

## INTRODUCTION

This addendum outlines Coliban Water's specific requirements in relation to the design and construction of sewerage works.

The information in this document is to be read in conjunction with the *Sewerage Code of Australia* (WSA 02-2002-2.3, Melbourne Retail Water Agencies Edition, version 1.0), further referred to as The Code.

Where this information conflicts with the standard clauses of the Sewerage Code of Australia, the information in this annexure shall take precedence.

The Code is applicable to all works undertaken by Coliban appointed contractors (Capital Investment Projects) and Developer Installed Works.

## PART 0: GLOSSARY OF TERMS, ABBREVIATIONS AND REFERENCES

### Glossary of Terms

Capital Investment Project	Design and construction of sewerage infrastructure managed directly by Coliban Water.
Developer Installed Works	Design and construction of sewerage infrastructure managed by a developer.
Case Manager	Coliban Water appointed person assisting developers with the design and construction of works.
MRWA	Melbourne Retail Water Agencies. This should be read as including the Coliban Region Water Corporation.

Add the following to the definition for *Concept Plan*:

Please note that the plans submitted by consultants to Coliban Water at the first step in the developer installed works process are often referred to as concept plans. In accordance with the terminology of WSA 02-2002, these plans should be referred to as Initial Pre-design Plans.

Add the following to the definition for *Property Connection Sewer*.

Coliban Water does not own any property connection sewers. Coliban Water's sewer shall include a branch on the sewer and in some cases a vertical riser. All pipes and fittings upstream of this point are deemed to be in private ownership.

## PART 1: PLANNING AND DESIGN

### 4.2.3 Sewer layout

#### *Industrial /Commercial areas*

Shall be replaced with:

For industrial / commercial areas, sewers shall be constructed in the road reserves unless approval has been obtained from Coliban Water. The location of the sewer must not unnecessarily reduce options for future subdivision.

### 4.2.5 Easements

Replace section with:

Where sewers are not located within road reserves or Crown Land easements shall be created in favour of the Coliban Region Water Corporation, to provide access for Coliban Water for future operations and maintenance activities and restrict any construction over the sewer (Refer Drawing SEW-1105-V for typical easement installations).

The minimum width of easements for sewers is 2.5 metres, or at least 1 metre either side from the edge of the pipe, whichever is the greatest. The centreline of the main located in the centre of the easement. When the sewer easement is shared with other assets, the width shall be at least 3.0 meters.

Easements are also to be created for existing assets in private property for which previously no easement has been defined.

### 4.3.2 Roads, reserves and open space

Shall be replaced with:

Sewers that are to be constructed in roads, drainage reserves and/or public open spaces shall be located in accordance with Coliban Water's requirements.

The designer shall seek to avoid locating sewers within private property parallel to the front boundary. If during the preliminary design phase it is identified that due to limitations within the road reserve, the sewer can not be located within the road reservation then it should be designed for installation in the private property.

Where a sewer is to be located within the front property boundary, crushed rock backfill is required across all known driveways, extending 1m either side of the driveway.

Where a sewer is located in a public road, backfill shall be to the specification of the relevant road authority.

Crossings of all roads, creeks drains and underground services shall, as far as practicable, be at right angles (Refer to Standard Drawings SEW-1400 and SEW-1404 and Drawings SEW-1401-V, SEW-1402-V and SEW-1403-V). As necessary, these drawings (or alternatives if acceptable to Coliban Water) shall be used to develop detailed construction drawings.

Where sewers cross freeways, arterial roads and other designated major road reserves, consideration should be given to the following design criteria after consultation with and approval by Coliban Water:

- i. Size the sewer one size larger than hydraulically necessary at those crossings to cater for future growth; or
- ii. Specify dual pipelines to avoid operational problems at a later date.

All maintenance structures shall be located outside the road pavement. In the case of freeways they shall be outside the freeway reserve. If the maximum spacing requirements as specified in Clause 6.2 cannot be met, Coliban Water shall be consulted.

#### **4.5.4 Minimum pipe sizes for maintenance purposes**

Correct Table 4.3 by listing the grade of 1 in 60 against DN 100 sewer with no fewer than 1 to 4 units and 1 in 80 against DN 100 sewer with no fewer than 5 to 10 units.

#### **4.5.5 Maximum capacity of reticulation sewers**

Add the following note to Table 4.4

NOTE:

- 2 The minimum size for new sewers is DN 150, except where Coliban Water approves a DN 100 extension to an existing DN 100 sewer.

#### **4.5.7 Minimum grades for self-cleansing**

##### **4.5.7.1 General**

Replace the first paragraph with:

Except as provided in Clauses 4.5.7.2 and 4.5.7.3, self cleansing of grit and debris shall be based on achieving a wetted cross section average velocity of 0.35m/s at PDWF + GWI.

#### **4.6.4.4 Partial lot service**

Replace the last paragraph with:

If partial lot control is permitted, prospective buyers of lots with partial control shall be informed of the limited service by one of the following methods;

- A limitation on the title defining the minimum floor level for a sewer building at the most distant point from the sewer connection point.
- A building envelope shown on the title.
- An agreement registered on title, in accordance with Section 173 of the Planning and Environment Act, defining the sewer servicing requirements for the property.

#### **MRWA 4.6.5.2 Limitations on connections to sewers**

Shall be replaced with:

Properties shall not be directly connected to sewers larger than 225mm, unless authorised by Coliban Water.

#### **4.6.5.4 Depth of connection point**

Refer Coliban Water Property Connection Details Drawings 1, 2 & 3 and Addendum Commentary.

### **5.2 LIMITATIONS OF CONNECTIONS TO SEWER**

Properties shall not be directly connected to sewers larger than 225mm unless authorised by Coliban Water.

Special precautions as specified by Coliban Water may be required.

#### **5.3.3 Buried interface method**

Delete this clause.

#### **5.4 Maximum Depth of Property Connection**

Refer Coliban Water Property Connection Details Drawings 1, 2 & 3 and Addendum Commentary.

#### **5.7 Y Property Connections**

Y Property Connections are not permitted.

## 5.8 Length of Property Connection Sewers

Refer Coliban Water Property Connection Details Drawings 1, 2 & 3 and Addendum Commentary.

## CW 5.9 Types of Property Connections.

Refer Coliban Water Property Connection Details Drawings 1, 2 & 3 and Addendum Commentary.

## 6.1 Types of Maintenance Structures

Replace the second point with:

- (b) Maintenance Shafts (MSs), which are currently only applicable to DN 150 and DN 225 sewers and only allow equipment access to the sewer system (Refer to Standard Drawing SEW-1317 and Drawings SEW-1314-V and SEW-1315-V); and

Replace the fourth point with:

- (d) The use of Inspection Shafts (ISs) is not permitted.

## 6.2 Locations of Maintenance Structures

Replace the first sentence after the list with:

Maintenance shafts are not permitted on sewers  $\geq$ DN 300, where manholes must be used.

## Figure 6.2 Multiple MSs Between Consecutive MHs

Add this text to Figure 6.2:

400m is the maximum distance between MHs permitted by Coliban Water.

## 6.6.8 Ladders, step irons and landings

Replace this section with:

Ladders, step irons and landings shall not be incorporated in new MHs.

## 6.7.2 Design parameters for MSs and TMSs

Replace the fifth paragraph with:

Property branch connections shall not be connected to the shaft.

### 6.7.3 Property connection sewer into MSs and TMSs

No property connections shall be connected into the riser shaft.

### MRWA 6.7.4 Inspection shafts (ISs)

Delete the clause and sub-clauses.

### 8.10 Bulkheads & Trenchstops

Trench stops are required with any grade between 1:7 and 1:20:

Spacing (m) = 100/grade, e.g. A gradient of 1:20 requires trenchstops at 20m spacings. 1:18 at 18m spacings etc.

### 9.1 Design Review

Delete (l).

### 9.2.3 Sewers

Delete (h) and (i).

### Appendix A Estimation of Equivalent Population (EP)

Table A1 Equivalent population for synchronous discharges, last row:

For future industrial areas use 75EP per gross hectare.

## PART 2: PRODUCTS AND MATERIALS

This section is to be read in conjunction with the Product Appraisals section on the Water Services Association of Australia website ([www.wsaa.asn.au](http://www.wsaa.asn.au)).

### Rotation of Valves

- All key operated (buried) valves shall be anti-clockwise closing;
- All valves in pits, buildings or above ground are clockwise closing. Closing direction shall be indicated on the valve.

## PART 3: CONSTRUCTION

### 12.1 Quality Assurance

Section 12.1 is not applicable for Capital Investment Projects. The provisions of Section 22 of the General Specifications apply.

For Developer Installed Works where the subdivision comprises of more than five lots, the following applies:

The Contractor shall establish and implement a management system to achieve compliance with the contract and to document such compliance. The Management System will include OH&S, environment and quality. Accepted management systems or components thereof are:

- Civil Contractors Federation (CCF) Integrated Management System;
- AS 9001: Quality Management Systems;
- AS 14001: Environmental Management Systems;
- AS 4801: Occupational Health and Safety Management Systems;
- SafetyMap;
- Subby Pack OHS Contractor Management Tool
- Other equivalent systems.

### 12.1.3 Project Management Plan

For Developer Installed Works of more than five lots, a Project Management Plan is submitted to the Case Manager together with the verified design.

## 13.4 Customer Focus

### 13.4.1 General

Coliban Water's "Requirements for customer service" are outlined in the *Urban Customer Charter* and *Rural Customer Charter*. These documents can be found on the Coliban Water website [www.coliban.com.au](http://www.coliban.com.au).

## 13.7 Alteration of Existing Services

All service alterations require a PIC number, which can be applied for at Coliban Water. At the completion of the alteration, drainage notes and a Plumbing Industry Commission Compliance certificate are required to be submitted to Coliban Water.

## 14.6 Supply of Water to the Works

All potable water supply for construction works has to be sourced from Coliban Water standpipes. Information about using a Coliban Water standpipe can be found on the website.

## 16.5 Bedding for Maintenance Shafts and bends

The bedding of all Maintenance Shafts and Terminal Maintenance Shafts shall be a 150 mm concrete ( $\geq 15$  MPa) base.

## 17.8 Dead ends

All dead ends are to be constructed as Terminal Maintenance Shafts (Drawing SEW-1316). In trafficable areas, including car parks, a manhole with trafficable lid shall be constructed.

## MRWA 17.11.3 Marking Posts

In addition to the, marker posts have to be marked with: "Coliban Water 1300 363200".

## 18.6 Benching and Channels

Existing PVC pipes are not to be converted to Manhole Channels.

## 19.2 Sealing Caps

Replace first paragraph with:

Cut the MS / TMS / IS shaft to provide the access cover clearance as specified. Seal the shaft with an approved push-on cap in accordance with the manufacturer's specifications.

## 21.3 Drives and Tunnel Fill

Replace with:

Refill drives and tunnels above the embedment zone to the obvert of the drive or tunnel using one of the following methods of filling as specified:

- (a) Authorised trench fill material pneumatically placed.
- (b) Sand-lime-cement slurry pressure grouted.
- (c) Sand-lime-cement slurry gravity grouted (only to be used where there is sufficient head space available to ensure adequate grouting of the sewer).

## 22.3 Compaction Testing

### 22.3.1 General

Add the following:

Compaction testing shall be undertaken visually. In cases where Coliban Water has reason to doubt that the trench has been adequately compacted, Clauses 22.3.3. and 22.3.4 shall apply.

### 22.3.4 Trench fill compaction testing

Replace with:

#### 22.3.4.1 Trafficable Test Zone

The depth of the trench shall be deemed to be the full depth of fill, i.e. from the surface of the trench to the top of the pipe embedment (Refer to Standard Drawing SEW-2101).

*The road owner may specify additional compaction testing requirements.*

#### 22.3.4.2 Non-trafficable test zone

For trenches located in a non-trafficable area, the length of trench represented by a test shall be deemed to be 50 m either side of the location at which the test is made. The depth of trench shall be deemed the full depth of fill.

#### 22.3.4.3 Test method

For granular embedment material (non-cohesive), determine the density index (ID) in accordance with AS 1289.5.6.1.

For non-granular material (cohesive), determine the Hilf density ration in accordance with AS 1289.5.7.1. Alternatively, determine the density ratio (RD) in accordance with AS 1289.5.4.1.

#### 22.3.4.4 Frequency and location of tests

For trenches located in a trafficable zone, conduct one test in each 300 mm layer of fill for each 100 lineal metres of sewer or part thereof.

For trenches located in a non-trafficable zone, conduct one test in each 900 mm of fill for each 100 lineal metres of sewer or part thereof.

For MSs and MHs conduct one test with each 1 m depth at one location within 300 mm of each MS and MH riser.

#### 22.3.4.5 Retesting

If one or more of the initial test results do not comply with Table 22.3, conduct two additional tests in the zone represented by the initial test. If one or more of the repeat tests does not comply, re-compact the full zone and continue repeat testing. Continue this cycle until the trench fill compaction test results comply with Table 22.3.

Table 22.3

*Trench/embankment fill of rigid and flexible pipes and maintenance structure – minimum compaction*

Fill type	Test method	Minimum value	
		Trafficable areas (Note 2)	Non-trafficable areas
Non-cohesive	Density Index (ID) AS 1289.5.6.1	70	60
Cohesive	Density Ratio (RD) AS 1289.5.4.1 and AS 1289.5.1.1 (Note 1)	95	90 (Notes 3,4,5)

NOTES:

1. Graded gravels and sands having fines (silts and clays) greater than 5% shall have their compaction determined by dry density ratio.
2. The road owner may specify an alternative value
3. Degree of compaction of the trench fill in trafficable areas depends on:
  - i. The backfill zone – higher degrees of compaction is required in the zone closer to the surface; and
  - ii. The road type – freeways and arterial roads carrying greater loads require higher degrees of compaction
4. The value given is a default where excessive initial surface settlement is not permitted. Specification of alternative degrees of compaction of the trench fill in non-trafficable areas depends on the site requirements.
5. Compaction shall be to the degree specified in the project Specification or the default value in Table 22.3 if not specified.

### 22.3.5 Other fill compaction testing

Replace with:

#### 22.3.5.1 General

Test other filled areas and embankments in accordance with this Clause. The test areas shall be chosen so as to be representative of the filled area or embankment. Drives and tunnel fill do not require compaction testing.

#### 22.3.5.2 Trafficable test zone

For filled areas located in a trafficable zone, the area of fill represented by a test shall be 300m<sup>2</sup> in area with its centre at the spot where the test is made. The depth of the

filled area represented by the test shall be deemed to be the full depth of fill, i.e. from the surface of the filled area to the top of the foundation or native ground.

*The Road Owner may specify additional compaction testing requirements.*

#### 22.3.5.3 Non-trafficable test zone

For filled areas located in a non-trafficable zone, the area of trench represented by a test shall be 1200 m<sup>2</sup> with its centre in a spot where the test is made. The depth of the filled area shall be deemed to be the depth, i.e. from the surface of the filled area to the top of the foundation or native ground.

#### 22.3.5.4 Frequency and location of tests

For filled areas located in a trafficable zone, conduct one test in each 300 mm layer of fill and each 300 m<sup>2</sup> or part thereof.

For trenches located in a non-trafficable-zone conduct one test in each 900 mm layer of fill and each 1200 m<sup>2</sup> or part thereof.

The Superintendent may carry out random confirmatory tests.

#### 22.3.5 Retesting

If one or more of the initial test results do not comply with Table 22.3, conduct two additional tests in the zone represented by the initial test. If one or more of the repeat tests does not comply, re-compact the full zone and continue repeat testing. Continue this cycle until the trench fill compaction test results comply with Table 22.3.

## PART 4: STANDARD DRAWINGS

### **SEW-1316: Maintenance Shafts**

No property branches are permitted on the riser shaft of a MS or TMS.

### **CW TMS Drawing Rev A**

Alternate TMS construction method

SEW-1104-V, SEW-1105-V, SEW-1106, SEW-1107, SEW-1108, SEW-1109, SEW-1153-M, SEW-1154-M AND SEW-1155-M

These drawings and commentary not used by Coliban Water. The drawings and commentary associated with these drawings is to be replaced with Clause 1 from the Coliban Water Addendum notes.

These drawings are replaced by:

- Coliban Water Property Connection Details 1 V1
- Coliban Water Property Connection Details 2 V1
- Coliban Water Property Connection Details 3 V1

## COMMENTARY

### Property Connections

Type 1 shows a typical layout and general arrangement for property connection sewers.

Types 2, 2A and 4 are only for use on deep sewers and must be approved by Coliban Water. The design is to provide full lot control for the lot it services.

Property Branch Types 3 & 5 may be used when authorised by Coliban Water and must be clearly labelled on the design drawings.

Property connections are to connect to the sewer main downstream of the TMS.

Property connections are NOT to connect to MHs or MSs unless authorised by Coliban Water.

No property connections shall be connected into the riser shaft of an MS or TMS.

Where property connection sewers are to be constructed adjacent to storm water drains, the property connection shall be extended a minimum of 300mm beyond the storm water drain or to the edge of the easement, to eliminate the future need to construct the private property drain beneath the storm water drain.

Property Connection Sidelines are to be a maximum of 3m in length unless authorised by Coliban Water.

Property connections are to terminate a minimum of 600mm within the Lot it is servicing.

The riser is to be extended to the surface and capped with a light concrete cover.

EW and VC pipes are not to be used for property connection side lines or risers.

The property owner/plumber is responsible for the cut in to the riser of the property connection at a height to provide the lot control required. This is to be constructed in accordance with AS/NZS 3500.2.2.