and Rural **Normal operating conditions**	22 m in the main adjoining the Property boundary.	22 m at the property boundary			
	In areas defined by the SP, properties requiring domestic private boosters	12 m at the property boundary				
	Maximum SERVICE Pressure	Target maximum pressure 55 m Maximum pressure 80 m	55 m			
	Emergency fire operating conditions (Minimum Residual Mains Pressures)	12m min at the main at the hydrant 9m minimum for infrastructure in small isolated or high elevated areas within the existing water supply zone	12 m min in the main at the flowing hydrant 6 m elsewhere in mains that have customer connections Positive pressure throughout			
A5	**Fire Fighting** **Rural and Small Communities** **(Definitions as per Glossary)**	Rural Residential only: 7.5L/s for 2 hours Rural Commercial: 15L/s for 2 hours			Rural (>5,000m2 lots): 7.5L/s for 2 hours	Rural Residential only: 7.5L/s for 2 hours Rural Commercial/Industrial: 15L/s for 2 hours
	Urban	Residential: 15 L/s for 2 hours Commercial/Industrial: 30 L/s for 4 hours	Detached Res (<= 3 storeys): 15 Ls for 2hrs w background Demand Multi storey Res (> 3 storeys): 30 L/s for 4 hours w background Demand Commercial/Industrial buildings: 30 L/s for 4 hours w background Demand Risk Hazard Buildings – assessed on needs basis		Semi-Rural (1,000 to 5,000 m^2 lots): 15 L/s for 2 hours Low Density Urban (1-3 storeys) Tin /Timber: 25 L/s for 2 hours Low Density Urban (1-3 storeys) Brick/Tile: Greenfield 25 L/s for 2 hrs Brownfield 15 L/s for 2 hrs Medium Density Urban (4-6 storeys): Greenfield 45 L/s for 4 hrs Brownfield 30 L/s for 4 hrs High Density Urban (>6 storeys): 60 L/s for 4 hrs City CBD/Inner City High Rise: Case by case but in the order of 300 L/s for 4 hrs Commercial/Industrial: Greenfield 45 L/s for 4 hrs Brownfield 30 L/s for 4 hrs	Detached Res (<= 3 storeys): 15 L/s for 2hrs w background Demand Multi story Res (> 3 storeys): 30 L/s for 4 hours w background Demand Commercial/Industrial buildings: 30 L/s for 4 hours w background Demand Risk Hazard Buildings – assessed on needs basis
	Background Demand	Res: 2/3 PH (not less than AD) and +ve residual pressure at PH Non Res: PH for localised Commercial/industrial or 2/3 PH for water supply zone. Worst case scenario should be used based on reservoir at MOL,**based on single residential or single commercial/industrial fire within water supply zone**	Res(Detached/ Multi storey): Highest of 2/3 PH or AD Commercial/Industrial: PH demand (between 10am and 4pm) (single fire event only)		2/3 x residential peak hour demands plus 1 x non-residential peak hour demands.	Res (Detached/ Multi storey): Highest of 2/3 PH or AD Commercial/ Industrial: PH demand (between 10am and 4pm) (single fire event only)

No	Parameter	Gold Coast	Logan	Redland	Queensland Urban Utilities	Unitywater
A. Drinking Water – Conventional (Single Supply Zone)						
A6	**Reservoir storage—operational capacity** (Min Operating Storage – four consecutive hours of demand)	GROUND LEVEL RESERVOIR: 3 x (PD – MDMM) + Emergency Storage (Emergency Storage - Greater of 4 hrs at MDMM or 0.5 ML. For less than 1000 EP, 150 kL)			GROUND LEVEL RESERVOIR: 3 x (PD – MDMM) + greater of 4 hrs MDMM and Firefighting Storage, subject to a minimum reservoir size of 150 kL (Firefighting Storage based on flow and duration requirements stated under item A5 for development types serviced by the reservoir)	GROUND LEVEL RESERVOIR: 3 x (PD – MDMM) + Emergency Storage (Emergency Storage - Greater of 4 hrs at MDMM or 0.5 ML. For less than 1000 EP, 150 kL)
		ELEVATED RESERVOIR: 6 x (PH – 1/12 MDMM)+150kL fire storage In supply zones where 8xPH is less than or equal to MDMM the following equation is used (2xPH)+150kL fire storage Note: PH is in kL/h, MDMM is in kL/d and reservoir storage is in kL in the above formulae.				
A7	**Reservoir Pump Servicing Requirements**					
	Ground level reservoir – Duty Pump	MDMM over 20 hrs				
	Elevated reservoir – Duty Pump	Capacity (L/s) = Peak Hour (L/s)				
	Standby pump capacity	Match largest single pump unit capacity				
A8	**Pipeline Capacity Requirements**	Trunk gravity system: MDMM in 24hours; Reticulation Mains: Maintain pressure for PH and fire flow performance Pump system: MDMM in 20 hours		Transport MDMM in 20 hrs Reticulation mains; Maintain pressure for Peak Hour and fire flow performance		
A9	**Pipe Friction Losses** **Hazen Williams Friction Factors** Based on the preferred material types outlined in the SEQ Water Supply Code (as amended). Any variation from these material types needs to be subject to further investigation.	<=150, C=100 >150 -300mm, C=110				
	Maximum Allowable Headloss (PH) (m/km)	5m/km for DN<=150 3m/km for DN>=200				
	Maximum allowable velocity	2.5m/s				

Table 4.2 - Water Network Design Criteria – Dual Supply Network

No	Parameter	Gold Coast[5]					Queensland Urban Utilities		Unitywater							
B. Drinking Water System in a Dual Supply Zone																
B1	**Average Day Demand (AD)**	Residential Single Family	Case 3 Case 4	177 L/EP/d 129			AD (drinking water): 150 L/EP/d									
		Residential Multi Family	Case 3 Case 4	226 L/EP/d 161												
		Commercial/ Public	Case 3 Case 4	161 L/EP/d 161												
		Industrial	Case 3 Case 4	290 L/EP/d 290												
		Tourist	Case 3 Case 4	226 L/EP/d 161												
		Open Space	Case 3 Case 4	81 L/EP/d 81												
B2	**Non-Revenue Water (NRW)**	10% NRW included in AD					15 L/EP/d									
B3	**Peaking Factors** **MDMM (Mean Day Max Month)** **PD (Peak Day)** **AD (Average Day)** **PH (Peak Hour)**			**MDMM/AD**	**PD/AD**	**PH/AD**	**PD/AD**	**PH/PD**	**SFR & RUR**		**MFR**		**COM**		**IND**	
									PD/AD	**PH/PD**	**PD/AD**	**PH/PD**	**PD/AD**	**PH/PD**	**PD/AD**	**PH/PD**
		Residential Single Family	Case 3 Case 4	1.14 1.34	1.31 1.54	2.67 3.14	1.2 (Res) 1.6 (Non Residential)	2.6 (Res) 1.5 (Non Residential)								
		Residential Multi Family	Case 3 Case 4	1.14 1.43	1.31 1.63	2.67 3.34			2.5	4.2	2.4	4.1	1.8	2.7	1.8	2.5
		Commercial/ Public	Case 3 Case 4	1.06 1.06	1.12 1.12	2.32 2.32										
		Industrial	Case 3 Case 4	1.06 1.06	1.12 1.12	1.54 1.54										
		Tourist	Case 3 Case 4	1.59 1.99	2.26 2.83	5.43 6.79										
		Open Space	Case 3 Case 4	1.15 1.15	1.37 1.37	2.4 2.4										
B4	**Reservoir Storage**	As Per Drinking Water – Single Supply Zone														
B5	**Pressure**															
	Minimum pressure * Normal operating conditions * Properties requiring domestic private boosters	As Per Drinking Water – Single Supply Zone														
	- Maximum pressure															
	- Emergency fire operating conditions															
B6	**Fire fighting**	No fire flow to be drawn from drinking water mains in areas where non-drinking water infrastructure has been provided					No requirement for provision of fire fighting capacity in the drinking water network where non-drinking water infrastructure has been provided.		As Per Drinking Water – Single Supply Zone							
B7	**Water Pump Servicing Requirements**	As Per Drinking Water – Single Supply Zone														
B8	**Pipeline Capacity Requirements**	As Per Drinking Water – Single Supply Zone														
B9	**Pipe Friction Losses (Hazen Williams 'C' Values)**	As Per Drinking Water – Single Supply Zone														

[5] **Case 3 : Potable water plus recycled water (Class A+ Greenfield); Case 4 : Potable water plus rainwater tanks plus recycled water (Class A+ Aggressive case- Greenfield)**

No	Parameter	Gold Coast[5]					Queensland Urban Utilities		Unitywater							
C. Non-Drinking Water System in a Dual Supply Zone																
C1	**Average Day Demand (AD)**	Residential Single Family	Case 3 Case 4	145 L/EP/d 145			AD (non-drinking water): 80 L/EP/d									
		Residential Multi Family	Case 3 Case 4	97 L/EP/d 97												
		Commercial/ Public	Case 3 Case 4	161 L/EP/d 161												
		Industrial	Case 3 Case 4	32 L/EP/d 32												
		Tourist	Case 3 Case 4	97 L/EP/d 97												
		Open Space	Case 3 Case 4	242 L/EP/d 242												
C2	**Non-Revenue Water (NRW)**	10% NRW included in AD					15 L/EP/d									
C3	**Peaking Factor** **MDMM (Mean Day Max Month)** **PD (Peak Day)** **AD (Average Day)** **PH (Peak Hour)**			**MDMM/AD**	**PD/AD**	**PH/AD**	**PD/AD**	**PH/AD**	**SFR & RUR**		**MFR**		**COM**		**IND**	
									PD/AD	**PH/AD**	**PD/AD**	**PH/AD**	**PD/AD**	**PH/AD**	**PD/AD**	**PH/AD**
		Residential Single Family	Case 3 Case 4	1.33 1.53	1.70 1.93	6.12 6.60	3.5 (Residential) 2.0 (Non Residential)	8.1 (Residential) 3.8 (Non Residential)	2.5	7.1	2.6	5.9	2.2	3.3	2.2	3.1
		Residential Multi Family	Case 3 Case 4	1.21 1.33	1.45 1.59	2.67 2.67										
		Commercial/ Public	Case 3 Case 4	1.08 1.13	1.18 1.24	2.32 2.32										
		Industrial	Case 3 Case 4	1.08 1.13	1.18 1.24	1.54 1.54										
		Tourist	Case 3 Case 4	1.86 2.38	2.83 3.43	5.43 5.43										
		Open Space	Case 3 Case 4	1.22 1.35	1.53 1.71	2.4 2.4										
C4	**Reservoir Storage**	**Operating Volume:** 3*(PD-MDMM) **Emergency storage**: As defined by Council in commercial, industrial and high density zones.Typically • Greater of 4 hrs MDMM demand or 0.5ML • Zone <350 ET; 150 kL **Elevated Storage Capacity ;** Operating Volume + 150 kL Fire Storage Where Operating volume • Water supply zones where 8 hours x PH is less than or equal to MDMM demand, operating volume = 2 hours x PH • Water supply zones where 8 hours x MH is greater than MDMM demand, operating volume = 6 x (PH - (MDMM/12))						0.5 x PD		**Ground Level RW Res**: 1.5 x PD + 30% emergency storage **Elevated RW Res:** 6 x (PH – 1/12 MDMM)+150kl fire storage							
C5	**Pressure**						As per Drinking Water – Single Supply Zone									
	Minimum pressure * Normal operating conditions *Pressure managed areas	17m 20m							17m							
	- Maximum pressure	75m					As per Drinking Water – Single Supply Zone		70m							
	- Emergency fire operating conditions	As per Drinking Water – Single Supply Zone							NA							
	Pressure Differential between dinking and non drinking	5m directly off a reservoir and 2m in a pressure managed area					NA		5m							
C6	**Fire fighting**	As per Drinking Water – Single Supply Zone							NA							
C7	**Water Pump Servicing Requirements**	As per Drinking Water – Single Supply Zone														
C8	**Pipeline Capacity Requirements**	As per Drinking Water – Single Supply Zone														
C9	**Pipe Friction Losses (Hazen Williams 'C' Values)**	As per Drinking Water – Single Supply Zone														

5 Demand and Flow Projections

5.1 Population projections

All water customer population loads should be specified in Equivalent Persons (EP). For residential land uses, the measure of EP will generally be equivalent to the estimated residential population. Estimation of EP loading for non residential land should reflect landuse types contained in the Planning Scheme of the relevant Council. Draft landuse demands (correct at the time of publication) are attached as Appendix A. Prior to commencement, the designer shall consult the relevant Councils to confirm the most recent landuse coding and conversion rates.

Population projections should be established for the existing case (base year) and at a maximum of five (5) year intervals over a planning horizon of at least 30 years or up to the proposed "ultimate" development.

5.2 Unit Loads

The process should include a clear and concise summary of the basis on which the current and future demand has been developed. Ideally, all unit loads should be based on actual system performance, historical records and a consideration of future demand patterns. Ideally, unit demand should be separated into "internal" and "external" components to allow the impact of demand management changes to be accurately assessed.

Current and projected water demands (per EP) for each area will be stated in terms of either:

- **Average Day Demand (AD)** – defined in litres per EP per day (L/EP/d). This information is detailed in the demand tables provided by the relevant Councils Planning Schemes and reproduced in Appendix A[6].
- **Non Revenue Water (NRW)** – unless noted otherwise, Non Revenue Water is to be added to the "Average Day" demand as part of the derivation of daily unit load; and
- **Peak Hour Demand (PH)** – defined in litres per EP per second (L/EP/s).

These are to be separately derived for different demand categories which depend on the type of land use being considered (e.g. residential, non residential etc).

For major users (defined as those customers who have a projected demand over the design horizon of greater than 100 ML/yr), demand is to be individually calculated and listed separately in the assumptions.

5.3 Non Revenue Water

Non Revenue Water has been determined by the water service providers businesses as the difference between the total customer meter readings and the total bulk water meter readings. For the purposes of design, the extent of Non Revenue Water is as stated in the Tables above.

Non Revenue Water shall have no peaking factors applied to it.

[6] It is imperative that the design criteria align with the current Planning Schemes used by each Council. As such, prior to commencement, the designer shall consult the relevant Councils to confirm the most recent landuse coding and conversion rates.

5.4 Peaking Factors and Diurnal Demand Patterns

Daily usage patterns generate fluctuations in the demand for water services throughout the day (peak hour). Further variation in demand can result from climatic conditions (peak day demand). This variation in peak flows can vary depending on the land use/demand category as well as varying across water supply zones. Such daily and peak demands should be accommodated within the modelling using the peaking factors contained within Tables 4.1 and 4.2.

5.5 Calculated Demand Rates

The following demand rates should be determined or estimated based on actual population, consumption, peaking factors and non revenue water

Average Day Demand (AD)

$$AD = ({}^{\text{demand category}}AD_{L/EP/day} \times EPs) + (NRW_{L/EP/day} \times EPs)$$

Peak Day Demand (PD)

$$PD = ({}^{\text{demand category}}PD/AD \times AD_{L/EP/day} \times EPs) + (NRW_{L/EP/day} \times EPs)$$

Peak Hour Demand (PH)

$$PH = ({}^{\text{demand category}}PH/AD \times AD_{L/EP/day} \times EPs) + (NRW_{L/EP/day} \times EPs)$$

5.6 Hydraulic Modelling Scenarios

To ensure good design outcomes, the following scenarios should be considered:

5.6.1 Steady State Analysis

5.6.1.1 Peak Hour

Purpose: To assess minimum, peak hour condition customer pressures with respect to the nominated standard of service.

Assumptions:

- Peak Hour Demands;
- All water reservoirs at Minimum Operating Level (MOL)[9] and;
- Pumps and control valves set such that minimum boundary HGL conditions exist for the pressure zone being analysed[7].

The planner must ascertain whether such assumptions are realistic and customize if necessary.

5.6.1.2 Fire-Flow

Purpose: To assess the total available fire flow capacity of the network water mains with respect to the nominated standard of service.

Assumptions:

- As for Peak Hour scenario, except where overridden by Table 4.1[8];

[7] For example, inlet valves open and/or lift pump station on for supply to export reservoirs

- All water reservoirs at Minimum Operating Level (MOL)[9].

5.6.2 Extended Period Simulation Analysis

5.6.2.1 Peak Day (3 consecutive days)

Purpose: To assess the bulk water transportation capacity of the network to ensure that

- Reservoirs never empty;
- Reservoir Minimum Operating Level is maintained (refer Table 4.1, indicator A6) and;
- The reservoir supply system has a net delivery capacity equal to or greater than Peak Day.

This scenario is required only for specific bulk water models or for those Water Supply Zones that have either internal or export reservoirs.

Assumptions:

- Reservoir initial levels to correspond to top water level (check appropriateness of individual service area operations);
- Network model to commence at 12:00 am; and;
- Ultimate demand diurnal shall be sourced form the specific SEQ-SP.

The modelling must consider the range of operational modes possible, as some Water Supply Zones have multiple configurations, often depending as to which water source(s) are in operation, and the mode of their operation.

5.7 Surge and Water Hammer

Further hydraulic analysis may be required on trunk pipes, pumped system or near actuated valves where water hammer is likely to occur (e.g. due to the effects of pump station start/stop; power failure or valve closure or upstream of major inlet valves on reservoirs). In such instances, the designer may need to demonstrate that the material and pressure class of selected pipe thrust restraints and proposed mitigation structures are adequate to sustain the surge pressures developed.

The designer shall confirm with the water service provider whether water hammer modelling needs to be undertaken. Where water hammer analysis is undertaken, consideration is to be given to the following:

Contributing factors:

- Operating flow; and
- System head

Modes of failure:

- Sudden Pump failure or power failure and/or;

[8] E.g. background demand assumptions.
[9] MOL defined as the greater of head or storage requirements as defined in Table 4.1

- Timing of valve closure; and/or
- Network pressure

Possible means of mitigation:

- Air release valves; and/or
- Slow closing valves;
- Enclosed surge tank; and/or
- Pressure reduction valves; and/or;
- Sacrificial pressure release flanges; and/or
- Appropriate material selection

In undertaking the water hammer analysis, the designer is to assess the impact of water hammer on the adjoining system pipe work when pumping into a system and not a reservoir. The designer must also be able to demonstrate that the mitigation device proposed can operate effectively under power failure conditions

6 Water Supply Network Infrastructure Considerations

6.1 Reservoir Sizing

The information below is intended as a guide on the scope of hydraulic analysis that may be undertaken for a range of reservoir types. Detailed hydraulic and cost benefit analysis undertaken in accordance with the provisions of this guideline may show that other combinations of storage and flow are more beneficial. This information only applies to Reservoirs owned (or to be built ad owned by) the SEQ-SPs. It does not relate to reservoirs owner by the States Bulk Water Supply business.

The minimum level of storage provided by a reservoir should be as specified in Table 4.1. If no specification is provided, the reservoir sizing should be consistent with the requirements of the WSAA Water Supply Code developed for the SEQ distribution network

6.1.1 Ground Level Reservoirs:

The minimum operating storage of a reservoir shall be equivalent to the four subsequent hours of demand in the system without inflow to the reservoir. The minimum operating storage varies throughout the day as demand in the system changes. This variation is also true for seasonal demand i.e., during winter and summer.

6.1.2 Elevated Reservoirs:

Sizing should be undertaken to provide the minimum volumes stated in Table 4.1. However, as the capacities of the delivery system and storage requirements for elevated reservoirs are interrelated, hydraulic modelling and economic analysis should be used to determine the most suitable and least cost combination. This will include consideration of:

- the capacity and reliability of the delivery network;
- the Peak Hour (PH) demand of the system; and
- The frequency and duration of power failures.

6.1.3 Fire Fighting:

Designers must ensure that the section of network they are designing retains sufficient fire fighting provision. As such, all designs must meet the requirements of the relevant SEQ-SP's "Fire Provision Policy" as well as the various provisions of the SEQ Water Supply Code (as amended).

Where non-drinking water is designated for providing fire protection, the fire provision shall be the equivalent of a potable system.

6.1.4 Private Building Fire Systems

The water services businesses do not evaluate the performance of private fire systems, nor aim to ensure their compliance with the relevant building codes and standards. However, where projects have or may have a significant change in the network's available fire flows, the designer should consider the potential impacts on private building fire systems, and recommended outcomes be complemented by customer consultation and communication.

6.1.5 Staging

As an area develops there will be corresponding increases in the demand for water and, in most areas, the construction of more storage will eventually be required. A cost benefit analysis may show that savings can be made by constructing the required storage in stages rather than as a single storage. The timing of each stage will depend upon a number of factors. When determining the

staging of augmentation to the available storage in a particular zone the following are to be taken into account:

- total storage required;
- storage elsewhere in the network;
- sensitivity of storage volumes to demand projections;
- impacts on water quality;
- cost benefit of constructing in stages;
- reliability of supply system;
- restrictions or bottlenecks in either the supply or reticulation system;
- available land at a proposed reservoir site; and,
- other supply options (usually only for elevated zones).

The construction of the next stage of a reservoir complex may be delayed by increasing the flow being delivered by the supply system. A detailed investigation and cost benefit analysis should be carried out into augmenting the supply system rather than constructing further storage. The initial capital costs and ongoing operations costs should be calculated for all options. Future augmentation and operations costs should be capitalised over the life of the asset. A comparison of the initial capital costs, ongoing operation costs and the total capitalised cost will show the least cost option.

Operational restrictions may also lead to increased storage requirements. As the MOL rises, the available buffer storage decreases. A maximum MOL of around 45% of the total available storage should be set as a trigger for the construction of a new reservoir or augmentation of the supply system.

Another operational restriction that should be addressed, when considering augmentations of the storage system, are isolated high points in a zone limiting the draw down of the reservoir. Here, augmenting the reticulation system to increase the useable storage may have a greater cost benefit than constructing a further reservoir.

6.1.6 Constant Flow / Trickle Top Up System

Constant flow systems consist of a service connection to an on-site storage tank, which is then supplied to the building via a pump and pressure system. **The water service businesses no longer accept constant flow/trickle top up systems as an acceptable solution.**

6.2 Pump Stations Sizing

6.2.1 General

Outlined below are the proposed guidelines for sizing pumping stations and boosters. The information below is intended to be a guide only. Detailed hydraulic modelling and cost benefit analysis may show that other combinations of flow and storage are more beneficial.

Typically, a pumping station is responsible for delivering flow into a zone which has a storage reservoir. The pumping station is required to recharge the water level in a reservoir and satisfy system demands during peak hour periods.

Booster stations are responsible for maintaining the desired pressures within a service area during periods of high demand in the system. The use of boosters is generally not a preferred option as they have ongoing operational and maintenance costs. However, over the life of the asset, a booster station can be a lower total cost option when compared to the cost of constructing an elevated storage reservoir or augmentation works involved with rezoning an area.

Refer to Clause 2.8 and Clause 6.2 of WSA03 Water Supply V3.1 for further details.

6.2.2 Pumping Stations

Pumping stations supplying flow to a ground level reservoir shall be capable of delivering water as outlined in Table 4.1. The volume of water to be pumped into an area may be reduced if there is sufficient excess storage capacity available in the service area to meet demands.

Pumping stations supplying flow to an elevated storage reservoir shall also be capable of delivering water supply as outlined in Table 4.1. A greater flow rate than that specified in Table 4.1 may be required for some smaller elevated reservoirs where there is insufficient storage compared to peak demands in the system being serviced. The flow rate required is dependent upon the volume of storage and the peak hour demand in the system. Hydraulic analyses should be carried out to determine the required flow given the available or proposed storage.

6.2.3 Boosters

In elevated areas during high demand periods in the system, booster stations may be required to maintain pressures above the minimum defined outcomes.

For booster zones less than 500 properties, network plans should consider that with a low number of serviced properties, the daily diurnal pattern changes significantly, typically with much higher peak hour peaking factors. In assessing the capacity of existing booster pumps, and recommendations for booster pump augmentations, network plans should make allowance for this. Typically, decisions on this should be supported by flow data from a reliable flow meter.

Surge control devices shall be included in the system design where required by the Water Service Provider.

6.2.4 Standby Pumps

All pump stations including boosters shall have standby pump(s) of equivalent capacity to duty pump(s). Private boosters shall be considered where serviced properties are 50 or less.

6.2.5 Power System and Supply

All pumps stations/boosters shall be assessed for power supply reliability and the consequence of power failures, and consideration given to the provision for fixed or portable generators, or diesel pumps.

6.3 Pipeline Sizing Criteria

Pipe selection shall be undertaken in accordance with the requirements of Table 4.1 and the SEQ WS&S D&C Water Supply Code. For design and hydraulic modelling purposes, the material, nominal diameter and associated internal diameter must be stipulated.

6.4 Land Requirements

It is important to ensure sufficient land is set aside for water supply infrastructure at the earliest opportunity and embedded into the local planning scheme. Land requirements shall consider site areas required for reservoirs, pump stations and associated pipelines, including consideration of staging and construction area requirements. Failure to incorporate sufficient land requirements in the

planning scheme can result in significantly more expensive and difficult to operate infrastructure to achieve the same performance outcomes.

7 Drinking Water Quality

7.1 General

All modelling and design needs are to be undertaken in a manner which will deliver the objectives of the water service providers statutory "Drinking Water Quality Management Plan" as well as Water Quality (clause 2.6 of the SEQ Water Supply Code (as amended)). While not limiting the scope of issues to be considered in assessing water quality, modelling and design should include (at a minimum) consideration of the following:

- Minimising storage time at reservoirs (i.e. elimination of long detention), incorporating provision to ensure stored water is well mixed. Preference is given to reservoirs which have a separate inlet/outlet (common inlet/outlets should be avoided)
- Minimising detention[10] within water mains and adequate provision of scour appurtenances; and
- Minimising dead ends in the network;

7.2 Drinking Water Quality Modelling

All extended hydraulic modelling (i.e. any modelling that extends beyond the limits of a single development), shall include consideration of the drinking water quality parameters within the network. The scope of the drinking water quality assessment will be defined by the Water Service Providers and reflect that businesses statutory Drinking Water Quality Management Plan. This may include but is not limited to, consideration of:

- General discussion on how the proposed infrastructure (as modelled) may affect the businesses Drinking Water Quality objectives:
- Discussion on disinfection within the nominated infrastructure network;
- Any hazards and hazardous events that may affect drinking water quality;
- A broad risk assessment of the process for managing these risks
- A brief summary of the day-to-day operational requirements for managing the system (including proposed monitoring regime)

Overall the assessment must contain sufficient detail and complexity to support the water service providers Drinking Water Quality Management Plan.

[10] Tables 4.1 and 4.2 provide preferred maximums or water storage in reservoirs and in the network.

8 Non-drinking Water

8.1 General

All Water Service Providers except Redland and Logan City Councils allow for the provision of non-drinking water networks which may supplement the potable water network. Recycled water networks will be approved by the relevant service provider on a case by case basis.

Application of non-drinking water for designated areas within the service area varies across the region as follows:

- Queensland Urban Utilities does not allow non-drinking water to be used within the building envelope; and
- Unitywater and Gold Coast City Council will allow (Class A+) non-drinking water for specific internal use in all landuse types (refer to the respective customer service standards or NetServ plans).

Development of dual supply networks needs to be designed to meet the requirements of the water service providers Recycled Water Management Plan

8.2 Temporary Cross Links:

No temporary cross-connections shall be installed downstream of the Water Service Providers headwork storages

Part C - Sewerage Network Infrastructure

9 Overview

This section of the guidelines provides a summary of those design criteria which are specific to Sewerage Network Infrastructure. To ensure ease of use, key design criteria for each water service provider is contained in Section 10. These criteria define the specific inputs to be used while sections 11 to 13 provides further explanation on HOW the above parameters are to be applied when undertaking detailed network modelling and design.

In most cases, the criteria provided below have been based on analysis of historical data as well as consideration of trends forecast in the South East Queensland Water Strategy.

10 Design Criteria – Sewerage

10.1 Key Criteria

The key criteria relevant to modelling and design of the sewerage network are summarised in Table 10 below

Table 10 - Sewerage Network Design Criteria

<table>
<tr><th>No</th><th>Parameter</th><th colspan="5"></th></tr>
<tr><th></th><th></th><th>Gold Coast</th><th>Logan</th><th>Redland</th><th>Unitywater</th><th>Queensland Urban Utilities</th></tr>
<tr><td>D1</td><td>Smart Sewer Option</td><td colspan="3">RIGS</td><td>NuSewer or RIGS</td><td>NuSewer</td></tr>
<tr><td>D2</td><td>Average Dry Weather Flow (ADWF)</td><td colspan="5">For RIGS 200 L/EP/d
For NuSewer 180 L/EP/d
For “baseline” calculations for existing Conventional Sewer 210L/EP/d</td></tr>
<tr><td>D3</td><td>Peak Dry Weather Flow (PDWF)</td><td colspan="4">PDWF = C2 X ADWF where C2 = 4.7 X (EP) $^{-0.105}$</td><td>NuSewer - d x SF + GWI
Where:
SF = Sanitary Flow of 150L/EP/d
GWI = Groundwater Infiltration of 30L/EP/d
<table><tr><th>EP</th><th>30</th><th>300</th><th>600</th><th>1.2k</th><th>3k</th><th>12k</th><th>20k</th><th>50k</th><th>100k</th><th>500 k</th></tr><tr><td>d”</td><td>7.8</td><td>4.2</td><td>3.7</td><td>3.2</td><td>2.7</td><td>2.2</td><td>2.0</td><td>1.9</td><td>1.8</td><td>1.7</td></tr></table></td></tr>
<tr><td rowspan="2">D4</td><td rowspan="2">Peak Wet Weather Flow (PWWF)</td><td colspan="4">For RIGS PWWF = 5 x ADWF

NuSewer and Coomera Pimpama in Gold Coast Area[11]: PWWF=4 x ADWF</td><td>PWWF = PDWF + Rainfall Dependent Inflow(RDF)
RDF = 360L/EP/d</td></tr>
<tr><td colspan="5">Vacuum Sewer/Low Pressure Sewer
PWWF = (4 x ADWF)</td></tr>
<tr><td rowspan="8">D5</td><td>Pump Station Servicing Requirements
Operating storage (m3)</td><td colspan="4">Ops Storage = 0.9 x Q / N

Q = pump rate (L/s) of duty pump or Total Pump Capacity (L/s) if multiple duty pumps.
However, Number of starts per hr are:
N=12 for motors<100kw
N=8 for 100-200kw
N=5 of motors >200kw</td><td>(0.9 x Single pump capacity L/s)/ N
N = 12 starts per hr for motors less than 50kW.
N = 5 starts per hr for motors greater than 50kW.</td></tr>
<tr><td>Minimum Wet Well diameter</td><td colspan="5">As shown in the Sewer Pump Station Code (As amended)</td></tr>
<tr><td>Emergency storage (new)
Required storage based on “in catchment” flows (i.e. upstream pump stations turned off)</td><td rowspan="2">4hrs at ADWF</td><td colspan="2">6hrs at ADWF</td><td>3 hrs Ultimate PDWF (New PStn)</td></tr>
<tr><td>Emergency storage (existing)</td><td colspan="2">Minimum 4 hours (up to 6hours)</td><td>3 hrs Ultimate ADWF (existing)</td></tr>
<tr><td>Pump Operation Mode[12]</td><td colspan="3">Duty/assist</td><td>Duty/Standby</td></tr>
<tr><td>Single pump capacity</td><td colspan="3">Min pump capacity for PStns(duty & assist) = C1 x ADWF
Where C1 = 15 x (EP) $^{-0.1587}$</td><td rowspan="2">For SPS with 3 pumps, 2 pumps delivers PWWF (third pump has same capacity as the larger of the other 2)
For SPS with 2 pumps, EACH pump delivers PWWF</td></tr>
<tr><td>Value of C1 to be within the range 3.5 - 5</td><td colspan="2">Value of C1 to be minimum of 3.5</td></tr>
<tr><td>Total pump station capacity</td><td>PWWF</td><td colspan="2">PWWF (i.e. 5 x ADWF min or C1 x ADWF; Whichever is the greater) Overflows should not occur at flow < 5 x ADWF or C1 x ADWF (whichever is the larger).</td><td>PWWF</td></tr>
<tr><td>Size of Pump Station Lot (and buffer)</td><td colspan="5">Refer Clause 5.2.4 of Sewer Pump Station Code (As amended)</td></tr>
<tr><td>D6</td><td>Low Pressure Sewer Flow
-</td><td colspan="5">900 L/EP/d</td></tr>
<tr><td>D7</td><td>Rising Main Requirements</td><td colspan="5" rowspan="2"></td></tr>
<tr><td>Preferred Velocity</td></tr>
<tr><td></td><td>Minimum velocity</td><td colspan="5">1.0 – 1.5 m/s
0.75m/s</td></tr>
</table>

[11] Based on licence requirements

[12] For “Duty/standby” arrangement, in a 2 pump sewerage pump station, EACH pump delivers PWWF and only 1 pump runs at a time. Under a “Duty/Assist” operating philosophy each pump delivers C1 x ADWF and 2 pumps together deliver PWWF

<table>
<tr><th>No</th><th>Parameter</th><th colspan="5"></th></tr>
<tr><th></th><th></th><th>Gold Coast</th><th>Logan</th><th>Redland</th><th>Unitywater</th><th>Queensland Urban Utilities</th></tr>
<tr><td></td><td>Maximum velocity</td><td colspan="5">3m/s</td></tr>
<tr><td></td><td>Roughness</td><td colspan="5">As per Clause 10.3.3 of WSA 04 Sewage Pumping Station Code</td></tr>
<tr><td></td><td>Odour Management Requirements</td><td colspan="5">Odour management requirements (including detention times) to be determined as part of the odour impact study for the site (refer Sewerage Pump Station Code (as amended) Clause 2.5)</td></tr>
<tr><td>D8</td><td>Gravity Sewer Requirements (Conventional)
- Roughness Equation
- Pipe friction coefficient</td><td colspan="5">Manning’s
All Smart Sewers (Nu Sewer and RIGS) - n = 0.0128</td></tr>
<tr><td></td><td>- Minimum pipe grades
(subject to minimum velocity stated below)</td><td colspan="5">Minimum Sewer Grades
<table>
<tr><th>RIGS (PVC) (mm)</th><th>NuSewer (PE) (mm)</th><th>Nominal Bore (mm)</th><th>slope</th></tr>
<tr><td>100</td><td>110</td><td>100</td><td>House Connection Branch, one allotment only at 1:60</td></tr>
<tr><td>150</td><td>160</td><td>150</td><td>House connection Branch and/or sewers for first 10 allotments: 1:100
Sewer after first 10 allotments 1:180 (see note 1)</td></tr>
<tr><td>225</td><td>250</td><td>225</td><td>1:300</td></tr>
<tr><td>300</td><td>315</td><td>300</td><td>1:400</td></tr>
<tr><td>375</td><td>400</td><td>375</td><td>1:550</td></tr>
<tr><td></td><td>500</td><td>450</td><td>1:700</td></tr>
<tr><td></td><td></td><td>525</td><td>1:750</td></tr>
<tr><td></td><td>630</td><td>600</td><td>1:900</td></tr>
<tr><td></td><td></td><td>675</td><td>1:1050</td></tr>
<tr><td></td><td>800</td><td>750</td><td>1:1200</td></tr>
<tr><td></td><td></td><td>825</td><td>1:1380</td></tr>
<tr><td></td><td>1000</td><td>900</td><td>1:1600</td></tr>
<tr><td></td><td>1200</td><td>1050</td><td>1:2000</td></tr>
<tr><td></td><td></td><td>1200</td><td>1:2400</td></tr>
<tr><td></td><td></td><td>1350</td><td>1:2800</td></tr>
<tr><td></td><td></td><td>1500</td><td>1:3250</td></tr>
<tr><td></td><td></td><td>1650</td><td>1:3700</td></tr>
<tr><td></td><td></td><td>1800</td><td>1:4200</td></tr>
<tr><td></td><td></td><td colspan="2">Note 1 – where approved by the Water Agency, DN 150 main line sewers may be laid at 1:200 in Canal Developments together with a Water Agency agreed reduction in the minimum PDWF Velocity Criteria for the DN 150 main line sewer</td></tr>
</table></td></tr>
<tr><td></td><td>Maximum depth of flow</td><td colspan="5">75% d (at PWWF)</td></tr>
<tr><td></td><td>Minimum Velocity</td><td colspan="5">0.7m/s at PDWF
Maximum: 3.0m/s (refer Cl 4.5.9.1 of the 2002 Sewer Code)</td></tr>
<tr><td>D9</td><td>Average Dry Weather Flow (ADWF) for Treatment Plants</td><td>263L/EP/d</td><td colspan="4">As per network flows</td></tr>
</table>

11 Flow Projections

11.1 General

All sewerage customer loads should be specified in Equivalent Persons (EP). Estimation of EP loading for both residential and non residential land uses should reflect landuse types contained in the Planning Schemes of the relevant Council. Draft lists of landuse Demand (correct at the time of publication) are attached as Appendix A. Prior to commencement, the designer shall consult the relevant Councils to confirm the most recent landuse coding and conversion rates.

Population projections should be established for the existing case (base year) and at a maximum of five (5) year intervals over a design horizon of at least 30 years or up to the proposed "ultimate" development

11.2 Unit Loads

All modelling and design should include a clear and concise summary of the basis on which the current and future demand has been developed. Ideally, all unit loads should be based on actual system performance, historical records and a consideration of future loading projections. Ideally, unit demand should take into account the potential for changes in internal water demand resulting from demand management initiatives and the impact of inflow/infiltration management programs.

The following loading rates should be determined or estimated based on actual population/EP and, peaking factors

Average Dry Weather Flow (ADWF)

$$ADWF = (\text{demand category } ADWF_{L/EP/day} \times EPs)$$

ADWF is to be separately derived for different demand categories which depend on the type of land use being considered (e.g. residential, non residential etc). Unless noted otherwise, the development areas to be applied in estimating EP loading are based on actual areas excluding roads, etc

Where existing or future developments will produce EP's greater than those determined from the above densities, site specific flows shall be used in the analysis. This particularly relates to industrial and commercial type developments. Site specific flow estimates shall utilise sewage flow and / or water consumption data where available. Where this information is not available or in the case of future development where the flow has not been quantified, the relevant water service provider shall specify the rates to be applied.

Trade waste loading should be included in the modelling of the sewerage network. For major trade waste users (defined as those customers who have a projected loading over the design horizon of greater than 5,000kl/annum), demand is to be individually calculated and listed separately in the assumptions.

Peak loads (PWWF and PDWF) should be determined with reference to ADWF using the parameters outlined in Table 10. In the event that there is a discrepancy, PWWF should be defined as at least 5 x ADWF

12 Sewer Network Modelling

12.1 Scope of Hydraulic Modelling

As a minimum, the scope of the hydraulic modelling should include all (current and future) infrastructure of the following types;

- All 225 mm dia. sewers and greater including associated maintenance holes that are required to service all areas to be sewered within the nominated wastewater service area;
- All pump stations and rising mains that are required to service all areas to be serviced within the nominated wastewater service area. This may include receiving reticulation; and
- Flows from private pump stations, rising mains and sewers shall be included from where they discharge into the Sewerage system.

12.2 Modelling Scenarios

12.2.1 General

The scope of modelling scenarios and their associated performance criteria is summarised in the States Guidelines as follows:

- **Dry Weather Flow:** System meets explicit operational criteria, e.g. minimising detention periods (odour management), or overflow events (equipment or power supply failure)
- **Wet Weather Flow:** Number and location of overflows do not exceed service provider customer service standards and EPA requirements

The scenarios should include assessment of the impacts of various strategies (e.g. new works, renewals, operational modifications, etc) to meet service standards and operational objectives (e.g. energy management or I/I reduction).

12.2.2 Static vs Dynamic Modelling:

It is anticipated that, in general (specifically on smaller developments) static modelling will be sufficient. In this instance, the criteria identified in Table 10 will apply. In some instances, dynamic modelling may be required. In this case, issues relevant to dynamic modelling (e.g. modelling scenarios, number and location of overflows etc) will comply with the requirements of sections 11, 12 and 13.

The requirements for dynamic modelling will be at the discretion of the relevant Service Provider. It is anticipated that dynamic modelling will be required for larger developments as well as for environmentally sensitive areas. The designer is to confirm with the Service Provider on the extent of modelling to be undertaken.

13 Sewer Network Considerations

13.1 Gravity Sewers

Pipe selection shall be undertaken in accordance with the design criteria contained in Table 10 and the SEQ WS&S D&C Sewerage Code (as amended). For design and hydraulic modelling purposes, the material, nominal diameter and associated internal diameter must be stipulated.

13.2 Rising Mains

Rising mains are to be designed in accordance with the criteria specified in Table 10.

The criterion for pump velocities should be assessed in parallel with the headloss gradient (i.e., higher velocity in smaller mains results in greater head loss per 1000m). Rising mains should be as short as possible, with the smallest economical diameter adopted with a view to minimizing sewage retention time. Consideration should be given to staging of rising mains to meet existing and ultimate flows where sewage retention times may be excessive in the initial period.

Discharge into reticulation sewers may only be considered if:

- It can be shown that the maximum expected flow (pumped slug flow + gravity flow) through the line under peak wet weather conditions will not exceed two-thirds depth of the sewer; or
- There are no downstream connections to the receiving sewer within 300 m of the rising main discharge point.

No rising main discharges shall be permitted into a reticulation sewer that is less than DN225 mm in diameter unless approved by relevant SEQ Service Provider.

13.3 Pumping Stations

13.3.1 General:

Pump Stations within QUU will operate on a “duty standby” basis. Gold Coast City Council, Logan City Council, Redland City Council and Unitywater use a “duty/assist” mode of operation.

Under “duty/standby” mode of operation, each pump within a 2 pump station delivers PWWF and only 1 pump operates at a time. Under a “duty/assist” mode of operation, each pump delivers C1 x ADWF and 2 pumps (running in parallel) deliver PWWF,

Under either operating mode, in the case of a three pump sewer pump station, two pumps operate as above and the third pump is on standby

Accepted pumps are to be used wherever possible. The list of “Accepted Products and Materials” has been developed as part of the SEQ WS&S D&C Code and is available from each water service provider on request. Special pumps may be required for pumps that fall outside this range. If non-standard pumps are required then an additional complete replacement pump may need to be provided. Specific written directions will be given in these circumstances.

Pump station wet wells are to be designed to meet the criteria stated in Table 10 for operational storage, pump starts and emergency dry weather overflow storage. Pump stations (civil works – wet / dry well) shall be designed to deliver the ultimate design PWWF (as defined in Table 10 above) and address septicity of wastewater. Pumps shall be sized to meet the maximum projected flow that the pumps will require to deliver during their lifetime (i.e. 15 to 20 years).

13.3.2 Pump Stations on Common Rising Mains:

Discharge into a common rising main is not encouraged by the SEQ-SPs. In the instance where a designer can demonstrate that discharge into a common rising main is the most cost effective solution, the pumps should be designed to operate as follows:

- When all other pumps on the rising main are continuously operating in duty/assist mode; and
- When a single pump from the pump station is operating.

13.4 Vacuum Sewer Systems and Vacuum Pump Stations

The design flows of vacuum systems shall be calculated using the same design criteria as a standard submersible pump station. The populations to be allowed for in the design of the system shall comply with the requirements for the design of gravity sewers.

The development of new vacuum sewer systems are not recommended by the Service Providers. Only very limited extensions to existing systems will be considered

13.5 Low Pressure Sewer Systems

The design flows of low pressure sewer systems shall be calculated using the same design criteria as a standard submersible pump station. The populations to be allowed for in the design of the system shall comply with the requirements for the design of gravity sewers.

The development of Low Pressure Sewer systems are not recommended by the Service Providers. Only very limited extensions to existing systems will be considered

13.6 Septicity and Odour Control

Where high retention times are likely to occur, some form of odour / sulphide control will be required. As a guide, average retention times in excess of two hours may lead to hydrogen sulphide generation. The gaseous hydrogen sulphide concentration in the sewer headspace shall not exceed 15ppm. If modelling predicts concentrations greater than 15ppm, then either pump station chemical dosing or headspace gas extraction/treatment will be required. Refer to the WSAA Sewerage Code (as amended) for further guidance on odour management studies.

Appendix A – Demand (by Landuse) Tables

The following tables of demand (by landuse) have been developed to align with the specific landuse types used within the Planning Schemes of each Council within the SEQ Water Service area. It is imperative that the design criteria align with the Planning Schemes used by each Council. Over time (as Council Planning Schemes consolidate on a more succinct range of landuse types) the tables below may be subject to change. Hence, the designer shall consult the relevant Councils prior to confirm the most recent landuse coding and conversion rates.

Noting that supporting documentation can use either EP or ET, the following table provides a general conversion between EP and ET for each area. However, this conversion depends on population and planning scheme densities; hence the factors provided below are regarded as "information only" and are not definitive.

EP/ET Conversion Factors for single residential family households

Source	EP/ET Conversion Rate
Gold Coast City Council	
City-wide Average using OESR data	2.73
Unitywater	
All areas	2.7
Logan City Council	
All areas	2.7
Redland City Council	
All areas	2.7

Appendix A1 – Gold Coast City Council

Table A1 - GCCC Planning Scheme Planned Demand - Domains (Gold Coast Area)

For demand for GCCC planning scheme local area plans & structure plans refer to Council's Planning Scheme Part 8, Division 2, Tables 2-58 and 2-59

Projection Category (Domain)	Planning Scheme Use Type	Development Density (ET/Ha of net dev area)		
		Water Supply	Wastewater	Data source
Detached Dwelling - where overlay Map OM5 applies	OM5 Constraint = Min Lot Size 1000m2	10	10	Table 2.55 - GCCC PIP
	OM5 Constraint = Min Lot Size 2000m2	5	5	Table 2.55 - GCCC PIP
	OM5 Constraint = Min Lot Size 4000m2	2.5	2.5	Table 2.55 - GCCC PIP
Detached Dwelling - All other	Size (NDA) if existing site to be developed: up to 500m2	20	20	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: 501m2 - 799m2	16	16	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: 800m2 - 1199m2	16	16	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: 1200-2399m2	18	18	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: > 2400m2	20	20	Table 2.55 - GCCC PIP
Park Living		3	0	Table 2.55 - GCCC PIP
Residential Choice	RD 2	20.79	20.79	Table 2.55 - GCCC PIP
	RD 3	25.2	25.2	Table 2.55 - GCCC PIP
	RD 4	31.5	31.5	Table 2.55 - GCCC PIP
	RD 5	55	55	Table 2.55 - GCCC PIP
	RD 6	82.5	82.5	Table 2.55 - GCCC PIP
	RD 7	110	110	Table 2.55 - GCCC PIP
Tourist and Residential	RD 4	31.5	31.5	Table 2.55 - GCCC PIP
	RD 5	60	60	Table 2.55 - GCCC PIP
	RD 6	90	90	Table 2.55 - GCCC PIP
	RD 7	120	120	Table 2.55 - GCCC PIP
	RD 8/RDX	231	231	Table 2.55 - GCCC PIP
Village (Mixed Use)	Size (NDA) if existing site to be developed: up to 500m2	16	16	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: 501m2 - 799m2	16	16	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: 800m2 - 1199m2	16	16	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: 1200-2399m2	16	16	Table 2.55 - GCCC PIP
	Size (NDA) if existing site to be developed: > 2400m2	16	16	Table 2.55 - GCCC PIP
Integrated Business	RD5	55	55	Table 2.55 - GCCC PIP

Projection Category (Domain)	Planning Scheme Use Type	Development Density (ET/Ha of net dev area)		
		Water Supply	Wastewater	Data source
	Uncoded	32	32	Table 2.55 - GCCC PIP
Local Business	RD 2	20.79	20.79	Table 2.55 - GCCC PIP
	RD 3	25.2	25.2	Table 2.55 - GCCC PIP
	RD 5	55	55	Table 2.55 - GCCC PIP
	Uncoded	20	20	Table 2.55 - GCCC PIP
Fringe Business	RD 2	20.79	20.79	Table 2.55 - GCCC PIP
	RD 3	25.2	25.2	Table 2.55 - GCCC PIP
	RD 5	55	55	Table 2.55 - GCCC PIP
	Uncoded	20	20	Table 2.55 - GCCC PIP
Industrial 1		16	16	Table 2.55 - GCCC PIP
Industrial 2		16	16	Table 2.55 - GCCC PIP
Extractive Industry		10	0	Table 2.55 - GCCC PIP
Marine Industry		10	10	Table 2.55 - GCCC PIP
Community Purpose		15	15	Table 2.55 - GCCC PIP
Public Open Space		0.3	0.01	Table 2.55 - GCCC PIP
Private Open Space		20	20	Table 2.55 - GCCC PIP
Rural		0	0	Table 2.55 - GCCC PIP

Table A2 Typical Water and Wastewater Supply Demand Generation Rates for Development Types (Gold Coast Area)

Development Type	Development Unit	Demand Equivalent Conversion Rate
Car Wash	Lane	1.0 ET / Lane
Caravan Park	Site	0.3 ET / Site
Child Care Centre	Pupil / staff member	0.05 ET per Pupil / staff member
Commercial (other)	100 m2 GFA	0.6 ET / 100 m2 GFA
Conference / meeting venue	100 m2 GFA	1.6 ET /100 m2 GFA
Detached Dwelling	Dwelling	1 ET/dwelling
Entertainment / Cinemas	100 m2 GFA	2.0 ET / 100 m2 GFA
Family Accommodation	Additional Dwelling	0.275 ET / Additional Dwelling
Hospital	Bed	0.5 ET / Bed
Hostel Accommodation	Bed	0.24 ET / Bed
Hotels / Clubs	Flushing Unit, Water Closet and Urinal	1.1 ET / Flushing Unit, Water Closet and Urinal
Industry	100 m2 GFA	0.36 ET / 100 m2 GFA
Laundromat	Washing Machine	0.4 ET / Washing Machine
Marina (Live aboard)	Berth	0.8 ET / Berth
Marina (Commercial)	Berth	0.2 ET / Berth
Marina (Transient Moorage)	Berth	0.4 ET / Berth
Medical / Dental Centre	Consultation Room	0.3 ET / Consultation Room
Motel / Hotel	Bedroom	0.6 ET / Bedroom
Multi Unit Dwelling 1 bedroom/studio	Dwelling	0.47 ET/ Dwelling
Multi Unit Dwelling 2 bedroom	Dwelling	0.63 ET/Dwelling
Multi Unit Dwelling 3 bedroom +	Dwelling	0.9 ET/Dwelling
Nursing Home	Bed	0.26 ET / Bed
Office	100 m2 GFA	0.6 ET / 100 m2 GFA
Restaurant / Café / Fast Food	Seat	0.05 ET / Seat
Retail	100 m2 GFA	0.6 ET / 100 m2 GFA
School - Primary	Pupil / staff member	0.03 ET per Pupil / staff member
School - Secondary	Pupil / staff member	0.03 ET per Pupil / staff member
School – Tertiary/Further with accom	Pupil / staff member	member 0.1 ET per Pupil / staff
School – Tertiary/Further without accommodation	Pupil / staff	member 0.01 ET per Pupil / staff member
Other development type or where development type is deemed to be a water intensive development.		Demand generation rate to be determined having regard to proposed development.

Interim Demands for Reconfiguring Park Living, Non Residential & Management identifies the interim demands for the reconfiguration of park living, non-residential and management lots.

Purpose of Reconfiguration	Development Unit	Demand Equivalent Conversion Rate
Park Living Lot	Proposed lot	1 ET/Lot
Non-residential (e.g. office, retail, industrial & other non-residential type development	Proposed lot	1 ET/Lot
Management	Proposed lot	1 ET/Lot

Note: Multi unit dwellings include units, flats, townhouses, duplexes and triplexes

Appendix A2 – Logan City Council

Table A3 – Logan Planning Scheme Development Density by Locality

Locality	Development	Unit or Basis	Development Density (EP/Unit)		
			Water	Sewerage	Data source
Residential Locality	Development, other than a dual occupancy or a multi-unit development, in the residential 250 zone, the Residential 600 zone, the Residential 1000 zone or the Residential 2000 zone, in respect of premises where the site area exceeds 600m2.	Lot	3.2	3.2	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development, other than a dual occupancy or a multi-unit development, in the Residential 250 zone, the Residential 600 zone, the Residential 1000 zone and the Residential 2000 zone, in respect of premises where the site area is 450m2 or greater but not greater than 600m2.	Lot	3.0	3.0	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development, other than a dual occupancy or a multi-unit development, in the Residential 250 zone, the Residential 600 zone, the Residential 1000 zone and the Residential 2000 zone in respect of premises where the site area is less than 450m2.	Lot	2.8	2.8	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development, other than a dual occupancy or a multi-unit development in the Residential 5000 one.	Lot	3.2	3.2	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development other than a dual occupancy or a multi-unit development in the Residential 10000 zone.	Lot	3.2	3.2	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development for a dual occupancy.	Dwelling Unit	2.8	2.8	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development for a multiunit development.	Dwelling Unit	2.0	2.0	Logan City Planning Scheme 2006 Policy 7, Schedule 2
Open space and conservation locality	Development for a residential use.	Lot	2.8	2.8	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development for a use other than a residential use.	Subject to assessment by the local government.			Logan City Planning Scheme 2006 Policy 7, Schedule 2
Centres locality	Development for a use other than a general industry or a noxious or hazardous industry.		30 (Water supply)	50 (Sewerage)	Logan City Planning Scheme 2006 Policy 7, Schedule 2
	Development for a general industry or a noxious or hazardous industry.		50 (Water supply)	80 (Sewerage)	Logan City Planning Scheme 2006 Policy 7, Schedule 2

Appendix A3 – Redland Council

Table A4 – Redlands Planning Scheme Development Density by Type

Category	Types of Use	Unit or Basis	Development Density (ET/Unit)		
			Water	Sewerage	Data source
	Aged Persons and Special Needs Housing	(1 bedroom)	0.33	0.33	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
		(2 bedroom)	0.57	0.50	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
		(3 bedroom)	0.76	0.63	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Hostel	(per person)	0.28	0.33	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Nursing Home	(per bed)	0.31	0.35	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Apartment Building	(per unit)	0.53	0.68	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Bulky Goods Showroom	(per 100m2 floor area)	0.14	0.20	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Child Care Centre	(per child)	0.04	0.03	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Commercial Office	(per 100m2 floor area)	0.13	0.17	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Community Facility- Welfare Premises	(per lot)	0.64	0.40	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Display and Sale Activity	(per 100m2 floor area)	0.48	0.20	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Dual Occupancy	(per unit)	0.53	0.68	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Dwelling House	(per lot)	1.00	1.00	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Education Facility				
	(1) Primary School	(per pupil)	0.035	0.3	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	(2) Secondary School	(per pupil)	0.5	0.5	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Garden Centre	(per 100m2 site area)	0.48	0.2	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	General Industry - Concrete Batching Plant	(per 100m2 site area)	0.28	0.06	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	General Industry	(per 100m2 floor area)	0.10	0.07	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Health Care Centre	(per 100m2 floor area)	0.21	0.3	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Heavy Industry	(per 100m2 floor area)	4.5	6.18	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Hospital	Per bed	0.93	0.93	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Hotel	(per 100m2 floor area)	0.8	1.15	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Indoor Recreation Facility				
	(1) With shower facilities	(per 100m2 floor area)	0.45	0.6	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	(2) No shower facilities	(per 100m2 floor area)	0.06	0.07	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Marine Services	(per 100m2 floor area)	0.1	0.07	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Mobile Home Park	Per site	0.34	0.5	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Multiple Dwelling	Per unit	0.53	0.68	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Outdoor Recreation Facility	(per 100m2	1.06	1.3	Redlands Planning Scheme

Category	Types of Use	Unit or Basis	Development Density (ET/Unit)		
			Water	Sewerage	Data source
		floor area)			Policy 3, Chapter 7 – Table 1
	Refreshment Establishment	(per 100m2 floor area)	2.05	2.87	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Retail Warehouse	(per 100m2 floor area)	0.14	0.20	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Service Station	(per 100m2 floor area)	1.36	0.40	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Shop				
	(1) Over 6000m2 floor area	(per 100m2 floor area)	0.42	0.57	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	(2) 200m2 - 6000m2 floor area	(per 100m2 floor area)	0.34	0.4	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	(3) Under 200m2	(per 100m2 floor area)	0.28	0.4	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Small Lot House	Per lot	1.0	1.0	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Tourist Accommodation-Caravan Park	Per site	0.34	0.5	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Tourist Accommodation-Motel	Per bedroom	0.23	0.32	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Vehicle Depot				
	(1) cars	(per 100m2 floor area)	0.06	0.03	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	(2) trucks	(per 100m2 floor area)	0.80	0.6	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Vehicle Repair Premises	(per 100m2 floor area)	0.11	0.12	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Veterinary Surgery	Per lot	0.48	0.4	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Warehouse - Freight Depot	(per 100m2 floor area)	0.39	0.4	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1
	Warehouse	(per 100m2 floor area)	0.04	0.01	Redlands Planning Scheme Policy 3, Chapter 7 – Table 1

Table A5 – Redlands Planning Scheme Development Density by Zone

Category	Zone	Unit or Basis	Development Density (ET/Unit)		
			Water	Sewerage	Data source
	Centre (Major, District, Neighbourhood, Local, SMBI, Pt Lookout)	As determined by the Local Government			Redlands Planning Scheme Policy 3, Chapter 7 – Table 2
	Commercial Industry	(per gross hectare)	12.5	12.5	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2
	General Industry	(per gross hectare)	12.5	12.5	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2
	Medium Density Residential	(per gross hectare)	30	30	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2
	Park Residential	(per lot - 6000m2 average)	1.5	0	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2
	Low Density Residential	(per lot - 2000m2 average)	1.25	1.25	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2
	Rural Non-Urban	(per lot)	1.5	0	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2

Category	Zone	Unit or Basis	Development Density (ET/Unit)		
			Water	Sewerage	Data source
	Urban Residential	(per gross hectare)	10.0	10.0	Redlands Planning Scheme Policy 3, Chapter 7 – Table 2

Appendix A4 – Queensland Urban Utilities

Table A6 – Brisbane City Planning Scheme Development Density (QUU)

Planning Scheme Use Type		Development Density (EP/Ha of net dev area)		
Category		Water	Sewerage	Data source
Residential	Low Density Residential (LR)	40	40	PIP Planning Assumptions
	Low -medium Density Residential (LMR)	60	60	PIP Planning Assumptions
	Character Residential (CR)	58	58	PIP Planning Assumptions
	Medium Density Residential (MR)	120	120	PIP Planning Assumptions
	High Density Residential (HR)	180	180	PIP Planning Assumptions
	Emerging Community (EC)	40	40	PIP Planning Assumptions
Multi Purpose Centres	City Centre (MP1)	300	300	PIP Planning Assumptions
	Major Centre (MP2)	150	150	PIP Planning Assumptions
	Suburban Centre (MP3)	45	45	PIP Planning Assumptions
	Convenience Centre (MP4)	21	21	PIP Planning Assumptions
Industrial Areas	Future Industry Area (FI)	30	30	PIP Planning Assumptions
	Light Industry Area (LI)	24	24	PIP Planning Assumptions
	General Industry Area (GI)	30	30	PIP Planning Assumptions
	Heavy Industry Area (HI)	30	30	PIP Planning Assumptions
	Extractive Industry Area (EI)	Individually assessed	Individually assessed	PIP Planning Assumptions
Community Use Areas	Cemetery (CU1)	0	0	PIP Planning Assumptions
	Community facilities (CU2)	18	18	PIP Planning Assumptions
	Crematorium (CU3)	0	0	PIP Planning Assumptions
	Education purposes (CU4)	18	18	PIP Planning Assumptions
	Emergency services (CU5)	18	18	PIP Planning Assumptions
	Health care purposes (CU6)	60	60	PIP Planning Assumptions
	Railway activities (CU7)	Individually assessed	Individually assessed	PIP Planning Assumptions
	Utility installation (CU8)	6	6	PIP Planning Assumptions
Special Purpose Centres	Major hospitals and medical facility (SP1)	60	60	PIP Planning Assumptions
	Major educational and research facility (SP2)	18	18	PIP Planning Assumptions
	Major defence and communications facility (SP3)	Individually assessed	Individually assessed	PIP Planning Assumptions
	Major sporting stadium (SP4)	30	30	PIP Planning Assumptions
	Entertainment centre (SP5)	30	30	PIP Planning Assumptions
	Airport (SP6)	Individually assessed	Individually assessed	PIP Planning Assumptions
	Port (SP7)	24	24	PIP Planning Assumptions
	Major residential institution (SP8)	36	36	PIP Planning Assumptions
	Correctional centre (SP9)	Individually assessed	Individually assessed	PIP Planning Assumptions
	The Brisbane Market (SP10)	Individually	Individually	PIP Planning Assumptions

Category	Planning Scheme Use Type	Development Density (EP/Ha of net dev area)		
		Water	Sewerage	Data source
		assessed	assessed	
	Vehicle sales and service (SP11)	18	18	PIP Planning Assumptions
	Mixed industry and business (SP12)	60	60	PIP Planning Assumptions
	Office park (SP13)	60	60	PIP Planning Assumptions
	Cottage industry and retail (SP14)	36	36	PIP Planning Assumptions
	Marina (SP15)	Individually assessed	Individually assessed	PIP Planning Assumptions
	South Bank (SP16)	Individually assessed	Individually assessed	PIP Planning Assumptions
Green Space Areas	Conservation Area (CN)	0	0	PIP Planning Assumptions
	Parkland Area (PK)	0	0	PIP Planning Assumptions
	Sport and Recreation Area (SR)	0	0	PIP Planning Assumptions
	Environmental Protection Area (EP)	0	0	PIP Planning Assumptions
	Rural Area (RU)	0*	0	PIP Planning Assumptions

* Water is supplied in some existing areas of Rural classified land. Use the EP per dwelling figures below for these areas.

For existing residential development and proposed residential development where development details are known, apply:

2.65 EP per detached dwelling (house)

1.79 EP per attached dwelling (townhouse, unit, flat, apartment etc.)

Table A7 – Ipswich City Planning Scheme Development Density (QUU)

Use Class	Planning Scheme Defined Use	Unit	Development Density (EP/Unit)		
			Water	Sewerage	Data source
Residential	Caretaker's Residence	1 bed	1	1	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
		2 bed	1.5	1.5	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
		3 Bed	1.75	1.75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Display Housing	Per residential	-	-	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Dual Occupancy	1 bed	1.25	1.25	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
		2 bed	1.75	1.75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
		3 Bed	2	2	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – 1 bed	1 bed	1	1	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – 2 bed	2 bed	1.5	1.5	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – 3 bed	3 Bed	1.75	1.75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – Caravan Park	Site	1.5	1.5	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – Boarding House	Bed	0.75	0.75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – Retirement Community	1 Bed	1	1	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – Retirement Community	2 Bed	1.5	1.5	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Multiple Residential – Student Accommodation	Bed	0.65	0.65	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Single Residential	Site >450m^2	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Single Residential	Site <450m^2	2.7	2.7	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Temporary Accommodation – Boarding House	Bed	0.75	0.75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Temporary Accommodation – Camping Ground	Site	1	1	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Temporary Accommodation – Caravan Park	Site	1.5	1.5	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Temporary Accommodation – Motel	Unit	1	1	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
Urban Areas	Large Lot Residential	ha	6	6	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Residential Low Density (RL1)	ha	12	12	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Residential Low Density (RL2)	ha	30	30	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Residential Medium Density (RM1)	ha	75	75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Residential Medium Density (RM2)	ha	38	38	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
Urban Areas	Residential Mixed Density (RM3)	ha	38	38	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Character Areas – Housing Low Density Zone (CHL)	ha	30	30	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Character Areas – Housing Mixed Density Zone (CHM)	ha	38	38	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Future Urban (Low Density)	ha	30	30	Ipswich Planning Scheme

Use Class	Planning Scheme Defined Use	Unit	Development Density (EP/Unit)		
			Water	Sewerage	Data source
					2007 Policy 5 Appendix 1
	Future Urban (Medium Density)	ha	75	75	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Local Business and Industry Buffer	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Bundamba Racecourse Stables	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Recreation	Lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Conservation	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Limited Development (Constrained)	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Special Uses	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Special Opportunity	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
Amberley Area	Amberley Air Base and Aviation	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
Rosewood Area	Character Areas – Housing Low Density Zone (CHL)	ha	30	30	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Character Areas – Housing Medium Density Zone (CHM)	ha	38	38	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Residential Low Density	ha	30	30	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Residential Medium Density	ha	38	38	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Urban Investigation	ha	30	30	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Recreation	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Special Uses	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
Township Areas	Township Residential	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Township Character Housing	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Township Character Mixed Use	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Stables Residential	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Township Business	lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Service Trades, Showgrounds and Trotting Track	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1
	Special Uses	residential lot	3.3	3.3	Ipswich Planning Scheme 2007 Policy 5 Appendix 1

Table A8 – Lockyer Valley Planning Scheme Development Density (QUU)

Category	Planning Scheme Zone	Development Density (EP/Ha of Net dev area)		
		Water	Sewerage	Data source
Rural	Rural General, Rural Upland, Rural Landscape, Rural Agricultural Land	0	0	PIP Planning Assumptions
Residential	Rural Residential, Homestead Residential	3	0	PIP Planning Assumptions
	Urban Residential, Residential Expansion, Emerging Communities	30 - 50	30 - 50	PIP Planning Assumptions
	Village	10 - 22	10 - 22	PIP Planning Assumptions
	Park Residential	5 - 15	5 - 15	PIP Planning Assumptions
Other	Commercial, Business	36	36	PIP Planning Assumptions
	Industry	30	30	PIP Planning Assumptions
	Community Facilities, Community Purpose	30	30	PIP Planning Assumptions
	Open Space	0	0	PIP Planning Assumptions

For existing residential development and proposed residential development where development details are known, apply:
2.7 EP per detached dwelling
1.6 EP per attached dwelling

Table A9 - Scenic Rim Planning Scheme Development Density (QUU)

Area	Land Use Type	Development Density (EP/Ha of net dev area)		
		Water	Sewerage	Data source
Beaudesert	Existing Residential	24	24	PIP Planning Assumptions
	Future Residential	36	36	PIP Planning Assumptions
	Commercial	45	45	PIP Planning Assumptions
	Education	Individually Assessed	Individually Assessed	PIP Planning Assumptions
	Community	18	18	PIP Planning Assumptions
	Health	Individually Assessed	Individually Assessed	PIP Planning Assumptions
	General Industry	30	30	PIP Planning Assumptions
	Light Industry	24	24	PIP Planning Assumptions
Aratula Boonah Canungra Kalbar Kooralbyn Mt Alford	Residential	34	34	PIP Planning Assumptions
	Commercial	20	20	PIP Planning Assumptions
	Education	Individually Assessed	Individually Assessed	PIP Planning Assumptions
	Community	18	18	PIP Planning Assumptions
	Health	Individually Assessed	Individually Assessed	PIP Planning Assumptions
	General Industry	30	30	PIP Planning Assumptions
	Light Industry	24	24	PIP Planning Assumptions

For existing residential development and proposed residential development where development details are known, apply:
2.45 EP per detached dwelling (house)
1.3 EP per attached dwelling (townhouse, unit, flat, apartment etc.)

Table A10 – Somerset Planning Scheme Development Density (QUU)

Area	Planning Scheme Zone	Development Density (EP/Ha of Net dev area)		
		Water	Sewerage	Data source
Rural	Rural	0	0	PIP Planning Assumptions
	Areas of large lot residential	4.8	0	PIP Planning Assumptions
Town and Village	Residential (other than in Kilcoy and Jimna)	32	32	PIP Planning Assumptions
	Residential (in Kilcoy and Jimna)	20	20	PIP Planning Assumptions
	Town Centre/Commercial	36	36	PIP Planning Assumptions
	Service Trades/Industry	30	30	PIP Planning Assumptions
	Park and Recreation	Individually Assessed	Individually Assessed	PIP Planning Assumptions
	Community Facilities	30	30	PIP Planning Assumptions
	Park Residential	4.8	0	PIP Planning Assumptions
	Village	27	27	PIP Planning Assumptions

For existing residential development and proposed residential development where development details are known, apply:
2.6 EP per detached dwelling in urban areas
3.1 EP per detached dwelling in rural areas other than in Kilcoy and Jimna
2.6 EP per detached dwelling in rural areas in Kilcoy and Jimna
1.7 EP per attached dwelling

Appendix A3 – Unitywater

Table A11 – Moreton Bay Planning Scheme Water Development Density by Zone – Caboolture

Catchment	Shire Plan Zoning	Unit or Basis	Development Density (EP/Unit)	
			Water	Data source
Upland Residential	Residential A - lot area >1000m2	Lot	3.4	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area 501m2 – 1000m2	Lot	2.8	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area <501m2	Lot	2.25	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential B	ha	67	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Rural Residential	Lot	3.4	
Upland Non-Residential	Metropolitan Centre	ha	30	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	District Centre	ha	30	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Local Centre	ha	10	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Regional Industry	ha	30	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	District Industry	ha	15	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Local Industry	ha	15	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Special Use	ha	6	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Open Space	ha	0	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Management Lot	Lot	3.4	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
Lowland - Residential	Residential A - lot area >1000m2	Lot	3.5	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area 501m2 – 1000m2	Lot	2.9	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area <501m2	Lot	2.3	
	Residential B	ha	67	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Rural Residential	Lot	3.5	

Catchment	Shire Plan Zoning	Unit or Basis	Development Density (EP/Unit)	
			Water	Data source
All Catchments Non-Residential	Metropolitan Centre	ha	30	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	District Centre	ha	30	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Local Centre	ha	10	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Regional Industry	ha	30	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	District Industry	ha	60	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Local Industry	ha	15	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Special Use	ha	10	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Open Space	ha	0	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Management Lot	Lot	3.4	Planning Scheme Policy PSP 21F - Trunk Infrastructure Contributions – Sewerage Table 3.3A

Table A12 – Moreton Bay Planning Scheme Sewerage Development Density by Zone - Caboolture

Catchment	Shire Plan Zoning	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
Bribie Island Residential	Residential A - lot area >1000m2	Lot	2.7	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area 501m2 – 1000m2	Lot	2.5	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area <501m2	Lot	2.0	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential B	ha	67	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
Burpengary East- Residential	Residential A - lot area >1000m2	Lot	3.3	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area 501m2 – 1000m2	Lot	3.0	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area <501m2	Lot	2.4	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential B	ha	67	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
South Caboolture – Residential	Residential A - lot area >1000m2	Lot	3.3	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area 501m2 – 1000m2	Lot	3.0	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A - lot area <501m2	Lot	2.4	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential B	ha	67	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
Woodford – Residential	Residential A – lot area >1000m2	Lot	3.1	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A – lot area 501m2 – 1000m2	Lot	2.8	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential A – lot area <501m2	Lot	2.25	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Residential B	ha	67	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
All Catchments Non-Residential	Metropolitan Centre	ha	30	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	District Centre	ha	30	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Local Centre	ha	10	Planning Scheme Policy PSP 21D - Trunk

Catchment	Shire Plan Zoning	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
	Regional Industry	ha	30	Infrastructure Contributions – Sewerage Table 3.3A Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	District Industry	ha	60	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Local Industry	ha	15	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Special Use	ha	10	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Open Space	ha	-	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A
	Management Lot	Lot	3.4	Planning Scheme Policy PSP 21D - Trunk Infrastructure Contributions – Sewerage Table 3.3A

Table A13 – Moreton Bay Planning Scheme Water Development Density by Zone – Pine Rivers

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
Upland Residential	RESIDENTIAL A	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RESIDENTIAL B	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPECIAL RESIDENTIAL	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	PARK RESIDENTIAL	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RURAL RESIDENTIAL	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	CENTRAL BUSINESS	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	COMMERCIAL	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	LOCAL BUSINESS	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	NEIGHBOURHOOD FACILITIES	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	URBAN VILLAGE	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	VILLAGE CENTRE	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	HOME INDUSTRY	ha	10	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SERVICE INDUSTRY	ha	15	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	GENERAL INDUSTRY	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	EXTRACTIVE INDUSTRY	ha	15	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
	FUTURE URBAN	ha	30	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RURAL ZONE (COAST AND RIVER LANDS LOCALITY)	ha	7.5	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RURAL ZONE (URBAN, MAJOR EMPLOYMENT CENTRE, CATCHMENT, RURAL LIVING, VILLAGE, MT SUMMIT AND FORESTS LOCALITIES)	ha	7.5	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	CONSERVATION	ha	0	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	PARK AND OPEN SPACE	ha	5	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPORTS AND RECREATION	ha	15	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPECIAL FACILITIES	ha	15	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPECIAL PURPOSES	ha	15	Planning Scheme Policy PSP 22 - Trunk Infrastructure Contributions – Water– Table 3.3A

Table A14 – Moreton Bay Planning Scheme Sewerage Development Density by Zone– Pine Rivers

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
Upland Residential	RESIDENTIAL A	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RESIDENTIAL B	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPECIAL RESIDENTIAL	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	PARK RESIDENTIAL	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RURAL RESIDENTIAL	Population Forecast as per Planning Assumptions		Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	CENTRAL BUSINESS	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	COMMERCIAL	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	LOCAL BUSINESS	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	NEIGHBOURHOOD FACILITIES	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	URBAN VILLAGE	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	VILLAGE CENTRE	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	HOME INDUSTRY	Ha	10	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SERVICE INDUSTRY	Ha	15	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	GENERAL INDUSTRY	Ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	EXTRACTIVE INDUSTRY	Ha	15	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	FUTURE URBAN	ha	30	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RURAL ZONE (COAST AND RIVER LANDS LOCALITY)	ha	7.5	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	RURAL ZONE (URBAN, MAJOR EMPLOYMENT CENTRE, CATCHMENT, RURAL LIVING, VILLAGE, MT SUMMIT AND FORESTS LOCALITIES)	ha	7.5	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
	CONSERVATION	ha	0	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	PARK AND OPEN SPACE	ha	5	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPORTS AND RECREATION	ha	15	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPECIAL FACILITIES	ha	15	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A
	SPECIAL PURPOSES	ha	15	Planning Scheme Policy PSP 23 - Trunk Infrastructure Contributions – Water– Table 3.3A

Table A15 – Moreton Bay Planning Scheme Water Development Density by Zone – Redcliffe

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Water	Data source
Low Density Residential Zone	Lot Size _ 500m2	Lot	2.0	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Lot Size 501-1500 m2	Lot	2.6	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Lot Size >1500 m2	ha	30	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
Mixed Density Residential Zone	Lot Size _ 500m2	Lot	2.0	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Lot Size 501-700 m2	Lot	2.6	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Lot Size >700 m2	ha	60	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
Medium Density Residential Zone < 3 Storeys	Lot Size _ 500m2	Lot	2.0	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Lot Size 501-750 m2	Lot	2.6	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Lot Size >750 m2	ha	60	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
Medium Density Residential Zone	3 Storeys	ha	120	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	6 Storeys	ha	175	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	8 Storeys	ha	220	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
Retail Core Zone	1-2 storeys	ha	30	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	3 storeys	ha	130	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	6 storeys	ha	190	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Water	Data source
	8 storeys	ha	240	3.3A Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	12 storeys	ha	290	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
Frame Business Zone	1-2 storeys	ha	30	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	3 storeys	ha	120	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	6 storeys	ha	175	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	8 storeys	ha	220	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	12 storeys	ha	260	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Industry Zone	ha	30	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Health services Zone	ha	30	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Community Purpose Zone	ha	30	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Natural value Zone	0	0	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A
	Open Space and Recreation Zone	ha	5	Planning Scheme Policy PSP4 Part 8.4.5 Development Contributions for Trunk Infrastructure – Water – Table 3.3A

Table A16 – Moreton Bay Planning Scheme Sewerage Development Density by Zone – Redcliffe

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
Low Density Residential Zone	Lot Size _ 500m2	Lot	2.02	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Lot Size 501-1500 m2	Lot	2.62	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Lot Size >1500 m2	ha	30.26	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
Mixed Density Residential Zone	Lot Size _ 500m2	Lot	2.02	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Lot Size 501-700 m2	Lot	2.62	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Lot Size >700 m2	ha	60.52	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
Medium Density Residential Zone < 3 Storeys	Lot Size _ 500m2	Lot	2.02	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Lot Size 501-750 m2	Lot	2.62	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Lot Size >750 m2	ha	60.52	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
Medium Density Residential Zone	3 Storeys	ha	121.05	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	6 Storeys	ha	176.53	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	8 Storeys	ha	221.92	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
Retail Core Zone	1-2 storeys	ha	30.26	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	3 storeys	ha	131.14	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	6 storeys	ha	191.66	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	8 storeys	ha	242.1	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	12 storeys	ha	292.53	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
Frame Business Zone	1-2 storeys	ha	30.26	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	3 storeys	ha	121.05	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	6 storeys	ha	176.53	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	8 storeys	ha	221.92	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	12 storeys	ha	262.27	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	Industry Zone	ha	30.26	Infrastructure – Sewer – Table 3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk
	Health services Zone	ha	30.26	Infrastructure – Sewer – Table

Area	Planning Scheme Zone	Unit or Basis	Development Density (EP/Unit)	
			Sewerage	Data source
	Community Purpose Zone	ha	30.26	3.3A Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Natural value Zone	0	0	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A
	Open Space and Recreation Zone	ha	5.04	Planning Scheme Policy PSP4 Part 8.4.6 Development Contributions for Trunk Infrastructure – Sewer – Table 3.3A

Table A17 – SCRC CENTRAL REGION Planning Scheme Development Density (UW)

Precinct	No	Planning Area	Development Density (ET/Ha)		
			Water	Sewerage	Data source
Business and Industry	All precincts		25	35	Maroochy Plan Policy DC1: Table 2a
Core Industry	All precincts		25	35	Maroochy Plan Policy DC1: Table 2a
General Rural Lands	All precincts		NA	NA	Maroochy Plan Policy DC1: Table 2a
Hill Slope Residential	All precincts		15	15	Maroochy Plan Policy DC1: Table 2a
Local Centre	22	Maroochydore	45	90	Maroochy Plan Policy DC1: Table 2a
	All precincts		35	70	Maroochy Plan Policy DC1: Table 2a
Master Planned Community	9	Maroochydore	110	121	Maroochy Plan Policy DC1: Table 2a
	10	Maroochydore	110	121	Maroochy Plan Policy DC1: Table 2a
	11	Maroochydore	110	121	Maroochy Plan Policy DC1: Table 2a
	15	Maroochydore	90	99	Maroochy Plan Policy DC1: Table 2a
	28	Nambour	35	38.5	Maroochy Plan Policy DC1: Table 2a
	4	Sippy Downs	40	44	Maroochy Plan Policy DC1: Table 2a
	5	Sippy Downs	40	44	Maroochy Plan Policy DC1: Table 2a
	8	Sippy Downs	40	44	Maroochy Plan Policy DC1: Table 2a
	11	Sippy Downs	40	44	Maroochy Plan Policy DC1: Table 2a
	15	North Shore	30	33	Maroochy Plan Policy DC1: Table 2a
	16	North Shore	190	209	Maroochy Plan Policy DC1: Table 2a
	8	Mt Coolum	100	133	Maroochy Plan Policy DC1: Table 2a
	9	Mt Coolum	35	38.5	Maroochy Plan Policy DC1: Table 2a
	16	Eudlo Creek Valley	50	55	Maroochy Plan Policy DC1: Table 2a
	All other precincts		30	30	
Mixed Housing	13	Maroochydore	135	180	Maroochy Plan Policy DC1: Table 2a
	17	Maroochydore	120	160	Maroochy Plan Policy DC1: Table 2a
	20	Maroochydore	120	160	Maroochy Plan Policy DC1: Table 2a
	23	Maroochydore	110	146	Maroochy Plan Policy DC1: Table 2a
	25	Maroochydore	135	180	Maroochy Plan Policy DC1: Table 2a
	27	Maroochydore	120	160	Maroochy Plan Policy DC1: Table 2a
	3	Nambour	80	106	Maroochy Plan Policy DC1: Table 2a
	4	Nambour	80	106	Maroochy Plan Policy DC1: Table 2a
	7	Mooloolaba	135	180	Maroochy Plan Policy DC1: Table 2a
	8	Mooloolaba	135	180	Maroochy Plan Policy DC1: Table 2a
	13	Mooloolaba	140	186	Maroochy Plan Policy DC1: Table 2a
	2	Buderim	85	113	Maroochy Plan Policy DC1: Table 2a
	5	Alexandra Headland/Cotton Tree	120	160	Maroochy Plan Policy DC1: Table 2a
	8	Alexandra Headland/Cotton Tree	140	186	Maroochy Plan Policy DC1: Table 2a
	10	Alexandra	120	160	Maroochy Plan Policy DC1: Table 2a

Precinct	No	Planning Area	Development Density (ET/Ha)		
			Water	Sewerage	Data source
		Headland/Cotton Tree			
	11	Alexandra Headland/Cotton Tree	135	180	Maroochy Plan Policy DC1: Table 2a
	4	Kuluin/Kunda Park	70	93	Maroochy Plan Policy DC1: Table 2a
	13	North Shore	70	93	Maroochy Plan Policy DC1: Table 2a
	2	Mt. Coolum	140	186	Maroochy Plan Policy DC1: Table 2a
	3	Coolum Beach	200	266	Maroochy Plan Policy DC1: Table 2a
	2	Woombye	60	80	Maroochy Plan Policy DC1: Table 2a
	6	Eumundi	60	80	Maroochy Plan Policy DC1: Table 2a
	All other precinct		100	133	Maroochy Plan Policy DC1: Table 2a
Multi storey Residential	5	Mooloolaba	240	384	Maroochy Plan Policy DC1: Table 2a
	6	Mooloolaba	240	384	Maroochy Plan Policy DC1: Table 2a
	2	Alexandra Headland/Cotton Tree	320	512	Maroochy Plan Policy DC1: Table 2a
	2	North Shore	200	320	Maroochy Plan Policy DC1: Table 2a
	All other precinct		300	480	Maroochy Plan Policy DC1: Table 2a
Neighbourhood Residential	All precincts		30	30	Maroochy Plan Policy DC1: Table 2a
Special Purpose	3	Sippy Downs	150	150	Maroochy Plan Policy DC1: Table 2a
	All other precincts		To determine demand factor rates, use the precinct or precincts from this table that most closely align with the proposed development		Maroochy Plan Policy DC1: Table 2a
Sustainable Cane Lands	All precincts		NA	NA	Maroochy Plan Policy DC1: Table 2a
Sustainable Horticultural Lands	All precincts		NA	NA	Maroochy Plan Policy DC1: Table 2a
Sustainable Pastoral Lands	All precincts		NA	NA	Maroochy Plan Policy DC1: Table 2a
Sustainable Rural Residential	All precincts		5	NA	Maroochy Plan Policy DC1: Table 2a
Town Centre Core	1	Maroochydore	300	600	Maroochy Plan Policy DC1: Table 2a
	2	Maroochydore	200	400	Maroochy Plan Policy DC1: Table 2a
	3	Maroochydore	110	220	Maroochy Plan Policy DC1: Table 2a
	4	Maroochydore	300	600	Maroochy Plan Policy DC1: Table 2a
	1	Nambour	50	100	Maroochy Plan Policy DC1: Table 2a
	1	Sippy Downs	60	120	Maroochy Plan Policy DC1: Table 2a
	1	Mooloolaba	300	600	Maroochy Plan Policy DC1: Table 2a
	All other precincts		50	100	
Town Centre Frame	5	Maroochydore	40	80	Maroochy Plan Policy DC1: Table 2a
	6	Maroochydore	35	70	Maroochy Plan Policy DC1: Table 2a

Precinct	No	Planning Area	Development Density (ET/Ha)		
			Water	Sewerage	Data source
	7	Maroochydore	150	300	Maroochy Plan Policy DC1: Table 2a
	8	Maroochydore	200	400	Maroochy Plan Policy DC1: Table 2a
	2	Nambour	45	90	Maroochy Plan Policy DC1: Table 2a
	2	Sippy Downs	80	160	Maroochy Plan Policy DC1: Table 2a
	2	Mooloolaba	200	400	Maroochy Plan Policy DC1: Table 2a
	3	Mooloolaba	200	400	Maroochy Plan Policy DC1: Table 2a
	4	Mooloolaba	100	200	Maroochy Plan Policy DC1: Table 2a
	1	Kuluin/Kunda Park	35	70	Maroochy Plan Policy DC1: Table 2a
	All other precincts		50	100	
Village Centre	1A	Buderim	45	90	Maroochy Plan Policy DC1: Table 2a
	1B	Buderim	45	90	Maroochy Plan Policy DC1: Table 2a
	1	Coolum Beach	200	400	Maroochy Plan Policy DC1: Table 2a
	All other precincts		35	70	
Water Resource Catchment Area	All precincts		NA	NA	