



**WATER SERVICES ASSOCIATION  
OF AUSTRALIA**

**Dual Water Supply Systems**

**First Edition**

**Version 1.2**

**A Supplement to the  
Water Supply Code of Australia**

**WSA 03—2002**

**(Replaces Version 1.1)**

## ACKNOWLEDGMENTS

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The WSAA Board would like to express its appreciation to WSAA Members, Associates and staff for their contributions to this first edition of the Supplement. Contributions from other industry organisations and individuals are also gratefully acknowledged. In particular the following contributors deserve special mention for their productive work and commitment to the development of this Supplement:

Bruce Douglas	Gold Coast Water
Graham Couchman	Sydney Water Corporation

Standard Drawings by Jan Tribe, Whizzcad Pty Ltd, 293 Galston Road, Galston, NSW.

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## FOREWORD

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Dual water supply systems are a component of “water sensitive urban development” (WSUD) directed at optimising the substitution of non-drinking water for drinking water.

Dual water supply systems are not new and have been used by Australia’s non-urban communities for many years. However, in more recent times the concepts have been applied to urban developments in Australia such as at Rouse Hill in north western Sydney and Sydney Olympic Park at Homebush in inner western Sydney and in other developments which have commenced construction at Aurora Estate, Melbourne, Pimpama Coomera, Gold Coast, Mawson Lakes, Adelaide and other locations.

While some reduction in residential drinking water demands can be achieved without hydraulic redesign of the water supply system, a common element of many planned WSUD’s is supply of both drinking water and non-drinking water with or without rainwater collection, storage and delivery.

It is thus opportune for the Water Services Association to produce a Dual Water Supply Systems Supplement to its Water Supply Code, drawing upon the experience and documentation of its members who have adopted the Water Supply Code, in particular South Australia Water, South East Water, Sydney Water and Yarra Valley Water and other members such as Gold Coast Water who use their own Codes (Land Development Guidelines).

## PREFACE

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*This Supplement should be read and applied in conjunction with the Water Supply Code of Australia WSA 03 and Water Agency supplementary requirements. Additional and/or different requirements for non-drinking water have been included in this Supplement and take precedence over the Water Supply Code.*

*The term “non-drinking water” has been adopted in preference to “recycled water” to acknowledge that not all water used for drinking water substitution has been recycled and to align with the Plumbing Code of Australia, 2004 and AS/NZS 3500.0 Plumbing and drainage Part 0: Glossary of terms and AS/NZS 3500.1 Plumbing and drainage Part 1: Water services.*

*Non-drinking water may be used within the building envelope for toilet/urinal flushing, clothes washing and for other designated commercial/industrial applications and/or outside the building envelope for cooling towers, evaporative air conditioners, irrigation, garden watering and for other designated commercial/industrial applications. Non-drinking water is not intended for human consumption, food preparation, utensil washing and oral hygiene and any other uses designated by the Health Regulator e.g. ablution.*

*There are no International Standards that apply to the colour identification of buried pipes, conduits and ducts. Blue has become the default internationally adopted colour for drinking water mains, although in above ground pipework International Standard ISO/R 508 (AS 1345) assigns blue for “air, vacuum, ventilation and pneumatic conveyor” pipework, conduits and ducts. In this Supplement it has been accepted that blue pipe does not require marking to designate “drinking water” since “blue” is the industry standard default colour for drinking water supply and, as such, it is only necessary to mark non-drinking water supply pipes. International Standard ISO/R 508 assigns “violet” for acids and alkalis for above ground pipes, conduits and ducts and AS 1345 more specifically requires “Lilac P23” to AS 2700.*

*The adoption of the colour “purple” for non-drinking water pipes follows the requirement of the NSW Guidelines for Urban and Residential Use of Reclaimed Water, 1<sup>st</sup> Edition, May 1993 published by the NSW Recycled Water Coordination Committee, which, in turn, had adopted the purple colour protocol of the State of California, USA as prescribed by Title 22, Chapter 4, of the California Code of Regulations.*

*Clause numbers in this Supplement have been prefixed ‘NDW’ to avoid confusion with the Clause numbers of the Water Supply Code. It is intended to incorporate this Supplement into the next edition of the Water Supply Code of Australia.*

*Requirements for the drinking water part of a dual water supply system should be in accordance with the Water Supply Code of Australia WSA 03 and Water Agency supplementary requirements.*

*Text in ‘italics’ is informative, while text in ‘normal case’ is normative or mandatory.*

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# **Dual Water Supply Systems**

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## **A Supplement to the Water Supply Code of Australia**

### **Part 0: Glossary of Terms, Abbreviations and References**

## GLOSSARY OF TERMS

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The purpose of this glossary is to assist in interpreting terminology used in the various parts of the Dual Water Supply Systems Supplement.

The terms and definitions are adopted from Water Agency documentation and are generally additional to those in the Water Supply Code.

<b>TERM</b>	<b>DEFINITION</b>
<b>blue</b>	<p>A colour defined in accordance with RAL<sup>1</sup> DESIGN colour numbers as being no darker than 200 80 25 or 210 80 25 and no lighter than 200 90 10 or 210 90 10, respectively</p> <p>NOTES:</p> <p>1 RAL Deutsches Institut für Gütesicherung und Kennzeichnung e.V. (RAL German Institute for Quality Assurance and Certification) Siegburger Straße 39 D-53757 Sankt Augustin Telephone: +49(0)2241/1605-30 Telefax: +49(0)2241/1605-16 <a href="http://www.ral.de/farben/en/farbvorlagen/index.html?content1.shtml">http://www.ral.de/farben/en/farbvorlagen/index.html?content1.shtml</a></p> <p>2 No equivalent colours can be defined in accordance with AS 2700 (NZS 7702)</p>
<b>direct tapping</b>	A procedure consisting of drilling and tapping the pipe wall followed by insertion of a tapping valve/maintap
<b>drinking water</b>	<p>Water that is suitable for human consumption, food preparation, utensil washing and oral hygiene. For the purposes of this Supplement, drinking water is cold water at a temperature <math>\leq 40^{\circ}\text{C}</math></p> <p>NOTE: Adopted from AS/NZS 4020.</p>
<b>dual water supply system</b>	A system of water supply consisting of dual separate mains (pipelines from separate sources) and designed to concurrently provide two separate water supplies to the consumer. One main conveys drinking (potable) water, the other conveys appropriately treated non-drinking water
<b>lilac</b>	See <i>purple</i>
<b>non-drinking water</b>	Any water other than drinking water including wastewater, stormwater, bore water, ground water, lake or river water, which has been treated to meet a Standard (as defined by the Regulator), and which is satisfactory for its intended use(s). For the purposes of this Supplement, non-drinking water is cold water at a temperature $\leq 40^{\circ}\text{C}$
<b>potable water</b>	See <i>drinking water</i>

<b>TERM</b>	<b>DEFINITION</b>
<b>purple</b>	<p>A colour defined in accordance with RAL<sup>1</sup> DESIGN colour numbers as being no darker than 330 40 40 or 310 50 30 and no lighter than 310 70 15, respectively</p> <p>NOTES:</p> <ol style="list-style-type: none"> <li>1 RAL Deutsches Institut für Gütesicherung und Kennzeichnung e.V. (RAL German Institute for Quality Assurance and Certification) Siegburger Straße 39 D-53757 Sankt Augustin Telephone: +49(0)2241/1605-30 Telefax: +49(0)2241/1605-16 <a href="http://www.ral.de/farben/en/farbvorlagen/index.html?content1.shtml">http://www.ral.de/farben/en/farbvorlagen/index.html?content1.shtml</a></li> <li>2 Equivalent to a colour defined in accordance with AS 2700 (NZS 7702) as being no darker than P24 Jacaranda or P12 Purple and no lighter than P23 Lilac</li> </ol>
<b>reclaimed water</b>	See <i>recycled water</i> and <i>non-drinking water</i>
<b>recycled water</b>	Water that has been reclaimed from wastewater and treated to a standard (as defined by the Regulator) for reuse. See <i>non-drinking water</i>
<b>water sensitive urban design</b>	<p>The integration of urban planning with the management, protection and conservation of the urban water cycle, that ensures urban water management is sensitive to natural hydrological and ecological processes</p> <p>NOTE: Adopted from Intergovernmental Agreement on a National Water Initiative, 25 June 2004</p>
<b>water sensitive urban development</b>	An holistic approach to planning, design and construction of water supply, sewerage, rainwater and stormwater systems for urban communities. Underpins sustainable development by improved efficiency in water use through optimised storage, distribution, use, diversion, loss reduction, treatment and recycling

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**A Supplement to the  
Water Supply Code of Australia**

**Part 1: Planning and Design**

## **NDW 1 INTRODUCTION**

### **NDW 1.1 SCOPE**

*This Supplement covers the design and construction of dual water supply systems for servicing new developments. The Supplement addresses the provision of a non-drinking water supply and its impacts on (drinking) water supply design and construction.*

### **NDW 1.2 APPLICATION**

*This Supplement should be applied in conjunction with the Water Supply Code of Australia and/or Water Agency requirements.*

## **NDW 2 DIFFERENTIATION OF PIPE SYSTEMS**

### **NDW 2.1 PRINCIPLES**

*Regulators' guidelines for use of non-drinking water generally stipulate a range of measures that permit clear and easy differentiation between the drinking and non-drinking water supply systems, particularly in urban/commercial/industrial developments.*

The principal means of differentiation between mains conveying drinking water and non-drinking water shall be as follows:

- (a) Pipes of different colours (Refer to Clauses NDW 2.2 and NDW 2.3).
- (b) Warnings printed on non-drinking water mains and/or sleeving (Refer to Clause NDW 2.3).
- (c) Use of marker tapes (Refer to Clause NDW 2.6).
- (d) Marking of surface fittings (Refer to Clause NDW 3.17).
- (e) Identification markers and marker posts (Refer to Clause NDW 3.18)

*Other additional differentiation measures may include:*

- (i) *Operating the systems with a service pressure differential (Refer to Clause NDW 3.6).*
- (ii) *Different pipe locations (Refer to Clause NDW 3.7).*
- (iii) *Maintaining a minimum pipe separation (Refer to Clauses NDW 3.7, NDW 3.8, NDW 3.9 and NDW 3.11, and relevant Clauses of WSA 03.*
- (iv) *Use of different pipe materials for the drinking and non-drinking water mains.*

*The application of each measure should be based on risk assessment. Risk assessment should be undertaken in accordance with AS/NZS 4360. Identified risks can be treated by reducing the likelihood or reducing the consequence or both.*

## **NDW 2.2 WATER SUPPLY MAINS – DRINKING WATER**

Water supply mains conveying drinking water as part of a dual water supply system shall be constructed from pipes that are:

- (a) blue in colour; or
- (b) blue striped in accordance with pipe product Standards; or
- (c) sleeved with polyethylene sleeving coloured blue.

*Blue pipe may include pipe that has a co-extruded blue sheathing.*

Blue sleeved purple pipes shall not be used for reticulation mains conveying drinking water.

Buried appurtenances such as fittings, valves, hydrants etc that form part of the reticulation system may be required to be colour coded for maintenance purposes, in which case, one of the following two options shall be adopted:

- (i) Buried components shall be coated blue in accordance with product Standards;  
or
- (ii) Buried components shall be sleeved with blue sleeving.

In the case of option (ii) purple components shall not be used.

*Where colour differentiation of buried appurtenances such as hydrants, flushing points etc is also required for operational purposes, this may be achieved by application of a blue (or purple in the case of non-drinking water) coating in accordance with AS/NZS 4158 to that part of the appurtenance visible from the surface when operating e.g. a spindle cap of a valve, a hydrant claw, a flushing point outlet etc.*

## **NDW 2.3 WATER SUPPLY MAINS – NON-DRINKING WATER**

Water supply mains conveying non-drinking water as part of a dual water supply system shall be constructed from pipes that are:

- (a) purple; or
- (b) purple striped in accordance with pipe product Standards; or
- (c) sleeved with polyethylene sleeving coloured purple.

Purple pipe, including purple striped or sheathed pipe, and purple sleeving shall be legibly and durably marked with one of the following wording options using distinctively coloured vertical block type lettering of a minimum size of at least 0.05 X DN mm and repeated at intervals such that the length of any unmarked pipe or sleeving does not exceed 1 m:

- (i) “NON-DRINKING WATER”; or
- (ii) “RECYCLED WATER – DO NOT DRINK”.

Blue pipe, including blue striped or sheathed pipe, shall not be used for non-drinking water reticulation mains.

*It may be acceptable to the Water Agency to use purple sleeving for any pipe material apart from that coloured blue.*

Buried appurtenances such as fittings, valves and hydrants that form part of the reticulation system are not required to be colour coded. Where a blue fitting is used for supply of non-drinking water to a property e.g. tapping band or pre-tapped connector, the outlet connection of the fitting shall be marked or coated purple.

*Where colour differentiation of buried appurtenances such as hydrants, flushing points etc is also required for operational purposes, this may be achieved by application of a purple (or blue in the case of drinking water) coating to that part of the appurtenance visible from the surface when operating e.g. a spindle cap of a valve, a hydrant claw, a flushing point outlet etc.*

#### **NDW 2.4 PROPERTY SERVICES – DRINKING WATER**

Property services conveying drinking water as part of a dual water supply system shall be installed using pipes that are:

- (a) blue in colour; or
- (b) blue striped in accordance with pipe product Standards; or
- (c) sleeved with polyethylene sleeving or expanded mesh coloured blue.

Refer to Standard Drawing WAT–1803 and Commentary Clause NDW 11.4 for property service pipe details.

Buried components that form part of the property service may be required to be colour coded for maintenance purposes, in which case, one of the following two options shall be adopted:

- (i) Buried components shall be coated blue in accordance with product Standards;  
or
- (ii) Buried components shall be sleeved with blue sleeving.

In the case of option (ii), purple components shall not be used.

Drinking water meters, meter boxes and standpipe hydrants shall not be coloured purple.

#### **NDW 2.5 PROPERTY SERVICES – NON-DRINKING WATER**

Property services conveying non-drinking water as part of a dual water supply system shall be installed using pipes that are coloured purple.

Refer to Standard Drawing WAT–1803 and Commentary Clause NDW11.4 for property service pipe details.

Purple pipe, including purple striped or sheathed pipe, shall be legibly and durably marked with one of the following wording options using distinctively coloured vertical block type lettering of a minimum size of at least 0.05 X DN mm and repeated at intervals such that the length of any unmarked pipe or sleeving does not exceed 1 m:

- (a) “NON-DRINKING WATER”; or
- (b) “RECYCLED WATER – DO NOT DRINK”.

Buried components that form part of the property service may be required to be colour coded for maintenance purposes, in which case, one of the following two options shall be adopted:

- (i) Buried components shall be coated purple in accordance with product Standards; or
- (ii) Buried components shall be sleeved with purple sleeving.

In the case of option (ii), blue components shall not be used.

Non-drinking water meters, meter boxes and standpipe hydrants shall be coloured purple.

## **NDW 2.6 MARKER TAPES**

Marker tapes (detectable and non-detectable) for drinking water mains and property services shall be coloured blue and shall include the words: "DRINKING WATER" in the written marking along the marker tape in distinctively coloured vertical block type lettering of a minimum size of at least 25 mm, and repeated at intervals such that the length of any unmarked section of tape does not exceed 1 m.

Marker tapes (detectable and non-detectable) for non-drinking water mains and property services shall be coloured purple and shall include the words: "RECYCLED WATER – DO NOT DRINK" in the written marking in distinctively coloured vertical block type lettering of a minimum size of at least 25 mm, and repeated at intervals such that the length of any unmarked section of tape does not exceed 1 m.

Where PE property services are not laid at  $90\pm 5$  degrees to the water main, detectable marker tapes shall be laid immediately above the property service. *Copper property services can be readily detected and do not require detectable marker tape.*

## **NDW 3 DESIGN**

### **NDW 3.1 DEMANDS**

Demands for design purposes shall be determined for each system, based on the ultimate predicted usage of drinking water and non-drinking water for the end uses nominated in the Concept Plan. Where rainwater tanks are to be integrated with the dual water supply system, the following factors shall be taken into account in substitution of collected rainwater for drinking water and/or non-drinking water:

- (a) reliability of rainwater collection, storage and supply;
- (b) usable volume of the rainwater tank;
- (c) top-up of rainwater tanks, which may be supplied from either the drinking water or non-drinking water supply systems; and
- (d) rainwater end uses.

The water demands for each system and their associated peaking factors shall be applied in accordance with Clause 2.2 of WSA 03 taking into account the different usage pattern for dual versus single water supply systems. An allowance shall be made for the additional potential demand when a dual water supply system is used.

*Experience on what this allowance should be is limited; however, a default allowance of 10 - 15% of the total demand for both systems is recommended until more usage data becomes available. Peaking factors for non-drinking water in warmer or dryer parts of Australia may exceed existing peaking factors.*

### **NDW 3.2 SERVICE RESERVOIRS**

Service reservoirs for the non-drinking water network shall be in accordance with Clause 2.7 of WSA 03.

### **NDW 3.3 SYSTEM CONFIGURATIONS**

The network layout of both drinking water and non-drinking water reticulation systems shall be subject to approval by the Water Agency.

*A guide to system configurations of dual water reticulation networks to complement the information and requirements of the Water Supply Code should generally be provided by the Water Agency.*

### **NDW 3.4 CROSS CONNECTION BETWEEN THE DRINKING AND NON-DRINKING WATER SUPPLY SYSTEMS**

#### **NDW 3.4.1 General**

There shall be no permanent cross connections between the drinking water and non-drinking water systems within the network downstream of storages. Where the non-drinking water supply needs to be supplemented by water from the drinking water supply, this shall be provided through an air-gap at the inlet to the non-drinking water storage.

#### **NDW 3.4.2 Temporary cross connections**

Temporary cross connection between the drinking water system and the non-drinking water system shall be permitted when the non-drinking water system is supplying drinking water.

Temporary cross connections shall be provided at locations and in accordance with WAT-1824 and the requirements of the Water Agency.

*It is responsibility of the Water Agency to ensure the management of temporary cross-connections and their removal when non-drinking water becomes available.*

### **NDW 3.5 SIZING OF MAINS**

#### **NDW 3.5.1 General**

Sizing of water mains for drinking water and non-drinking water shall be determined in three steps.

Firstly, size the water mains for drinking water and non-drinking water based upon estimated ultimate water demands for each system as determined in NDW 3.1 without imposing the requirements for fire fighting (Refer to Clause 3.2.4 of WSA 03 and Clause NDW 3.5.2).

Secondly, determine the most appropriate system from which to satisfy fire fighting needs in accordance with NDW 3.5.2.

Thirdly, size the mains identified in step 2 in accordance with NDW 3.5.2.

Irrespective of the sizes determined in steps 1 to 3, the following limitations shall apply:

- (a) The minimum pipe size shall be DN 40 or equivalent (Refer to Appendix NDW A); and
- (b) For non-drinking water with turbidity  $\geq 2$  NTU, the minimum velocity shall be at least 0.8 m/s at least once per day when modelled on the peak day demand for the ultimate development (Refer to Clause 2.2.3 of WSA 03).

NOTE: Appendix NDW A designates equivalent pipe sizes for commonly used pipe materials and pressure classes.

#### **NDW 3.5.2 Fire flows**

Where the design of systems is to incorporate fire fighting capability, either by specific flow allowance or water main sizing to suit basic fire fighting, determination of the most appropriate system from which to satisfy fire fighting needs shall be based upon the following factors:

- (a) security of supplies;
- (b) available storage volumes;
- (c) life-cycle costs;

NOTES:

- 1 It will generally be more cost effective to supply water for fire fighting from the larger main irrespective of whether it is for drinking water or non-drinking water).
- 2 In some systems it may be necessary to increase the size of the main(s) to provide fire fighting capability, in which case the larger main(s) should be used as noted above.

- (d) pressure of supplies;
- (e) other factors nominated by the Water Agency.

Pipe sizes to satisfy fire fighting demands shall be determined by hydraulic design or adoption of a standard minimum size by the Water Agency (Refer to Section 3 of WSA 03) and in each case shall not be less than:

- (i) DN 100 for residential zones.
- (ii) DN 150 for industrial and commercial zones.

### **NDW 3.6 ALLOWABLE SERVICE PRESSURES**

Where specified by the Water Agency, the non-drinking water supply system shall be designed with a lower available static head or steady state pumping pressure than the drinking water supply system provided the minimum service pressures of each system comply with Clause 2.4 of WSA 03.

*A typical differential static design head or steady state pumping pressure is 10 m.*

### **NDW 3.7 LOCATION OF MAINS**

The location of drinking water and non-drinking water mains shall be nominated by the Water Agency from one or more of the following options:

- (a) in a common trench in the footway allocation;
- (b) in a common trench in the road carriageway;
- (c) in separate trenches in the same footway allocation;
- (d) in separate trenches in the footway allocation on opposite sides of the road reserve; and/or
- (e) in separate trenches in the road carriageway.

Where both mains are located in the footway allocation on the same side of the road carriageway, the non-drinking water main shall be located closest to the property boundary (Refer to Standard Drawings WAT-1800 to WAT-1803 inclusive and Commentary Clauses NDW 11.1 to NDW 11.4 inclusive).

Where insufficient space is available in the footway allocation to accommodate both mains, each main shall be located separately on either side of the road carriageway in the respective footway allocation (Refer to Standard Drawing WAT-1102).

Where no footway allocation agreement exists such as for footways less than 3 m wide, the drinking water main (or non-drinking water main if nominated by the Water Agency) shall be laid as close as possible to the kerb to allow room for other services, but also allow sufficient clearance for maintenance excavation. The minimum clearance from the back of the kerb shall be 300 mm.

Where both mains are located under the road carriageway, the non-drinking water main shall be located nearer to the centreline.

### **NDW 3.8 MAIN DEPTHS**

Mains shall be laid to a common obvert depth to facilitate property service connections (offtakes), except where mains are to be offset for crossings, installation of thrust blocks etc (Refer to Standard Drawings WAT-1810 and WAT-1811 and Commentary Clauses NDW 11.10 and NDW 11.11).

### **NDW 3.9 CROSSINGS**

Where practicable, the non-drinking water main shall be laid under the drinking water main wherever they cross.

### **NDW 3.10 PROPERTY SERVICES**

Property services for drinking water and non-drinking water shall be positioned to suit the type of planned development [single, duplex side-by-side or duplex one behind the other (battle-axe)].

Separate property service outlets (connection points for on-property water services) for drinking water and non-drinking water shall be provided for each identified lot in the development to service the planned number of customers occupying the lot.

Service connections at the main shall suit either single or split services as detailed in Drawings WAT-1803, WAT-1804 and WAT-1806.

Meters for drinking water and non-drinking water shall be placed together near a common boundary or in the middle of the front property boundary or at the side of an access way as detailed in Standard Drawings WAT-1803 and WAT-1804.

*When located above-ground, meters may be installed as detailed in Standard Drawing WAT-1806. When located below-ground, meters may be installed as detailed in Standard Drawing WAT-1807.*

Refer also to Commentary Clauses NDW 11.4, NDW 11.5, NDW 11.7 and NDW 11.8.

Service connections shall be made to reticulation or rider mains only.

The locations of all service connections and property services shall be recorded on the Work as Constructed plans.

### **NDW 3.11 CLEARANCES**

Clearances between services non-drinking water mains and other services shall be not less than the minimum clearances specified in Clause 4.10 of in WSA 03 for drinking water mains.

### **NDW 3.12 HYDRANTS**

Hydrants for fire fighting and/or operational purposes shall be installed on the water main designated for fire fighting in accordance with Clause 6.8 of WSA 03.

Hydrants for operational purposes shall be installed on the water main not designated for fire fighting in accordance with Clause 6.8 of WSA 03.

*Hydrants connected to water mains not designated for fire fighting purposes may be made available for fire fighting purposes. Where the Water Agency wishes to limit or prevent access to the system not designated for fire fighting purposes, an alternative non-standard hydrant (preferably one used elsewhere within Australia) may be specified.*

Hydrants on each system shall be of the same standard type specified by the Water Agency for installation on a single (drinking) water reticulation system.

The maximum spacing of hydrants in residential areas shall be:

- (a) On mains designated for fire fighting—normal Water Agency requirements.
- (b) On mains not designated for fire fighting (e.g. for operational purposes)—as defined in Clause 6.8.2 of WSA 03 for flushing/ swabbing and Clause 6.8.9 of WSA 03 for high and low points.

### **NDW 3.13 CUL-DE-SACS AND DEAD END NON-DRINKING WATER MAINS**

Dead end non-drinking water mains shall be avoided in the non-drinking water main layout design by the use of looped mains, link mains or reduced diameter mains. Refer to Standard Drawing WAT-1801.

### **NDW 3.14 FLUSHING POINTS**

Non-drinking water reticulation mains shall be provided with flushing points at the permanent dead ends of all mains and at maximum intervals of 150 m or an interval nominated by the Water Agency. Refer to Standard Drawings WAT-1822 and WAT-1823.

NOTE: Non-drinking water may be high in nutrients. The environmental regulator should be consulted to determine whether discharge of non-drinking water to the receiving water/environment is permissible. If it is not permissible, flushing to a tanker for disposal or to a collection structure for transfer to a tanker and disposal or to the sewer should be investigated to provide the most appropriate solution.

### **NDW 3.15 SCOURS**

Scours shall be installed on non-drinking water mains using the same criteria as specified in Clause 6.6 of WSA 03 for drinking water mains.

### **NDW 3.16 THRUST AND ANCHOR BLOCKS**

Where non-restrained joint pipeline systems are used, pipeline anchorage shall be provided in accordance with WSA 03, WAT-1811 and the Design Drawings. Separate thrust/anchor blocks shall be provided except where common thrust/anchor blocks are required due to site constraints, in which case the thrust/anchor block shall be designed for all design force combinations. Elastomeric seal joints shall not be encased by concrete.

### **NDW 3.17 SURFACE FITTINGS**

Surface fittings for appurtenances on the drinking water network shall be as specified in WSA 03.

Surface fittings for appurtenances on the non-drinking water network shall be as specified in Standard Drawings WAT-1820 and WAT-1821 and shall be identified in accordance with Standard Drawing WAT-1825 using either:

- (a) the words “NON-DRINKING WATER” or “RECYCLED WATER” cast into the cover of the surface fitting; or
- (b) the letters “NDW” or “RW” cast, stamped, embossed or engraved onto the cover of the surface fitting; or
- (c) a purple surface fitting cover and/or surround; or
- (d) any combination of the above as nominated by the Water Agency.

**NDW 3.18 IDENTIFICATION MARKERS AND MARKER POSTS**

Retro-reflective pavement markers, marker posts and the coloured tops of Type B marker posts as well as the lettering on marker plates (Refer to WAT-1300) for the non-drinking water supply system shall be coloured purple in accordance with Standard Drawings WAT-1820, WAT-1821 and WAT-1825 and Water Agency requirements.

# **Dual Water Supply Systems**

**First Edition**

**Version 1.2**

**A Supplement to the  
Water Supply Code of Australia**

**Part 2: Products and Materials**

## **NDW 4 PIPE MATERIALS**

### **NDW 4.1 GENERAL**

Refer to WSA 03 Part 2 – Products and Materials and Water Agency requirements.

### **NDW 4.2 PRODUCTS AND MATERIALS IN CONTACT WITH NON-DRINKING WATER**

All products and materials used in contact with non-drinking water shall comply with AS/NZS 4020.

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### **Part 3: Construction**

## **NDW 5 GENERAL REQUIREMENTS FOR EXCAVATION AND INSTALLATION**

All excavations and installation of pipes and fittings shall be in accordance with the Design Drawings and Standard Drawings referenced in Part 4.

## **NDW 6 PRODUCT INSTALLATION ARRANGEMENTS**

### **NDW 6.1 PIPES**

Pipes shall be installed with identification markings facing upwards.

### **NDW 6.2 VALVES, HYDRANTS AND OTHER APPURTENANCES**

Valves, hydrants and other appurtenances shall be installed so that access to each item for maintenance and repair purposes is not restricted. *This requirement particularly applies to installation of dual water reticulation in common trenching.*

## **NDW 7 PROPERTY CONNECTIONS**

### **NDW 7.1 TAPPING OF MAINS**

Tapping of the drinking water and non-drinking water reticulation mains shall be made at the time of construction with the main dry and completed before completing embedment and placement of trench fill. Tapping shall be as detailed in Standard Drawing WAT-1805.

For PVC, GRP and DI mains, an approved tapping band/saddle/tee or pre-tapped connector shall be used. For PE mains, an approved electrofusion tapping band/saddle/tee shall be used.

Appropriately sized ball valves shall be installed on property services at predetermined locations on the drinking and non-drinking water mains as they are being laid.

### **NDW 7.2 INSTALLATION OF PROPERTY SERVICES**

Property services shall be installed in accordance with Standard Drawings WAT-1803, WAT-1804 and WAT-1806, as appropriate. *It is preferable that property services are installed at the same time as tapping and before completing embedment, embedment compaction and placement of trench fill.* The timing of provision of property services shall be in accordance with the requirements of the Water Agency.

As far as is practicable, property services shall be laid across footways at  $90\pm 5^\circ$  to the water main/kerb up to the point of bifurcation for split property services.

The location of all service connections shall be advised to the Designer for recording on the Work As Constructed plan.

If required by Plumbing Regulation in the area of construction, the installation of property services shall be carried out by, or under the supervision of, a licensed plumber. The work shall comply with the Plumbing Standards (AS/NZS 3500.1) and with the requirements of Standard Drawings WAT-1803 to WAT-1807 inclusive, and as appropriate. If not required by Plumbing Regulation, the installation of property services shall be carried out in accordance with Water Agency requirements.

All property services crossing a road shall be laid within a duct, with the drinking water and non-drinking water service pipes being housed in the same duct. The duct shall be laid in accordance with Standard Drawing WAT-1806. Permission to lay pipes across a street or

public place shall firstly be obtained from the local planning authority, generally the local council, before commencing construction.

The common pipe of a split property service (Refer to standard Drawing WAT–1803) shall be positioned to service:

- (a) two properties on adjoining lots; or
- (b) two properties on the same lot in the case of duplex lots,

and shall be in line with the abutting lot boundaries. A split property service shall be bifurcated in accordance with Standard Drawing WAT–1803 and located at standard offsets from the side boundary in accordance with Standard Drawing WAT–1804.

In cases where there is conflict with existing driveways and/or other services and no other solution exists, each of the properties in question shall be serviced by a single service, located as near as practicable to the mid-point of the front property boundary.

Refer also to Commentary Clauses NDW 11.4 to NDW 11.7 inclusive.

## **NDW 8 ACCEPTANCE TESTING OF PROPERTY SERVICES**

### **NDW 8.1 GENERAL**

*Testing of property services may be carried out in conjunction with testing of the reticulation pipeline or independently after installation of the services.*

### **NDW 8.2 TESTING IN CONJUNCTION WITH RETICULATION MAIN**

During pressure testing of the reticulation main, the ball valve or electrofusion tapping saddle (with integral cutter and service isolation valve) at the reticulation main, for each service connection, shall be open. For each property service, the ball valve at the property shall be closed. In order to ensure escape of entrapped air and to check that service connections are to the correct supply water main (drinking or non-drinking), the appropriate ball valves at each property shall be temporarily opened to allow water to flow through the service.

### **NDW 8.3 TESTING INDEPENDENTLY OF RETICULATION MAIN**

Unless tested in conjunction with the drinking water or non-drinking water main (Refer to Clause NDW 8.2), each property service up to the meter valve shall be pressure tested to 1.5 MPa (as per AS/NZS 3500.1).

**APPENDIX NDW A**  
**EQUIVALENT PIPE SIZES FOR COMMONLY USED MATERIALS**

COMMONLY SPECIFIED WATER PIPE MATERIALS AND SIZES			EQUIVALENT PE PIPE SIZE, PRESSURE CLASS AND COMPOUND TYPE			
Material and Pressure class Copper-Type B PVC-M-PN 12/16 DICL-PN 35	Pipe size DN	Mean ID mm	Pipe size DN	Mean ID mm		Pressure class PN
				Compound PE80B	Compound PE100	
Copper	20	17	25	20	21	12.5
				19	20	16
Copper	25	23	32	26	27	12.5
				24	26	16
Copper	32	29	40	32	34	12.5
				30	33	16
Copper	40	36	50	41	42	12.5
				39	41	16
Copper	50	48	63	51	53	12.5
				48	51	16
Copper	65	61	90	73	76	12.5
				69	73	16
Copper	80	73/	90	73	76	12.5
				69	73	16
*			110	90	94	12.5
				85	90	16
PVC-M - PN 12/16 DICL - PN 35	100	113/110	125	101	106	12.5
		102		96	101	16
*			160	130	136	12.5
				123	130	16
PVC-M - PN 12/16 DICL - PN 35	150	164/160	180	146	153	12.5
		157		138	146	16
PVC-M - PN 12/16 DICL - PN 35	200	215/210	250	203	212	12.5
		212		192	203	16
PVC-M - PN 12/16 DICL - PN 20/35	225	240/234	280	228	238	12.5
		239/239		216	228	16
PVC-M - PN 12/16 DICL - PN 20/35	250	265/259	315	256	268	12.5
		266/265		242	256	16
PVC-M - PN 12/16 DICL - PN 20/35	300	320/312	355	289	302	12.5
		325/322		273	289	16
PVC-M - PN 12/16 DICL - PN 20/35	375	395/386	450	366	382	12.5
		406/401		346	366	16

\* No equivalent pipe size

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## **A Supplement to the Water Supply Code of Australia**

### **Part 4: Standard Drawings**

## **NDW 9 INTRODUCTION**

### **NDW 9.1 GENERAL**

*Standard Drawings are included in this Supplement to Water Supply Code of Australia to assist in understanding of the principles and methodology involved in construction of dual water supply systems and to enhance the design and construction parts of this Code. The Drawings should be read in conjunction with the balance of the Code.*

*The Standard Drawings refer to “recycled water” throughout as an example of “non-drinking water”.*

*The Drawings included in this Part of the Code provide “deemed-to-comply” solutions for the installation of most elements of a dual water supply system. However, they will not suit all circumstances or overcome all problems. To meet special needs, Designers and Constructors are encouraged to identify improved construction methods and other variations from the requirements set out in the Standard Drawings. Authorisation by the Water Agency may be necessary before any major departure from the principles outlined in the drawings is implemented. Successful initiatives will be considered by WSAA for inclusion in future editions of this Code.*

*All Design Drawings should include the name of the Water Agency and have a signature block to allow confirmation that each drawing complies with Water Agency requirements.*

*The symbols and markings used on these Drawings are typical only, although they have been based on drawings supplied by Gold Coast Water and Sydney Water.*

*Individual Water Agencies may have specific information and presentation requirements, which should be determined before commencing any project. Any additional information, layout or format requirements specified by the Water Agency take precedence over these Drawings.*

*All special requirements including, but not limited to geotechnical requirements, embedment and compaction details, should be shown in the Design Drawings and/or the Specification.*

### **NDW 9.2 DRAWING COMMENTARY**

*This informative commentary preceding the Drawings provides background information on the purpose and content of the Standard Drawings and serves as a general guide for Designers and Constructors, as well as a training aid. The use of separate commentary avoids excessive detail and complexity in the Drawing notes.*

*The Designer is responsible for ensuring that Design Drawings and Specifications clearly address the issues of a particular project. It is the Designer’s responsibility to provide detailed requirements such as trench depth, embedment and fill materials, anchor block design, concrete type and reinforcement in the Design Drawings.*

*Both the Designer and Constructor should understand information relevant to selecting a feasible solution to a design and/or construction problem. Many of the Standard Drawings are “typical” and are not suitable for use without further design detail.*

**NDW 10 LISTING OF STANDARD DRAWINGS**

<b>DRAWING NUMBER</b>	<b>ACTIVITY</b>	<b>TITLE</b>
<b>DUAL WATER SUPPLY SYSTEM</b>		
WAT-1800	Typical Mains Construction	Reticulation Main Arrangement for Dual Water Supply Systems
WAT-1801	Typical Mains Construction	Main Arrangement for Cul-de-sacs and Court Bowls
WAT-1802	Typical Mains Construction	Offtake Main Details
WAT-1803	Property Services	Typical Service Layouts and Alternative Marking Systems
WAT-1804	Property Services	Typical Service Arrangement
WAT-1805	Property Services	Standard Tapping Methods
WAT-1806	Property Services	Single and Split Services Across Carriageways
WAT-1807	Property Services	Typical Above-Ground Meter Arrangements
WAT-1808	Property Services	Typical In-Ground Meter Arrangement
WAT-1810	Embedment and Trench Fill	Main Arrangement for Dual Water Supply Systems
WAT-1811	Thrust Block Details	Concrete Thrust Blocks for Adjacent Dual Water Mains
WAT-1820	Hydrant Identification	Identification Markers and Marker Posts
WAT-1821	Valve Identification	Identification Markers and Marker Posts
WAT-1822	Typical Appurtenance Installation	Hydrant, Valve and Flushing Installation on PE Mains using Compression Fittings
WAT-1823	Typical Appurtenance Installation	Hydrant, Valve and Flushing Installation on PE Mains using Electrofusion Fittings
WAT-1824	Typical Appurtenance Installation	Temporary Cross Connections
WAT-1825	Typical Recycled Water Surface Fittings	Marking and Colour Identification

## **NDW 11 COMMENTARY ON WAT-1800 SERIES – DUAL WATER SUPPLY SYSTEMS**

*The 1800 series of Drawings deals with the construction of dual water supply mains and property services and associated appurtenances and surface fittings, as well as marking of the non-drinking water supply system.*

*AS 1100 Part 401-1984, which specifies standard drawing symbols for water supply, has not been adopted by WSAA. A consensus standard is yet to be developed. Water Agencies should specify their individual requirements.*

### **NDW 11.1 WAT-1800 – TYPICAL MAINS CONSTRUCTION – MAIN ARRANGEMENT FOR DUAL WATER SUPPLY**

*This drawing shows two adjacent water mains laid in a common trench in the footway allocation with the drinking water main closest the kerb. While the Supplement requires this location, there is no reason why the opposite convention could not have been adopted.*

*The drinking water main has been shown constructed in PE pipes in which case the thrust block shown at the tee is not needed. The thrust block shown at tee on the recycled water main extends beyond the adjacent main which assumes that the recycled water main has been laid with deeper cover than the adjacent drinking water main (Refer to WAT-1802).*

*Where approved by the Water Agency, restrained joint pipeline systems such as welded PE and restrained joint DICL may be used to avoid the need for thrust and anchor blocks especially in common trench installations. The use of restrained joint pipeline systems should be thoroughly investigated since it has the potential to avoid difficult construction practices and increased construction costs, not to mention the future difficulties that could be faced by maintenance personnel.*

*Valves, hydrants and other appurtenances should be located so that access to each item for maintenance and repair purposes is not restricted e.g. to provide adequate access, hydrants may need to be offset from the mains located adjacent to the property boundary. This requirement particularly applies to installation of dual water reticulation in common trenching.*

### **NDW 11.2 WAT-1801 – TYPICAL MAINS CONSTRUCTION – MAIN ARRANGEMENT FOR CUL-DE-SACS AND COURT BOWLS**

*WAT-1801 shows typical layouts for mains in cul-de-sacs and court bowls where the fire fighting supply is shown from the recycled water main. It could equally have been on the drinking water main. Looped mains are preferred because the potential for deterioration of water quality is reduced and water for fire fighting can be supplied at the court bowl at the end of the cul-de-sac, which is particularly relevant for deep cul-de-sacs.*

*Where reduced diameter mains are used, the length and placement of the larger diameter ( $\geq$ DN 100) feeder main should be extended to ensure the serviced houses can all be reached by fire hoses attached to the nearest hydrant.*

*The flushing point valves at the end of reduced diameter mains should have the handles removed or locked or otherwise secured to prevent illegal use of water.*

### **NDW 11.3 WAT-1802 – TYPICAL MAINS CONSTRUCTION – MAIN ARRANGEMENT OFFTAKE MAIN DETAILS**

*WAT-1802 shows typical offtake main details using “traditional” installation methods. Under pressure cut-in connections may also be used where the size of offtakes and type and condition of main to be cut into are appropriate to this technique, which has the advantage of not requiring the connected main to be shut down.*

*While the mains are generally laid to a common obvert depth to facilitate property service connections, the trench depths and widths will need to be increased to accommodate offtake pipework so that the thrust block on the inside main does not directly load the outer adjoining main. The use of a restrained joint pipeline system for at least one of the mains may alleviate some of the difficulties constructing thrust blocks at offtakes, bends etc.*

*Extension spindles may be need on the offtake valve on the deeper main.*

#### **NDW 11.4 WAT-1803 – PROPERT SERVICES – TYPICAL SERVICE LAYOUTS AND ALTERNATIVE MARKING SYSTEMS**

*WAT-1803 shows the typical service layouts for single and split property services that terminate at meters inside property boundaries and in the footways. In either case, the property services should be laid in line with the common boundary to service two adjacent properties or in the middle of the front property boundary to service properties side-by-side on duplex lots or at the boundary of the access way to service two properties one behind the other in battle axe lots. Where the access way services more than two battle axe lots provide split and single property services to suit the number of battle axe lots.*

*It is preferable that property services are installed at the same time as tapping and before completing embedment, embedment compaction and placement of trench fill. Where practicable, split property services should be laid.*

*Two details of two alternative duct and service marking systems are shown. Whatever system is adopted, it is important to identify the location of service ducts under the road carriageway and the locations of the property services. If there is no kerb on which to place markers alternative marking systems will need to be devised.*

*The sizes of single and split property service pipes are also provided for PE and copper pipes along with their relevant purchase specifications which can be downloaded from the [WSAA website](#).*

#### **NDW 11.5 WAT-1804 – PROPERTY SERVICES – TYPICAL SERVICE ARRANGEMENT**

*WAT-1804 shows the boundary offset dimensions and spacings for split property services that terminate at meters inside property boundaries and in the footways. The bifurcation positions for meter in property split services are also shown.*

*Property service crossovers show that property services should be laid from the connected main over the adjoining main with a 150 mm minimum clearance.*

*A table of minimum bending radii for PE and copper pipes is also provided to assist the constructor. It is obvious that in tight pipe corridors copper pipe offers considerable advantages in being able to be bent in much tighter radii than PE.*

#### **NDW 11.6 WAT-1805 – PROPERTY SERVICES – STANDARD TAPPING METHODS**

*WAT-1805 shows typical details for connecting a property service to a (reticulation) main and is similar in detail to WAT 1108.*

*The method of connection is dependent on the pipeline material. Direct tapping of water mains (i.e. without use of a tapping band/saddle/tee) is not permitted.*

*The tappings may be performed at surface level before the section of pipe is lowered into the trench.*

*Pre-tapped connectors are the preferred option for all connections installed during construction of the reticulation main because they are an integral part of the pipeline system rather than an add-on component. Pre-tapped connectors reduce the likelihood of leakage, external corrosion of DI mains and external damage to PVC mains.*

*Tapping bands used on PVC pipe should be full circle clamping to prevent over tightening and subsequent compression of the pipe. Stainless steel tapping band clamps should not be used on PVC-M and PVC-O pipes if tapping is conducted under pressure, since there is a risk that once depressurised the clamp type tapping bands will not reseal to provide a watertight connection.*

*Electrofusion welded tapping saddles should be used at all times with new installations of PE pipe. Tapping of curved PE pipe should take place only at the top of the pipe to minimise stress around the tapping hole. Where dry tapping is performed, a plug cutter should be used, and all swarf removed. Under pressure tapping should be used only with systems that utilise plug cutters that retain the PE pipe wall plug within the cutter. Where welded tapping systems are used, the assembly should be allowed to fully cool naturally before cutting the mainline PE plug.*

*Ball valves at the water main are not necessary where electrofusion tapping saddles are used, since electrofusion tapping systems have an integral service isolation valve.*

*Type and application for alternative tapping products are provided, together with their relevant purchase specifications, which can be downloaded from the [WSAA website](#).*

*NOTE: The Water Agency's requirements for "dry" or "under-pressure" tapping should be outlined in the Specification.*

#### **NDW 11.7 WAT-1806 – PROPERTY SERVICES – SINGLE AND SPLIT SERVICES ACROSS CARRIAGEWAYS**

*WAT-1806 shows typical details for single and split property services across carriageways which terminate in property. The Drawing applies equally to services that terminate in footway.*

*Drinking water and non-drinking water property services are placed in the same duct, which should have minimum fall away from the mains. The duct should be constructed in solvent cement jointed PVC stormwater or sewer pipe with minimum stiffness SN4. Where the duct is provided using trenchless techniques such as directional boring a continuous length of PE duct pipe may be preferred.*

#### **NDW 11.8 WAT-1806 – PROPERTY SERVICES – TYPICAL ABOVE-GROUND METER ARRANGEMENT**

*WAT-1806 shows a typical above-ground meter arrangement that is used at Rouse Hill, Sydney. The meter spacing dimensions may vary depending on the type of meter used.*

*The most important aspect of meter installation is to minimise the likelihood of cross-connections between the drinking water supply and the non-drinking water supply. Procedures should be put in place to ensure cross-connections do not occur.*

#### **NDW 11.9 WAT-1807 – PROPERTY SERVICES – TYPICAL IN-GROUND METER ARRANGEMENTS**

*WAT-1806 shows a typical in-ground meter arrangement that is used on the Gold Coast and Brisbane. The meter spacing dimensions may vary depending on the type of meter used.*

*The most important aspect of meter installation is to minimise the likelihood of cross-connections between the drinking water supply and the non-drinking water supply. Procedures should be put in place to ensure cross-connections do not occur.*

### **NDW 11.10 WAT-1810 – EMBEDMENT AND TRENCH FILL – MAIN ARRANGEMENT FOR DUAL WATER SUPPLY SYSTEMS**

*WAT-1810 shows typical trench installations for same and different diameter mains in a common trench. The mains are laid obvert to obvert. The minimum clearance between the mains is given together with standard trench depths for non-trafficable and trafficable local road carriageways assuming Series 2 pipes are used.*

*It is important to maintain clearances between the pipes and the trench walls to permit embedment compaction.*

### **NDW 11.11 WAT-1811 – EMBEDMENT AND TRENCH FILL – MAIN ARRANGEMENT FOR DUAL WATER SUPPLY SYSTEMS**

*It may be necessary to lay mains at different depths to facilitate construction of separate thrust/anchor blocks and/or to facilitate water main branching.*

*WAT-1811 shows typical manipulation of depths of adjacent mains within a common trench so as to enable construction of thrust blocks with the deeper main thrust block of the inner main being below the outer main thrust block.*

*Protection between the barrel of the main and the concrete thrust block also needs to be provided to prevent damage to the pipe.*

*Thrust blocks cast one on top of the other should also be separated using PE sheet to aid their selective removal should the need ever arise.*

*The construction technique shown is only suitable for mains  $\leq$ DN 300 where the allowable horizontal bearing pressure (Refer to WAT-1200) permits.*

*Detailed design drawings for thrust block installation should be provided to the Constructor. Alternative thrust block installation designs may be equally applicable.*

### **NDW 11.12 WAT-1820 – HYDRANT IDENTIFICATION – IDENTIFICATION MARKERS AND MARKER POSTS**

*WAT-1820 shows deemed-to-comply identification and marker post systems for hydrants used for fire fighting and/or operational purposes.*

*The most important aspect of hydrant markers is to allow easy identification by emergency service and operation and maintenance personnel. Positive identification of drinking and non-drinking water mains is achieved once the surface fitting has been located and the surface fitting markings and/or colour is noted.*

*Water Agencies may have varying standard systems and these should be determined prior to commencing the project.*

### **NDW 11.13 WAT-1821 – VALVE IDENTIFICATION – IDENTIFICATION MARKERS AND MARKER POSTS**

*WAT-1821 shows deemed-to-comply identification and marker post systems for valves used for operational purposes.*

*The most important aspect of valve markers is to allow easy identification by operation and maintenance personnel. Positive identification of drinking and non-drinking water mains is achieved once the surface fitting has been located and the surface fitting markings and/or colour is noted.*

*Water Agencies may have varying standard systems and these should be determined prior to commencing the project.*

#### **NDW 11.14 WAT-1822 – TYPICAL APPURTENANCE INSTALLATION – HYDRANT, VALVE AND FLUSHING INSTALLATION ON PE MAINS USING COMPRESSION FITTINGS**

*WAT-1822 shows typical installation configurations for hydrants, valves and flushing points in various parts of the reticulation system including in-line and end-of-line and bowls of cul-de-sacs using compression fittings designed for use with PE pipe.*

*The ABS riser components used for the DN 63 flushing point shows deemed-to-comply solution that is being used at Pimpama-Coomera, Gold Coast. Alternative designs may be equally applicable. Detailed design drawings for installation should be provided to the Constructor following verification that all components are readily available at local stockists.*

*Where colour differentiation of hydrant claws, valve stem caps and/or flushing valves is also required for operational purposes to minimise the likelihood of cross-connections between the drinking water supply and the non-drinking water supply, the Constructor needs to have procedures in place to ensure the correctly coloured components are used.*

#### **NDW 11.15 WAT-1823 – TYPICAL APPURTENANCE INSTALLATION – HYDRANT, VALVE AND FLUSHING INSTALLATION ON PE MAINS USING ELECTROFUSION FITTINGS**

*WAT-1823 shows typical installation configurations for hydrants, valves and flushing points in various parts of the reticulation system including in-line and end-of-line and bowls of cul-de-sacs using electrofusion fittings designed for use with PE pipe.*

*The electrofusion components nominated show deemed-to-comply solutions that are being used at Pimpama-Coomera, Gold Coast. Alternative designs may be equally applicable. Detailed design drawings for installation should be provided to the Constructor following verification that all components are readily available at local stockists.*

*Where colour differentiation of hydrant claws, valve stem caps and/or flushing valves is also required for operational purposes to minimise the likelihood of cross-connections between the drinking water supply and the non-drinking water supply, the Constructor needs to have procedures in place to ensure the correctly coloured components are used.*

#### **NDW 11.16 WAT-1824 – TYPICAL APPURTENANCE INSTALLATION – TEMPORARY CROSS CONNECTIONS**

*WAT-1824 shows the valve and fittings arrangements required for temporary cross connection between drinking water and non-drinking (recycled) water mains of different materials. The mains should be laid at the same depth to enable the connection to be made more easily.*

*The temporary connection should be installed in such a way as to facilitate easy and permanent removal once the non-drinking (recycled) water supply system has been commissioned. The temporary cross connection arrangement may be installed in a valve chamber, although this is not completely necessary, as long as there is access to the valve and the embedment material can be easily excavated when the cross connection and access cover and frame is permanently removed and restoration can be made. If a valve chamber is required refer to Standard Drawings WAT-1308 and WAT-1309.*

*WAT-1824 shows connections on PVC and DI pipes made using “traditional” cut-in installation methods using a tee and mechanical couplings. Under pressure cut-in connections are not appropriate for this type of installation given the proximity of the adjacent mains.*

*The flanged offtake tees shown for connection to PE mains have end thrust restraint connections. The Constructor needs to make sure that the flange drillings of the valve*

*match the offtake tee. Where a PE main (Series 1—ISO sized) is cross connected to a PVC or DI main (Series 2 CIOD sized), the flange drillings of the valve will most likely be different (Figure B5 of AS 4087 versus AS/NZS 4331.2) due to the dimensional series of the pipes being cross connected and the likelihood that the flanged offtake tees with end thrust restraint are Series 1 with ISO flange drillings.*

*Type and application for products needed to make the cross connection are provided, together with their relevant purchase specifications, which can be downloaded from the [WSAA website](#).*

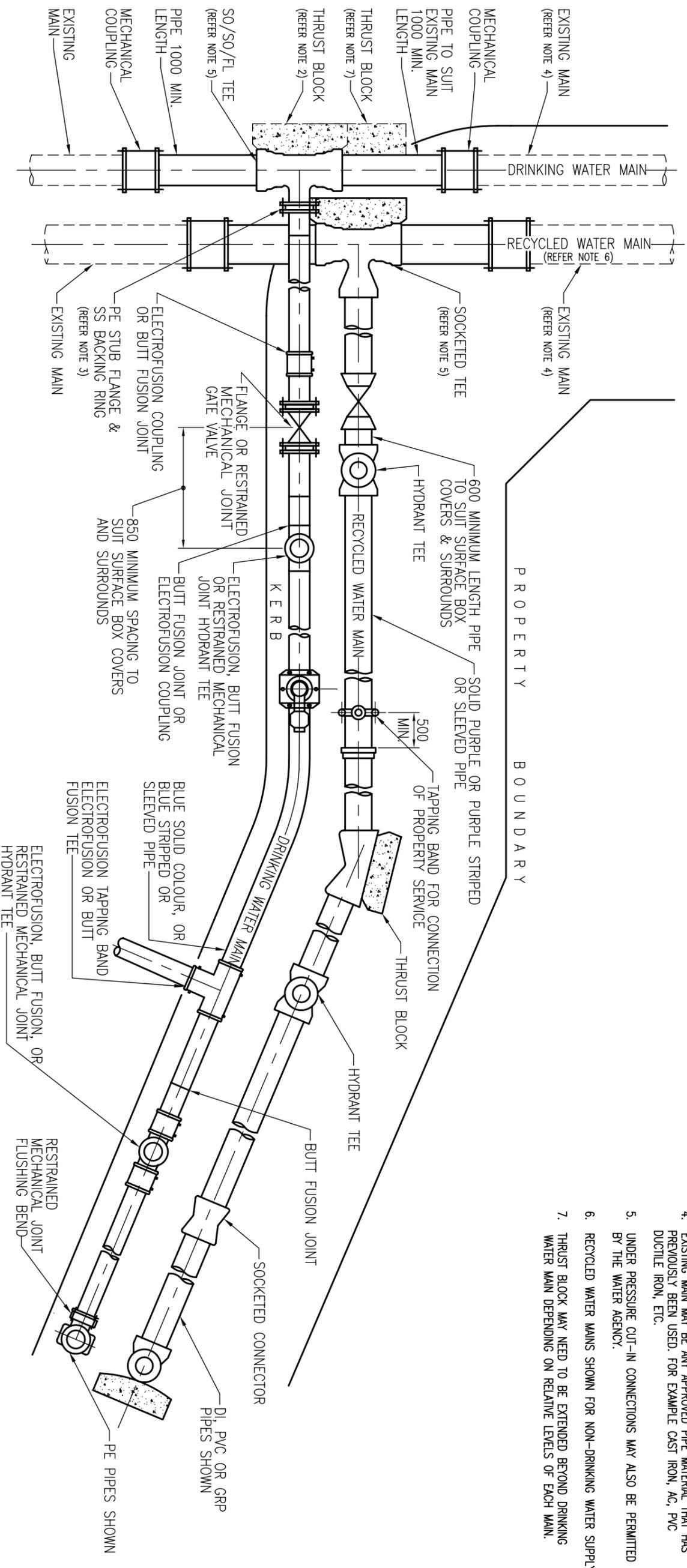
#### **NDW 11.17 WAT-1825 – TYPICAL RECYCLED WATER SURFACE FITTINGS – MARKING AND COLOUR IDENTIFICATION**

*WAT-1825 shows the marking of recycled water surface fittings. Typical trafficable (Classes D and E, heavy duty) and non-trafficable (Class B, light duty) DN 375 and DN 600 access covers and valve and hydrant boxes are shown and should be considered as indicative only.*

*Each Water Agency has an authorised range of covers and frames and a range of associated support material. Each cover shown has been given a type letter to allow easy identification. Prior to commencing projects, the appropriate covers and associated materials should be obtained and the correct method of installation determined.*

*Painting of surface surrounds of non-trafficable surface fittings with road marking paint may also be required.*

*For further guidance on typical surface fitting installation refer to WAT-1303 to WAT-1306 inclusive.*



**NOTES**

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THRUST BLOCK IS NOT REQUIRED FOR THE RESTRAINED JOINT PE PIPELINE SHOWN.
3. FULL FACE FLANGE ADAPTOR MAY ALSO BE USED
4. EXISTING MAIN MAY BE ANY APPROVED PIPE MATERIAL THAT HAS PREVIOUSLY BEEN USED. FOR EXAMPLE CAST IRON, AC, PVC DUCTILE IRON, ETC.
5. UNDER PRESSURE CUT-IN CONNECTIONS MAY ALSO BE PERMITTED BY THE WATER AGENCY.
6. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.
7. THRUST BLOCK MAY NEED TO BE EXTENDED BEYOND DRINKING WATER MAIN DEPENDING ON RELATIVE LEVELS OF EACH MAIN.

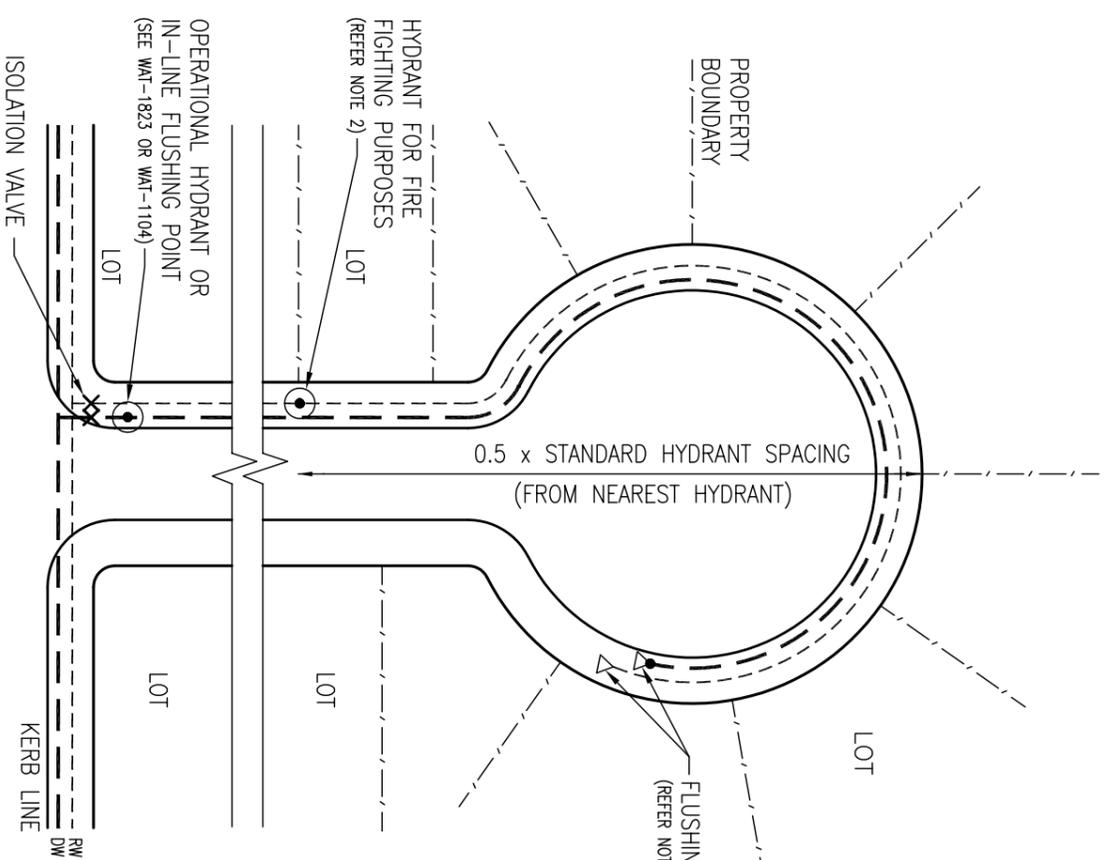


**WATER SUPPLY CODE OF AUSTRALIA**  
TYPICAL MAINS CONSTRUCTION  
RETICULATION MAIN ARRANGEMENT  
FOR DUAL WATER SUPPLY SYSTEMS

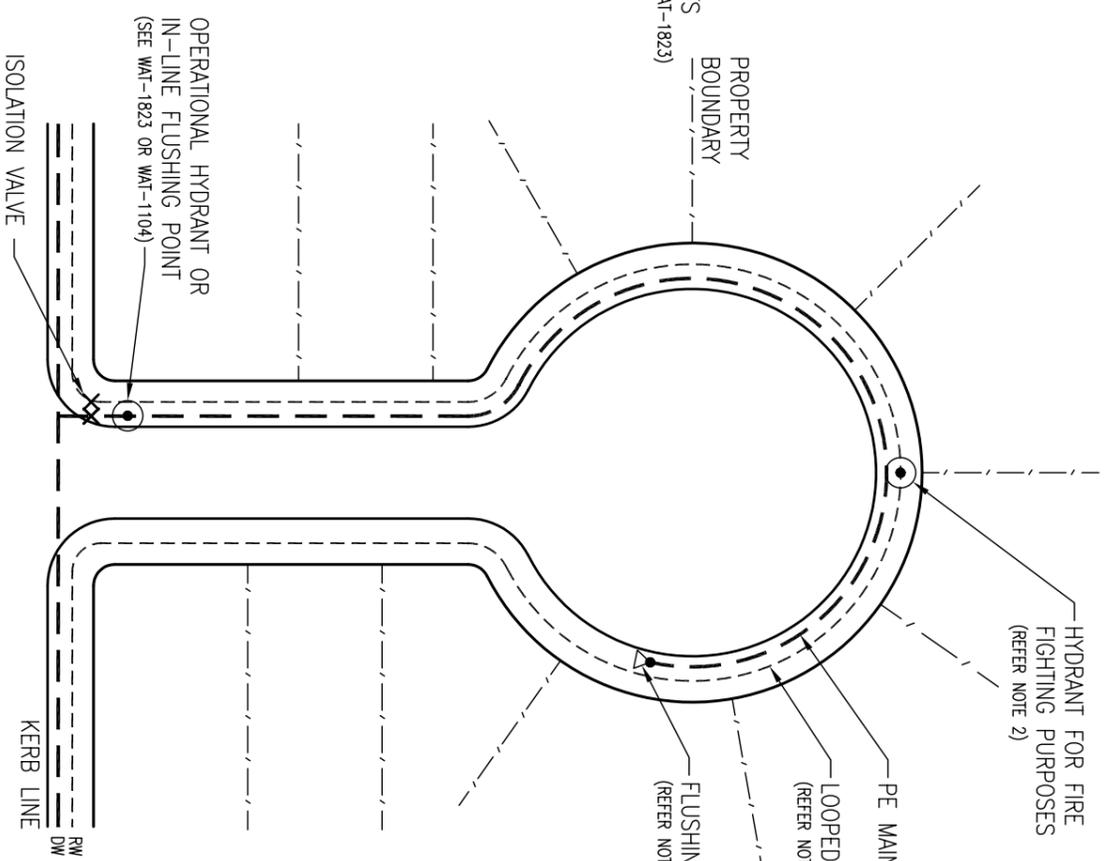
NOT TO SCALE  
**WAT-1800**  
© WSA. 2004 V1.1

**NOTES**

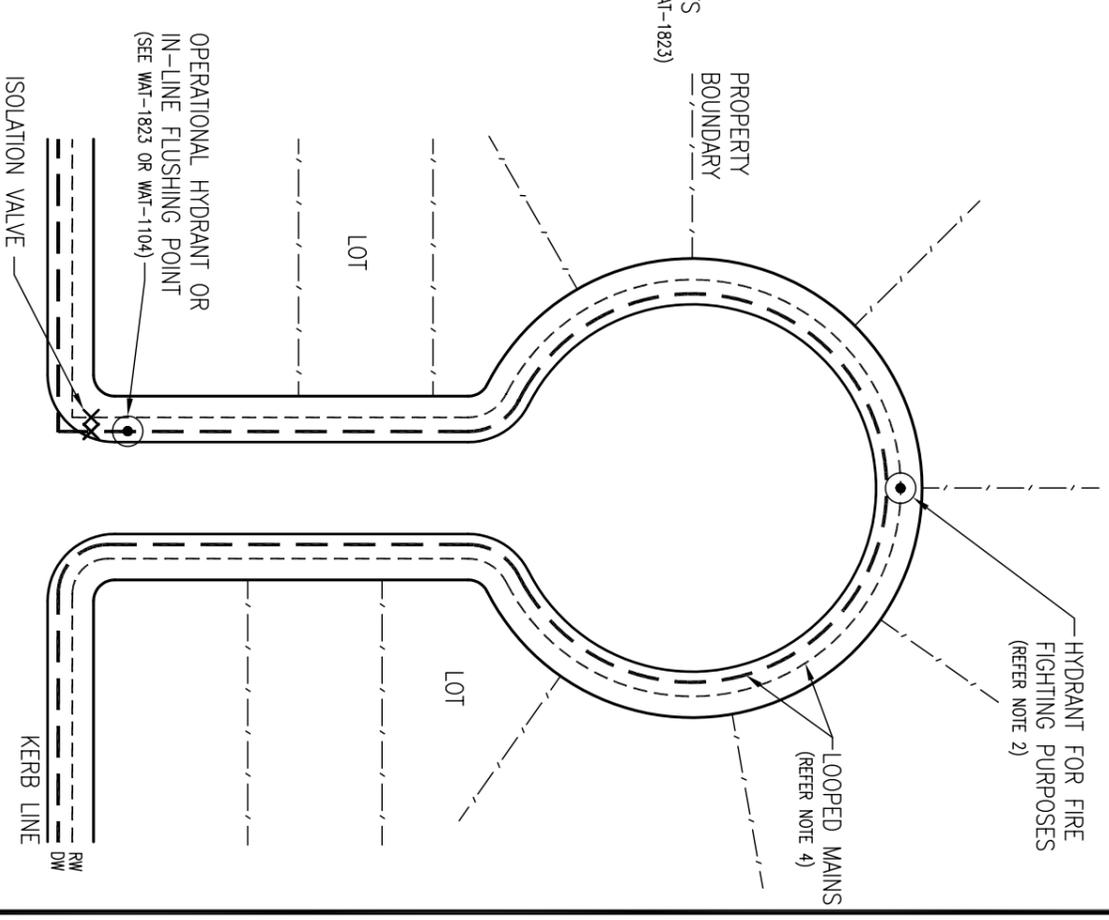
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. SUPPLY OF WATER FOR FIRE FIGHTING SHOWN FROM RECYCLED WATER MAIN.
3. LOCATE FLUSHING POINTS AND CONNECTION POINTS FOR PROPERTY SERVICES (TAPPING BANDS) TO AVOID EXISTING AND PROPOSED DRENWANS AND OTHER OBSTRUCTIONS.
4. ANY APPROVED PIPE SYSTEM, AS APPROPRIATE TO DRINKING WATER OR RECYCLED WATER, MAY BE USED FOR LOOPED MAINS.
5. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.



REDUCED DIAMETER MAINS  
FOR DRINKING WATER & RECYCLED WATER



REDUCED DIAMETER MAIN  
FOR DRINKING WATER ONLY & LOOPED MAIN  
FOR RECYCLED WATER



LOOPED MAINS FOR DRINKING WATER  
& RECYCLED WATER

**LEGEND**

- DW ——— DRINKING WATER MAIN
- RW ——— RECYCLED WATER MAIN
- (REFER NOTE 5)



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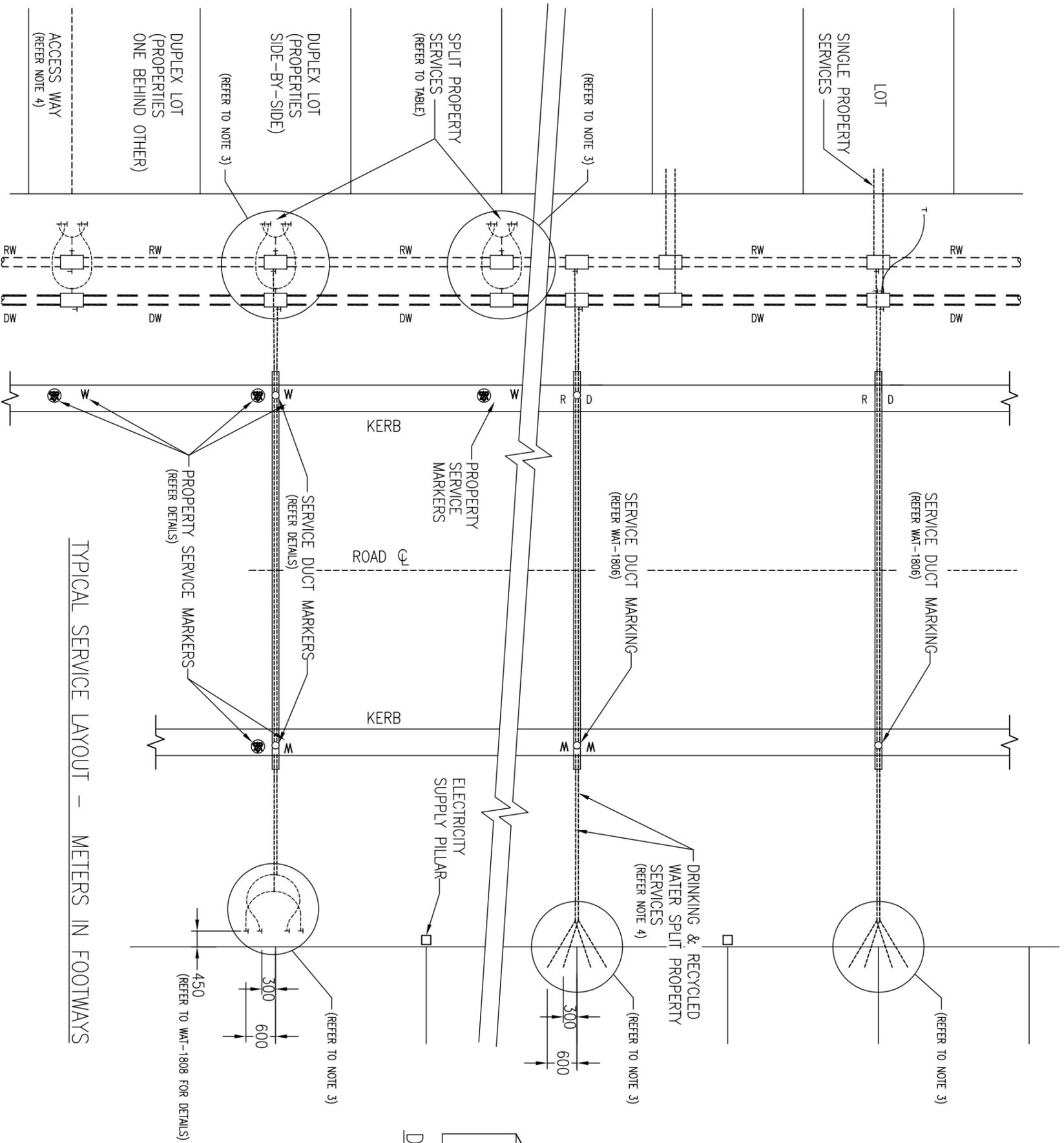
WATER SUPPLY CODE OF AUSTRALIA

TYPICAL MAINS CONSTRUCTION  
MAIN ARRANGEMENT FOR CUL-DE-SACS  
AND COURT BOWLS

NOT TO SCALE

**WAT-1801**

TYPICAL SERVICE LAYOUT – METERS IN PROPERTIES



TYPICAL SERVICE LAYOUT – METERS IN FOOTWAYS

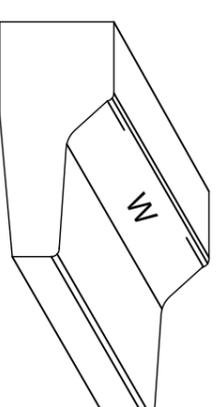


NOTES:

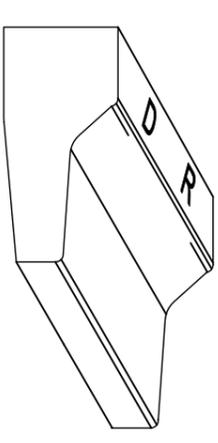
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. LAY SPLIT PROPERTY SERVICES WHEREVER PRACTICABLE.
3. REFER TO WAT-1804 FOR DETAILS.
4. LENGTH OF ACCESS WAY MAY REQUIRE UPSIZING OF PROPERTY SERVICE. SPLIT PROPERTY SERVICES MAY NOT BE SUITABLE.
5. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.
6. FOR SPLIT PROPERTY SERVICES ≤ 16.5 METRES.
7. FOR SPLIT PROPERTY SERVICES > 16.5 METRES.

PROPERTY SERVICE PIPE DETAILS

SYSTEM	TYPE	MATERIAL	PIPE SIZE DN	PURCHASE SPECIFICATIONS
DRINKING WATER	SINGLE	PE	25	WSA PS-215
	SPLIT	PE	20	WSA PS-214
RECYCLED WATER	SINGLE	PE	25.6	WSA PS-215
		PE	32.7	WSA PS-215 RW
	SPLIT	PE	20	WSA PS-214 RW
		PE	25.6	WSA PS-215 RW
		PE	32.7	WSA PS-215 RW
		PE	25.6	WSA PS-214 RW
		PE	25.7	WSA PS-214 RW



DUCT LOCATION MARKING  
DETAIL 1



MAIN TAP LOCATION MARKING  
DETAIL 2

KERB MARKING  
FOR ALL UNDEVELOPED AREAS



- RECYCLED WATER SERVICE (BRASS OR SS)



- DRINKING WATER SERVICE (BRASS)
- DUCT (STAINLESS STEEL)

DUCT AND SERVICE MARKER DETAILS

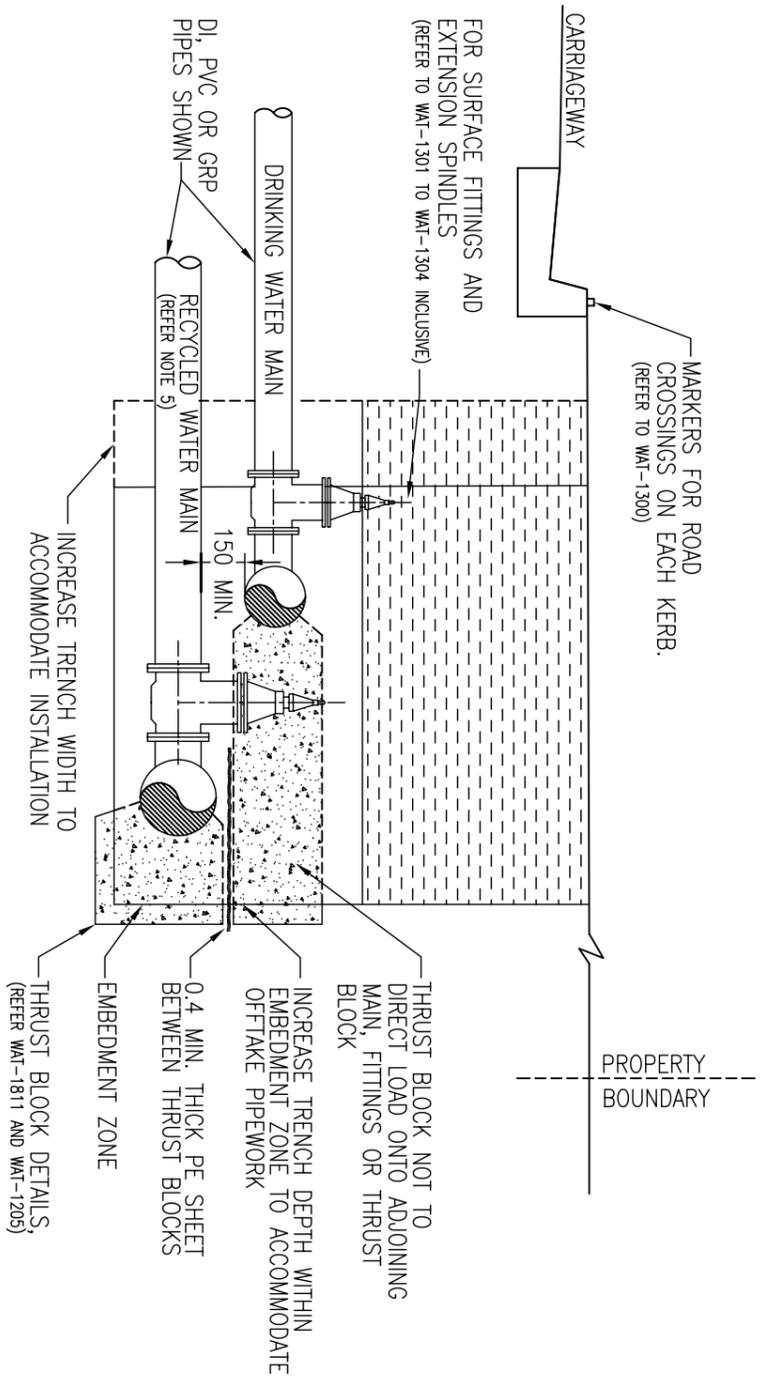


WATER SUPPLY CODE OF AUSTRALIA

PROPERTY SERVICES  
TYPICAL SERVICE LAYOUTS AND  
ALTERNATIVE MARKING SYSTEMS

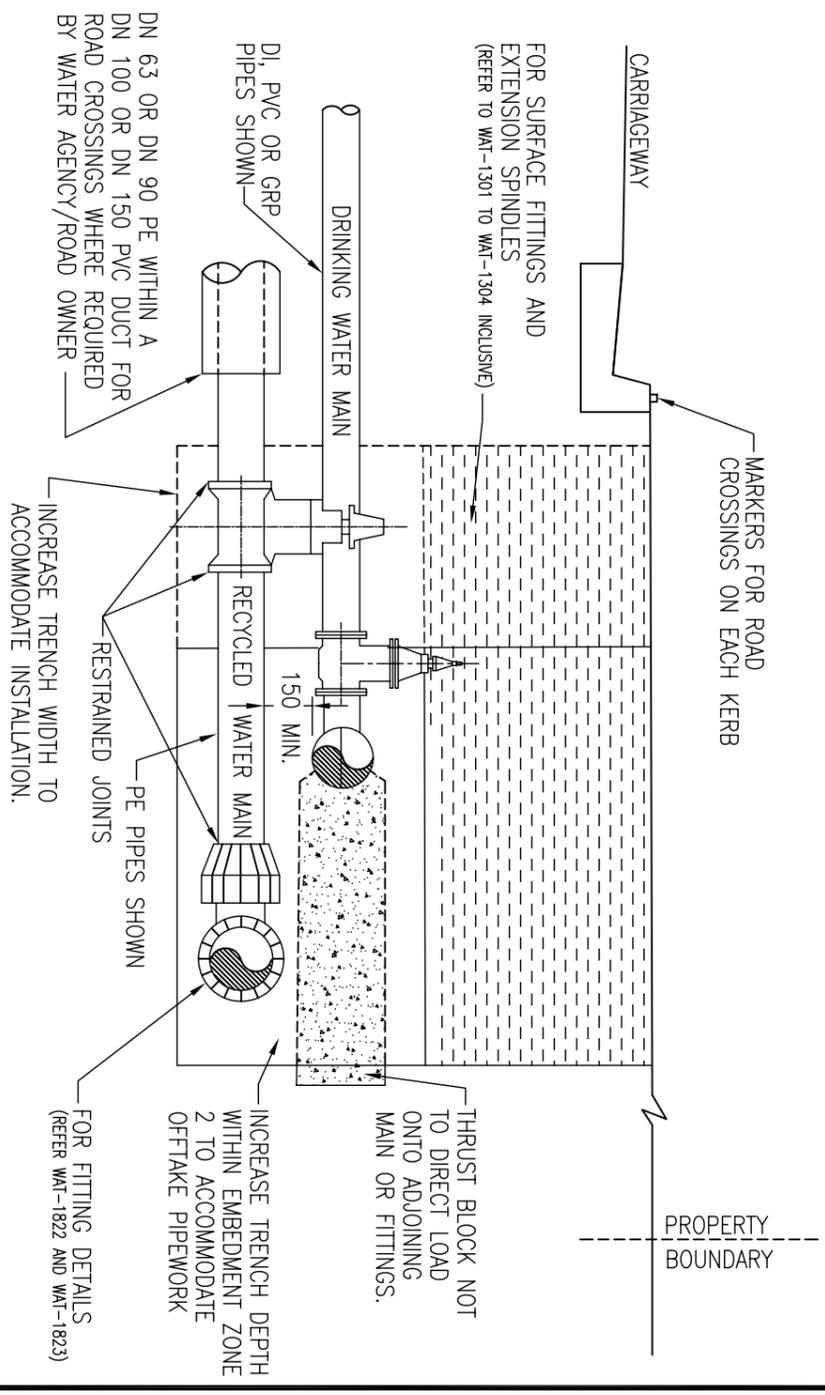
WAT-1803

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**OFFTAKE DETAIL A**

(REFER WAT-1810 FOR EMBEDMENT DETAIL)



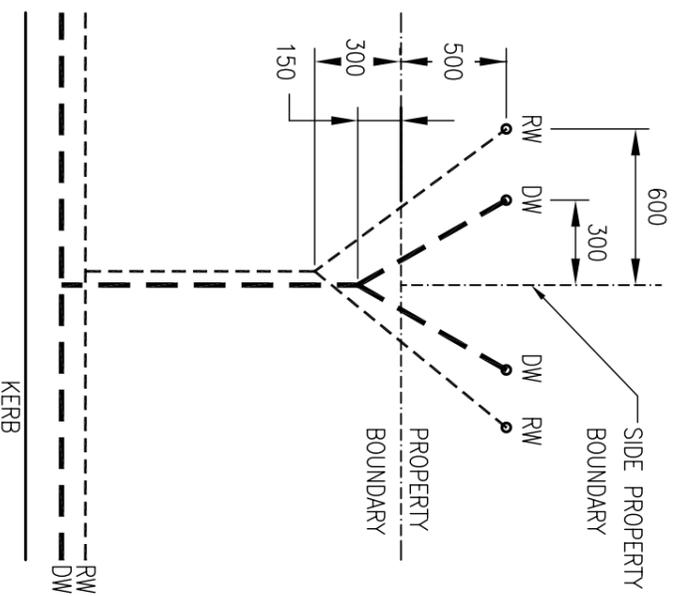
**OFFTAKE DETAIL B**

(REFER WAT-1810 FOR EMBEDMENT DETAIL)

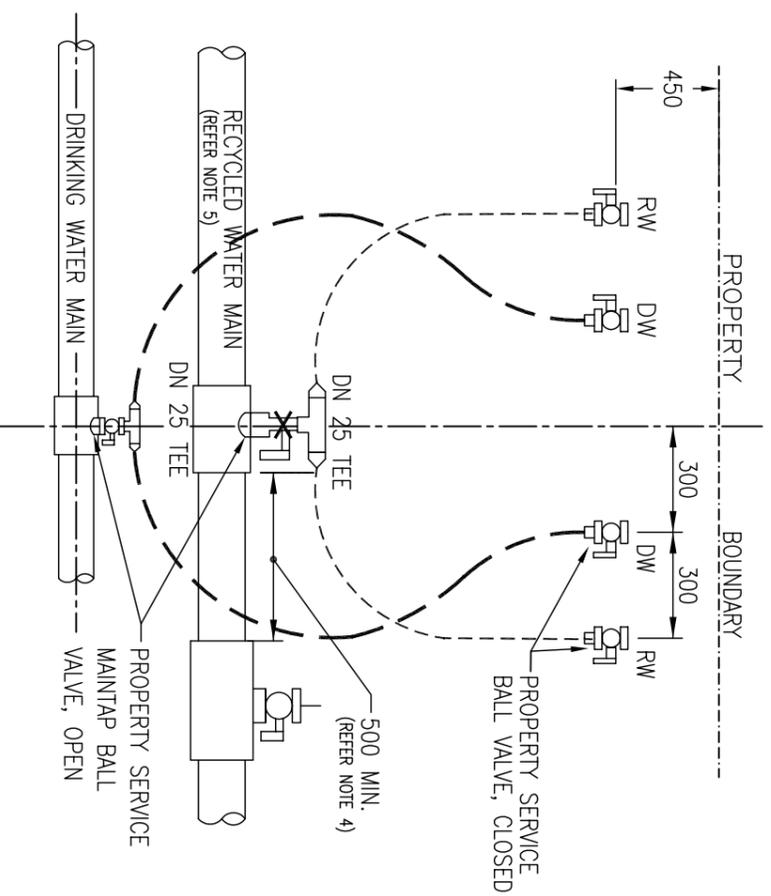
**NOTES**

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. ONLY STANDARD EMBEDMENT TYPES 'A' OR 'B' SUPPORT SHOWN. REFER TO WAT-1202.
3. FOR EMBEDMENTS WITH INADEQUATE SIDE SUPPORT AND/OR FOUNDATION REFER TO WAT-1203.
4. FOR EMBEDMENTS WITH INADEQUATE TRENCH WALL STIFFNESS AND WHERE GROUNDWATER SEEPAGE EXISTS REFER TO WAT-1204.
5. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.

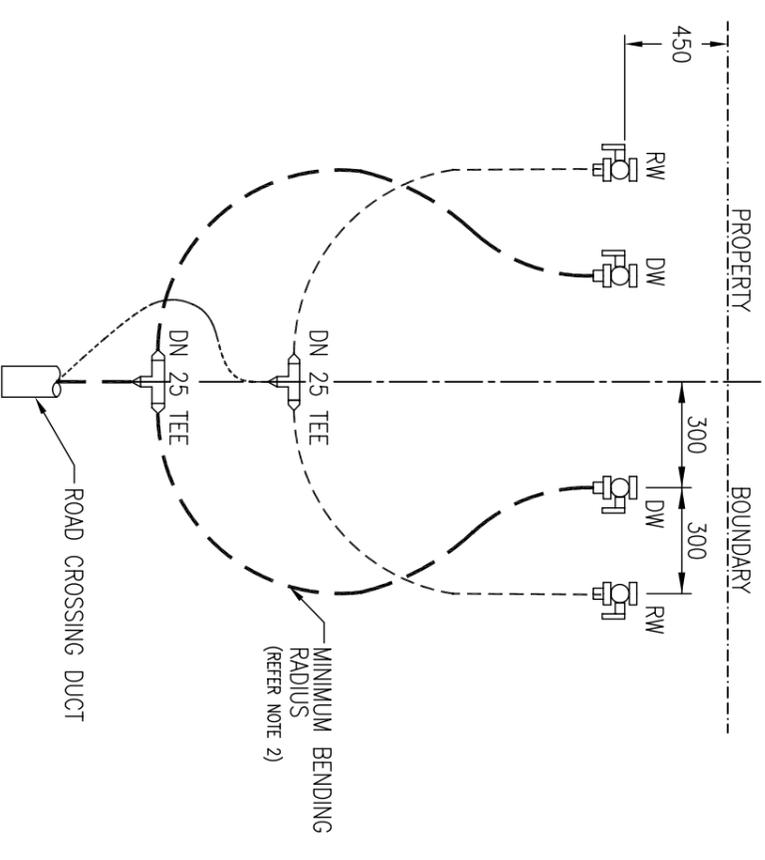
 <b>WATER SERVICES ASSOCIATION</b> <i>of Australia</i>	<b>WATER SUPPLY CODE OF AUSTRALIA</b>	NOT TO SCALE
	TYPICAL MAINS CONSTRUCTION OFFTAKE MAIN DETAILS	<b>WAT-1802</b>
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SPLIT PROPERTY SERVICES TYPICAL  
TYPICAL SERVICE LAYOUT – METER IN PROPERTY

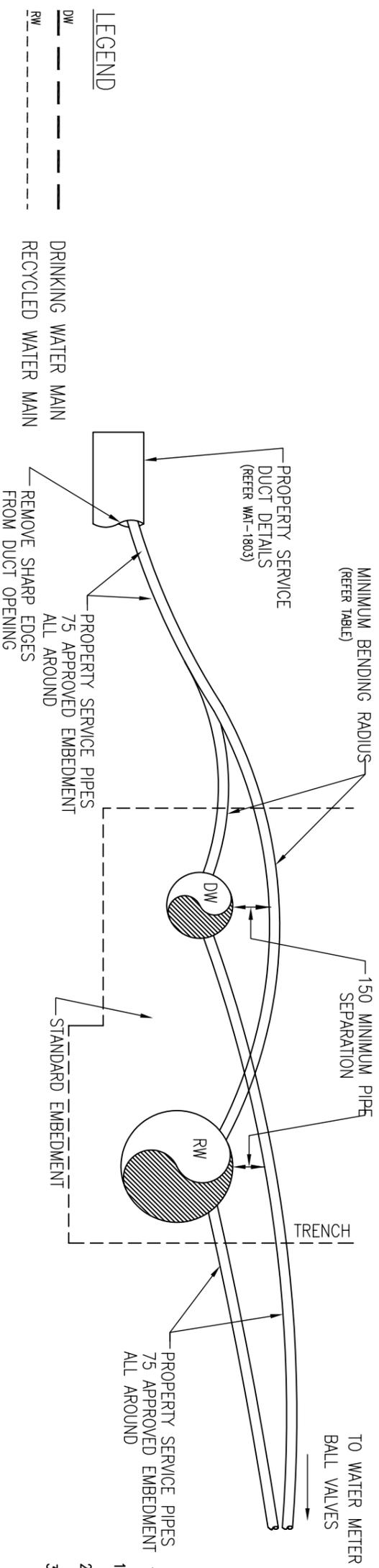


SHORT SPLIT PROPERTY SERVICES



LONG SPLIT PROPERTY SERVICES

TYPICAL SERVICE LAYOUTS – METER IN FOOTWAY



TYPICAL PROPERTY SERVICE CROSSOVERS  
(FITTINGS NOT SHOWN FOR CLARITY)

NOTES:

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. LAY SPLIT PROPERTY SERVICES WHEREVER PRACTICABLE.
3. FOR SINGLE PROPERTY SERVICES LOCATE AT MIDDLE OF FRONT PROPERTY BOUNDARY AWAY FROM SIDE BOUNDARIES AS SHOWN IN WAT-1106.
4. MAINTAIN A MINIMUM 500 SPACING BETWEEN TAPPING BANDS, SADDLES, PRETAPPED CONNECTORS AND/OR PIPE JOINTS, EXCEPT FOR EXISTING PVC-U, CAST IRON AND ASBESTOS CEMENT PIPES WHERE SPACINGS SHOULD BE IN ACCORDANCE WITH WATER AGENCY REQUIREMENTS AND/OR PIPE CONDITION.
5. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.

LEGEND

- DW ——— DRINKING WATER MAIN
- RW ——— RECYCLED WATER MAIN

PIPE SIZE		PE		COPPER	
DN	PE 80B	SDR 11 & 13.6 PE 100	ANNEALED	REFER TO AS 4809	BENDABLE
20	Not used	Not used	60		85
25	500	800	75		Not available
32	600	1000	100		Not available
40	800	1300	120		Not available
50	1000	1600	150		Not available

MINIMUM BENDING RADIUS  
mm

REFER TO AS 4809



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of Australia

WATER SUPPLY CODE OF AUSTRALIA

PROPERTY SERVICES  
TYPICAL SERVICE ARRANGEMENT

NOT TO SCALE

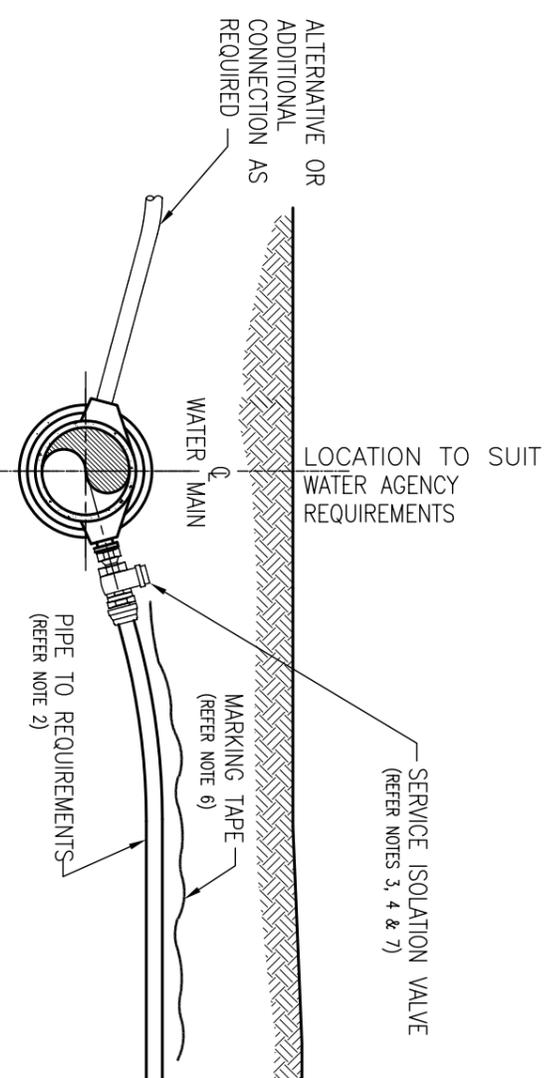
WAT-1804

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V1.1

**NOTES**

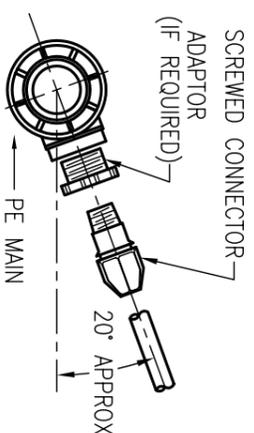
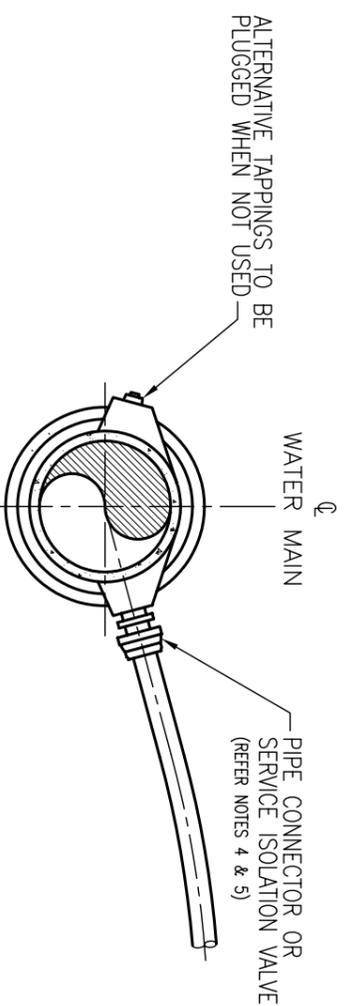
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. FOR PROPERTY SERVICE PIPE DETAILS REFER TO WAT-1803.
3. SERVICE ISOLATION VALVES ARE REQUIRED WHEN THE MAIN IS TAPPED UNDER PRESSURE.
4. INSTALL SERVICE ISOLATION VALVES WHERE REQUIRED BY THE WATER AGENCY.
5. ONLY INSTALL PIPE CONNECTORS IF PERMITTED BY THE WATER AGENCY.
6. WHERE PRACTICABLE LAY PROPERTY SERVICES AT RIGHT ANGLES TO THE WATER MAIN. WHERE NOT PRACTICABLE, LAY MARKING TAPE ON TOP OF THE PROPERTY SERVICES. USE DETECTABLE MARKING TAPE WITH PE PROPERTY SERVICES AND THE OFF TRACER WIRE TO FITTINGS AT EACH END OF SERVICE AND/OR AT "Y" OR TEE
7. USE APPROPRIATELY COLOURED PE PROTECTIVE SLEEVING (AS USED FOR DI PIPE) TO ENCAPSULATE THE PIPE CONNECTION AND SERVICE ISOLATING VALVE.
8. MECHANICAL TAPPING SADDLES NOT PERMITTED ON PE MAINS  $\geq$  DN 63 UNLESS APPROVED BY WATER AGENCY.
9. MAINTAIN A MINIMUM 500 SPACING BETWEEN TAPPING BANDS, SADDLES, PRETAPPED CONNECTORS AND/OR PIPE JOINTS, EXCEPT FOR EXISTING PVC-U, CAST IRON AND ASBESTOS CEMENT PIPES WHERE SPACINGS SHOULD BE IN ACCORDANCE WITH WATER AGENCY REQUIREMENTS AND/OR PIPE CONDITION.



TYPICAL SERVICE CONNECTION

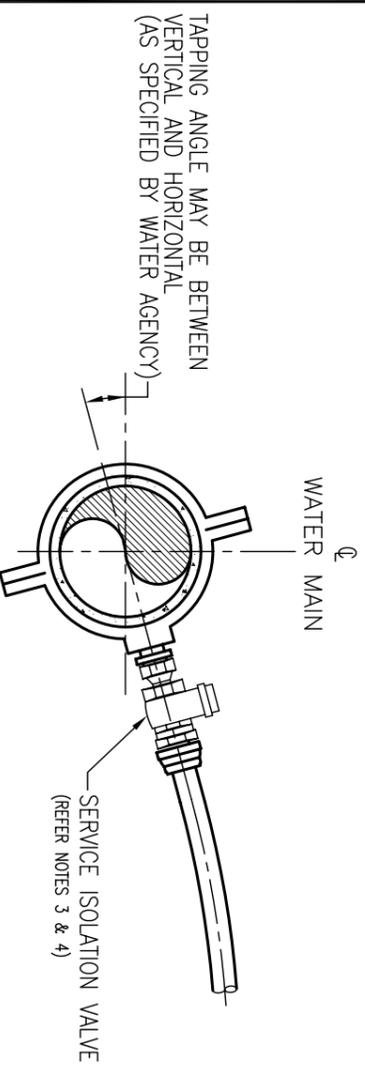
**PRETAPPED CONNECTOR (DI)**

(FOR DN 100 - DN 200 PVC & DI MAINS)



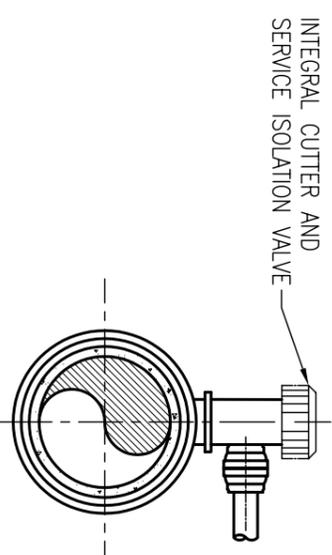
**MECHANICAL TAPPING SADDLE**

(FOR PE MAINS < DN 63)  
(REFER NOTE 8)



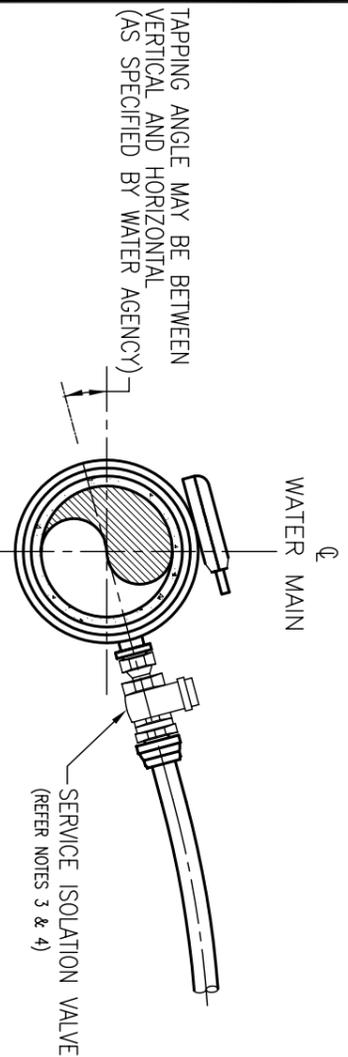
**NARROW CLAMP TAPPING BAND**

(FOR PVC & DI MAINS)



**ELECTROFUSION TAPPING SADDLE**

(FOR PE MAINS  $\geq$  DN 63)



**SS WIDE CLAMP TAPPING BAND**

(FOR PVC-U AND DI MAINS ONLY)

PRODUCTS	TYPE AND APPLICATION	MATERIALS	NOMINAL SIZES DN	PURCHASE SPECIFICATIONS
PRETAPPED CONNECTORS	SOC-SOC FOR USE WITH DI AND PVC WITH 4 OUTLETS	COATED DI	100-200 TO SUIT MAIN SIZE	WSA PS-201
TAPPING BANDS	SCREWED CONNECTORS AND ADAPTORS FOR PE AND CU PROPERTY SERVICES	COPPER ALLOYS PLASTICS	20, 25 AND 32	WATERMARKED PRODUCTS TO AS 3688 AND/OR STANDARDS MARKED PRODUCTS TO AS/NZ 4129
	MECHANICAL FOR DI AND PVC MAINS - NARROW CLAMP	COATED DI, PLASTICS AND REINFORCED	TO SUIT MAIN AND TAPPING SIZES	WSA PS-300
	MECHANICAL FOR DI AND PVC MAINS - WIDE CLAMP - SOMETIMES WITH INTEGRAL CUTTER	STAINLESS STEEL PLASTICS	TO SUIT MAIN AND TAPPING SIZES	WSA PS-303
	MECHANICAL FOR PE MAINS WITH INTEGRAL CUTTER	VARIOUS MATERIALS	TO SUIT MAIN AND TAPPING SIZES	WSA PS-317
MARKING TAPES	DETECTABLE	PE		WSA PS-308
VALVES	RESILIENT SEATED BALL FOR SERVICE ISOLATION AT PROPERTY CONNECTION & METER	COPPER ALLOYS	TO SUIT TAPPING AND PROPERTY SERVICE SIZES	WSA PS-270

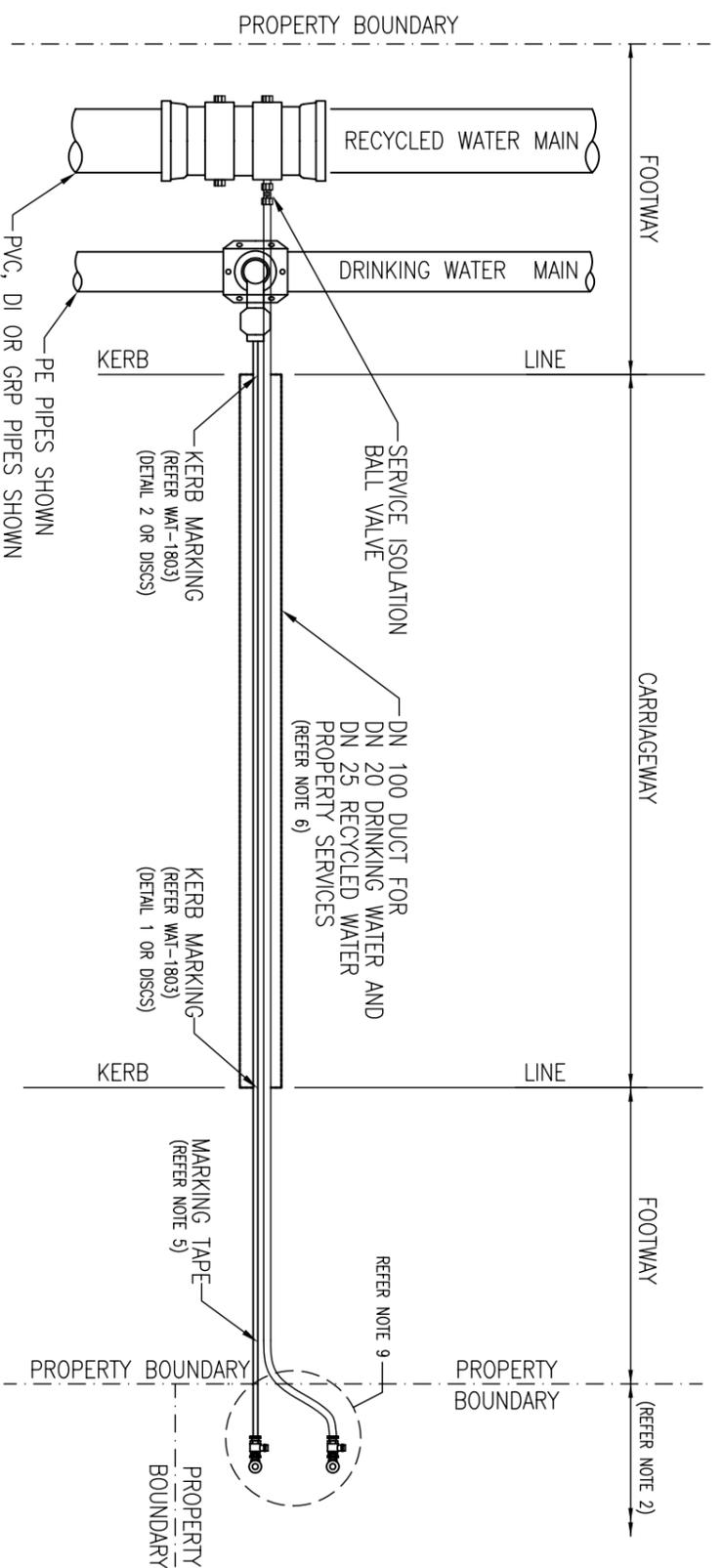
NOTES: FOR PROPERTY SERVICE PIPE DETAILS SEE WAT-1803



**WATER SUPPLY CODE OF AUSTRALIA**  
PROPERTY SERVICES  
STANDARD TAPPING METHODS

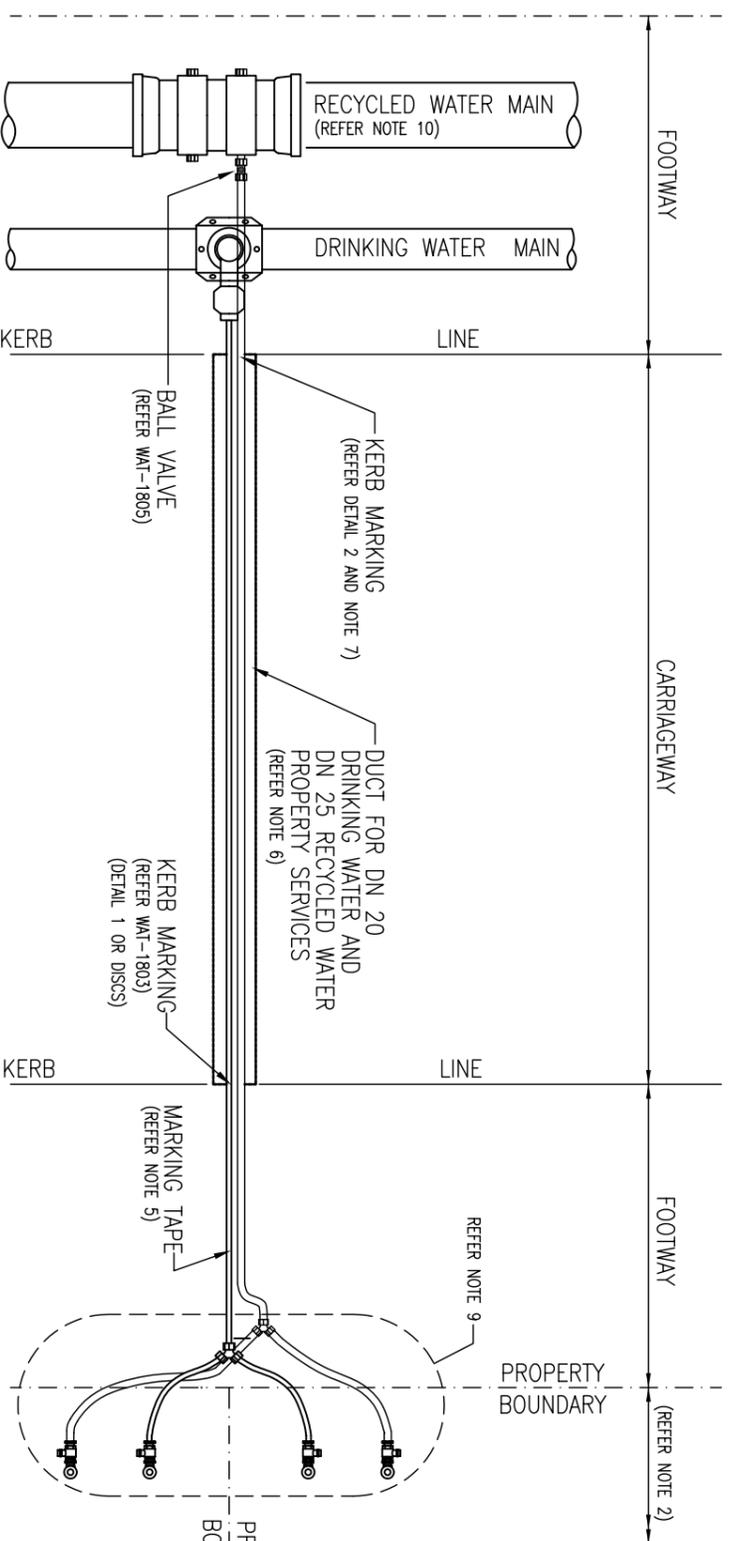
NOT TO SCALE

**WAT-1805**



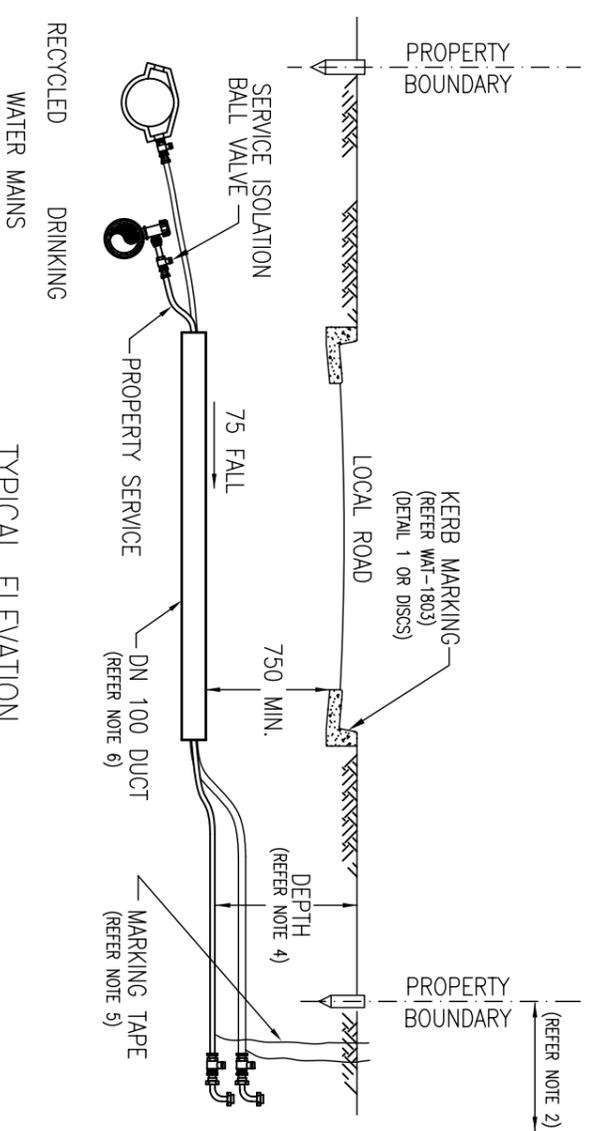
TYPICAL PLAN

SINGLE PROPERTY SERVICES PRELAID ACROSS CARRIAGEWAY



TYPICAL PLAN

SPLIT PROPERTY SERVICES PRELAID ACROSS CARRIAGEWAY



TYPICAL ELEVATION

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH WAT-1803, WAT-1804, WAT-1805 AND WAT-1807.
3. FOR KERB MARKING AND PROPERTY SERVICE LAYOUT DETAILS REFER TO WAT-1803.
4. DEPTHS IN OTHER THAN LOCAL ROADS TO BE IN ACCORDANCE WITH ROAD OWNER AND WATER AGENCY.
5. PROVIDE MARKING TAPE OVER SERVICES IN FOOTWAY AND TIED TO THE SERVICE CONNECTION VALVE AND RUN VERTICALLY TO SERVICE.
6. FOR PROPERTY SERVICES PRELAID ACROSS CARRIAGEWAYS:
  - INSTALL DW AND RW SERVICES IN SAME DUCT.
  - LAY DUCT BETWEEN KERB LINES AT MINIMUM DEPTH OF 750 MEASURED FROM UNDERSIDE OF KERB TO TOP OF DUCT.
  - USE DN 90 OR DN 100 SCJ PVC PIPE OF MINIMUM STIFFNESS SN4 (EITHER STORMWATER OR SEWER PIPE) FOR DUCT.
7. FOR SPLIT PROPERTY SERVICES, DUCTS TO BE PRELAID DIRECTLY IN LINE WITH COMMON BOUNDARY OF PROPERTIES TO BE SERVICED.
8. LAY SPLIT PROPERTY SERVICES WHEREVER PRACTICABLE.
9. LOCATE PROPERTY SERVICES FROM MAIN TO METER IN THE ONE STREET ONLY, AT FRONTAGE OF PROPERTIES.
10. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.



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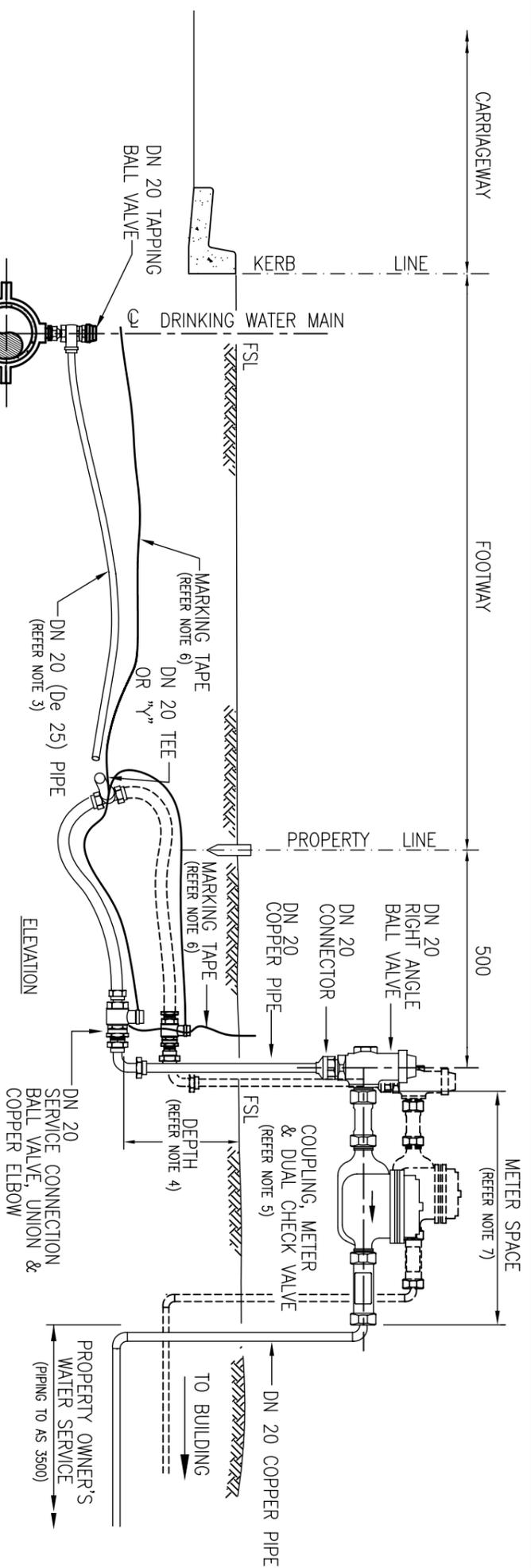
WATER SUPPLY CODE OF AUSTRALIA

NOT TO SCALE

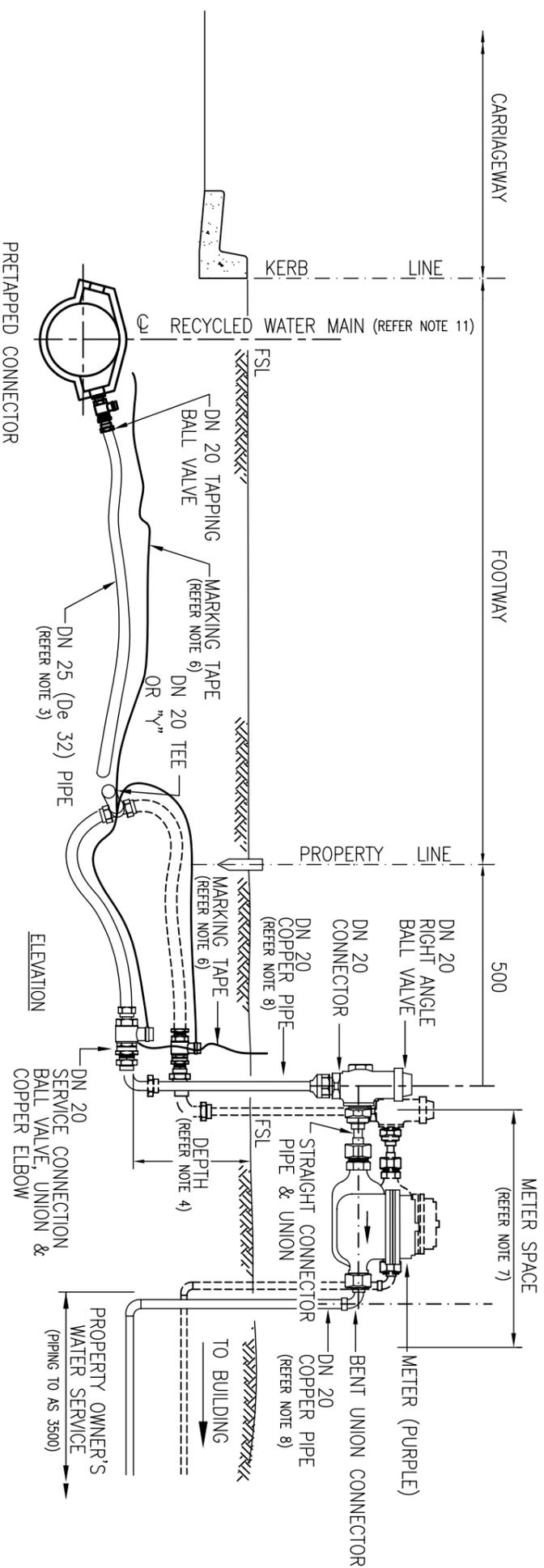
PROPERTY SERVICES  
SINGLE AND SPLIT SERVICES  
ACROSS CARRIAGEWAYS

WAT-1806

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TYPICAL SPLIT PROPERTY SERVICES PRELAID IN FOOTWAY



TYPICAL SPLIT PROPERTY SERVICES PRELAID IN FOOTWAY

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. DIRECT TAPPING NOT PERMITTED ON MAINS, EXCEPT FOR DI MAINS LAID PRIOR TO 2004.
3. PROPERTY SERVICES CONNECTED TO:  
DI/L MAINS  
ALL NON-METALLIC (PLASTIC) PIPE MATERIAL FOR USE IN PROPERTY SERVICES TO BE IN ACCORDANCE WITH AS 3500 (MINIMUM PN 12).  
ALL PROPERTY SERVICE PIPE FOR DRINKING WATER TO BE COLOURED SOLID BLUE OR BLUE STRIPED.  
PVC/GRP MAINS  
ALL MATERIALS FOR USE IN PROPERTY SERVICES SHALL BE IN ACCORDANCE WITH AS 3500 (MINIMUM PN 12). ALL PROPERTY SERVICE PIPE FOR RECYCLED WATER SHALL BE COLOURED BLACK WITH PURPLE STRIPES TO WSA PS-215 RW, WHERE THE NOMINAL SIZE OF A PIPE IS SPECIFIED, AN EQUIVALENT PIPE SIZE APPROPRIATE TO THE MATERIAL BEING USED TO BE AS SPECIFIED IN AS 3500.1, TABLE 1.1.
4. DEPTHS TO BE IN ACCORDANCE WITH AS 3500.
5. DUAL CHECK VALVES REQUIRED FOR DRINKING WATER MAINS ONLY.
6. PROVIDE DETECTABLE MARKING TAPE ON ALL PE PROPERTY SERVICES WITHIN THE FOOTWAY UP TO THE BALL VALVE AND THE OFF TRACER WIRE TO FITTINGS AT EACH END OF SERVICE AND/OR AT "Y" OR TEE, AS APPROPRIATE. TAPE TO BE COLOURED:  
(i) "PURPLE" AND MARKED "CAUTION RECYCLED MAIN BURIED BELOW" OR  
(ii) "BLUE" AND MARKED "CAUTION WATER MAIN BURIED BELOW"

7. METER SPACE  
DRINKING WATER  
METER SPACE FOR DRINKING WATER IS THE DISTANCE BETWEEN THE THREADED END OF THE BALL VALVE AND THE THREADED END OF THE ELBOW. DISTANCES ARE AS FOLLOWS:

METER SIZE	20	25
METER SPACE	244	283

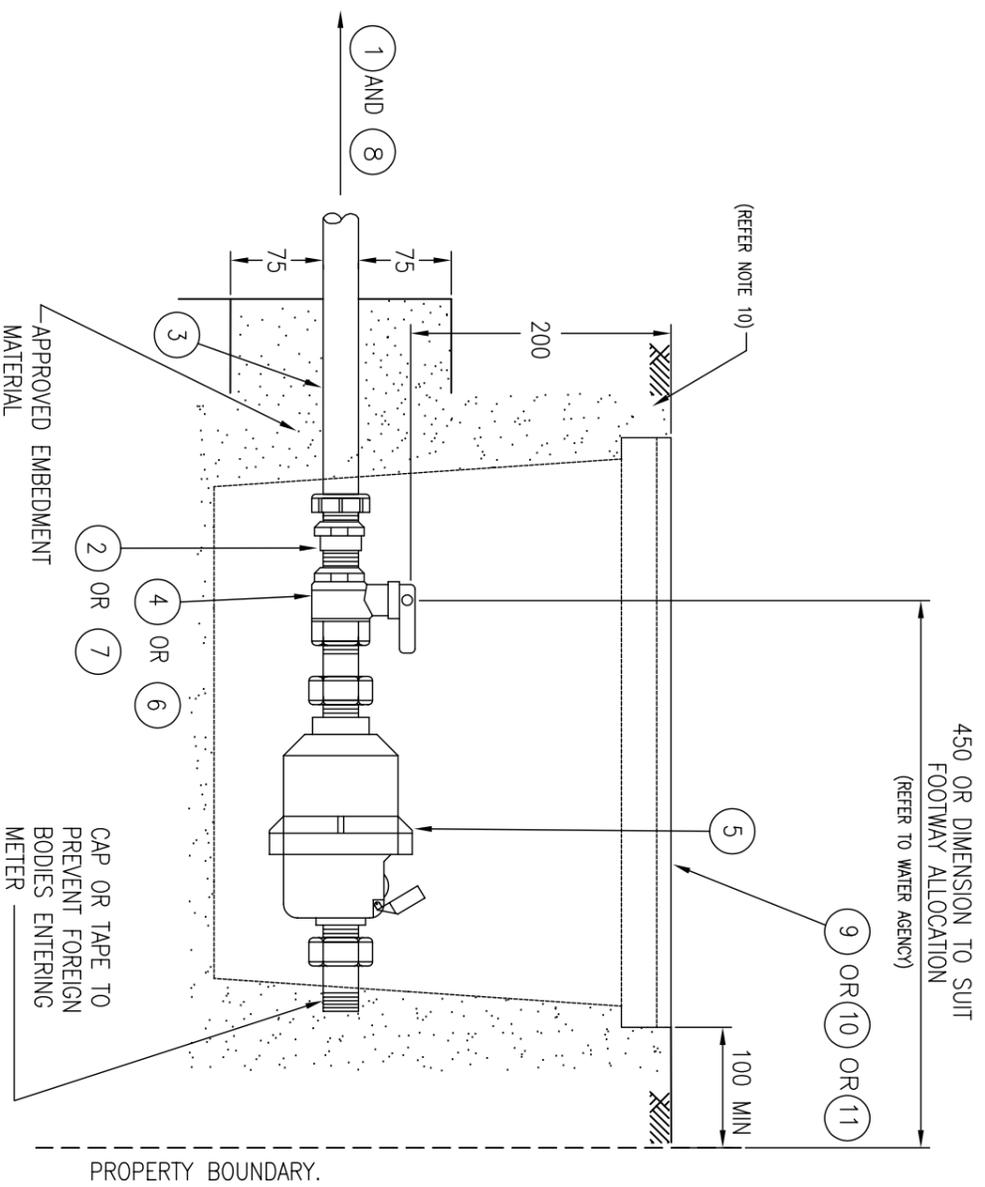
8. RECYCLED WATER  
METER SPACE FOR RECYCLED WATER IS THE DISTANCE BETWEEN THE CENTRE-LINES OF THE COPPER RISER PIPES. DISTANCES ARE AS FOLLOWS:

METER SIZE	20	25
METER SPACE	290	340

9. USE COPPER TUBE PRECOATED WITH PURPLE COLOURED PE FOR RISERS ON RECYCLED WATER SERVICES AND BLUE FOR RISERS ON DRINKING WATER SERVICES.
9. INSTALL SERVICES FROM MAIN TO METER IN A STRAIGHT LINE AND AT RIGHT ANGLES TO KERB LINE.
10. LOCATE PROPERTY SERVICES FROM MAIN TO METER, (DRINKING AND RECYCLED WATER) IN THE ONE STREET ONLY, AT FRONTAGE OF PROPERTIES. PLACE DRINKING AND RECYCLED WATER METERS TOGETHER (300 APART) NEAR THE ONE BOUNDARY.
11. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.

**NOTES**

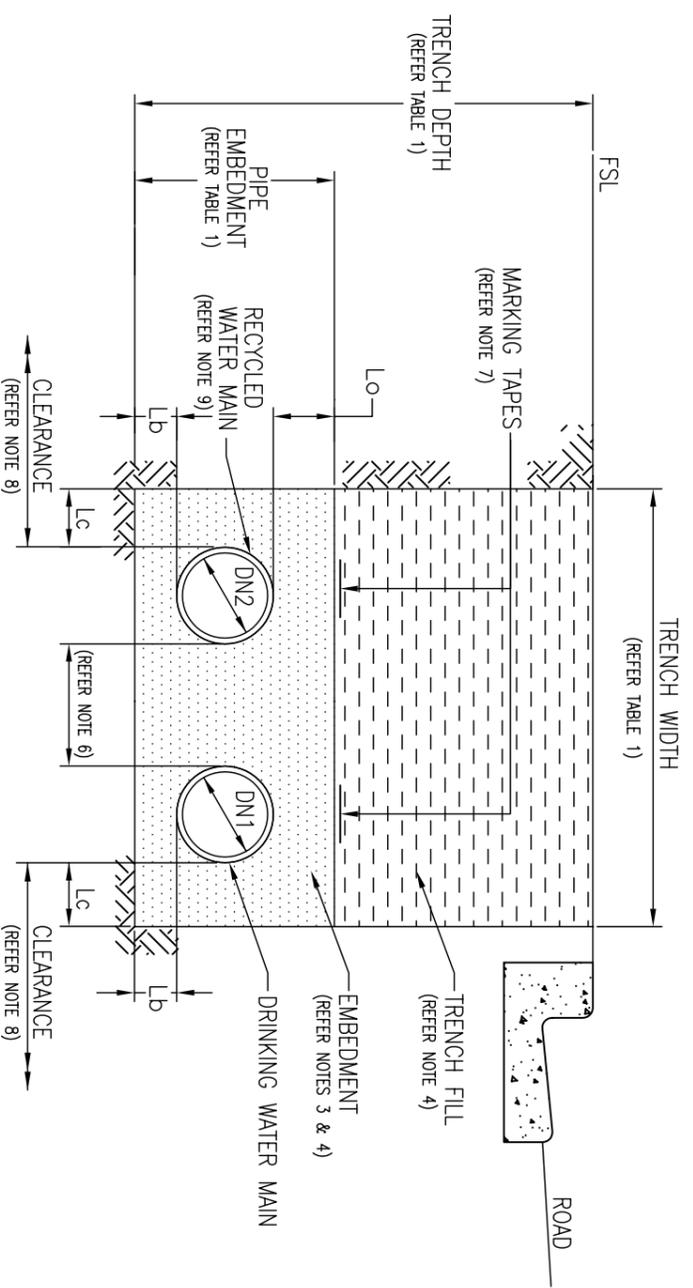
1. DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. FOR GENERAL INSTALLATION REQUIREMENTS REFER WAT-1803 AND WAT-1804.
3. LOCATE THE METER INSTALLATION WITHIN THE FOOTWAY PERPENDICULAR TO THE BOUNDARY AS NEAR AS PRACTICAL.
4. LOCATE WATER SERVICES & METERS CLEAR OF ELECTRICAL SERVICES.
5. DO NOT SURROUND OR COVER ANY COMPONENTS WITHIN THE METER BOX WITH EMBEDMENT MATERIAL.
6. FOR WATER SERVICE DUCT INSTALLATION DETAILS REFER WAT-1806.
7. IF USING PRE-TAPPED CONNECTORS OR ELECTROFUSION TAPPING SADDLES, PROVIDE METER ASSEMBLY AND METER BOX ONLY.
8. STANDARD BSP THREADED COMPONENTS SHOWN: IN SPECIAL INSTALLATIONS OTHER APPROVED COMPONENTS MAY BE USED: LIAISE WITH SUPPLIERS.
9. WHERE HARD SURFACE EXISTS, PROVIDE INSTALLATIONS WITH PATH OR ROAD BOX TO SUIT, USING A ROAD BOX SUPPORT SYSTEM SIMILAR TO STANDARD HYDRANT & VALVE BOX SUPPORT SYSTEM.
10. CHECK THAT EMBEDMENT MATERIAL AROUND THE METER BOX IS FREE OF ROCKS OR LUMPS OF MATERIAL THAT MAY PREVENT REMOVAL OR FUTURE HEIGHT ADJUSTMENT OF THE BOX TO MATCH FINAL FOOTWAY PROFILE.
11. ALIGN THE DIRECTIONAL ARROW ON THE METER TO POINT DOWNSTREAM TOWARDS PROPERTY.



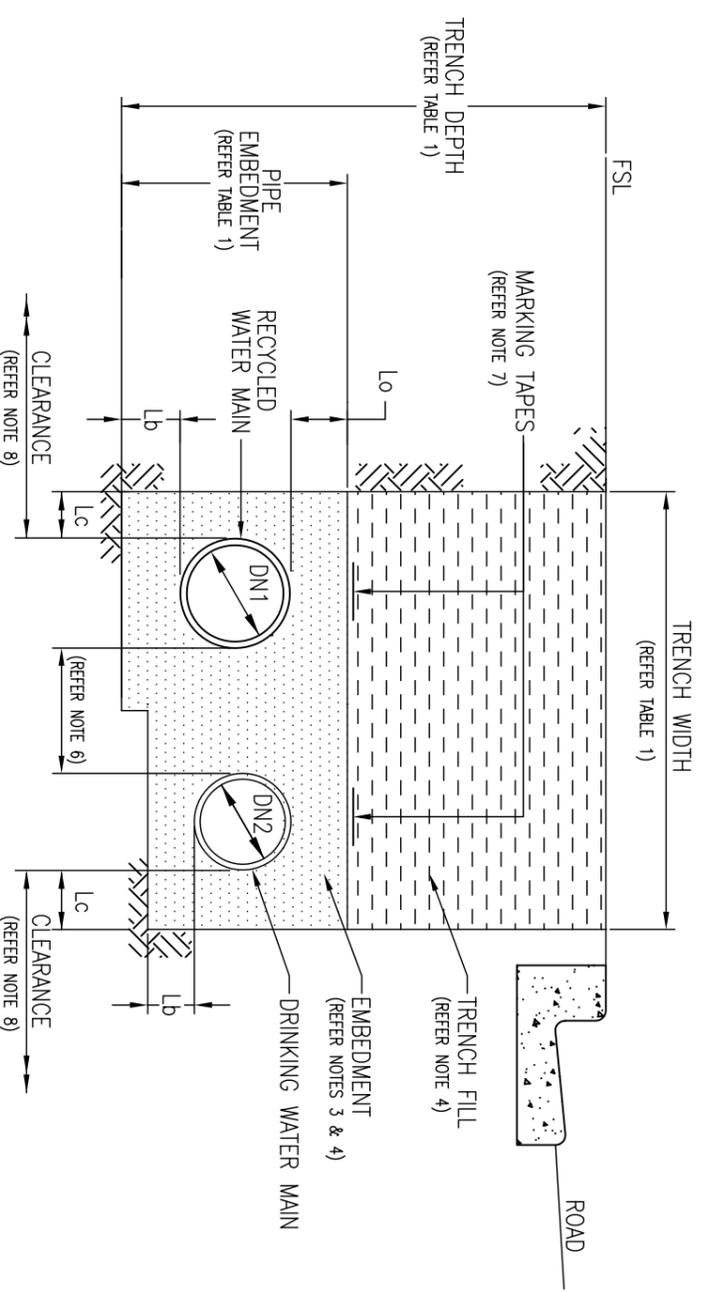
TYPICAL DN 20 IN-GROUND METER INSTALLATION

ITEM	COMPONENTS GENERAL DESCRIPTION
1	TPFN BONNET FERRULE COCK 20 X 25 (MAIN TAP).
2	END CONNECTOR - 25 PE TO 25 F. BSP (GMT 28).
3	POLYETHYLENE PIPE DN 25
4	BALL VALVE BRASS 20 F X 25 PE
5	WATER METER 20 (INC 2 COUPLINGS, TAILS & SEALS)
6	GATE VALVE 20
7	END CONNECTOR - 25 PE TO 20 M. BSP (GMT 22).
8	DI / AC / PVC / GRP (SERIES 2) TAPPING BAND DN 100 X 20 DI / AC / PVC / GRP (SERIES 2) TAPPING BAND DN 150 X 20 PVC (SERIES 1) TAPPING BAND DN 100 X 20 PVC (SERIES 1) TAPPING BAND DN 150 X 20 PE ELECTROFUSION TAPPING SADDLE DN 63 X 25, DN 90 X 25, DN 110 X 25, DN 125 X 25, DN 160 X 25, DN 180 X 25
9	METER BOX 20 LOW PROFILE
10	METER BOX 20 HIGH PROFILE
11	PATH BOX SQUARE (FOOTWAY) PATH BOX ROUND (CARRIAGEWAY)

\* LARGER TAPPING BANDS UP TO DN 300 ARE AVAILABLE, LIAISE WITH SUPPLIERS.



TYPICAL TRENCH INSTALLATION  
FOR SAME DIAMETER MAINS



TYPICAL TRENCH INSTALLATION  
FOR DIFFERENT DIAMETER MAINS

NOTES

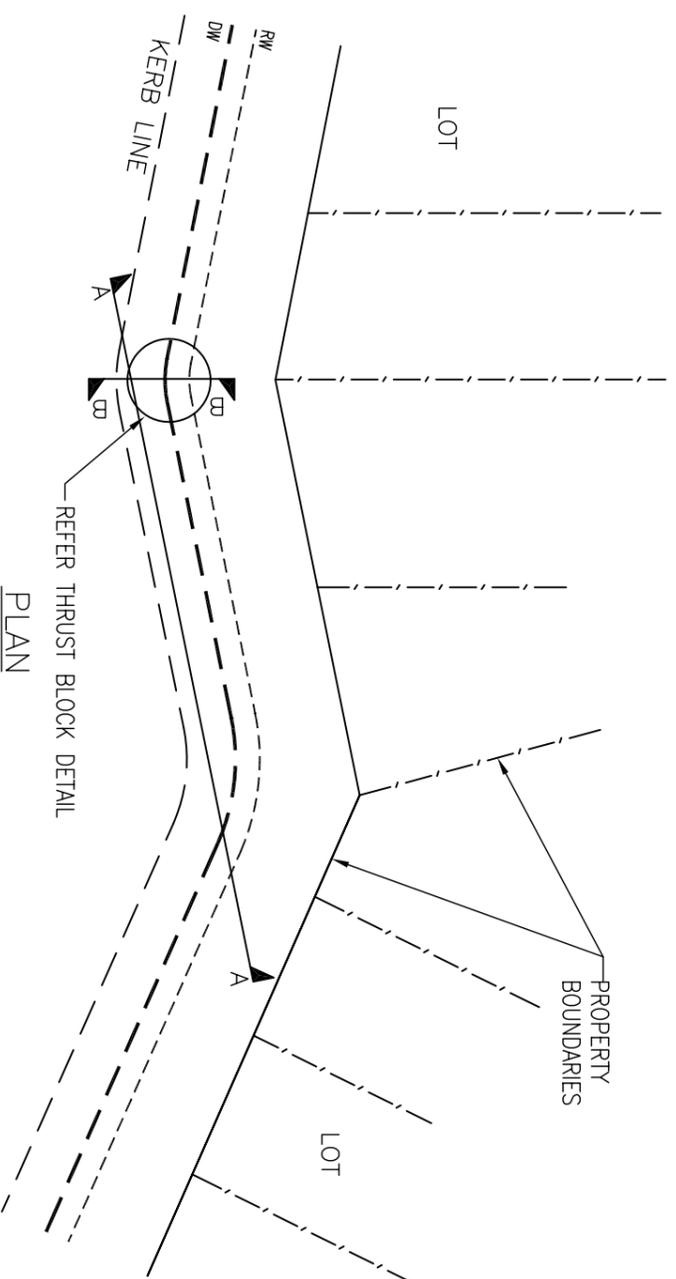
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING TO BE READ IN CONJUNCTION WITH WAT-1201.
3. SPECIFY BEDDING - SPECIAL BEDDING TO SUIT THE CONDITIONS IF TRENCH FLOOR HAS:
  - IRREGULAR OUTCROPS OF ROCK;
  - AHP OF <50 kPa (REFER TO WAT-1200); OR
  - UNCONTROLLED GROUND WATER HAS DISTURBED THE FLOOR OF THE TRENCH.
4. USE EMBEDMENT, TRENCH FILL AND COMPACTION THAT MEETS THE REQUIREMENTS OF WSA 03 PART 3 AND THE ROAD OWNER AND WATER AGENCY AS APPROPRIATE.
5. KEEP SIDES OF THE EXCAVATION VERTICAL TO AT LEAST 150 ABOVE THE PIPES IN STRATA OTHER THAN SAND. FOR TRENCHES IN SAND STRATA REFER TO WAT-1202.
6. WHERE BOTH D1 AND D2 ARE ≤ DN 200, MAINTAIN 300 MINIMUM CLEARANCE BETWEEN MAINS, EXCEPT WHERE ONE OR BOTH OF MAINS ARE < DN 200 MAINTAIN 450 MINIMUM CLEARANCE.
7. LAY MARKING TAPE ALONG ROUTE OF EACH MAIN AS SPECIFIED (REFER TO CLAUSE 15.10 OF WSA 03).
8. MAINTAIN MINIMUM CLEARANCES BETWEEN MAINS AND OTHER SERVICES IN ACCORDANCE WITH TABLE 4.1 OF WSA 03.
9. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.

NOMINAL SIZE DN	TRENCH WIDTH (REFER NOTE 5)	STANDARD TRENCH DEPTH*				
		NON-TRAFFICABLE	TRAFFICABLE	BEDDING L <sub>b</sub>	SIDE SUPPORT L <sub>c</sub>	OVERLAY L <sub>o</sub>
100	W=500+DN1+DN2	700	800	75	100	100
150	W=500+DN1+DN2	850	900	75	100	100
200	W=600+DN1+DN2	950	950	100	150	150
250	W=750+DN1+DN2	1000	1100	100	150	150
300	W=750+DN1+DN2	1100	1200	100	150	150
375	W=850+DN1+DN2	1200	1250	100	200	150

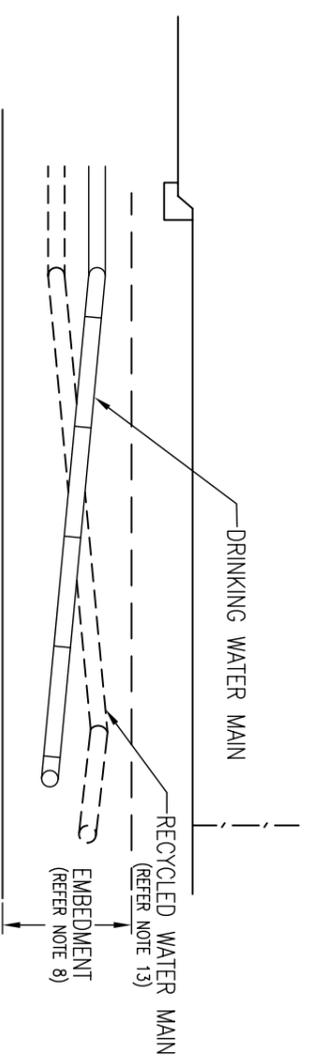
\* STANDARD TRENCH DEPTHS AS SHOWN ARE FOR INSTALLATIONS IN LOCAL ROADS ONLY.

TABLE 1 TRENCH DETAILS

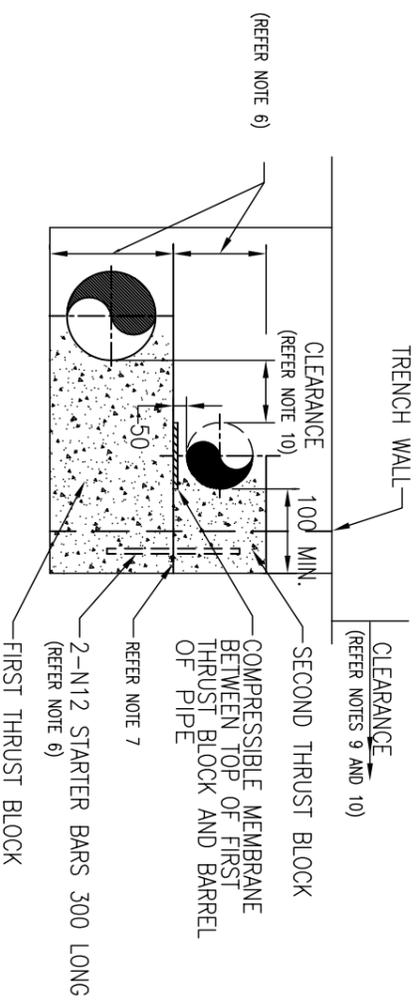
(SERIES 2 PIPES LISTED)



PLAN



SECTION A-A



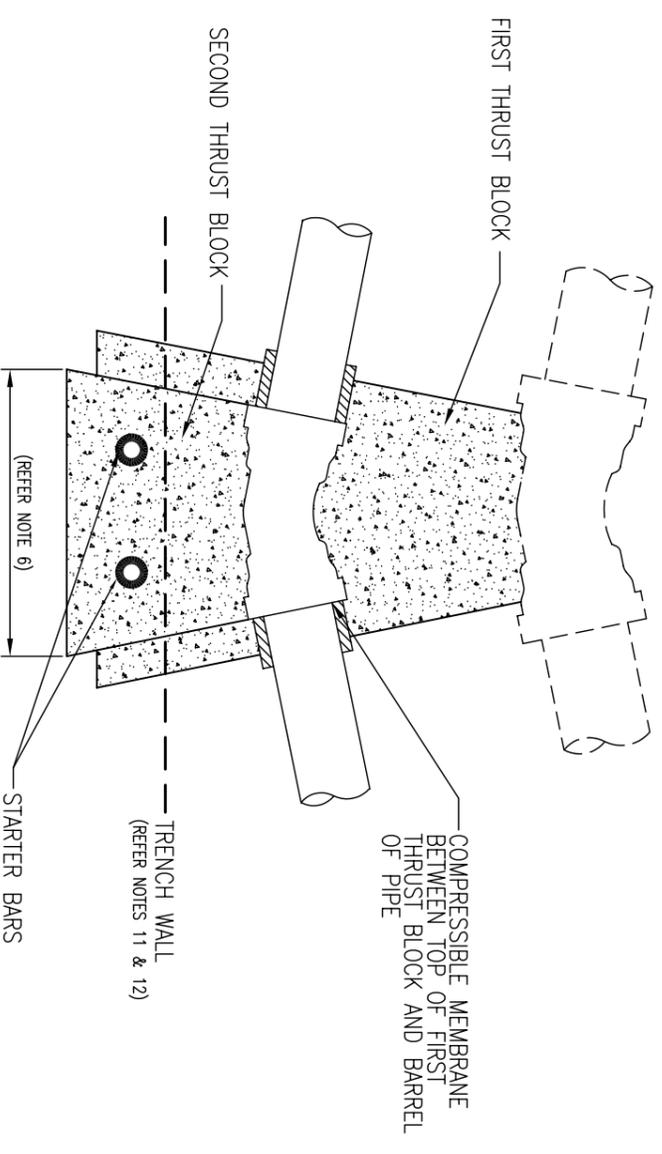
SECTION B-B



LEGEND

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THIS DRAWING APPLIES TO NON-JOINT RESTRAINED PIPELINES.
3. THE MAIN ON THE OUTSIDE OF THE BEND IS THE HIGHER MAIN.
4. MAINTAIN MAXIMUM PIPE COVERS BY DEEPENING THE TRENCH.
5. THIS DRAWING TO BE READ IN CONJUNCTION WITH WAT-1205.
6. DETERMINE THE SEPARATE THRUST AREA FOR EACH WATER MAIN (DRINKING AND RECYCLED) UNLESS A SPECIAL DESIGN IS PREPARED AND ITS USE AUTHORISED.
7. WHERE THRUST BLOCKS ARE CAST ONE ON TOP OF THE OTHER, SEPARATE USING 0.4 MINIMUM THICK PE SHEET.
8. EMBEDMENT, TRENCH FILL AND COMPACTION SHALL MEET THE REQUIREMENTS OF WSA 03 PART 3 AND THE ROAD OWNER AND WATER AGENCY AS APPROPRIATE.
9. MAINTAIN MINIMUM CLEARANCES BETWEEN MAINS AND OTHER SERVICES IN ACCORDANCE WITH TABLE 4.1 OF WSA 03.
10. WHERE BOTH D1 AND D2 ARE  $\leq$  DN 200, MAINTAIN 300 MINIMUM CLEARANCE BETWEEN MAINS EXCEPT WHERE ONE OR BOTH OF MAINS ARE  $>$  DN 200 MINIMUM 450 CLEARANCE.
11. DESIGN AND CAST THRUST BLOCKS TO TRANSFER THRUST TO UNDISTURBED STRATA, CLEAR OF OTHER SERVICES.
12. REBATE THRUST BLOCKS INTO TRENCH WALL. REFER TO WAT-1205.
13. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.



THRUST BLOCK DETAIL

(REFER NOTE 2)



WATER SERVICES ASSOCIATION  
of Australia

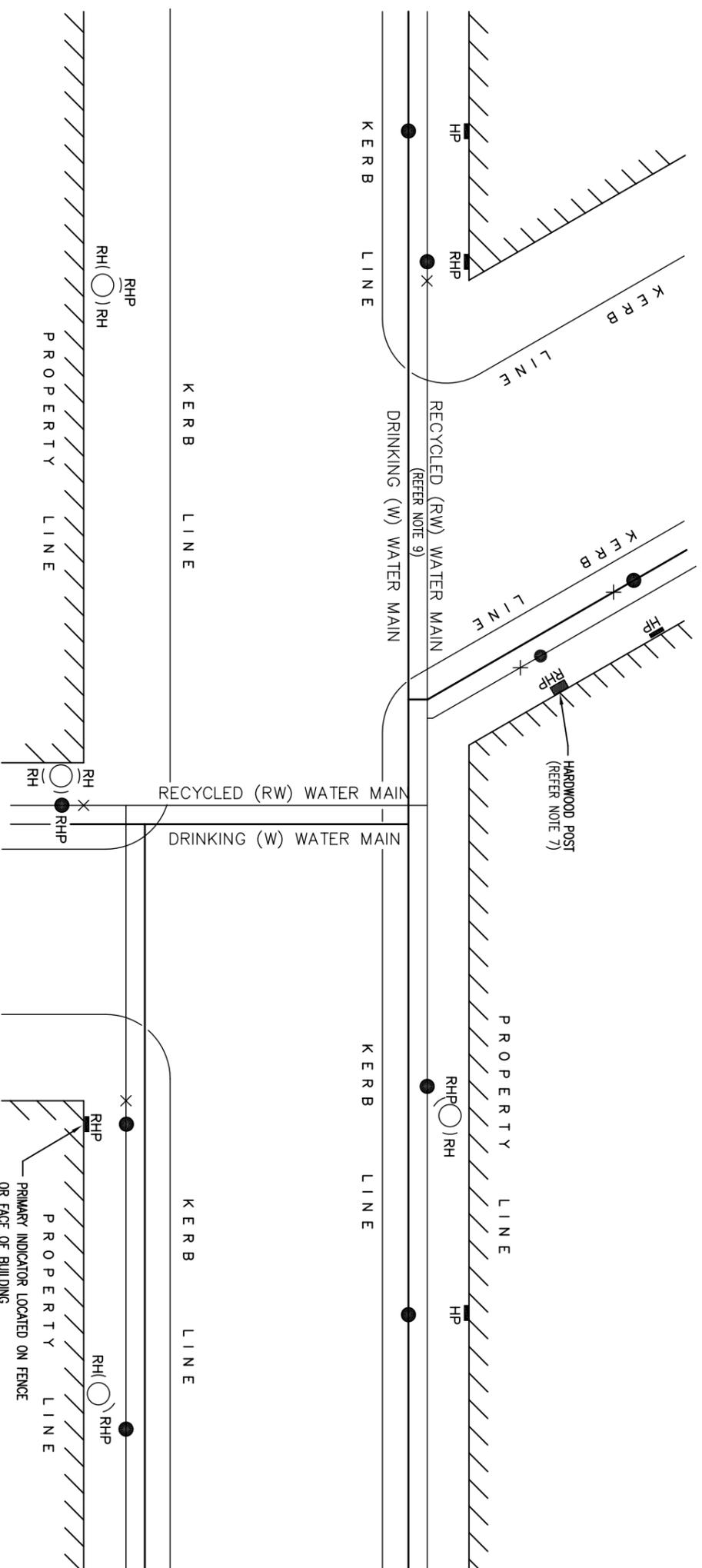
WATER SUPPLY CODE OF AUSTRALIA

THRUST BLOCK DETAILS  
CONCRETE THRUST BLOCKS FOR  
ADJACENT DUAL WATER MAINS

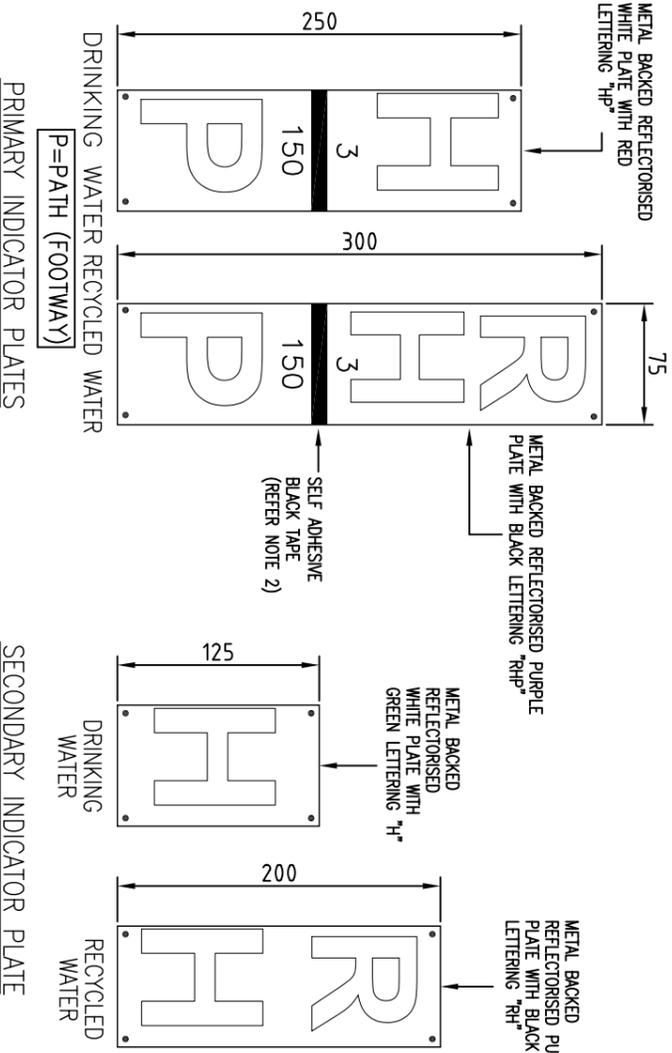
NOT TO SCALE

WAT-1811

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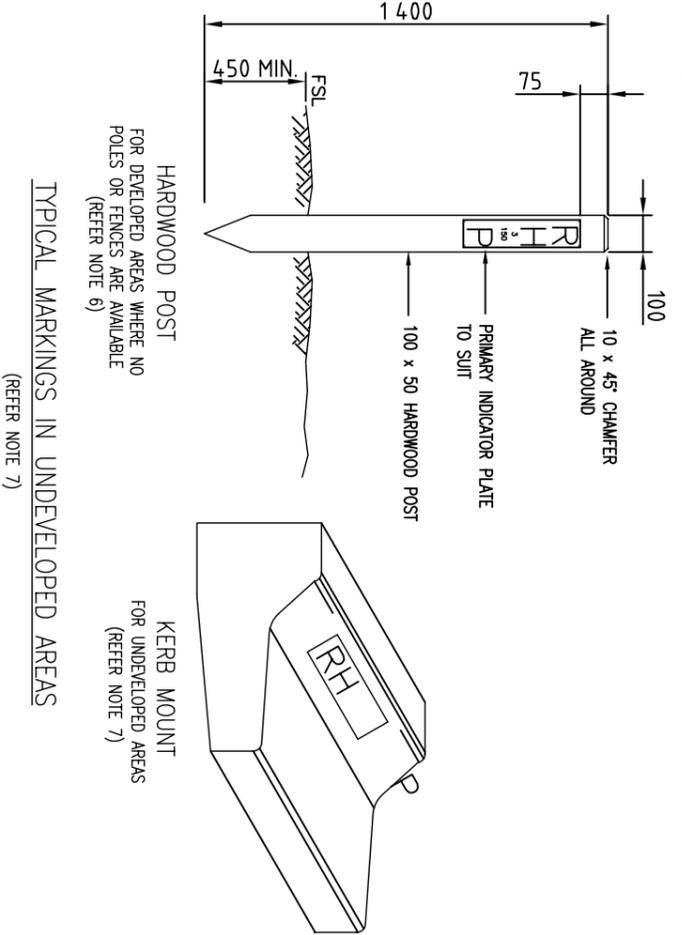


TYPICAL POSITIONING OF HYDRANT INDICATOR PLATES IN DEVELOPED AREAS (REFER NOTE 2)



TYPICAL PLATE ARRANGEMENTS

MAY BE FIXED TO POLE, POST, FENCE OR BUILDING (REFER ALSO WAT-1300)



TYPICAL MARKINGS IN UNDEVELOPED AREAS (REFER NOTE 7)

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. MARKING OF HYDRANTS IN DEVELOPED AREAS.  
PLACE INDICATOR PLATE SUCH THAT IT FACES DIRECTION OF HYDRANT.  
PRIMARY INDICATORS  
PUNCH PRIMARY INDICATOR PLATES WITH TWO SETS OF NUMBERS. TOP NUMBER TO GIVE DISTANCE IN METRES FROM PLATE TO HYDRANT, AND BOTTOM NUMBER TO GIVE NOMINAL SIZE OF MAIN ON WHICH HYDRANT IS LOCATED.  
APPLY SELF ADHESIVE BLACK TAPE TO PLATE BETWEEN THE TWO PUNCHED NUMBERS IF HYDRANT IS ON OPPOSITE SIDE OF ROAD. RETURN INDICATOR TAPE AROUND EDGES OF PLATE WHERE PRACTICABLE.
3. PLACE BOTH PRIMARY AND SECONDARY INDICATORS 2100 ABOVE GROUND LEVEL.  
POSITION INDICATORS ABOVE RATHER THAN BELOW 2100 IF AN OBSTACLE PREVENTS FIXING AT SPECIFIED HEIGHT.  
ALL INDICATORS ON ONE POLE TO BE AT ONE HEIGHT.
4. PUNCH PLATES ON HARD METAL SURFACE WITH 12 HIGH DIE STAMPS BEFORE PLATES ARE ATTACHED TO POLE.  
TAKE CARE NOT TO PUNCH STAMP THROUGH PAINTED SURFACE OF PLATE TO BARE METAL.
5. WHERE IT IS NOT POSSIBLE TO USE METAL PLATE INDICATORS, USE SELF ADHESIVE INDICATORS.
6. IN AREAS WHERE HYDRANT INDICATORS CANNOT BE PLACED ON POLES, PLACE A PRIMARY INDICATOR DIRECTLY OPPOSITE THE HYDRANT ON:  
(i) A PROPERTY BOUNDARY FENCE OF FACE OF A BUILDING ON THE PROPERTY BOUNDARY, OR  
(ii) A WHITE HARDWOOD POST (WHERE THERE ARE NO FENCES) ON THE PROPERTY BOUNDARY LINE.
7. MARKING OF HYDRANTS IN UNDEVELOPED AREAS  
IF POWER OR LIGHT POLES ARE NOT AVAILABLE, PROVIDE PRIMARY INDICATORS ON HARDWOOD POSTS (SEE NOTE 6) AND PROVIDE KERB MARKINGS AS SECONDARY INDICATORS.  
PLACE KERB MARKING ON NEAREST KERB, DIRECTLY OPPOSITE THE FITTING.  
IF FITTING IS BEHIND THE KERB USE MARKING "HP/RHP" OR IF IN FRONT USE "HR/RHR".  
KERB MARKINGS TO BE IN LETTERS OF APPROXIMATELY 100 HIGH, NEATLY CHASED (CUT) INTO KERB AND PAINTED USING AN APPROVED ROAD MARKING PAINT.  
LETTER GROOVES TO BE AT LEAST 3 DEEP AND 5 WIDE.
8. LOCATE HYDRANTS FOR FIRE FIGHTING ON RECYCLED WATER MAINS. HYDRANTS ON DRINKING WATER MAINS MAY ALSO BE USED FOR FIRE FIGHTING.
9. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.

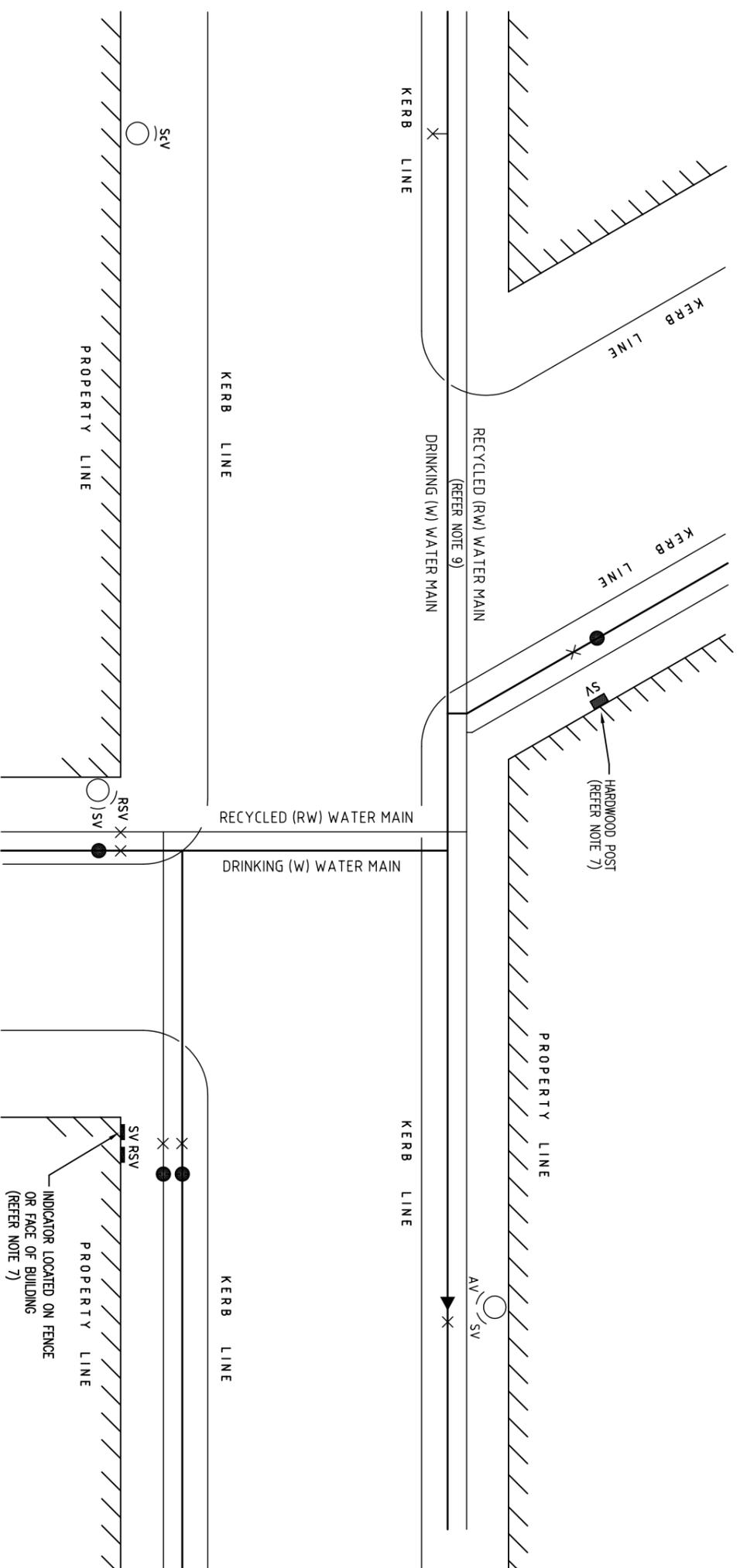


WATER SUPPLY CODE OF AUSTRALIA  
HYDRANT IDENTIFICATION  
IDENTIFICATION MARKERS  
AND MARKER POSTS

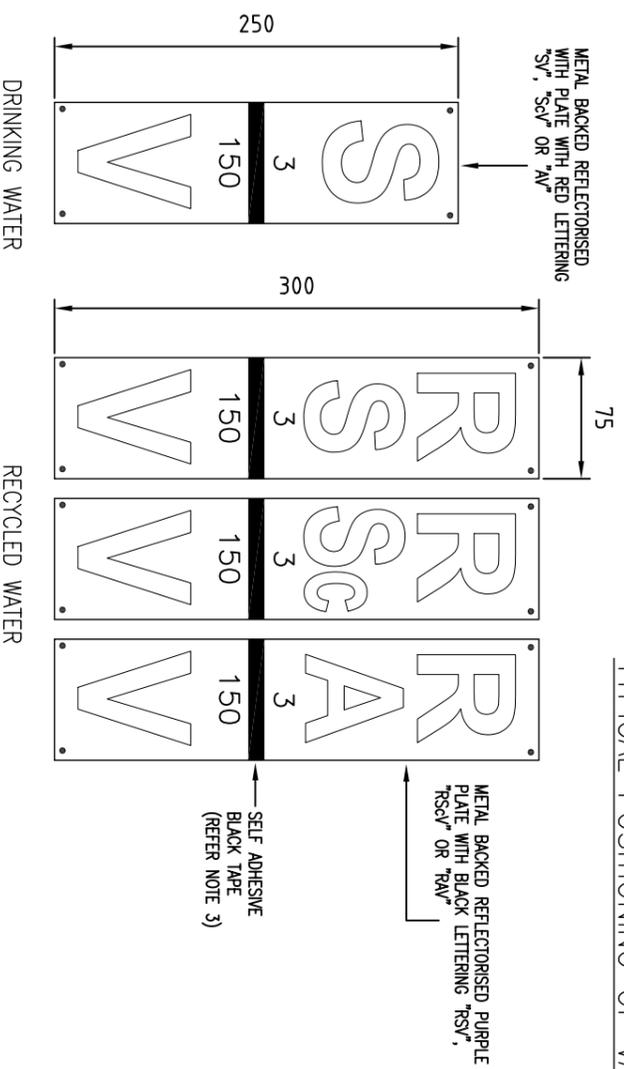
NOT TO SCALE  
WAT-1820  
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**NOTES**

1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. THE PROCEDURES DETAILED APPLY TO INDICATOR PLATES FOR STOP VALVES, SCOUR VALVES AND AIR VALVES.
3. **MARKING OF VALVES IN DEVELOPED AREAS**  
PLACE INDICATOR PLATE SUCH THAT IT FACES DIRECTION OF THE VALVE.  
**PRIMARY INDICATORS**  
PUNCH PRIMARY INDICATOR PLATES WITH TWO SETS OF NUMBERS TOP NUMBER TO GIVE DISTANCE IN METRES FROM PLATE TO VALVE AND THE BOTTOM NUMBER TO GIVE NOMINAL SIZE OF MAIN ON WHICH THE VALVE IS LOCATED.  
APPLY SELF ADHESIVE BLACK TAPE TO PLATE BETWEEN THE TWO PUNCHED NUMBERS IF VALVE IS ON OPPOSITE SIDE OF ROAD TO PLATE. RETURN INDICATOR TAPE AROUND EDGES OF PLATE WHERE PRACTICABLE.  
**SECONDARY INDICATORS**  
USE SECONDARY INDICATORS IN CASES WHERE PRIMARY INDICATOR CANNOT BE SEEN FROM A VEHICLE TRAVELLING ALONG A STREET IN A PARTICULAR DIRECTION.  
SECONDARY INDICATORS TO FACE EACH DIRECTION OF APPROACH FROM WHICH THE PRIMARY CANNOT BE SEEN.
4. PLACE INDICATOR PLATES 2100 ABOVE GROUND LEVEL.  
POSITION INDICATORS ABOVE RATHER THAN BELOW 2100 IF AN OBSTACLE PREVENTS FIXING AT SPECIFIED HEIGHT.  
ALL INDICATORS ON ONE POLE TO BE AT ONE HEIGHT.
5. PUNCH PLATES ON HARD METAL SURFACE WITH 12 HIGH DIE STAMPS BEFORE PLATES ARE ATTACHED TO POLE.  
TAKE CARE NOT TO PUNCH STAMP THROUGH PAINTED SURFACE OF PLATE TO BARE METAL.
6. WHERE IT IS NOT POSSIBLE TO USE METAL PLATE INDICATORS, USE APPROVED SELF ADHESIVE INDICATORS.
7. IN AREAS WHERE VALVE INDICATORS CANNOT BE PLACED ON POLES, PLACE A PRIMARY INDICATOR DIRECTLY OPPOSITE THE VALVE AN ON:  
(i) A PROPERTY BOUNDARY FENCE OR FACE OF A BUILDING ON THE PROPERTY BOUNDARY, OR  
(ii) A WHITE HARDWOOD POST (WHERE THERE ARE NO FENCES) ON THE PROPERTY BOUNDARY LINE.
8. **MARKING OF VALVES IN UNDEVELOPED AREAS**  
IF POWER OR LIGHT POLES NOT AVAILABLE, PROVIDE PRIMARY INDICATORS ON HARDWOOD POSTS (SEE NOTE 7) AND PROVIDE KERB MARKINGS AS SECONDARY INDICATORS.  
PLACE KERB MARKING ON NEAREST KERB, DIRECTLY OPPOSITE THE FITTING.  
KERB MARKINGS TO BE IN LETTERS OF APPROXIMATELY 100 HIGH NEATLY CHASED (CUT) INTO KERB AND PAINTED USING AN APPROVED ROAD MARKING PAINT.  
LETTER GROOVES TO BE AT LEAST 3 DEEP AND 5 WIDE.
9. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.

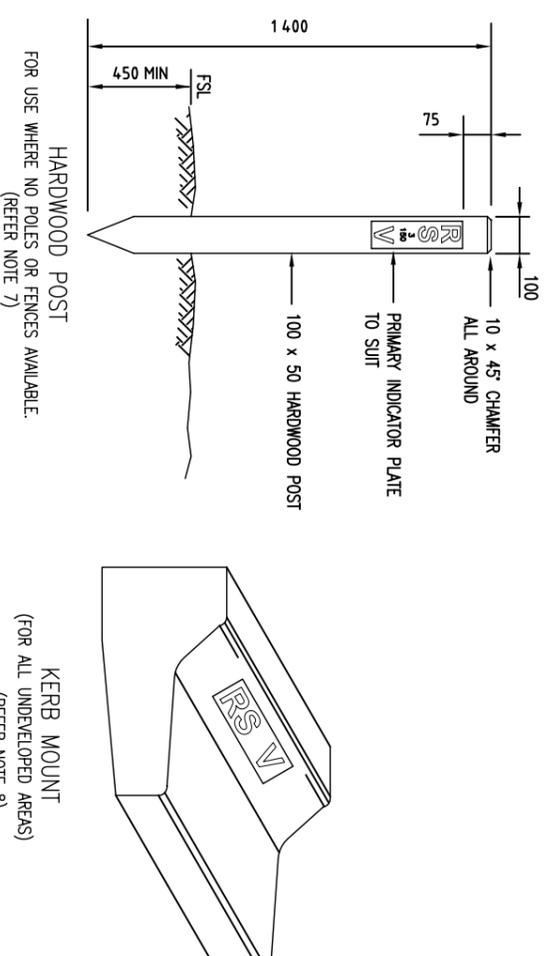


**TYPICAL POSITIONING OF VALVE INDICATOR PLATES IN DEVELOPED AREAS**  
(REFER NOTE 2)

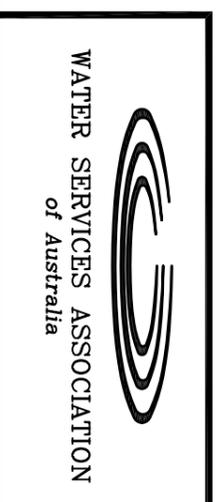


**TYPICAL PLATE ARRANGEMENTS**

MAY BE FIXED TO POLE, KERB, FENCE OR BUILDING  
(REFER ALSO WAT-1300)

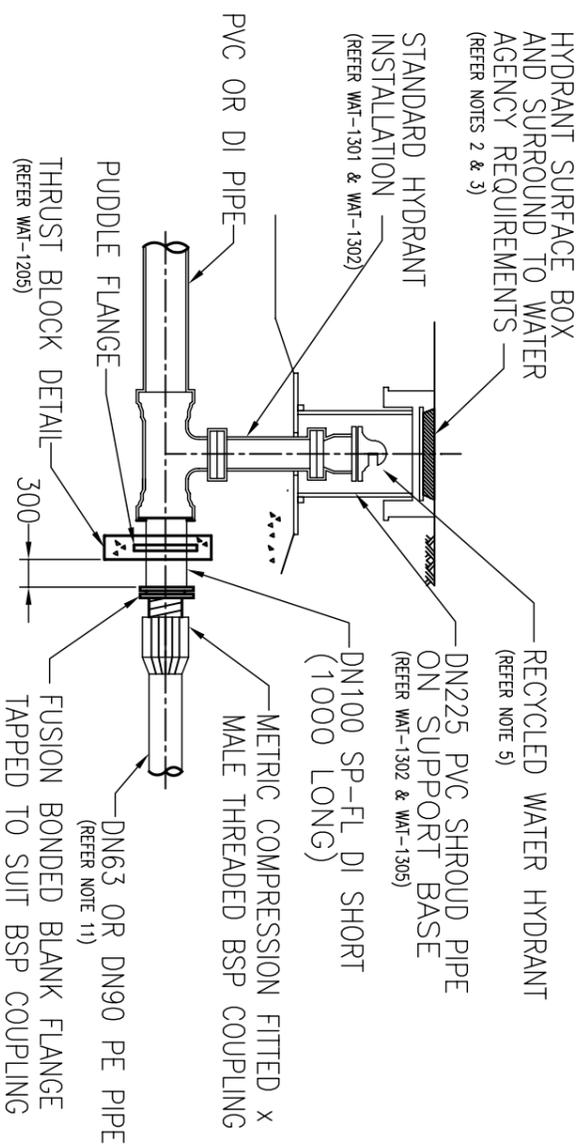


**TYPICAL MARKINGS IN UNDEVELOPED AREAS**  
(REFER NOTE 8)

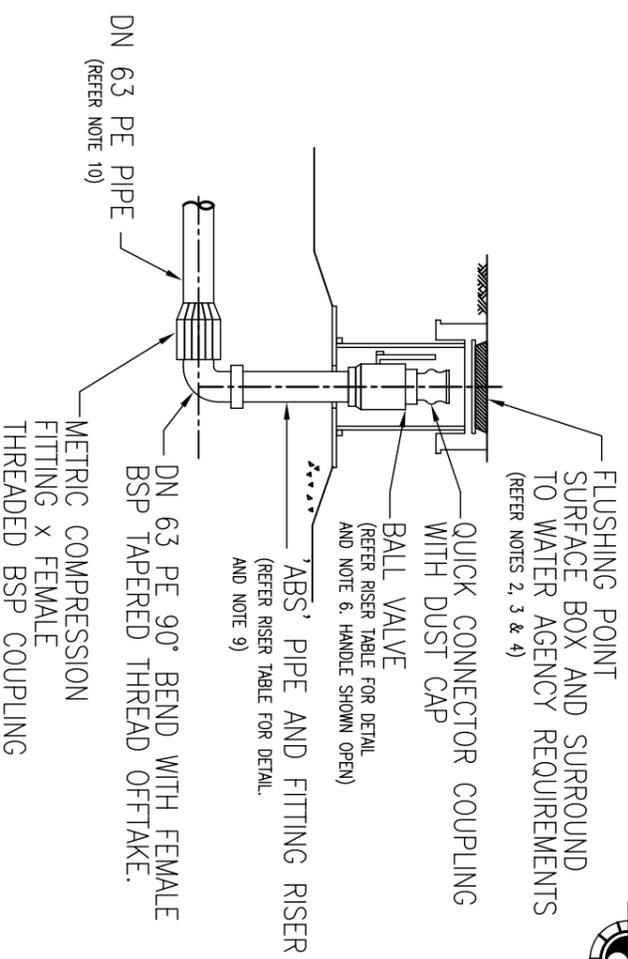


**WATER SUPPLY CODE OF AUSTRALIA**  
VALVE IDENTIFICATION  
IDENTIFICATION MARKERS  
AND MARKER POSTS

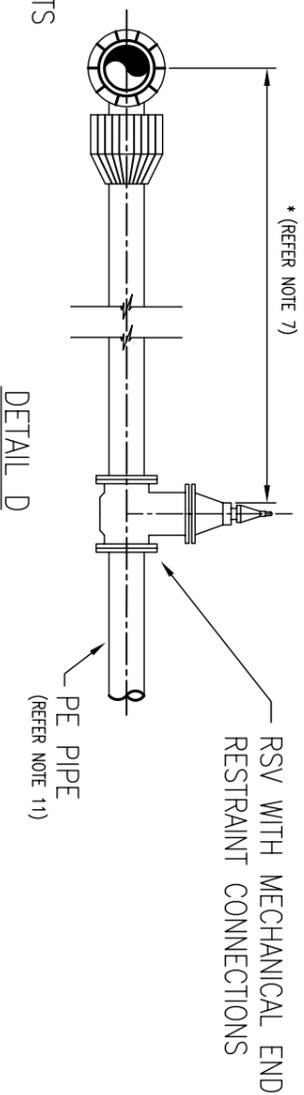
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**DETAIL A**  
**IN-LINE CONNECTION DN 63 & DN 90 PE PIPE**  
 (DRINKING AND RECYCLED WATER)  
 (FOR ALTERNATIVE DETAIL SEE WAT-1104)



**DETAIL B**  
**IN-LINE VALVE AND FLUSHING POINT**  
 (DRINKING AND RECYCLED WATER)  
 (MAY BE USED AS TEMPORARY END-OF-LINE VALVE AND FLUSHING POINT - WITH END CAP)  
 (REFER DETAIL C AND NOTE 9)



**DETAIL C**  
**FLUSHING POINT AT END OF LINE AND BOWL OF CUL-DE-SAC**  
 (DRINKING & RECYCLED WATER)  
 (FOR ALTERNATIVE DETAIL USING ALL PE PIPE & FITTINGS SEE WAT-1104)

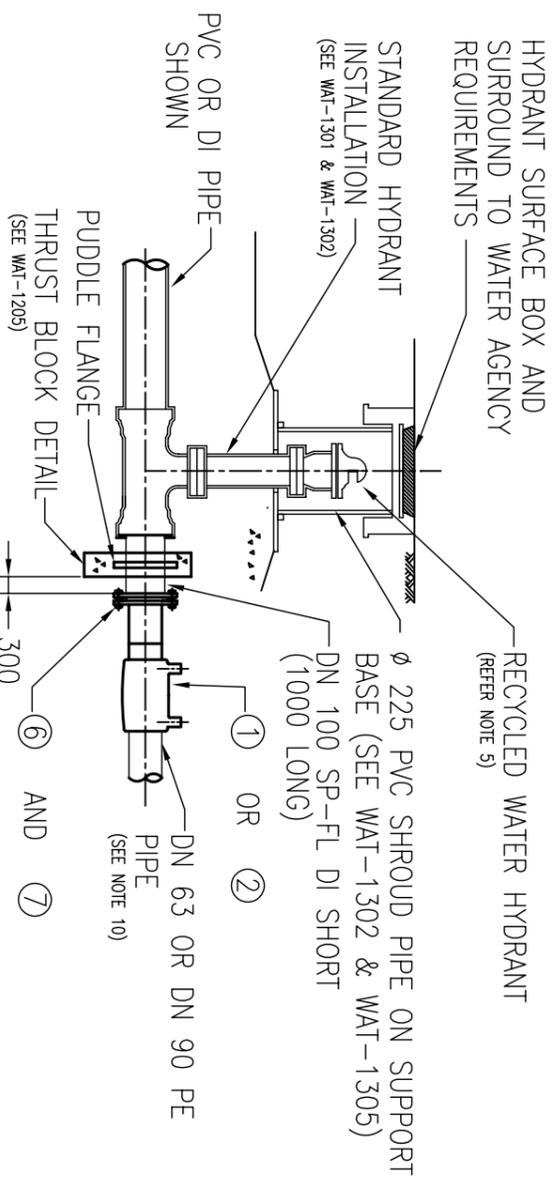
**DETAIL D**  
**PE TEE AND IN-LINE VALVE**

**ABS RISER COMPONENTS FOR DN 63 FLUSHING POINT**  
 (REFER NOTES 8 & 9)

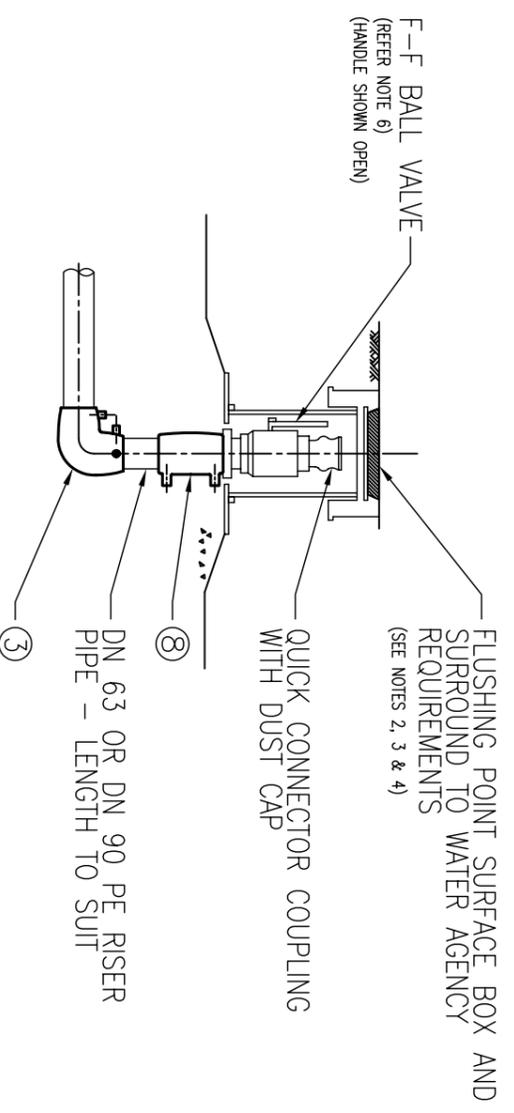
COMPONENT	ITEM	(ALL DIMENSIONS IN INCHES)
BASE	2 BSP THREADED MALE ADAPTOR	
BUSH	2 x 1/2 REDUCING BUSH	
RISER	1/2 CLASS T PIPE (REFER NOTE 10)	
TOP	1/2 BSP THREADED ADAPTOR F/M	
BALL VALVE	1/2 RESILIENT SEATED BALL VALVE TO AS 4796 WITH 316 SS SPINDLE, NUT AND HANDLE	

**NOTES:**

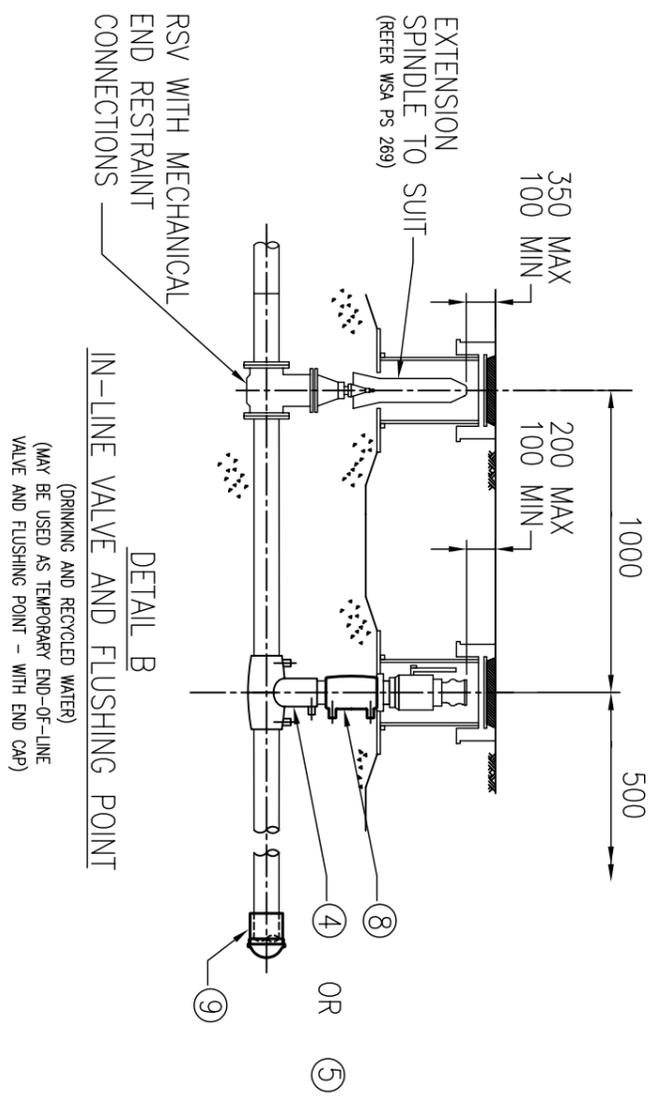
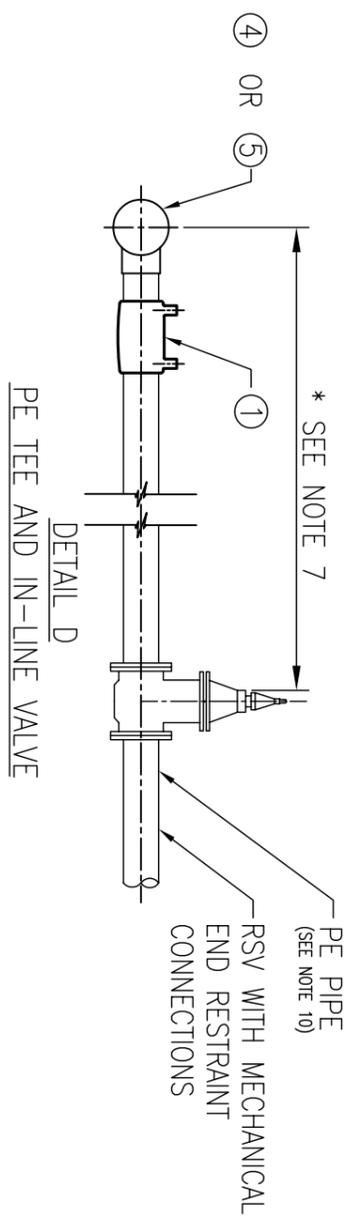
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. REFER TO WAT-1305 AND WAT-1306 FOR ADDITIONAL DETAILS.
3. SURFACE BOX SURROUND TO BE PAINTED WITH PURPLE ROAD MARKING PAINT TO MATCH AS 2700 COLOURS AS FOLLOWS:  
 - NO DARKER THAN P24 JACARANDA OR P12 PURPLE; AND  
 - NO LIGHTER THAN P23 LILAC.
4. REFER TO WAT-1825. DN 375 COVERS TO WSA PS-291RW MAY BE SUITABLE FOR FLUSHING POINTS.
5. RECYCLED WATER HYDRANT TO WSA PS-267RW.
6. FIT THE FLUSHING POINT VALVE IN SUCH A WAY AS TO PREVENT MOVEMENT OR ROTATION OF THE VALVE BODY AND PROVIDE A SUITABLE PLUG OR CAP TO KEEP OUT DIRT AND GRAVEL.
7. SELECT THIS DIMENSION TO ALIGN THE RESILIENT SEATED VALVE (RSV) WITHIN THE FOOTWAY TANGENTIAL TO THE LOT FRONT BOUNDARY.
8. ABS RISER COMPONENTS LISTED ARE BASED ON INCH SERIES PRODUCTS BECAUSE OF AVAILABILITY; EQUIVALENT METRIC PRODUCTS COULD BE USED.
9. USE SUFFICIENT LENGTH OF RISER PIPE TO SUIT THE INSTALLATION DEPTH.
10. 300 LONG FOR STANDARD 600 COVER.
11. INSTALLATION OF PE PIPE AND FITTINGS TO WSA 01.



DETAIL A  
IN-LINE CONNECTION FOR DN 63 & DN 90 PE PIPE  
(DRINKING AND RECYCLED WATER)  
(FOR ALTERNATIVE DETAIL SEE WAT-1104)



DETAIL C  
FLUSHING POINT AT END OF LINE AND BOWL OF CUL-DE-SAC  
(DRINKING AND RECYCLED WATER)



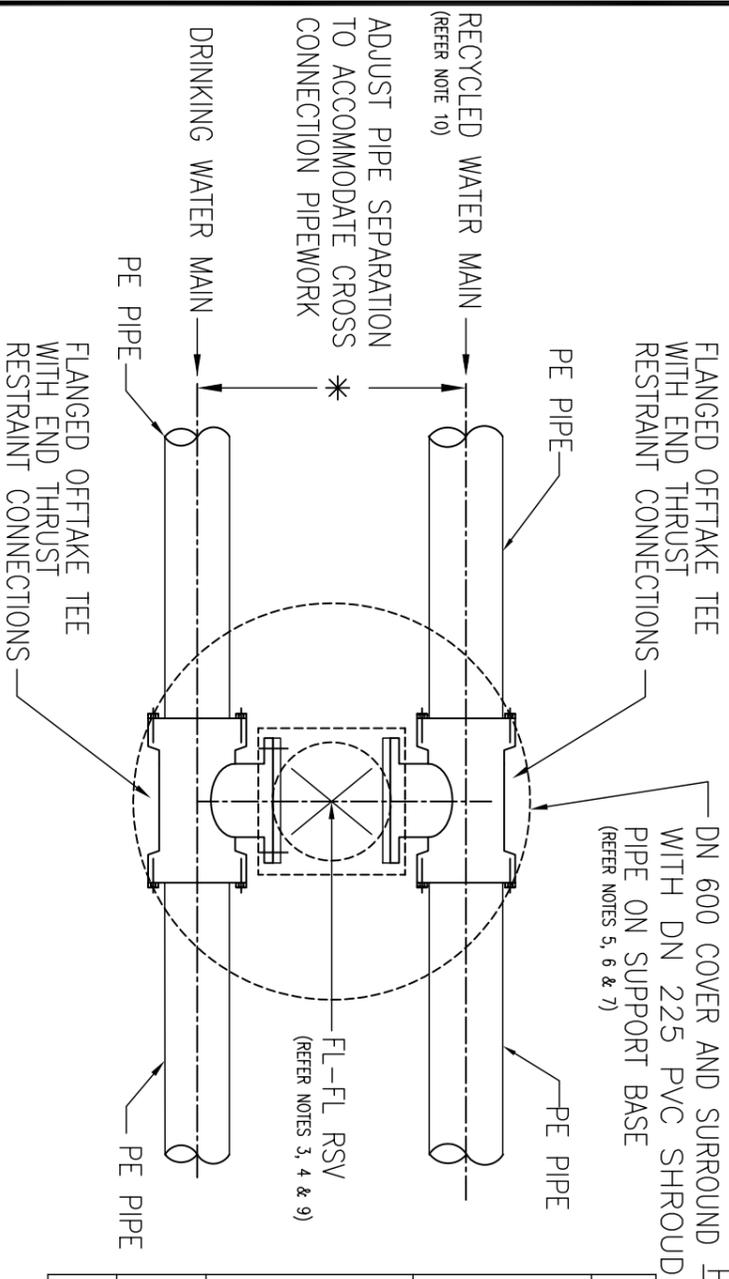
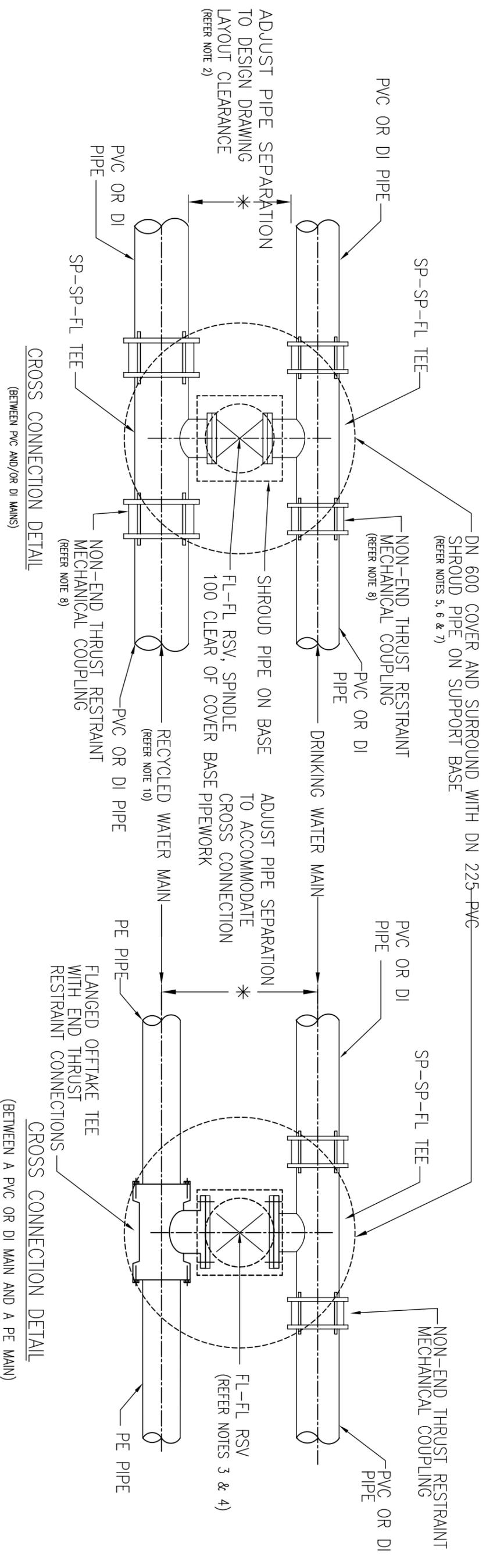
DETAIL B  
IN-LINE VALVE AND FLUSHING POINT  
(DRINKING AND RECYCLED WATER)  
(MAY BE USED AS TEMPORARY END-OF-LINE VALVE AND FLUSHING POINT - WITH END CAP)

ITEM	COMPONENT	SIZES (NOTE 11)
①	EF COUPLING	90
②	EF REDUCING COUPLINGS	90x63
③	EF ELBOWS (BENDS) 90°	90, 63
④	EF TEES	90x90x90, 63x63x63
⑤	EF REDUCING TEES	90x63x90
⑥	PE STUBE FLANGE	90
⑦	STAINLESS STEEL BACKING RING	90
⑧	EF TRANSITION COUPLING- MALE DZ BRASS BSP OUTLET	63X50, 63X40
⑨	EF END CAP (PLUG)	90, 63

- PE COMPONENTS FOR HYDRANT AND FLUSHING POINT ARRANGEMENTS (SEE NOTES 8 & 9)
- NOTES :
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
  2. REFER TO WAT-1305 AND WAT-1306 FOR ADDITIONAL DETAILS.
  3. SURFACE BOX SURROUND TO BE PAINTED WITH PURPLE ROAD MARKING PAINT TO MATCH AS 2700 COLOURS AS FOLLOWS:  
- NO DARKER THAN P24 JACARANDA OR P12 PURPLE; AND  
- NO LIGHTER THAN P23 LIAC.
  4. DN375 COVERS TO WSA PS-291RW MAY BE SUITABLE FOR FLUSHING POINTS.
  5. RECYCLED WATER HYDRANT TO WSA PS-267RW.
  6. FIT THE FLUSHING POINT VALVE IN SUCH A WAY AS TO PREVENT MOVEMENT OR ROTATION OF THE VALVE BODY AND PROVIDE A SUITABLE PLUG OR CAP TO KEEP OUT DIRT AND GRAVEL.
  7. SELECT THIS DIMENSION TO ALIGN THE RESILIENT SEATED VALVE (RSV) WITHIN THE FOOTWAY TANGENTIAL TO THE LOT FRONT BOUNDARY.
  8. PE FITTINGS TO WSA PS-208.
  9. USE SUFFICIENT LENGTH OF RISER PIPE TO SUIT THE INSTALLATION DEPTH. DO NOT USE COIL PIPE.
  10. INSTALLATION OF PE PIPE AND FITTINGS TO WSA 01.
  11. FOR FULL RANGE OF PE FITTINGS SEE MANUFACTURER CATALOGUES.



WATER SUPPLY CODE OF AUSTRALIA	NOT TO SCALE
	WAT-1823
TYPICAL APPURTANCE INSTALLATION HYDRANT, VALVE AND FLUSHING INSTALLATION ON PE MAINS USING ELECTROFUSION FITTINGS	© WSA. 2004 V1.1



PRODUCT DETAILS FOR TEMPORARY CROSS CONNECTIONS

PRODUCTS	TYPE AND APPLICATION	PURCHASE SPECIFICATIONS
MECHANICAL COUPLINGS	NON-END THRUST RESTRAINT FOR USE WITH DI AND PVC PIPES	WSA PS-270
	END THRUST RESTRAINT FOR USE WITH PE AND PVC PIPES	WSA PS-271
TEES	NON-END THRUST RESTRAINT FOR USE WITH DI AND PVC PIPES	WSA PS-201 WSA PS-212
	END THRUST RESTRAINT FOR USE WITH PE AND PVC PIPES	WSA PS-273
	RESILIENT SEATED FL-FL, FL-SOC, SOC-SOC, SP-SP	WSA PS-270
ACCESS COVERS	DN 600 AND DN 375	WSA PS-291

- NOTES:
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
  2. ADJUST PIPE SEPARATION OVER 12000 OR LESS I.E. APPROXIMATELY TWO PIPE LENGTHS FOR STANDARD LENGTH 6000 PVC AND DI PIPES. REFER TO CLAUSE 4.10.5.2, TABLE 4.1 AND FIGURE 4.4 OF WSA 03. FOR PE PIPE DO NOT USE A BEND RADIUS OF LESS THAN 33 x PIPE OD.
  3. OTHER RESILIENT SEATED VALVE (RSV) END CONFIGURATIONS MAY BE USED DEPENDENT ON THE SEPARATION DISTANCE BETWEEN THE MAINS AND ANCHORAGE ARRANGEMENTS.
  4. LOCATE THE TOP OF THE SPINDLE CAP AT LEAST 150 BELOW THE UNDERSIDE OF THE ACCESS COVER.
  5. REFER TO WAT-1305 AND WAT-1306 FOR ADDITIONAL DETAILS.
  6. PAINT ACCESS COVER SURROUND WITH PURPLE ROAD MARKING PAINT TO MATCH AS 2700 COLOURS AS FOLLOWS:  
- NO DARKER THAN P24 JACARANDA OR P12 PURPLE; AND  
- NO LIGHTER THAN P23 ULAC.
  7. DN 375 ACCESS COVERS TO WSA PS-291RW MAY BE SUITABLE FOR CROSS CONNECTION RSVs.
  8. END THRUST RESTRAINT MECHANICAL COUPLINGS MAY ALSO BE USED WITH PVC PIPES.
  9. MATCH V-FLANGE DRILLINGS OF TEE AND RSV.
  10. RECYCLED WATER MAINS SHOWN FOR NON-DRINKING WATER SUPPLY.



WATER SUPPLY CODE OF AUSTRALIA

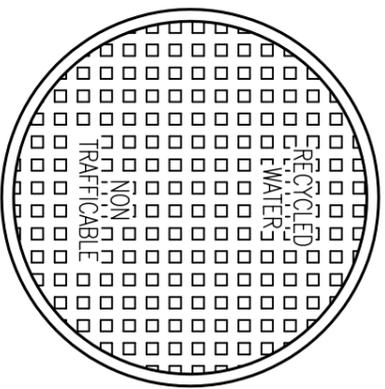
TYPICAL APPURTENANCE INSTALLATION  
TEMPORARY CROSS CONNECTIONS

NOT TO SCALE

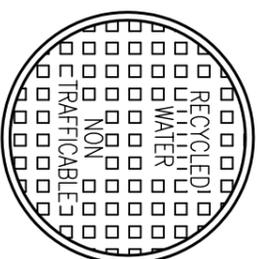
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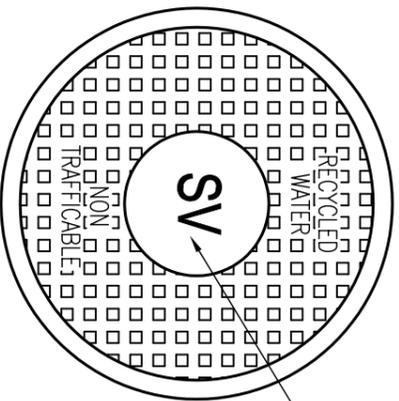
ACCESS COVERS CLASS B



DN 375 ACCESS COVER



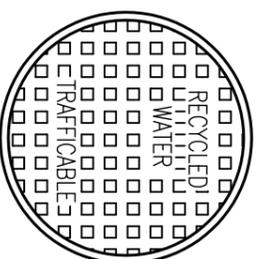
INSERT MARKING TO SUIT  
(REFER NOTE 6)



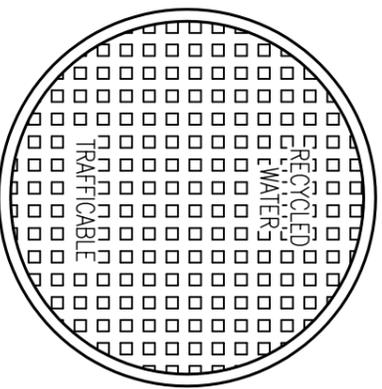
DN 600 ACCESS COVER

NON-TRAFFICABLE SURFACE FITTINGS

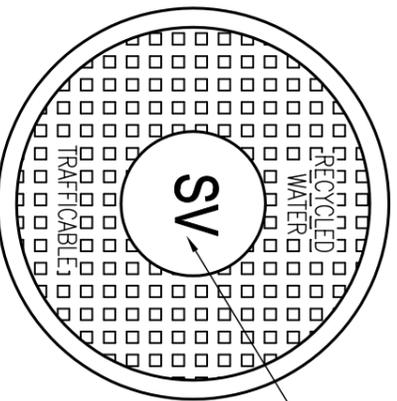
(REFER NOTES 2, 4, 5, 7 & 9)



DN 375 ACCESS COVER



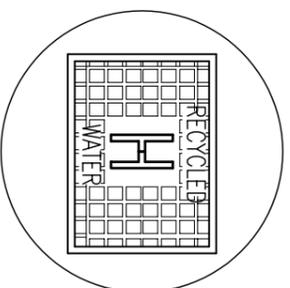
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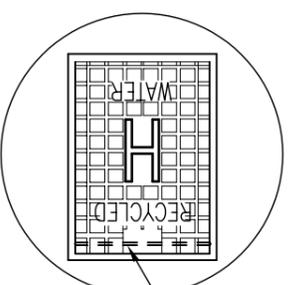
DN 600 ACCESS COVER

ACCESS COVERS CLASSES D AND E

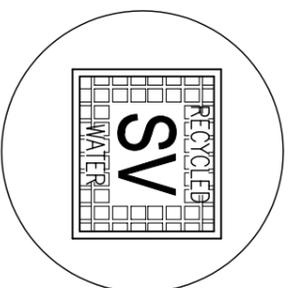
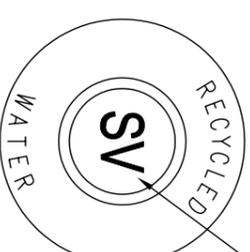
DIRECTION OF TRAFFIC



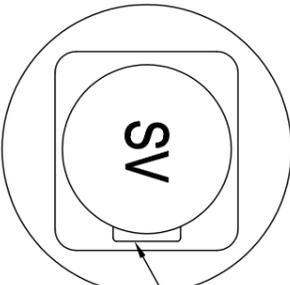
HINGE  
(REFER NOTE 3)



INSERT MARKING TO SUIT  
(REFER NOTE 6)



HINGE  
(REFER NOTE 3)



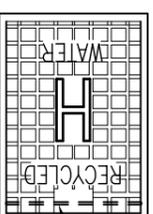
SURFACE BOXES

NOTES :

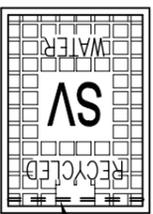
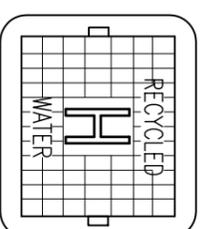
1. ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE NOTED.
2. PAINT ACCESS COVERS AND SURROUNDS AS SPECIFIED BY WATER AGENCY WITH PURPLE ROAD MARKING PAINT TO MATCH AS 2700 COLOURS AS FOLLOWS:
  - NO DARKER THAN P24 JACARANDA OR P12 PURPLE; AND
  - NO LIGHTER THAN P23 LLAC.
3. HINGED COVERS TO CLOSE IN DIRECTION OF ADJACENT ROAD LANE TRAFFIC OR FALL OF LAND AS APPROPRIATE TO THE SITE.
4. SHAPE AND SURFACE FITTING MATERIAL AND SURROUND TO BE AS SPECIFIED BY WATER AGENCY.
5. SURFACE FITTING SURROUNDS NOT REQUIRED IN CONCRETE, PAVED OR BITUMEN SURFACES.
6. INSERT COVER MARKINGS AS FOLLOWS:
 

HYDRANTS	H
ISOLATING RSVs	SV
GROSS CONNECTION RSVs	SV
FLUSHING POINTS	ScV
SCOUR VALVES	ScV
AIR VALVES	AV
7. REFER TO WAT-1301, WAT-1302, WAT-1303 FOR ADDITIONAL DETAILS.
8. REFER TO WAT-1301, WAT-1302, WAT-1304 AND WAT-1306 FOR ADDITIONAL DETAILS.
9. RECYCLED WATER SURFACE FITTINGS SHOWN TO REFLECT THAT RECYCLED WATER IS BEING USED FOR NON-DRINKING WATER SUPPLY.

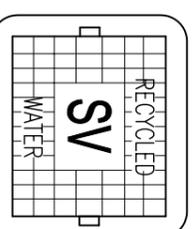
DIRECTION OF TRAFFIC



HINGE  
(REFER NOTE 3)



HINGE  
(REFER NOTE 3)



SURFACE BOXES

TRAFFICABLE SURFACE FITTINGS

(REFER NOTES 2, 4, 8 & 9)



WATER SUPPLY CODE OF AUSTRALIA  
TYPICAL RECYCLED WATER SURFACE FITTINGS,  
MARKING AND COLOUR IDENTIFICATION

NOT TO SCALE

WAT-1825