

# Supplementary Information to the WSAA Sewerage Code

This document  
contains information  
supplementary to the  
WSAA Sewerage Code of  
Australia – Melbourne  
Retail Water Agencies  
Edition – Version 1-  
WSA 02-2002-2.3



wannonWATER



# **WANNON WATER SUPPORTING DOCUMENTATION SEWERAGE CODE**

## **INTRODUCTION**

### **General**

This supplementary documentation describes Wannon Water's specific requirements for sewerage works additional to those detailed in the WSAA Sewerage Code of Australia WSA-02-2002-2.3 - Melbourne Retail Water Agencies Edition. Version 1

The Supplementary section of the Water Reticulation Code contains

- Table of Contents to the supplementary Documentation
- Description of Wannon Water requirements where required or different to the WSAA Code

### **Operation**

The clause numbering of this supplementary document matches the WSAA Code.

### **Innovative Solutions**

WSAA Sewerage Code of Australia and this supporting documentation essentially provides "deemed-to-comply" solutions for the creation of Water Agency Sewerage assets. Alternative solutions, practices, equipment and methodologies will continue to evolve and offer opportunities to improve the creation of these assets. Wannon Water encourages employment of any innovation that offers enhanced productivity and serviceability, but Wannon Water input should be sought before any innovative system is designed.

### **Responsibilities**

Designers and constructors are responsible for their respective aspects of the design and construction process. It is the designer/constructors responsibility to justify any variation from the requirements set out in the Sewerage Code of Australia (including the attached Wannon Water conditions) and/or the Wannon Water Construction Drawings plus any specific directions given by Wannon Water for the particular project. The designer/constructor is to obtain Wannon Water endorsement for any variation.

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**Note:** The clause and section numbers match those that are used in the Melbourne Retail Water Agencies version of the WSAA Sewer Reticulation Code (WSA 02-2002-2.3).

## **PART 1: PLANNING AND DESIGN**

### **2: SYSTEM PLANNING**

#### **2.1. SEWERAGE SYSTEM PHILOSOPHY AND DEFINITION**

##### **2.1.4.2 Sewage Pumping Stations (SPSs)**

Wannon Water does not usually support the “other options.... e.g. vacuum sewerage and pressure sewerage systems”, therefore these type of systems may not be approved except in exceptional circumstances.

### **3: FLOW ESTIMATION**

#### **3.2 DESIGN FLOW ESTIMATION METHOD**

##### **3.2.2 Traditional Design Flow Estimation Method**

Sewer is designed for peak wet weather flows at 2/3 full capacity.

Average Dry Weather Flow		200 L/h/d
Average Peak Wet Weather Flow		800 L/h/d
Number of persons per tenement		3.5
Multi-Tenement Development (Residential)		1 unit = 0.65 House
Maximum Flow	150mm	2/3 cap. at P.W.W.F.
	225mm	"
	300mm	"

Calculations based on Mannings formula with  $n = 0.014$ .

### **4: DETAIL DESIGN**

#### **4.1 DETAIL DESIGN PROCESS**

The detail design should also take into consideration proposed physical assets. Pre design meetings are encouraged for all significant subdivisions.

##### **4.2.3 Sewer Layout**

Sewer offset to be in accordance with the municipality or controlling authority requirements in road reserves if safe and practicable. Offsets from title boundaries of 1 m minimum is preferred. OH&S of location must be a priority in the location and construction of Wannon Water infrastructure.

##### **4.2.5 Easements**

Easements are to be in accordance with the Land Tenure Guidelines set out in section 3.2.3 (policy section) of Wannon Water’s Land Development Manual.

### 4.3.2 Sewer offset (within front property boundary)

Sewers <= 2.5 m deep and DN150 to be located at a minimum offset of 1.0 m from front boundary. Sewers at greater depth and diameter will require increased offset and easement. Contact Wannon Water for advice.

### 4.3.6. Dead Ends

Addition to clause.

Stub to be extended in future shall be designed at the required grade for the future sewer.

### 4.3.7 Horizontal curves in sewer

No curved sewer without prior approval from Wannon Water.

The use of manufactured bends is not approved.

Horizontal curve sewer to maintain constant offset from property boundary. If constant offset cannot be maintained contact Wannon Water – sewer may have to be located within property frontage.

### 4.4.5 Underground Obstructions & Services

#### 4.4.5.1 General

In addition to existing obstructions, the design is to consider obstruction from future or proposed utilities services – this is especially relevant in greenfield sites.

#### 4.4.5.2 Clearance Requirements

Table 4.2 is to be replaced with the following table to allow services to traverse past outside walls of manholes, allow the construction of new manholes and the installation of ground support for any excavations.

#### CLEARANCES BETWEEN SEWERS AND OTHER SERVICES

Utility (Existing service)	Minimum horizontal clearance <sup>1*</sup> mm	Minimum vertical clearance <sup>1*</sup> mm
Sewers	600	300
Gas mains	600	300
Telecommunication conduits and cables	600	300
Electricity conduits and cables	1000	300
Drains	1000 (600) <sup>2*</sup>	300
Water mains	1000	500
Kerbs	600 B.O.K.	Min. cover required

<sup>1\*</sup> Reduction in minimum clearance by Wannon Water approval only. No reduction will be allowed for high risk assets i.e. HV electricity, fibre optic, HP gas.

<sup>2\*</sup> Reduction to 600 mm horizontal clearance if drains are 450 mm in diameter or less and sewer is < 2.5 m deep.

#### 4.5.4. Minimum pipe size for maintenance purposes

DN150 or greater sewer to be used. No DN100 sewer to be constructed.

#### 4.5.5. Maximum Capacity for Reticulation Sewers

Table 4.4 not to be used. DN100 reticulation sewer not to be used.

The table shown below is to be used to determine the sewer grades.

**a. 150 mm diameter**

	<b>Min</b>	<b>Max</b>	
1 in 50	1	350	Occupancies
1 in 80	3	200	"
1 in 100	5	185	"
1 in 120	10	160	"
1 in 150	20	140	"

**b. 225 mm diameter**

	<b>Min</b>	<b>Max</b>	
1 in 50	60	1100	Occupancies
1 in 80	85	900	"
1 in 100	100	850	"
1 in 120	115	780	"
1 in 150	140	710	"
1 in 180	155	660	"
1 in 200	180	610	"
1 in 250	220	550	"

**c. 300 mm diameter**

	<b>Min</b>	<b>Max</b>	
1 in 80	100	3100	Occupancies
1 in 100	120	2800	"
1 in 120	140	2600	"
1 in 150	170	2300	"
1 in 180	225	2000	"
1 in 200	280	1750	"
1 in 250	335	1600	"
1 in 300	390	1500	"
1 in 400	450	1350	"

**d. 375 mm and 450 mm diameter**

To be determined using engineering principles and approved by Wannon Water. These sewers would be classified as shared assets and size and grade determined in consultation with Wannon Water.

#### 4.6.4.4 *Partial Lot Service*

Restriction to be placed on design drawings as well as plan of subdivision.

#### 4.6.4.5

Servicing of basements is not required.

#### **4.6.7 Vertical curves**

The use of vertical curves is not permitted unless directed by Wannon Water.

#### **4.6.8 Compound Curves**

Not permitted.

### **5: PROPERTY CONNECTION**

#### **5.4 MAXIMUM DEPTH OF PROPERTY CONNECTIONS**

Any connection > 4.0 m to be connected directly into a manhole only.

##### 5.6.1

Refer to Wannon Water std dwg for location of connection points.

#### **5.7 Y- PROPERTY CONNECTIONS**

Not permitted for connections across roads. Permission may be considered on very deep sewers.

#### **5.8 LENGTH OF PROPERTY CONNECTION SEWERS**

Maximum length of property connection sewer shall generally be 10 metres although servicing issues, restrictions at times will require longer connections.

#### **5.9 TYPES OF PROPERTY CONNECTIONS**

Refer Wannon Water standard drawings listed in Part 4: Standard Drawings.

#### **5.10 RETAINING WALLS**

Works in close proximity to retaining walls are to be designed in accordance with Wannon Water's Asset Protection policy and subsequent approval.

### **6: MAINTENANCE STRUCTURES**

#### **6.1 TYPES OF MAINTENANCE STRUCTURES**

As per product committee requirements

Spacing of Maintenance Structures

Table 6.1 to be checked



### **6.3.1 Spacing of Maintenance Structures**

Table 6.1 – MS not allowed for change in grade at same level or for change in horizontal direction.

Maximum spacing between maintenance holes with intermediate MSs is 180 m.

Maximum spacing between maintenance holes without intermediate MS is 90 m.

Maximum spacing between maintenance hole and intermediate MS is 90 m.

Maximum spacing between a MS/TMS and any maintenance hole is 90 m at the end of line. Use TMS with no upstream branch connection only.

Only one intermediate MS to be used between maintenance holes.

For distances of 45 m or less from a maintenance hole to the end of line an I.S. type A can be used.

### **6.6.2 Types of Manhole Construction**

(b) used with poured in-situ manhole base only.

### **6.6.3 Design Parameters for Manholes**

Multiple units of 10 or more do not require a manhole connection.

### **6.6.5 Diameters of Manholes**

600 mm and 900 mm diameter manholes are not permitted for shallow sewers.

### **SC. 26/7/23 6.6.8 Ladders, Step Irons and Landings**

Step irons are not to be provided in Sewer Access Points (SAPs)/ Manholes.

Landings are generally not required.

### **6.6.9 MH Covers**

Concrete infill manholes are only to be used, typically Class B (non-trafficable) and Class D (trafficable). No bolt downs are required.

### **6.7.1 Maintenance Shafts (MS)**

Second Paragraph Not Applicable as all maintenance shafts are to be either on straight runs between manholes or at end of lines.

Use TMS with no upstream connection only.

MSs to have 450 mm clear opening.

### **6.7.3 Property Connection into MSs and TMSs**

Property connections not allowed.

#### **6.7.4 Inspections Shafts (IS)**

Use IS Type A only.

### **6.9 SEWERS FROM JUNCTIONS**

Case A is only allowed with IS type A or TMS in property frontage. Length up to 45 m ??? permitted.

## **7: ANCILLARY MAINTENANCE STRUCTURES**

### **7.2 WATER SEALS, BOUNDARY TRAPS & WATER SEALED MHS**

Not required. All service areas are B.T.O.

### **7.3 WATER SEALS AND GAS CHECK MANHOLES**

Not required by Wannon Water.

## **STRUCTURAL DESIGN**

### **8.2 PRODUCTS & MATERIALS**

Sewer to be constructed will be S.C.J. SN8 PVC.

Use of any other pipe material requires written permission from Wannon Water.

## **DESIGN REVIEW AND DRAWINGS**

### **9.2.3 Sewers**

Any other relevant information to be included but not limited to:

- Survey Bench Mark
- Wannon Water standard notes
- Plan of subdivision and lot numbers (if available)
- Location of any existing and proposed utility services and obstructions
- Coordinates
- Pipe size, material, jointing type and grade
- Easements
- All storm water drains with details of size and clearances
- North point
- Scale
- Drawing number
- Drawing revisions
- Consultant details and sign off

One copy of each drawing is to be submitted along with road construction drawings, for checking and subsequent acceptance.

### 9.2.6 Title Block notation and standard notes

The following schedule and Wannon Water standard notes are required on the drawings:

#### Other Underground Services

OTHER U/G SERVICES	
EXISTING WATER MAIN	—————
STORM WATER	—————
GAS	—————
TELSTRA	—————
POWER	• (POLE) ———
SEWER	—————

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**ACCEPTED BY WANNON WATER  
DEVELOPMENT SERVICES**

No works shall commence prior to plans being accepted and signed by Wannon Water.

#### New Mains

NEW SEWER MAINS (Example Shown)





SIZE	TYPE	LENGTH
150mm	PVC SN8	100m
225mm	PVC SN8	100m
300mm	VC	100m

#### Services Location

SERVICES LOCATION SCHEDULE (Example Shown)

Street Name	Telecom	Gas	Water	Power	Kerb	Fibre Optic
Street	1.65N	2.1N	2.7N	3.3S	4.5	
Road	1.65W	2.1W	2.7W	3.3E	4.25	

### Survey Marks

SURVEY MARKS AND LOCATIONS Datum AHD		LEVELS
	TBM STAR PICKET – GROVE ROAD REAR OF LOT 2	18.356
	TBM STAR PICKET – GROVE ROAD OPPOSITE LOT 4	18.356
	PSM (parish name) No 31	19.574
	PSM (parish name) No 33	19.574

### K. Entry to Maintenance Holes

**"WARNING; ENTRY INTO MAINTENANCE HOLE IS CONTROLLED BY CONFINED SPACE REGULATIONS BEING "OCCUPATIONAL HEALTH AND SAFETY (CONFINED SPACES) REGULATIONS 1996, STATUTORY RULE No 148/1996 AND A.S.2865-1995 SAFE WORKING IN CONFINED SPACES". NO ENTRY TO WANNON WATER MAINTENANCE HOLES IS ALLOWED. ALL CONNECTIONS BY WANNON WATER STAFF ONLY.**

Water and sewer designs on separate drawings only.

As previously mentioned the accepted scale is 1:500 with the same orientation.

When all drawings have been finalised and accepted, the consultant will be requested to lodge on computer disc containing the drawing for entry in Wannon Water's computer records.

Location plans can be produced at reduced scales and for clarity detailed connection drawings can be "Not to Scale", but are to be labelled accordingly.

Final plans submitted to Wannon Water must be transparencies and should be A3 or A1 in size.

Wannon Water retains the original set of plans and provides the consultant with a copy. If an original set is required to be returned, an additional copy is to be submitted for approval.

## **PART 2: PRODUCTS AND MATERIALS**

For 150 – 225 mm diameter sewers, PVC SJC SN8 (sewer extra heavy) shall only be used.

For sewers > 225 mm diameter contact Wannon Water for the preferred pipeline material.

For Noxious Waste Sewers contact Wannon Water for preferred pipeline material.

## **PART 3: CONSTRUCTION**

### **12 QUALITY**

#### **12.1 QUALITY ASSURANCE**

Construction contractors are to be QA accredited or progressing towards third party accreditation. Construction contractors not QA accredited by 1 January 2012 will not be eligible to undertake works for developers.

#### **14.6 SUPPLY OF WATER TO THE WORKS**

A metered hydrant is to be hired from Wannon Water and used to comply with the "metered hydrant terms and conditions".

#### **15.1 SAFETY**

Commencement of Works notices must be forwarded to Workcover for excavations over 1.5 metres deep.

#### **15.5 BLASTING**

Blasting is not permitted.

#### **17.2.2 Methods of Deflection**

Pipe curvature may only be achieved by cumulative deflection at pipe joints. Design shall specify pipe proposed to be used. Manufacturer's recommended maximum joint deflection for those pipes shall be provided with the design.

Methods b & c not approved.

#### **17.11 MARKING TAPES**

For subdivision sewers use non-detectable marking tape.

### **18 MAINTENANCE HOLES (MHs)**

No precast bases to be used.

#### **18.10 CONNECTIONS TO MHS**

Connections to live MHs by Wannon Water staff only.

#### **19.3 COVERS**

Concrete infill covers to be used. Refer to standard notes on design plans.



## 20.6 CONCRETE EMBEDMENT AND ENCASEMENT

Not allowed.

## 21 FILL

### 21.1.2 Material requirements

In addition to CI 21.1.2 the following applies:

#### ***Selected refill***

Selected refill shall be soil that is free from clay lumps retained on a 75 mm sieve and stones retained on a 25 mm sieve. Where non-clayey soil is available it shall, unless otherwise directed, be used in preference to clayey soil. The soil shall be either excavated from the works or, where insufficient suitable soil is available, imported. Imported selected refill shall comply with the above requirements. The selected refill shall be carefully packed and rammed solidly in layers not exceeding 100 mm thick at the sides and over the pipes as indicated on the drawings with spades and other approved tamping tools. Unless otherwise directed, further filling will be ordinary refill.

#### ***Ordinary refill***

Ordinary refill shall comprise material excavated from the works and shall contain no more than 20% of rock fragments of size 40 mm to 75 mm with no fragments being greater than 75 mm. Where, in the opinion of Wannon Water, the excavated material is not considered satisfactory for use as ordinary refill, the Contractor shall be required to fill above the normal limit of the selected refill with selected refill or sand fill as directed.

Unless otherwise directed by Wannon Water, ordinary refill in the trench and shaft may be placed with the aid of mechanical plant but care must be taken to ensure the material is not dumped into the trench or shaft and that no rock shall be placed until the pipes are covered by at least 600 mm of selected and ordinary refill.

## 21.3 DRIVES AND TUNNEL FILL

The method of placing and compacting the refill is to be forwarded to Wannon Water prior to excavation works commencing. The contractor may be directed to grout the obvert of the tunnel or drive.

### 21.3.3 Compaction of trench fill

In addition to Clause 21.1.3 the following is required:

Trench compaction testing is required on all reticulation pipelines and shared asset pipelines constructed under Wannon Water's Developer Works Process. Reticulation assets include all gravity sewer mains, sewer rising mains, and water mains.

Compaction testing is to be in accordance with the MRWA Backfill Specification 04-03.1. Testing locations for each test shall be in accordance with Clause 2.6 of the MRWA Backfill Specification 04-03.1 which states (in part):

*"...the laboratory staff shall randomly select the test location within the relevant backfill/layer... Under no circumstances shall the contractor or his staff or agents direct the laboratory staff where to take tests, except where the contractor requires additional test at his own cost..."*

Compaction test results are to be forwarded with the "as-constructed" notes under the Developer Works Process.

As a guide, Table 1 below shows the minimum frequency and compaction required; these are based on conventional field density and laboratory reference testing and an alternate method for testing (including frequency) such as PSP penetration resistance can be found in the MRWA Backfill

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Specification 04-03.1.

Table 1 – Minimum compaction test requirements

<b>Traffic Areas</b>		
<b>Location</b>	<b>Frequency</b>	<b>Results</b>
Road base course	Every 50 m, 3 tests within top 100 mm	Top 100 mm 98% (dry density ratio)
Road sub-base	Every 50 m, 3 tests within depth range 100-300 mm	Below 100 mm 95% (dry density ratio) if FCR. Below 100 mm 85% (dry density ratio) if sand (where permitted).
Under roads, road shoulders, median strips (below sub-base)	Every 40 m, 1 test per 2 layers	Below 100 mm 95% (dry density ratio) if FCR. Below 100 mm 85% (dry density ratio) if sand (where permitted).
Footpaths	Every 100 m, 3 tests within top 100 mm Every 100 m, 3 tests within depth range 100-300 mm	Top 100 mm 98% (dry density ratio) Below 100 mm 95% (dry density ratio) if FCR. Below 100 mm 85% (dry density ratio) if sand (where permitted).

<b>Cohesion-less Soils (e.g. sand)</b>		
<b>Location</b>	<b>Frequency</b>	<b>Results</b>
Road reserves, excluding traffic areas	Every 40 m, 1 test per 2 layers	65% (dry density ratio)
All other areas	Every 100 m, 1 test per 2 layers	60% (dry density ratio)

<b>Cohesion Soils</b>		
<b>Location</b>	<b>Frequency</b>	<b>Results</b>
All areas	Every 100 m, 1 test per 2 layers	Within 600 mm of FSL 95% (dry density ratio) Below 600 mm of FSL 90% (dry density ratio)

Note: should proposed lengths be less than the frequency (distance) specified, then one test location is to be used.

## 22 Acceptance Testing

### 22.1 GENERAL

CCTV testing of sewers in accordance with Wannon Water CCTV specification is required.

### 22.6 DEFLECTION (OVALITY) TESTING OF FLEXIBLE SEWERS

Ovality testing can be replaced with CCTV ovality testing. Acceptance ovality testing is required at the end of all construction works.

## **22.7 CLOSED CIRCUIT COLOUR TV (CCTV) INSPECTION**

CCTV required as per Wannon Water's CCTV specification.

## **24 CONNECTION TO EXISTING SEWERS**

All live sewer connections are undertaken by Wannon Water's maintenance staff at the developer's cost, including the insertion of gas plugs to isolate upstream works.

## **26 WORK AS CONSTRUCTED DETAILS**

Refer to SURVEY section of Wannon Water's Land Development Manual (process document).

All as constructed records must be provided to Wannon Water prior to subdivision compliance.

## **PART 4: STANDARD DRAWINGS**