TOOWOOMBA REGIONAL COUNCIL

ADDENDUM TO THE
WATER SUPPLY CODE OF AUSTRALIA
WSA 03 – 2011
Version 3.2

TOOWOOMBA REGIONAL COUNCIL SUPPLEMENT TO WATER SUPPLY CODE OF AUSTRALIA WSA 03 – 2011

Preamble

This supplement describes the Toowoomba Regional Council's requirement for water reticulation works additional to those specified in Water Supply Code of Australia, WSA 03 – 2011 –V3.2. This supplement must be read in conjunction with the Code.

Note

The clause and table numbers given in this supplement correspond with the clause and table numbers given in the Water Supply Code of Australia, WSA 03 – 2011 –V3.2.

PART 0: GLOSSARY OF TERMS, ABBREVIATIONS AND REFERENCES

I. Glossary

Water Agency –Toowoomba Regional Council
The Authority – Toowoomba Regional Council

II. Abbreviations

TRC – Toowoomba Regional Council
Council – Toowoomba Regional Council
DEWS – Department of Energy and Water Supply

PART 1: PLANNING AND DESIGN

1. GENERAL

1.2.7 Instrumentation and Control Systems

Flow and pressure measurement points shall be installed for all bulk / trunk water mains and significant water mains as determined by Council.

2. SYSTEM PLANNING

2.2 System Planning Process

2.2.2 Extending / upgrading an existing Water Supply System

The developer/designer shall submit details of water demand generated by the proposed development so as to quantify the impact of proposed system extension on the affected water supply network. Where available, a water supply network simulation model shall be used to conduct analysis.

2.3 Demands

Assessment of demands shall be based on methodology identified by Department of Energy and Water Supply (DEWS), "Planning Guidelines for Water Supply and Sewerage – APRIL 2010" – Chapter 5: Demand / Flow Projections.

Unit water consumption shall be specified as per equivalent person (EP). EP is defined as water supply demand for a person resident in a detached house. An equivalent tenement (ET) is defined as a detached house. Derivation of EPs should be based on:

Residential EPs to be derived from location specific tenement occupancy ratios. Where this information is unavailable, the adopted EP/ET ratio as provided in the Australian Bureau of Statistics website.

- Non Residential EPs being derived from metered water consumption information and adopted EP rates. Where this is unavailable, Guideline unit rates (e.g. DEWS, WSA) may be used, upon agreement with Council. In the absence of location specific data, the following diurnal patterns shall be used.

Residential

Time	Factor	Time	Factor
0:00	0.12	12:00	0.97
0:30	0.06	12:30	0.92
1:00	0.02	13:00	0.90
1:30	0.01	13:30	0.92
2:00	0.01	14:00	0.90
2:30	0.00	14:30	0.87
3:00	0.00	15:00	0.84
3:30	0.00	15:30	0.90
4:00	0.02	16:00	1.01
4:30	0.06	16:30	1.25
5:00	0.18	17:00	1.54
5:30	0.52	17:30	1.92
6:00	1.13	18:00	2.15
6:30	1.91	18:30	2.17
7:00	2.46	19:00	1.93
7:30	2.38	19:30	1.65
8:00	2.03	20:00	1.47
8:30	1.78	20:30	1.29
9:00	1.57	21:00	1.18
9:30	1.41	21:30	0.96
10:00	1.26	22:00	0.83
10:30	1.20	22:30	0.49
11:00	1.13	23:00	0.35
11:30	1.10	23:30	0.21

Industrial

Time	Factor	Time	Factor
0:00	0.44	12:00	1.49
1:00	0.35	13:00	1.59
2:00	0.32	14:00	1.68
3:00	0.31	15:00	1.50
4:00	0.46	16:00	1.54
5:00	0.41	17:00	1.53
6:00	0.59	18:00	1.30
7:00	0.75	19:00	1.22
8:00	1.19	20:00	0.90
9:00	1.35	21:00	0.81
10:00	1.49	22:00	0.70
11:00	1.43	23:00	0.63

Commercial

Time	Factor	Time	Factor
0:00	0.20	12:00	2.01
1:00	0.21	13:00	1.84
2:00	0.21	14:00	1.76
3:00	0.24	15:00	1.74
4:00	0.25	16:00	1.74
5:00	0.37	17:00	1.59
6:00	0.58	18:00	1.38
7:00	0.82	19:00	1.04
8:00	1.20	20:00	0.89
9:00	1.46	21:00	0.47
10:00	1.74	22:00	0.20
11:00	1.86	23:00	0.20

Per Capita Water Consumption

Locations	Recommended (L/EP/d)
Toowoomba	200
Highfields	
Oakey and Jondaryan	
Crows Nest and Hampton	
Gowrie Mountain, Kingsthorpe & Gowrie Junction	
Meringandan (East and West)	
Yarraman	
Goombungee	
Top Camp, Hodgson Vale & Vale View	
Cambooya, Greenmount	
Wyreema	
Nobby	
Clifton	250
Pittsworth, Southbrook, Brookstead	
Cecil Plains	280
	300
Millmerran	

The Department of Energy and Water Supply Guidelines list the key planning parameters and indicative ranges for peaking factors for demand assessment.

In the absence of location/study specific data the following base values shall be adopted:

- **MDMM** = 1.5 AD
- **PD** = 2.25 AD
- **PH** = 4.5 AD
- **NRW = 34.5 L/EP/d**

2.5 System Hydraulics

2.5.2 Network Analysis

System analysis shall have regard for network modelling principles and methodology identified in Department of Energy and Water Supply Planning Guidelines, Chapter 6 - Network Modelling.

2.5.3 Operating Pressures

2.5.3.2 Maximum Allowable Service Pressure

Maximum allowable service pressure shall be 80 m.

2.5.3.3 Minimum Service Pressure

Minimum service pressure for Residential shall be 30.0 m.
Minimum service pressure for Industrial /commercial shall be 35.0 m.
Absolute minimum service pressure for Residential shall be 22.0m by Council approval only.
Absolute minimum service pressure for Industrial and commercial sites shall be 25m by Council approval only.
Minimum fire fighting modelling results of less than 16m head are to be considered as "Pressure Disadvantaged" and pressures between 12-16m head will require Council approval with justification for adoption.

2.6 Water Quality

2.6.3 Water Age

Figure 5.2 shall be superseded by Council drawing no 101213.

2.8 Pumping Stations

Refer Hydraulic Design Section in Department of Energy and Water Supply Planning Guidelines.

2.9 Service Reservoirs

Refer Hydraulic Design Section in Department of Energy and Water Supply, Planning Guidelines.

The following table shall be used as a guide for allowance for emergency storage.

System Type	Volume, kL
Zone with Special Risk / Hazard Building*	400
Commercial Supply Zone	220
General Supply Zone	150
Small Community	75

*Only for Special Risk / Hazard > 30 L/s

3. HYDRAULIC DESIGN

In the absence of other location/study specific requirements, system capacity shall be based on water supply infrastructure sizing components identified in the Department of Energy and Water Supply, Planning Guidelines, Chapter 7 – Options for Service Provision.

3.1.5 Fire flows

Provision of network capacity to fight fires shall be based on the Department of Energy and Water Supply, Planning Guidelines, Chapter 6 – Network Modelling.

However, where the developed area (or part thereof) of a residential development has a density greater than 35 ET/ha (excluding road reserves), the area exceeding this density shall be classed as High Density for the purposes of fire provision.

4. PRODUCTS AND MATERIALS

4.1 General

In locations specified below, the pipe material shall be as shown.

Under roadways or proposed roadways:
Ductile iron, steel - but not PVC
Other locations:
DN300 and above - ductile iron, steel but not PVC

Under DN300 - ductile iron, PVC-U Series 1 (only where compatibility with an existing installation is required), PVC-M or PVC-O Series 2 (with PVC-O to have SN greater than 10 (a minimum stiffness of 10,000 N/m.m)).

The appropriate pressure rating, re-ratings for operating conditions (temperature, water hammer, cyclic loading, etc) and corrosion protection is required for the specific application.

The above is on the proviso that for certain specific projects (for example large diameter trunk mains, long lengths of "trunk" delivery mains), project specific designs and pipe material selection will be undertaken to minimise the whole of life cost to Council.

GRP (Glass Reinforced Plastic) and ABS (Acrylonitrile Butadiene Styrene) pipes shall not be permitted and PVC fatigue de-rating shall be as per WSAA technical notes.

5. GENERAL DESIGN

5.2 Reticulation Design for Water Quality

5.2.1 Layout of water mains

Typical Cul-de-sac details shall be in accordance with Council Drawing No. 101213. Enveloper pipe for OD63 poly pipe is required only for road crossings. End of water main control valves are to be resilient seated gate valves.
In Industrial areas where the water mains are greater than DN100, minimum size for cul de sac looping arrangement shall be DN100.

5.2.3 Link mains

Linked water mains are required wherever determined by Council. The location of water mains shall require the provision of public lanes or walkways of a width required by Council (nominally 4-6 m wide).

5.4 Location of water mains

5.4.1 General

Water mains shall be located in public space (such as road reserves, laneways, parks etc.). The location shall be:

(a) Located within the footpath (verge) and on the high side of the street carriageway where applicable.

(b) Alignments and levels of water mains shall be in accordance with the relevant standard cross section for each street type. Refer Council drawing no 101214 for a typical detail of services allocation in a footpath.

(c) If Items (a) & (b) cannot be achieved then an easement must be obtained in favour of Toowoomba Regional Council. Any structures including swimming pool and spa pools should be located clear of zone of influence of water infrastructures. Anchor rods of any foundation, building or structures are not located within zone of influence.

(d) A minimum of 4.0m unobstructed vertical clearances is to be maintained over the water supply infrastructure and must not have additional fill placed over the water supply infrastructure.

(e) Mains shall not be laid on the same horizontal alignment as stormwater pipes, wastewater pipes, gas or electricity conduits. Cover to all other services is to be shown on the design plan where crossings are required. A minimum vertical separation of 200 mm for pipes ≤ DN300 and 500 mm for pipes > DN300 shall be maintained where services cross.

(f) Footpaths must not be installed along water main alignments. The minimum horizontal separation that must be provided between water main alignments and footpaths is 500mm. It is permissible for a footpath to cross the water Main.

5.6 Shared Trenching

Under no circumstances are electricity or gas conduits to be laid in the same trench as a water main.

Gas and long side water services may be laid in the same trench with minimum horizontal separation of 500mm.

5.9 Connection of new mains to existing mains

Connection to the water main network can be made prior to On Maintenance acceptance subject to Council approval. However, Water supply will not be made live until works are accepted On Maintenance**.**

5.11 Property Services

All pipe networks and enveloper pipes must be constructed by developer at sub division stage. Water meters shall be installed by Council on request.

Property service connections to mains shall be in accordance with Council Drawing No 101214. Kerb markers are to be installed in line with enveloper conduits for property connections. TPFNR (Tapping

Pressure Ferrule Non Return Valve) shall be installed with a PVC access shaft brought to the surface as per Council Drawing No. 101214.

Enveloper pipes must be minimum SN8 and DN100 diameter. Water meters are to be located in the verge within 0.2m of adjoining property boundaries. Water services and electrical pillars should not be located at the same adjoining boundary.

5.12 Obstructions and Clearances

5.12.6 Deviation of Water mains

5.12.6.1 General

Multiple joint deflections shall not be more than 50% of the manufacturer's recommendations. Whenever possible, deviation of water mains must be achieved by deflection through joints rather than installing pipe bends.

Bending of pipes both vertically or horizontally is not permitted, unless otherwise approved by Council.

7. STRUCTURAL DESIGN

7.4.2 Pipe cover

The required minimum depth of cover to water mains measured from top of kerb shall be as follows.

Diameter of the pipe	In Footpath Cover (mm)	In roads and road crossing Cover (mm)
DN100	600	900
DN150	600	900
>DN150	900	1200

In Industrial/Commercial areas, water mains must be laid at 900mm minimum cover.

Where a new Industrial/Commercial driveway is installed when the existing water main has less than 900mm cover, the water main must be upgraded to DICL at no cost to Council. The upgrade must extend 1.0m beyond the driveway.

Maximum cover should be less than 1500mm, unless otherwise approved by Council.
Maximum allowable centreline deviation from the given alignment shall be ± 75 mm horizontally and ± 50 mm vertically.

Where the grade of a footpath is non-standard, the depth of cover to the main as detailed above, shall not be measured from the kerb, but shall be measured from the finished surface level.

Where a reticulation branch enters a steeply graded street, minimum cover must be maintained by cutting pipe lengths and deflecting joints to suit or by use of vertical bends. The maximum design deflection allowable at a joint shall be 50% of manufacturer's recommendations.

Where a DN100 or a DN150 main connects to a trunk main, cover to the smaller diameter main shall be reduced to the required 600 mm below top of kerb over a maximum of 2 pipe lengths.

7.8 Above-Ground Water Mains

Where mains could be exposed to impact (e.g. floating debris) or heat from fire, water main material types such as mild steel or ductile iron shall be used.

7.9 Pipeline Anchorage

7.9.2.4 Timber and recycled plastics thrust blocks

Timber and recycled plastics thrust blocks are not permitted.

8. APPURTENANCES

8.1 Valves – General

8.1.2 Valve siting principles

- Valves should be located within 200 mm of the nearest dividing property boundary, where possible.
- Valves must not be located within driveways or roadways.

Council may, at its absolute discretion, consider a reduction of number of valves depending on site specific circumstances in well designed water supply networks.

(a) Construction valves
A construction valve shall be a sluice valve of the same diameter as the main and shall be installed at the commencement of all new work, except as otherwise approved by Council. There should be at least 5 m from the point of connection to Council water main to allow for live connection by Council.

(b) Section valves
A section valve shall be a sluice valve of the same diameter as the main. Section valves shall be installed on all reticulation branches. Valves are to be resilient seated sluice valves.

No more than two reticulation branches shall be located between section valves. Notwithstanding this requirement, each section of main between valves shall serve a maximum of 20 allotments.

8.2 Stop Valves

8.2.4 Stop valves for reticulation mains

Stop valves selection criteria shall be as follows.

Table 6.1: Stop Valve Spacing Criteria

Water main size DN	Number of property service connections (nominal)	Maximum spacing m
≤DN150	20	300
DN200-DN300	20	300

8.2.7 Stop Valves – Location and arrangements

8.2.7.1 General

Stop valves to be installed on all legs of a tee.

8.8 Hydrants

8.8.5 Hydrant Installation

Standard depths for valves and hydrants should be in the range of 150-250mm from the finish surface level.

8.8.8 Hydrant Spacing

The Maximum spacing between hydrants shall be 80m and within 40 m of the property.

Hydrant spacing in rural residential development can be 120m. In large lot rural residential and industrial developments, hydrants should be located by maintaining 40m to the nearest point of the property boundary.

Developments that include small lots may require a higher level of water supply provisions including, but not limited to the provisions specified in the DEWS Planning Guidelines. This may include additional fire hydrants.

8.8.9 Hydrant location

Hydrants to be located within ±200 mm of the nearest dividing property boundary and not directly in front of a residential allotment.

For water mains located within the road carriageway and the alignment is less than 2.5 m from the kerb face, the fire hydrant shall be positioned adjacent to the driveway preferably on the dividing boundary side.

For hatchet blocks, an additional hydrant shall be provided in the Council water main if the access handle of the hatchet is greater than 30 m. The additional hydrant must be located adjacent to the access handle, but clear of any driveway cross over.

In reticulated areas, hydrants shall be located within 20m of street intersections.

8.11.2 Marker posts and plates

Marker posts shall be made of fire resistant material where located within or adjacent to medium or high risk bushfire hazard zones. Refer to Council drawing no 105321 for installation details and notes.

8.11.4 Kerb markings

Brass or Stainless Steel Indicators Discs shall be installed on the face of the kerb to indicate the alignment of all water road crossings.

9. DESIGN REVIEW AND DRAWINGS

9.2 Design Drawings

9.2.4 Contents of Design Drawings

Design drawings shall be in accordance with Council Drawing No 101215.

Plans shall be at a scale of 1:500 or 1:1000 at A3 provided that the details are legible at this size. Generally, the North Point direction shall be towards the top of the drawings.

Design drawings shall detail the individual services to each lot of the subdivision. In addition, all other service locations shall be shown locally at points of crossover with the water reticulation main.

9.4 Recording of WORK-AS CONSTRUCTED information

All As-constructed drawings and details must be certified by a Registered Professional Engineer, Queensland.

Methodology used for the As-constructed drawings must be in accordance with ADAC standards (http://www.adac.com.au/) and shall be included a digital copy showing all *as constructed* details supplied in AutoCAD drawing files with two hard copies.

The datum for all levels in As-constructed drawings shall be in Australian Height Datum (AHD) in metres to three decimal places e.g. 600.999. Projection shall be based on GDA 2020 Map Grid of Australia Zone 56 coordinate system.

As-constructed drawings for water mains must include a minimum of:

- pipe materials;
- type of coating;
- lengths;
- pipe jointing types;
- diameters;
- main alignments to property boundaries (to a tolerance of 0.1m);
- water main chainages;
- depths where possible;
- positions/chainages of all fittings, etc. in relation to property boundaries (to a tolerance of 0.1m);
- water service locations, size and length of services for each pipe diameter and material type; and
- Locations of end caps of property connections in relation to property boundaries (to a tolerance of 0.1m).

Each sheet that has as-constructed details annotated must have the revisions title box annotated with the words " As-constructed " and the next revision number allocated for that sheet.

PART 2: CONSTRUCTION

10. GENERAL

A Registered Professional Engineer, Queensland, must certify all construction works as per Annexure1:_Council Inspection and Test Plans for Water Reticulation Networks.

12. PRODUCTS AND MATERIALS

12.5 Concrete Works

All concrete works shall be in accordance with relevant Australian Standards.

16. PIPE EMBEDMENT AND SUPPORT

Grading of bedding material for pipes shall be as follows:

Sieve size aperture width (AS 1152)	Percentage passing
9.5 mm	100
6.7 mm	90-100
425 µm	40-90
150 µm	0-10

17. FILL

17.1.1 Material Requirements

Approved selected backfill for trench material to within 300 mm of finished surface level

19. ACCEPTANCE TESTING

19.4 Hydrostatic Pressure Testing

19.4.1 General

Testing must be in accordance with the WSA Code - Section 19. Compressed air testing shall not be used for pressure pipe. Each pipe joint and anchor blocks should be exposed during pressure testing.

22. CONNECTIONS TO EXISTING WATER MAINS

22.1 General

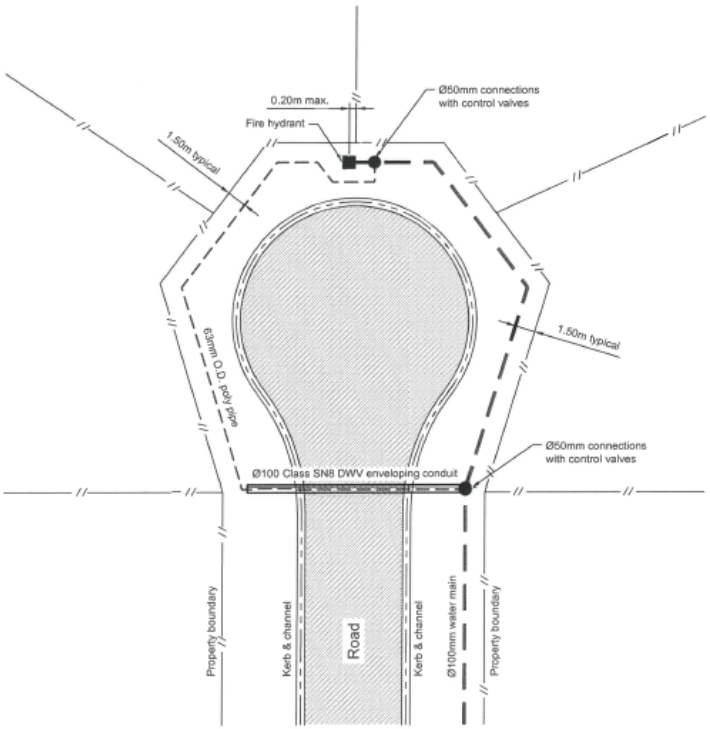
Live Connection must be carried out by Council

COUNCIL Drawings

101213 - Typical Cul-de-Sac & Intersection Details
101214 - Typical Utility Services Allocation & Water Service Enveloping Conduit
101215 – Example of Design Layout Plan
101216 – Example of “As Constructed” Plan
105321 – Hydrant & Valve Markers

Annexed:

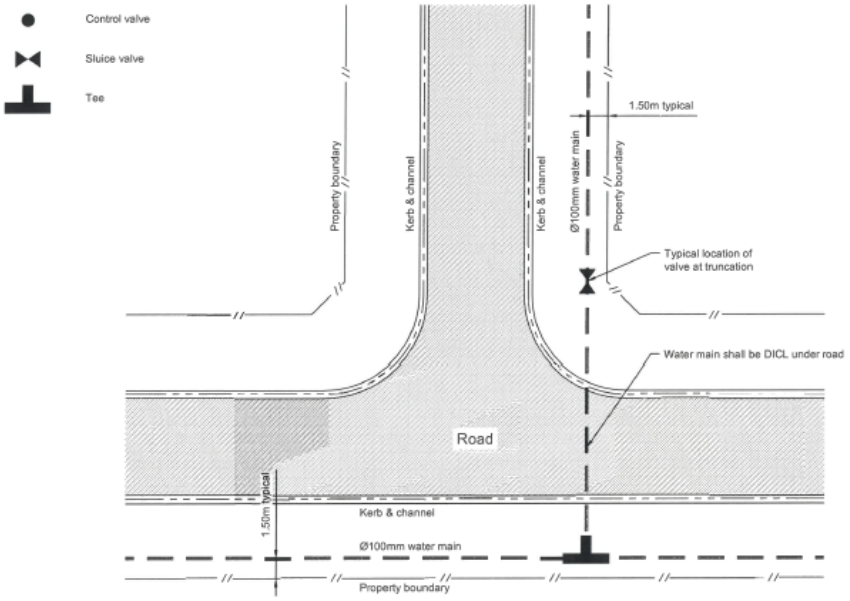
Annexure 1: Inspection and Test Plans
Annexure 2 : Standard Specification for Council Works and Development Installations - Supply of Hydrant and Valve Covers (and Identification/Marking)



TYPICAL DETAIL
DEAD END WATER MAIN

LEGEND

- Fire hydrant
- Control valve
- Sluice valve
- Tee



TYPICAL DETAIL
LOCATION OF WATER RETICULATION
SERVICES AT TRUNCATIONS

General Manager - Water and Waste Services

B	Envelopes limited to road, Class SN8 DWV	N/A	N/A	N/A	N/A	
A	Original Issue	GC	AB	7961	3-3-10	
Revisions		Drawn	Appd.	RPEQ	Date	

Surveyor N/A
Field Book No. N/A
Datum - Horz N/A
Datum - Vert N/A
Upload File N/A

Drafting 21-3-23
Design 21-3-23
Check 21-3-23
Recommended 21-3-23
Approved RPEQ

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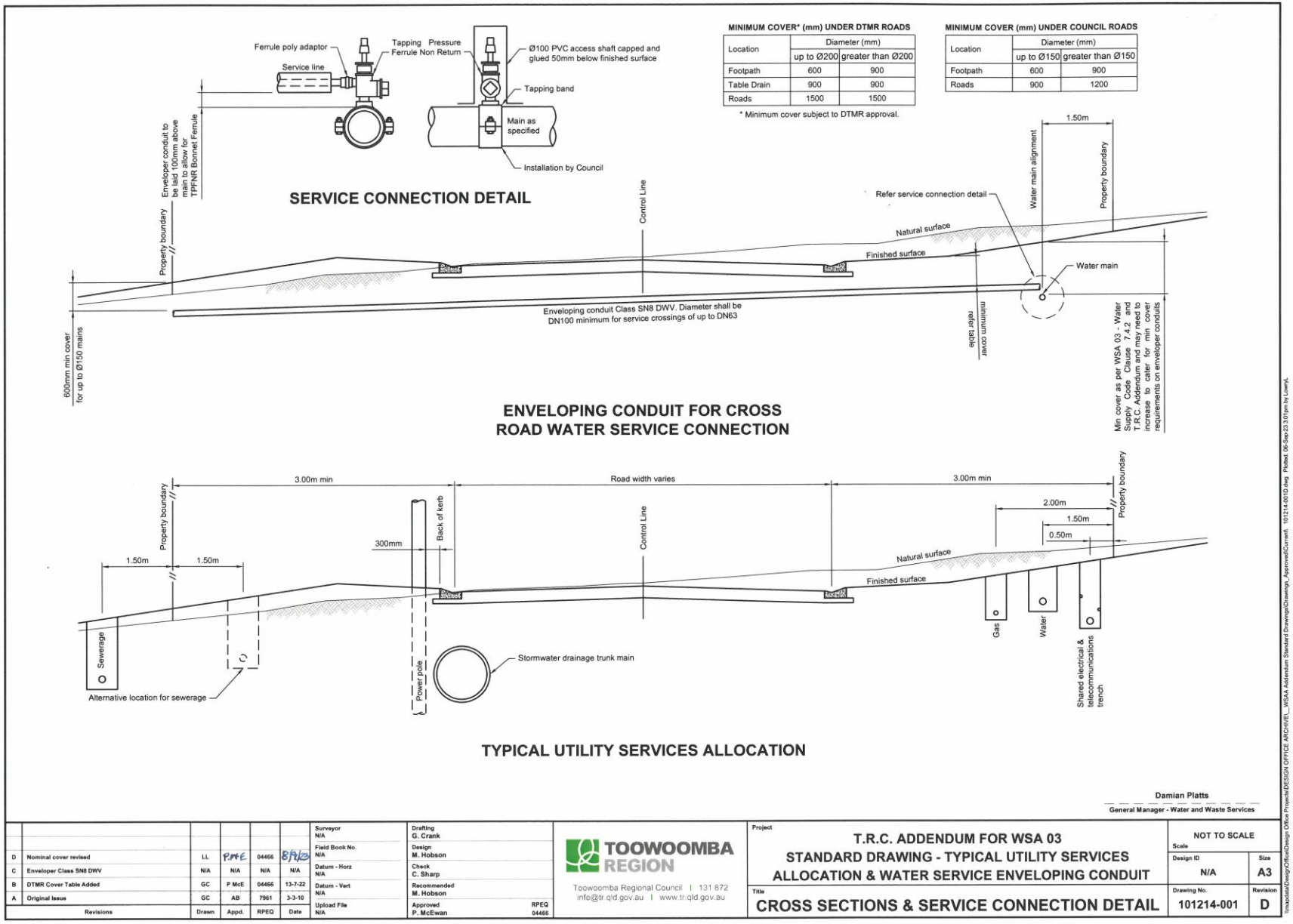
Project: T.R.C. ADDENDUM FOR WSA 03
STANDARD DRAWING
WATER RETICULATION

Title: TYPICAL CUL-DE-SAC & INTERSECTION DETAILS

Scale: NOT TO SCALE
Design ID: N/A
Size: A3
Drawing No.: 101213-001
Revision: B


MINIMUM COVER* (mm) UNDER DTMR ROADS
Location | Diameter (mm) up to Ø200 | greater than Ø200
Footpath 600 900
Table Drain 900 900
Roads 1500 1500
* Minimum cover subject to DTMR approval.
MINIMUM COVER (mm) UNDER COUNCIL ROADS
Location | Diameter (mm) up to Ø150 | greater than Ø150
Footpath 600 900
Roads 900 1200
Ferrule poly adaptor
Service line
Tapping Pressure Ferrule Non Return
Ø100 PVC access shaft capped and glued 50mm below finished surface
Tapping band
Main as specified
Installation by Council
Enveloper conduit to be laid 100mm above main to allow for TPFNR Bonnet Ferrule
SERVICE CONNECTION DETAIL
Property boundary
Control Line
Refer service connection detail
Water main alignment
1.50m
Property boundary
Natural surface
Finished surface
Water main
Enveloping conduit Class SN8 DWV. Diameter shall be DN100 minimum for service crossings of up to DN63
600mm min cover for up to Ø150 mains
minimum cover refer table
Min cover as per WSA 03 - Water Supply Code Clause 7.4.2 and T.R.C. Addendum and may need to increase to cater for min cover requirements on enveloper conduits
ENVELOPING CONDUIT FOR CROSS ROAD WATER SERVICE CONNECTION
3.00m min
Road width varies
3.00m min
Property boundary
2.00m
1.50m
0.50m
Property boundary
300mm
Back of kerb
Control Line
1.50m
1.50m
Natural surface
Finished surface
Sewerage
Alternative location for sewerage
Power pole
Stormwater drainage trunk main
Gas
Water
Shared electrical & telecommunications trench
TYPICAL UTILITY SERVICES ALLOCATION
Damian Platts
General Manager - Water and Waste Services
D Nominal cover revised LL PPFE 04466 BPW
C Enveloper Class SN8 DWV N/A N/A N/A N/A
B DTMR Cover Table Added GC P McE 04466 13-7-22
A Original Issue GC AB 7961 3-3-10
Revisions Drawn Appd. RPEQ Date
Surveyor N/A
Field Book No. N/A
Datum - Horz N/A
Datum - Vert N/A
Upload File N/A
Drafting G. Crank
Design M. Hobson
Check C. Sharp
Recommended M. Hobson
Approved P. McEwan RPEQ 04466
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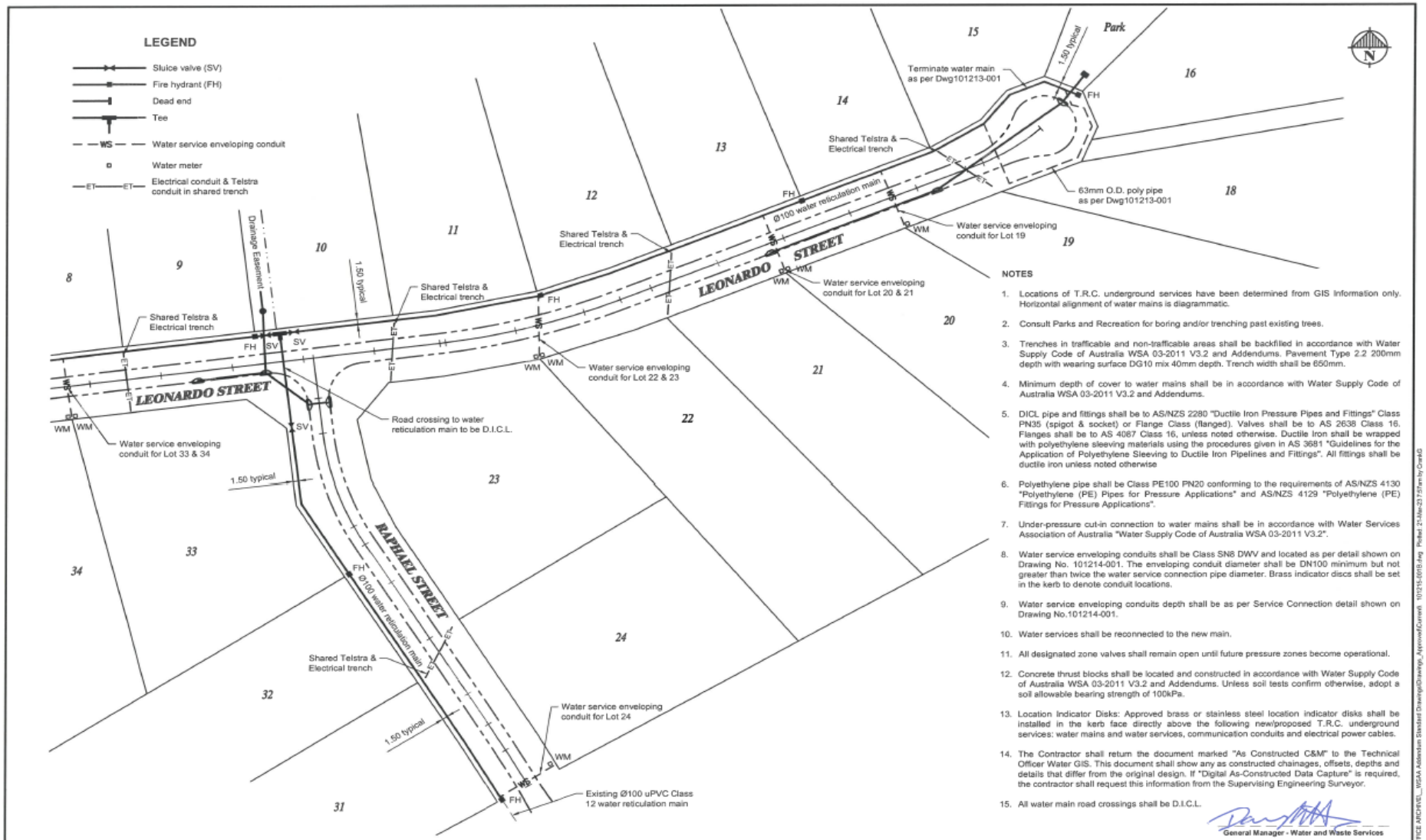
Project
T.R.C. ADDENDUM FOR WSA 03
STANDARD DRAWING - TYPICAL UTILITY SERVICES ALLOCATION & WATER SERVICE ENVELOPING CONDUIT
Title
CROSS SECTIONS & SERVICE CONNECTION DETAIL
NOT TO SCALE
Scale
Design ID N/A
Size A3
Drawing No. 101214-001
Revision D



NOTES

1. Locations of T.R.C. underground services have been determined from GIS Information only. Horizontal alignment of water mains is diagrammatic.
2. Consult Parks and Recreation for boring and/or trenching past existing trees.
3. Trenches in trafficable and non-trafficable areas shall be backfilled in accordance with Water Supply Code of Australia WSA 03-2011 V3.2 and Addendums. Pavement Type 2.2 200mm depth with wearing surface DG10 mix 40mm depth. Trench width shall be 650mm.
4. Minimum depth of cover to water mains shall be in accordance with Water Supply Code of Australia WSA 03-2011 V3.2 and Addendums.
5. DICL pipe and fittings shall be to AS/NZS 2280 "Ductile Iron Pressure Pipes and Fittings" Class PN35 (spigot & socket) or Flange Class (flanged). Valves shall be to AS 2638 Class 16. Flanges shall be to AS 4087 Class 16, unless noted otherwise. Ductile Iron shall be wrapped with polyethylene sleeving materials using the procedures given in AS 3681 "Guidelines for the Application of Polyethylene Sleeving to Ductile Iron Pipelines and Fittings". All fittings shall be ductile iron unless noted otherwise
6. Polyethylene pipe shall be Class PE100 PN20 conforming to the requirements of AS/NZS 4130 "Polyethylene (PE) Pipes for Pressure Applications" and AS/NZS 4129 "Polyethylene (PE) Fittings for Pressure Applications".
7. Under-pressure cut-in connection to water mains shall be in accordance with Water Services Association of Australia "Water Supply Code of Australia WSA 03-2011 V3.2".
8. Water service enveloping conduits shall be Class SN8 DWV and located as per detail shown on Drawing No. 101214-001. The enveloping conduit diameter shall be DN100 minimum but not greater than twice the water service connection pipe diameter. Brass indicator discs shall be set in the kerb to denote conduit locations.
9. Water service enveloping conduits depth shall be as per Service Connection detail shown on Drawing No.101214-001.
10. Water services shall be reconnected to the new main.
11. All designated zone valves shall remain open until future pressure zones become operational.
12. Concrete thrust blocks shall be located and constructed in accordance with Water Supply Code of Australia WSA 03-2011 V3.2 and Addendums. Unless soil tests confirm otherwise, adopt a soil allowable bearing strength of 100kPa.
13. Location Indicator Disks: Approved brass or stainless steel location indicator disks shall be installed in the kerb face directly above the following new/proposed T.R.C. underground services: water mains and water services, communication conduits and electrical power cables.
14. The Contractor shall return the document marked "As Constructed C&M" to the Technical Officer Water GIS. This document shall show any as constructed chainages, offsets, depths and details that differ from the original design. If "Digital As-Constructed Data Capture" is required, the contractor shall request this information from the Supervising Engineering Surveyor.
15. All water main road crossings shall be D.I.C.L.

General Manager - Water and Waste Services

Revisions	Drawn	Appd.	RPEQ	Date
B Notes revised	N/A	N/A	N/A	N/A
A Original Issue	GC	AB	7991	3-3-10

Surveyor N/A | Field Book No. N/A | Datum - Horz N/A | Datum - Vert N/A | Upload File N/A

Drafting 21-3-23 | Design 21-3-23 | Check 21-3-23 | Recommended 21-3-23 | Approved RPEQ

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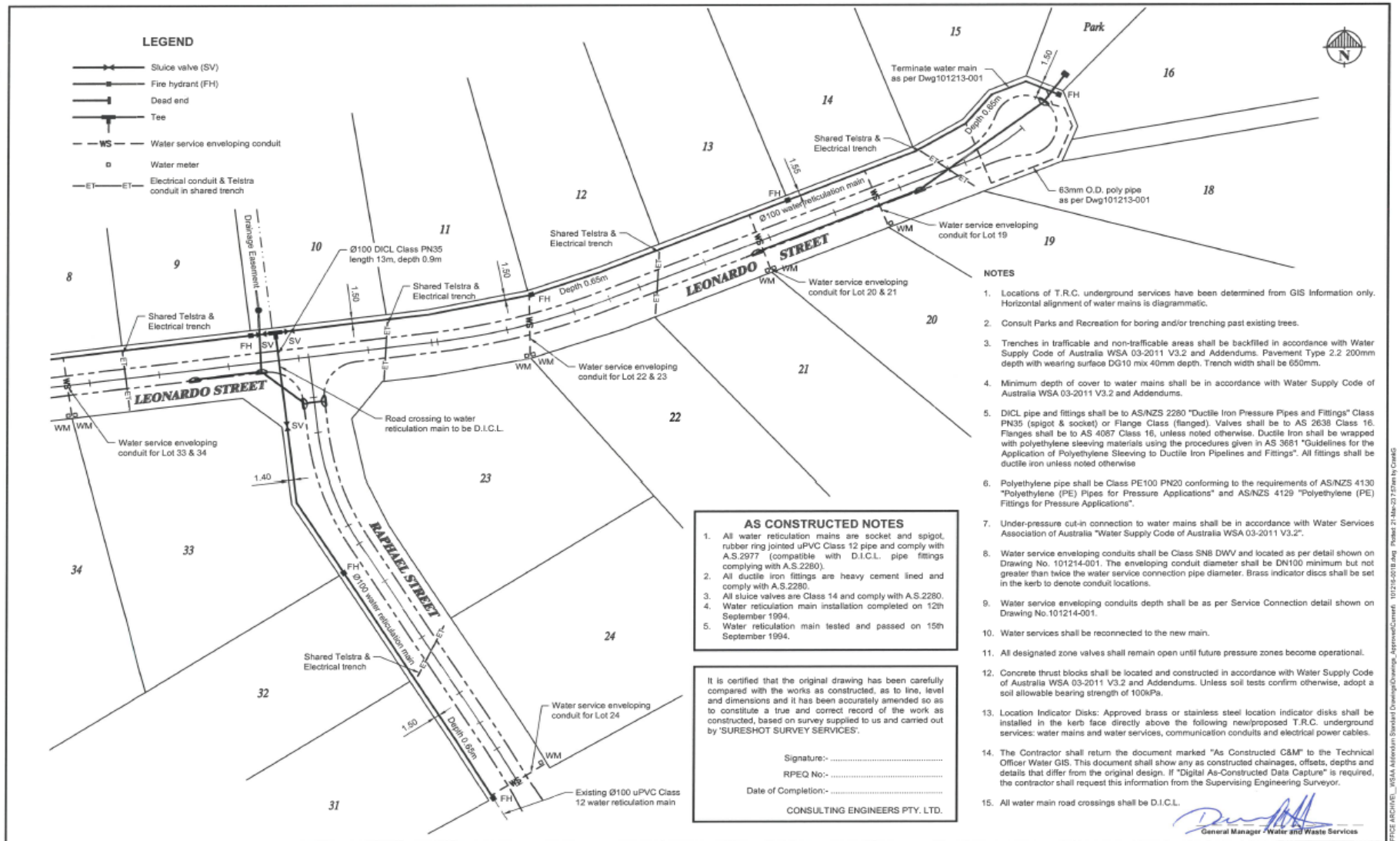
Project: T.R.C. ADDENDUM FOR WSA 03 STANDARD DRAWING WATER RETICULATION

Title: EXAMPLE OF DESIGN LAYOUT PLAN

Scale 1:1000 (m) | Design ID N/A | Size A3 | Drawing No. 101215-001 | Revision B

I:\Design Office Projects\DESIGN OFFICE ARCHIVE_WSAA Addendum Standard Drawings\Drawings_Approved\Current\ 101215-001B.dwg Plotted: 21-Mar-23 7:57am by CraigG


LEGEND
Sluice valve (SV)
Fire hydrant (FH)
Dead end
Tee
Water service enveloping conduit
Water meter
Electrical conduit & Telstra conduit in shared trench
LEONARDO STREET
RAPHAEL STREET
Park
Terminate water main as per Dwg101213-001
Shared Telstra & Electrical trench
Ø100 DICL Class PN35 length 13m, depth 0.9m
Ø100 water reticulation main
63mm O.D. poly pipe as per Dwg101213-001
Water service enveloping conduit for Lot 19
Water service enveloping conduit for Lot 20 & 21
Water service enveloping conduit for Lot 22 & 23
Water service enveloping conduit for Lot 33 & 34
Water service enveloping conduit for Lot 24
Road crossing to water reticulation main to be D.I.C.L.
Existing Ø100 uPVC Class 12 water reticulation main
Drainage Easement
Depth 0.65m
1.50
1.40
1.55
AS CONSTRUCTED NOTES
1. All water reticulation mains are socket and spigot, rubber ring jointed uPVC Class 12 pipe and comply with A.S.2977 (compatible with D.I.C.L. pipe fittings complying with A.S.2280).
2. All ductile iron fittings are heavy cement lined and comply with A.S.2280.
3. All sluice valves are Class 14 and comply with A.S.2280.
4. Water reticulation main installation completed on 12th September 1994.
5. Water reticulation main tested and passed on 15th September 1994.
It is certified that the original drawing has been carefully compared with the works as constructed, as to line, level and dimensions and it has been accurately amended so as to constitute a true and correct record of the work as constructed, based on survey supplied to us and carried out by 'SURESHOT SURVEY SERVICES'.
Signature:- .....
RPEQ No:- .....
Date of Completion:- .....
CONSULTING ENGINEERS PTY. LTD.
NOTES
1. Locations of T.R.C. underground services have been determined from GIS Information only. Horizontal alignment of water mains is diagrammatic.
2. Consult Parks and Recreation for boring and/or trenching past existing trees.
3. Trenches in trafficable and non-trafficable areas shall be backfilled in accordance with Water Supply Code of Australia WSA 03-2011 V3.2 and Addendums. Pavement Type 2.2 200mm depth with wearing surface DG10 mix 40mm depth. Trench width shall be 650mm.
4. Minimum depth of cover to water mains shall be in accordance with Water Supply Code of Australia WSA 03-2011 V3.2 and Addendums.
5. DICL pipe and fittings shall be to AS/NZS 2280 "Ductile Iron Pressure Pipes and Fittings" Class PN35 (spigot & socket) or Flange Class (flanged). Valves shall be to AS 2638 Class 16. Flanges shall be to AS 4087 Class 16, unless noted otherwise. Ductile Iron shall be wrapped with polyethylene sleeving materials using the procedures given in AS 3681 "Guidelines for the Application of Polyethylene Sleeving to Ductile Iron Pipelines and Fittings". All fittings shall be ductile iron unless noted otherwise
6. Polyethylene pipe shall be Class PE100 PN20 conforming to the requirements of AS/NZS 4130 "Polyethylene (PE) Pipes for Pressure Applications" and AS/NZS 4129 "Polyethylene (PE) Fittings for Pressure Applications".
7. Under-pressure cut-in connection to water mains shall be in accordance with Water Services Association of Australia "Water Supply Code of Australia WSA 03-2011 V3.2".
8. Water service enveloping conduits shall be Class SN8 DWV and located as per detail shown on Drawing No. 101214-001. The enveloping conduit diameter shall be DN100 minimum but not greater than twice the water service connection pipe diameter. Brass indicator discs shall be set in the kerb to denote conduit locations.
9. Water service enveloping conduits depth shall be as per Service Connection detail shown on Drawing No.101214-001.
10. Water services shall be reconnected to the new main.
11. All designated zone valves shall remain open until future pressure zones become operational.
12. Concrete thrust blocks shall be located and constructed in accordance with Water Supply Code of Australia WSA 03-2011 V3.2 and Addendums. Unless soil tests confirm otherwise, adopt a soil allowable bearing strength of 100kPa.
13. Location Indicator Disks: Approved brass or stainless steel location indicator disks shall be installed in the kerb face directly above the following new/proposed T.R.C. underground services: water mains and water services, communication conduits and electrical power cables.
14. The Contractor shall return the document marked "As Constructed C&M" to the Technical Officer Water GIS. This document shall show any as constructed chainages, offsets, depths and details that differ from the original design. If "Digital As-Constructed Data Capture" is required, the contractor shall request this information from the Supervising Engineering Surveyor.
15. All water main road crossings shall be D.I.C.L.
General Manager - Water and Waste Services
B Notes revised N/A N/A N/A N/A
A Original Issue GC AB 7961 3-3-10
Revisions Drawn Appd. RPEQ Date
Surveyor N/A
Field Book No. N/A
Datum - Horz N/A
Datum - Vert N/A
Upload File N/A
Drafting 21-3-23
Design 21-3-23
Check C. Sharp 21-3-23
Recommended 21-3-23
Approved RPEQ
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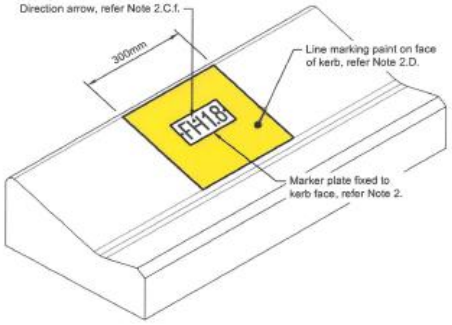
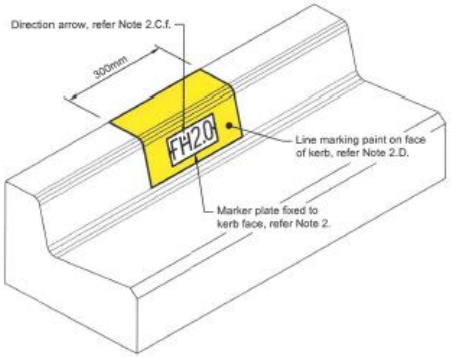
Project
T.R.C. ADDENDUM FOR WSA 03
STANDARD DRAWING
WATER RETICULATION
Title
EXAMPLE OF "AS CONSTRUCTED" PLAN
Scale 1:1000 (at)
Design ID N/A
Size A3
Drawing No. 101216-001
Revision B



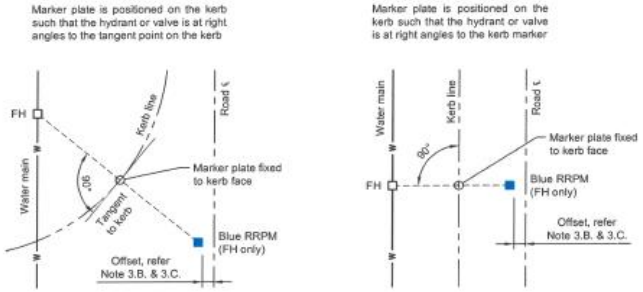
LAYBACK KERB & CHANNEL



BARRIER KERB & CHANNEL

MARKER PLATE DETAILS URBAN STANDARD

Not to Scale



MARKER PLATE & RRPM SETOUT DETAILS

Not to Scale

1. **VALVE & FIRE HYDRANT MARKERS - GENERAL**
   - A. All relevant valve & hydrant markers including blue retro-reflective pavement markers (RRPM), kerb markers, kerb paint, indicator discs or marker posts shall be installed in line with the relevant hydrant or valve & each other.

2. **VALVE & FIRE HYDRANT MARKER PLATES - KERBED AREAS (TYPICALLY URBAN)**
   - A. Marker plates shall be used for:
     - a. Scour Valves - **'ScV'** (alternatively **'Scour'**)
     - b. Air Valves - **'AV'**
     - c. Section or Stop (isolation) Valves - **'SV'**
     - d. Fire Hydrants - **'FH'** (or less preferable **'H'**)
     - e. Cul-de-sac - Control Valves - **'V'**
   - B. General arrangements to include:
     - a. Fixing - RAMSET SDM06030 fasteners or equivalent, including stainless steel pins, x2 minimum.
     - b. Markers shall be located as per the above setout details and with markers rotated facing towards the valve or hydrant.
   - C. Marker plate size, materials & text:
     - a. Aluminium marker plates shall be 1.6mm minimum thickness using marine grade aluminium to suit road signage standards.
     - b. Marker plates shall be full thickness aluminium plates. Architectural sandwich construction materials using polymer resins are not permitted.
     - c. Marker plate dimensions: 150mm x 75mm.
     - d. Text height shall be 55mm.
     - e. Text colour shall be black & non-reflective.
     - f. The marker plate shall show the distance to the hydrant or valve in metres to one decimal place & shall have a small direction arrow on the plate to which the distance applies. The arrow shall be up or down only (due to tangential placement of plates).
     - g. Hydrant marker plates shall be yellow. All other marker plates designating the water main ScV, AV, SV, V & crossings shall be white.
     - h. Reflective sheeting shall be Class 1 with a clear protective overlay sheet.
     - i. Any adhesive products shall be at road signage standards.
   - D. Line marking paint 300mm wide, shall be applied to the kerb face surrounding each marker plate. Paint colour for hydrants shall be yellow. Paint colour for all other locations designating the water main ScV, AV, SV & crossings shall be white.

3. **ROAD PAVEMENT MARKERS FOR FIRE HYDRANT LOCATIONS**
   - A. Blue RRPMs for hydrants shall comply with AS1906.3.
   - B. For locations in Council controlled road reserves, blue RRPM shall be installed in accordance with this drawing.
     - a. The reflector shall be located 50mm from the centre line of the road & on the same side as the hydrant.
   - C. For locations in State controlled road reserves (TMR), blue RRPMs shall be installed in accordance with the Manual of Uniform Traffic Control Devices.
   - D. Blue RRPMs shall be installed in accordance with the manufacturer's recommendations.
     - a. Blue RRPMs shall be installed with epoxy or a bituminous pad, (for flexible pavements, as per WSA 8.11.3).
   - E. Painted yellow reflective directional arrow is optional.
   - F. Where the road pavement is unsealed gravel or dirt, a marker post must be installed instead of a blue RRPM.

4. **VALVE & FIRE HYDRANT MARKER POSTS - UNKERBED AREAS (TYPICALLY RURAL)**
   - A. Marker post size & arrangements generally as per WSA 8.11 & WAT-1300.
   - B. Marker posts shall be used for:
     - a. Scour Valves - **'ScV'** (alternatively **'Scour'**)
     - b. Air Valves - **'AV'**
     - c. Section or Stop (isolation) Valves - **'SV'**
     - d. Fire Hydrants - **'FH'** (or less preferable **'H'**)
   - C. Marker posts shall be of fire-resistant material (e.g. steel not plastic) & painted or manufacturer coloured:
     - a. Yellow for Fire Hydrants.
     - b. Blue for all other markers designating the water main ScV, AV, SV & crossings.
   - D. Marker Posts shall be typically installed at property boundary fence lines, or secondary to an appropriate existing structure.
   - E. Posts should extend approximately 1m above FSL in open areas & 1.5m above FSL in grass or cropped areas. Where marker plates are fixed to existing structures e.g. buildings, poles, posts they should be at least 1.5m above FSL.
   - F. Galvanised 50NB Mild Steel Tube C350LO should be considered for remote area posts where no fences or structures are present.
   - G. The marker shall show the distance to the hydrant or valve in metres to one decimal place & shall have a small direction arrow on the marker to which the distance applies. The arrow shall be up or down only (due to tangential placement of markers).
   - H. Markers should denote the nominal diameter of the main in millimetres.
   - I. If all the required information is unable to fit on the post directly, then a marker plate shall be securely fixed to the marker post.

General Manager - Water and Waste Services

Revisions		Drawn	Appd.	RPEQ	Date
A	Original Issue				

Surveyor N/A | Field Book No. N/A | Datum - Horz N/A | Datum - Vert N/A | Upload File N/A

Drafting F.Cook 21-3-23 | Design C.Sharp 21-3-23 | Check M.Hall 21-3-23 | Recommended M.Hall 21-3-23 | Approved RPEQ 14466

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Project: T.R.C. ADDENDUM FOR WSA 03 STANDARD DRAWING WATER RETICULATION

Title: HYDRANT & VALVE MARKERS

Scale: NOT TO SCALE | Design ID: N/A | Size: A3 | Drawing No.: 105321-001 | Revision: A

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Annexure1: Inspection and Test Plan

ITP -Water 001

TOOWOOMBA REGIONAL COUNCIL
WATER RETICULATION

Annexure 1 for TRC Addendum for WSA 03

Job Name and Description:-
Job Number:-
Site Forman

No	Activity	Method	Frequency	Quality Requirements	Test Confirmation (RPEQ)				Remarks by Contractor or Engineer
					Contractor		Supervising Engineer		
					Sign	Date	Sign	Date	
1	Prestart Meeting								
2	Set out works	Survey	Each Section	to be approved by Engineer					
3	Cut existing Pavement Surface (if any)	Concrete saw cutting wheel	Existing Paved Areas	Depth of cut to exceed depth of seal or asphalt					
4	Order & Receive Pipes	Visual Inspection	Each Section	All pipes undamaged, correct Class etc retain delivery dockets					
5	Order & receive Bedding material	Visual	Each Load	Free of contaminants, as per Specification					
6	Excavate Trenches	Visual, Geometrics	Each Section	Vertical faces, free of excess loose material,					**Hold Point**
7	Depth of cover at road and footpath	Measurements	Each Section	As per standard					
8	Place Bedding Material	Visual	Each Section	Free of unsuitable material					
9	Bed, Lay & Joint Pipes Marker tapes	Visual	Each Length	In accordance with specification					**Hold Point**
10	Thrust Blocks	Visual Inspection	Each Anchor	As per WSA Manual					
11	Survey As Constructed	Survey by Engineer	Each Section	General Specification Engineering Plans					
12	Pressure Test	As per WSA	Entire Works	As per WSA Manual					**Hold Point**
13	Backfill Trenches	As per WSA	Entire Works	Compaction test results					
14	Reinstate	Visual	Entire Works	As per standard					
15	Check all valve & hydrant boxes etc	Visual	Entire Works	All works to satisfaction of the Engineer					
16	Disinfection	As per WSA	Entire Works	All works to satisfaction of the Engineer					

#DM 3550960-V1

Toowoomba Regional Council

Annexure 2

STANDARD SPECIFICATION FOR COUNCIL WORKS AND DEVELOPMENT INSTALLATIONS - SUPPLY OF HYDRANT AND VALVE COVERS (AND IDENTIFICATION/MARKING) (TO BE READ IN CONJUNCTION WITH WATER INFRASTRUCTURE POLICY 2.03)

COVERS

(a) For Non- Trafficable footpath areas and all other Non-Trafficable areas

Hydrants
Recycled plastic hydrant box with ductile iron lid embossed with FH, non-hinged cover, grey or yellow box with yellow cover.
Installation shall be generally in accordance with Type A2 WSA 03 Dwg No WAT-1305 (Notes: PVC pipe shroud/flange is to be 225mm PVC, Surround base plate shall be used; base seal shall be "Hydrant Protection" Hydraguard or equivalent).
Valves
Recycled plastic valve box with ductile iron lid embossed with "V", non-hinged cover, grey box with white cover.
Installation shall be generally in accordance with Type A1 WSA 03 Dwg No WAT-1303 (Notes: PVC pipe shroud/flange is to be 225mm PVC; Surround base plate shall be used; base seal shall be "Hydrant Protection" Valveguard or equivalent).

(b) For all Trafficable footpath areas

Hydrant and Valve Covers
Cast Iron cover and frame (manufactured by Allmains, Tyco and others) with precast concrete surround as used by Toowoomba Regional Council. Hydrant covers shall be coloured yellow and valve covers shall be coloured white (epoxy coated or epoxy paint).
Hydrants
Installation shall be generally in accordance with Part Type A2 WSA 03 Dwg No WAT-1305 and Part Type H2 WSA 03 Dwg No WAT-1306 (Notes: PVC pipe shroud/flange is to be 225mm PVC; Surround base plate shall be used; base seal shall be "Hydrant Protection" Hydraguard or equivalent).
Valves
Installation shall be generally in accordance with Part Type A1 WSA 03 Dwg No WAT-1303 and Part Type H1 WSA 03 Dwg No WAT-1304 (Notes: PVC pipe shroud/flange is to be 225mm PVC; surround base plate shall be used; base seal shall be "Hydrant Protection" Valveguard or equivalent).

(c) For all other Trafficable areas (Bitumen, AC and Concrete Roads)

Hydrant and Valve Covers
Cast Iron cover and frame (manufactured by Allmains, Tyco and others) as used by Toowoomba Regional Council. Hydrant covers shall be coloured yellow and valve covers shall be coloured white(epoxy coated).
Hydrants
Installation shall be generally in accordance with Type H2 WSA 03 Dwg No WAT-1306 (Notes: PVC pipe shroud/flange is to be 225mm PVC; Surround base plate shall be used; base seal shall be "Hydrant Protection" Hydraguard or equivalent).
Valves
Installation shall be generally in accordance with Type H1 WSA 03 Dwg No WAT-1304 (Notes: PVC pipe shroud/flange is to be 225mm PVC; surround base plate shall be used; base seal shall be "Hydrant Protection" Valveguard or equivalent).

Note:
Fire Hydrant and Valve Indication systems shall be installed within all new subdivisions in accordance with the **EDROC STANDARDS MANUAL Dwg No EDROC-33 and** the 'Austroads Guide to Traffic Management'**,** at the developer's cost.