



# WATER AND WASTEWATER

# MODELLING DESIGN STANDARDS



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Document Control		Modelling Design Standards		
Rev	Date	Revision Details	Author	Approved
V1.6	June 2019	Previous version	TBell	
V1.7	June 2020	Updated sewer pipe diameters, applied new corporate style	TBell	TDay
V1.8	February 2024	Removed Average Day Demand per person in Water Demand Criteria. Added desirable minimum pressure. Amended I/I to contributing area. Applied new corporate style.	KSubra	TBell

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## Introduction

Wingecarribee Shire Council's (Council) Water and Wastewater Modelling Design Standards define parameters and practices to be applied when modelling is required as part of a development assessment. When designing assets, it is the designer's responsibility to ensure that requirements included in the design standards are suitable for each particular application.

Council has adopted the following Water Services Association of Australia (WSAA) design codes as baseline standards for water & wastewater design requirements:

- Polyethylene Pipeline Code (WSA 01)
- Gravity Sewerage (WSA 02)
- Water Supply (WSA 03)
- Sewerage Pumping Station Code (WSA 04)
- Conduit Inspection Reporting Code (WSA 05)
- Pressure Sewerage (WSA 07)
- Fire Service Metering Code of Practice (WSA 13).

In addition, Council utilises Water Directorate's Section 64 Determinations of Equivalent Tenements Guidelines for estimating ETs.

Council provides the following specific design standards for modelling purposes.

Refer to Council's website for more information on the requirements of water and wastewater modelling and other relevant Council standards.

## Water Design Criteria

### Demands

The following average day demand and peak day demand factors shall be used when modelling future/proposed developments within Council's Local Government Area:

- Average Day Demand per dwelling = 684 L/Dwelling/Day
- Max Day Demand per dwelling = 3000 L/Dwelling/Day
- Max Hour demand to Max day demand factor is 2.76.

Section 64 Determinations of ET Guidelines from the Water Directorate should be used in determining loading rates for Commercial and Industrial developments.

### Operating pressures

Description	Pressure (m head)
Minimum pressure at the domestic meter	12
Desirable minimum pressure at the domestic meter	20
Maximum pressure	90
Desired operating pressures	40 to 60
Variance between maximum and minimum pressures during peak day demand	< 30

### Minimum pipe diameters

Development type	Minimum pipe size (DN)
Low and medium density residential	125
High density residential	180
Industrial and commercial	180
Multiple developments of high density residential ( $\geq 8$ storeys)	250 or 280

### Fire flow

Desired minimum fire flows with residual pressure maintained above 15m head.

Development type	Fire flow (L/s)
Low and medium density Residential	10
High density Residential	20
Industrial and Commercial	20

## Flow velocity and head loss

- Flow velocities shall not exceed 2.0 m/s in the reticulation network and 3.0 m/s in trunk and transfer mains. Council's advice shall be sought if proposed velocities exceed 2.0m/s.
- The optimum velocity is typically in the range 0.8 m/s to 1.4 m/s
- Head loss in mains should be no more than 5 m head per km for reticulation mains ( $\leq$  150mm internal diameter) and 3 m head per km for trunk and transfer mains ( $>$  150mm internal diameter) unless alternate head loss rate limits are approved by Council.

## Reservoir storage

- Total storage within the supply reservoir should be at least 24 hours peak day demand (PDD)
- The supply reservoir should have at least 12 hours reserve PDD storage at its lowest operating range under normal conditions.

## Water Treatment Plant design capacities

Location	Design Capacity (ML/Day)	Design Flow (L/s)
<b>Wingecarribee WTP</b>	40	300
<b>Bundanoon WTP</b>	10	126
<b>Evans Lane pump station</b>		110
<b>Medway WTP*</b>	8	

\* Medway WTP currently not in operation. Evans Lane pump station supplies Medway zone from Wingecarribee WTP.

## Wastewater Design Criteria

### Loading rates

The following sewage loading rates shall be applied when modelling future/proposed developments within Council's Local Government area:

- Average Day Demand per person = 230 L/Person/Day
- Storm Allowance = 0.058 L/s/ET
- Average Dry Weather Flow (ADWF) and Peak Wet Weather Flow (PWWF) as per WSA 02
- EP per single dwelling = 3.5 EP as per WSA 02
- Inflow and Infiltration (I/I) rates = 2% of the contributing area for each proposed lot.
  - Contributing areas to be confirmed with Council prior to modelling.

Section 64 Determinations of ET Guidelines from the Water Directorate should be used in determining loading rates for Commercial and Industrial developments.

### Minimum pipe diameters

Development type	Minimum pipe size (DN)
Low and medium density Residential	150
High density Residential	150
Industrial and Commercial	225
Trunk mains	≥225

For sewer mains up to DN600; the downstream sewer shall not be smaller than the upstream sewer.

### Wet weather containment

The following containment requirements must be met for all new developments:

- No dry weather overflows permitted
- All sewage infrastructure must have the hydraulic capacity to contain all flows associated with a 1 in 2-year rainfall event.

### Pumping stations

Pump stations shall be designed in accordance with Council's Engineering standards and WSA 04. The following is required at minimum:

- Pump capacity shall be sized to at least 2.5 x PDWF
- Emergency storage tanks shall be sized to accommodate at least 8 hours ADWF
- No dry or wet weather overflows pumping stations.

## Wastewater Treatment Plant design capacities

Location	Design Capacity (EP)	Design Flow (ADWF L/s)	Design Flow (PWWF L/s)
<b>Berrima STP</b>	2,000	5.5	38.9
<b>Bowral STP</b>	14,600	40.0	280.0
<b>Bundanoon STP</b>	5,400	13.2	112.2
<b>Mittagong STP</b>	14,000	36.9	269.4
<b>Moss Vale STP</b>	9,000	25.0	224.1
<b>Robertson STP</b>	2,000	4.86	17.0