

CHAPTER 6

WATER SUPPLY

CHAPTER 6

WATER SUPPLY

PART 1 DESIGN

6.1.1 INTRODUCTION

This chapter sets out the basic design principles for the provision of reticulation for the supply of water. While some construction information is included for completeness, detailed information on construction standards will be found in Part 2 of this Chapter.

6.1.2 GENERAL

6.1.2.1 Standards

- a) All lots shall be connected to an approved potable water supply
- b) Where a Council water supply is not available for connection to the proposed development, the developer shall nominate an independent potable water supply for each lot, to the satisfaction of the Director Environment and Policy.

If a communal water supply is to be used to satisfy condition (b), then the consent holder shall:

- (i) Establish to the satisfaction of the Director Environment and Policy that the proposed source of water supply to serve the lots meets the requirements of the New Zealand Drinking Water Guidelines in terms of potability. All costs incurred in establishing this condition are to be met by the applicant;
 - (ii) Create appropriate easements over the proposed source of water supply serving the development as well as over the water supply lines should they pass through adjoining lots;
 - (iii) Submit to Council for approval a comprehensive supply and maintenance agreement which shall address such matters as:
 - Maintenance
 - Continuity of supply
 - Monitoring and costs associated with monitoring to the satisfaction of the Director Environment and Policy.
- c) A backflow preventer shall be installed at the boundary of the lot where required under Clause 6.1.12

6.1.2.2 Design Life

Any water supply system shall have a design life of not less than 50 years for in-ground pipeline components.

6.1.2.3 Level of Service

The water supply reticulation shall be such that a water supply connection can be readily installed outside the lot boundary and at the “front” of each site [ie where the driveway will be installed] for all new allotments within reticulated supply areas in the Whakatane District.

The system shall comply with the current NZ Fire Service “Code of Practice for Fire Fighting Water Supplies”.

All pipes shall conform to PN 12 requirements unless the Engineer expressly approves a lesser standard for low pressure areas or requires a higher class of pipe for an area of higher working pressure.

6.1.2.4 ADDITIONAL RETICULATION REQUIREMENTS

The Council may require the Developer to install a reticulation system with greater capacity than that required for the development, in order to service future areas or to upgrade the present level of service. In such cases, the Council may by agreement negotiate with the Developer and make a financial contribution to the additional cost that may be incurred. Such an agreement shall be made in writing with the Council, preferably before the issue of a Resource Consent, and before the commencement of construction.

6.1.3 FLOW REQUIREMENTS

The system shall provide sufficient water at fire hydrants to comply with the current NZ Fire Service Code of Practice for Fire Fighting Water Supplies for the class of development proposed, plus the daily average domestic demand or any other demands where those in total exceed one-third of the appropriate fire demand. For purely residential subdivisions, this shall be 25 litres per second from each hydrant at a minimum running pressure of 100kPa.

The minimum working residual pressure, in other than fire fighting conditions, shall be 300kPa at the ground level at the house site of every lot. Any reduction below this pressure will require the approval of the Engineer.

For other than residential subdivisions and developments, the developer shall meet the appropriate level of protection as required by SNZ PAS 4509:2003, NZ Fire Service Code of Practice for Fire Fighting Water Supplies.

Where a development is situated in an area where the water main is defined as having a fire fighting capacity, and the water demand for fire fighting purposes for any single building exceeds 25 litres per second, that building shall be provided with a fire fighting system in accordance with the Fire Fighting Code of Practice.

The upgrading of any existing water main to a capacity greater than 25 litres per second for fire fighting purposes shall be at the Developer’s expense, if the feasibility of such is agreed to by the Engineer.

In urban residential areas the following demands should be assumed:

- Average daily requirement /person 240 litres per head per day
- Average number of people per dwelling 3.1
- Number of houses per hectare the maximum allowed by zoning. (May be assumed to be 15 where unknown)
- Peak flow factor Four (4) times daily average flow

Rural, commercial and industrial areas shall be worked out on a case by case basis, subject to the approval of the Engineer.

For design purposes, the Council will provide the details of working pressure if it is available in the zone where the connection to the existing reticulation will be made. Where such details are not available, or if required by the Council, the Developer shall obtain the necessary information by carrying out independent investigations at his own cost.

Where any investigation is required to assess the capacity of the existing system, or to determine the upgrades required to the existing reticulation to supply water to a particular development at the specified level of service, the cost of such investigation shall be borne by the Developer.

6.1.4 RETICULATION LAYOUT

A water main fitted with fire hydrants and service connections to the street frontage of each lot is required on one side of all streets and a rider main with service connection to the street frontage of each lot is required on the opposite side of the street. Mains and rider mains are to be laid in the berm on the standard alignments specified in Standard Drawing R 02.

Dead end water mains are not permitted except with the approval of the Engineer.

Reticulation shall be designed to minimise pipework passing under road surfaces. Rider mains shall be looped so as to serve the maximum number of lots with the minimum number of road crossings. In the case of cul-de-sacs, the rider main will continue on the standard alignment from the end of the larger main around the head of the cul-de-sac and up the other side of the street.

Should an unreasonable length of rider main with no service connection be involved, the Engineer may agree to extra road crossings being provided. In the case of some routes, eg dual carriageways or industrial developments, the Engineer may require mains to be laid on both sides of the street.

6.1.5 ALIGNMENT OF MAINS

The standard position of water mains in the street shall be in the berm in the position shown on Standard Drawing R 02 and shall generally be in straight lines.

Where water mains cannot be laid on the standard alignment, an alternative alignment showing the relative location of all services shall be designed and submitted for approval with the engineering plans.

Water mains that cross roadways shall be at right angles to the carriageway.

6.1.6 INTERSECTIONS

At street intersections, wherever possible, 90 degree tees or 90 degree bends are to be used in preference to 45 degree bends.

6.1.7 RIDER MAINS

All rider mains shall be MDPE of a minimum size of 63mm nominal outside diameter. Rider mains shall be connected to the supply main by means of a tee. Where possible, rider mains shall be fed from both ends, by connection to a larger main. Specific approval from the Engineer will be required if the rider main is not to be fed from both ends.

In this requirement, it is assumed that all service connections will be for normal 20mm internal diameter connections to all lots. Where special provision is to be made for larger supplies, then larger rider mains may be required or special connections made to the principal main in the street. Such cases shall be subject to special approval by the Engineer.

6.1.8 HYDRANTS

No main on which a fire hydrant is installed shall be less than 100mm in diameter.

Hydrants shall generally be located at street intersections and near private accessways and shall be evenly spaced between these points so that the maximum spacing does not exceed 135m. Where special conditions apply, the Engineer may require this spacing to be reduced.

In cul-de-sacs or other terminal streets or rights of way, the last hydrant at the end of the supply main shall be not more than half the maximum approved spacing from the head of the street, and in no case more than 125 metres from the furthest building site on any allotment when measured along the route of travel.

In urban areas, a principal main shall be constructed and a hydrant installed within every private accessway, where required to ensure that every building is within the distance from a hydrant as specified above.

6.1.9 VALVES

Valves shall be placed on all branches of each tee or cross and shall be sited adjacent to the flanged tee or cross or at such other location as may be directed. Valves shall be located clear of the carriageway.

The spacing of line valves on principal mains in any street shall not exceed 500m. Where possible, not more than 40 consumers on a main or rider main shall be isolated should the supply be shut down for maintenance purposes. Individual branch mains are to be valved at the tee or cross and all sections of inter-connecting mains and riders are to be provided with isolation valves at each end. In no case shall more than three valves be required to isolate any section of the reticulation.

6.1.10 DEPTH OF MAINS

The minimum depth of mains from the finished surface level to the top of the pipe shall be as shown in Table 6.2 below except where special protection is provided to the main, with the approval of the Engineer.

Table 6.2: Depths of Water Mains

Table 6.2: Depth of Mains		
Location	Minimum Depth of Mains from Finished Surface Level to Top of Pipe (mm)	Maximum Depth of Mains from Finished Surface Level to Top of Pipe (m)
Under grass berms and footpaths	600	1.00
Under carriageways	750	1.20
Service pipes in all cases	500	

Note: Service pipes shall not be deeper than 500mm, nor be shallower than 160mm, at the property boundary.

In cases where there are practical difficulties in complying with the above requirements, the Engineer's approval may be given to change the minimum and maximum depths set out above.

6.1.11 ANCHOR AND THRUST BLOCKS

Cast in-situ thrust blocks shall be provided at all bends, sluice valves, tees, and crosses. All thrust blocks shall be poured against trimmed natural ground and placed in such a way that access to and removal of any bolts on adjacent fittings is unimpaired.

All sluice valves shall be provided with anchorage in accordance with Standard Drawing WS 01.

Special requirements apply to the anchoring of uPVC lines and Developers should refer to the manufacturer's specification for these.

6.1.12 SERVICE PIPES AND CONNECTIONS

Note: All sizes refer to internal diameter.

Service connections will normally be provided by the subdivider. In subdivisions where extensions to the existing reticulation system are not required, the service connections will be installed by Council after the Developer has made application and paid the relevant fees.

Where service connections are required, the following Standards shall apply:

- Except for special large connections, all lots shall be provided with a 20mm internal diameter service connection connected to the main by means of a tapping band of approved proprietary type as shown on Standard Drawing WS 05 or WS 06.
- All rear lots shall be individually serviced by connection to the street frontage with the connection points located offset from the right of way so as to be clear of the vehicle crossing, except in accordance with the options as set out in Standard Drawing WS 14.
- All service connections shall terminate with a 20mm manifold. Valves shall be enclosed in a meter box in accordance with Standard Drawing WS 05 or WS 06. The installation of water meters will be carried out by the Council.
- All connections, other than urban residential connections which are used solely for normal domestic supply, shall be provided with an approved backflow preventor.

- The type of backflow preventer to be installed shall be appropriate to the on-site occupation or usage and shall meet the requirements for High, Medium and Low risk hazards as set out in Table 1 of Acceptable Solution G12/AS1 of the NZ Building Code.
- Where a private water supply serves more than one lot and it is used for purposes in addition to normal domestic usage (eg stock watering), back flow prevention complying with the NZ Building Code and the Water Supply Protection Regulations shall be installed, to ensure that no cross-contamination can occur in the supply.

6.1.13 HYDRANT FLOW TESTS

Following completion of the pipe test and connection to the main supply, the subdivider shall provide certification from an independent authority (eg Fire Service) that each hydrant meets the required minimum flow for 95% of the time.

6.1.14 AIR AND SCOUR VALVES

All high points on mains and rider mains shall be provided with a 20mm service connection and valve mounted vertically and enclosed in a surface box for the purpose of air release. Approved scour points shall be provided where directed by the Engineer. Notwithstanding the gradients of mains to be laid, all rider mains shall have one such scour point for the purpose of flushing the line.

6.1.15 INDICATION

The position of all sluice valves and hydrants shall be indicated by means of approved markers as set out in Clause 6.2.9 and in accordance with Standard Drawing WS 04.

PART 2 MATERIALS AND CONSTRUCTION

6.2.1 WATER MAINS

All water mains and service connections shall conform to PN12 requirements.

Mains shall be laid using uPVC unplasticized Polyvinylchloride (Series 2) or PVC-M (Series 2).

In special cases, Medium Density Polyethylene [MDPE] pipe may be used, subject to the approval of the Engineer.

uPVC pipes shall comply with the requirements of AS/NZS 1477 : 1999 – “PVC Pipes and Fittings for Pressure Applications” Series 2

PVC-M pipes shall comply with AS/NZS 4765 : 2000 Series 2 -.”Modified PVC [PVC-M] Pipes for Pressure Applications”

PE 80 Type B (MDPE) and PE 100 (HDPE) pipes shall comply with AS/NZS 4130: 2001 – “Polyethylene [PE] Pipes for Pressure Applications”

Fittings for HDPE pipes shall comply with AS/NZS 4120 : 2000 – “Fittings for Polyethylene (PE) Pipes for Pressure Applications”

Installation of water mains shall comply with:

NZS/AS 2566.1 : 1998 - “Buried Flexible Pipelines – Structural Design”

NZS/AS 2566.2 : 1998 - “Buried Flexible Pipelines - Installation”

NZS/AS 2033 : 1980 - “Installation of Polyethylene Pipe Systems”

NZS 7643 : 1985 – “Code of Practice for the Installation of Unplasticized PVC Pipe Systems”

Pipe joints shall be of an approved type and generally of the pipe manufacturer's proprietary rubber ring flexible joint or detachable gibault type.

Special pipes may be approved by the Engineer in the case of unusual circumstances.

6.2.2 RIDER MAINS

For normal construction works, rider mains shall be of Medium Density Polyethylene Pipe (MDPE) Class PN 12.5 to NZS 7610 : 1991.- Blue Polyethylene Pipes up to Nominal Size 63 for Below Ground Use for Potable Water” .

Subject to special written approval, pipes of other manufacture, material or class may be used.

6.2.3 SERVICE CONNECTIONS

6.2.3.1 Urban Connections

All pipes for service connections shall be MDPE as specified in Clause 6.2.2 above. All fittings for service connections shall be Marley “Pushlok” and shall incorporate the use of a nose cone

liner in the pipe. The sealing system between the pipe and the body of the fitting shall be an EPDM or Nitrile rubber 'O' ring.

Service connections shall be connected to mains or riders with an appropriately sized tapping band as manufactured by "Milnes" or a Marley "Talbot" self tapping ferrule, and all work shall comply with the details as shown on Standard Drawing WS 06.

All service pipes shall terminate with an 20mm "RMC" or such other manifold as approved by the Engineer, complete with pressure cap manufactured from gunmetal dezincification resistant brass with compliance certificates to BS 5433 or WIS:ISSN 0267-305. The manifold shall be of non vibration design, guided, spring loaded resilient seating with integral non-return valve and shall incorporate an isolating ball valve and an inbuilt double check valve. Valves and meters shall be enclosed in a meter box in accordance with Standard Drawing WS 04. The installation of all meters will be carried out by the Council.

6.2.3.2 Rural Connections

All pipes and mains connections shall be as Clause 6.2.3.1 above and all work shall comply with the details as shown on Standard Drawing WS 06.

The service pipe shall include an RMC 20mm inline ball valve and strainer. A Watt 007M2 QT or a Wilkins 950 LXLT 20mm back flow preventer shall be installed on the property side of the manifold, complete with a 20mm ball valve. A meter box of the appropriate size shall be used to enclose the meter and back flow preventer.

The back flow preventer shall be a testable double check assembly with down stream side shutoff ball valves, 20mm diameter, suitable for supply pressure up to 175 PSI and temperature of 180°F, with a cast bronze body assembly.

For installations on the Braemar Water Supply Scheme, a flow restrictor shall be included in the connection installation.

6.2.3.3 Meter Boxes

All water meter boxes shall comply with the following:

- The body and the lid shall be constructed from HDPE/Polypropylene
- The lid shall be secured to the body with a stainless steel flexible wire or a galvanised chain with stainless steel bolt and nut.
- Shall have a proven resistance to soil and to ultra violet light
- Shall have the name /brand printed on the underside of the lid
- The lid shall be blue in colour with "Water Meter" moulded on the top surface
- The lid shall comply with slip resistant standard AS/NZS 36661.1 : 1991

6.2.4 VALVES

Sluice valves on mains shall be epoxy coated cast iron water works pattern sluice valves, conforming to NZS/BS 5163 : 1986 -.:Specification for Predominately Key Operated Cast Iron Gate Valves for Waterworks Purposes" to PN16, anti-clockwise closing, with external and

internal protective coating to AS/NZS 4158 : 2003 – “Thermal Bonded Polymeric Coatings on Valves and Fittings for Water Industry Purposes” Flanges shall be raised face and shall be drilled to NZS/AS 4087 : 1996 – “Metallic Flanges for Waterworks Purposes”, rated at PN16 (Equivalent to BS10 Table D).

The use of light pattern valves will not be permitted. All valve joints isolated from other fittings may be plain ended. In all other cases, valves shall be flanged.

All sluice valves shall be enclosed in a surface box set flush with the finished ground surface in such a way that the spindle is not more than 600mm below finished ground level and readily accessible to a standard valve key and all work shall comply with the details shown on Standard Drawing WS 01

Valves in rider mains shall be either sluice valves as above or gate valves. Gate valves shall be hand wheel operated and enclosed in a surface box set flush with the finished ground surface. Valves shall have the hand wheel not more than 600mm below the finished ground level. Gate valves shall conform to NZS/BS 5163 : 1986 Class 150 or higher, with non-rising stems.

6.2.5 HYDRANTS

Hydrants shall be "medium" pattern clockwise closing, screw-down type, and shall be cast iron complying with NZS/BS 750 : 1984 – “Specification for Underground Fire Hydrants and Surface Box Frames and Covers”, with protective coating complying with AS/NZS 4158 : 2003, or as otherwise approved by the Engineer.

Hydrants shall be mounted on approved hydrant tees with risers, if necessary, so that the top of the spindle on the valve is between 115mm and 300mm below the finished surface level.

The installation of all hydrants shall be strictly in accordance with the details shown on Standard Drawing WS 02.

Hydrant boxes shall be Heavy Duty cast iron complying with NZS/BS 750 : 1984, Grade A in accordance with the details shown on Standard Drawing WS 03. Boxes shall be installed in accordance with the details shown on Standard Drawing WS 02 so that no traffic load on the surface box can be transferred onto the pipe or fittings.

A loose lid surface box shall be installed to enclose the hydrant in such a way that a standpipe and key can be fitted and the hydrant operated without obstruction and the box shall be aligned to show the direction of the main.

The top surface of the hydrant box shall sit flush with the finished level of the surrounding ground or seal, and the following tolerances shall be adhered to: a) Grass berm

+ 5mm to - 5mm

b) Footpath or road +10mm to - 0mm.

6.2.6 PIPE FITTINGS

Pipe fittings such as tees, hydrant tees, tapers, crosses, hydrant risers, caps, plugs and bends shall be of approved manufacture and shall comply with AS/NZS 2544 : 1995 – “Grey Iron

Pressure Fittings”, or AS/NZS 2280 : 1999 .-.”Ductile Iron Pressure Pipes and Fittings”. All pipe fittings shall comply with the dimensions of the line in which they are to be used. Flanges shall be drilled to NZS/AS 4087 : 1996 Table D.

All fittings for use with uPVC pipe shall be moulded fittings as produced by the pipe manufacturer to a pressure rating equal to at least that of the pipe used or as otherwise approved by the Engineer.

In the case of specials, the Engineer may approve fabricated units of welded steel pipe complying with the specification for pipes of like material. All specials shall be dimensionally equivalent to the pipe line in which they are to be used and capable of insertion using the same joining method as the main.

Gibaults, tapping bands, etc, shall be of approved type and material.

The arrangement of inter-connected flanged and flexible jointed fittings is to be to the approval of the Engineer.

All bolts, nuts and washers for flanged joints shall be Grade 316 stainless steel with Molybond anti-galling coating. Graphite greases, graphite packing and graphite compounds shall not be used in contact with stainless steel. Where dissimilar metals are used, purpose made Delrin thermoplastic inserts shall be installed in the flanges to prevent electrolytic action.

Electrofusion fittings and couplings for MDPE pipes shall comply with NZS/AS 4129

6.2.7 PIPE BEDDING

Pipe bedding material shall be clean, well graded non-cohesive granular material complying with the requirements of NZS 7643 for PVC pipes and AS/NZS 2033 for PE pipes.

6.2.8 PIPE LAYING

uPVC pipes shall be laid in conformity with the requirements of NZS 7643 : 1979 and PE pipes shall comply with the requirements of NZS 2033 : 1980.

Pipes shall be laid on straight grades or lines or on smooth curves without exceeding the manufacturer's recommended deflection of the joints or, in the case of flexible pipe, the recommended curvature of the barrel.

Where greater deflections are needed, formed bends shall be separated by one full pipe length unless flanged joints are used. Flanged joint combinations must be interspersed by flexible couplings to allow ready removal and replacement of individual fittings.

A series of flexible joints in close proximity to each other without adequate lateral support will not be acceptable.

The method of pipe laying and jointing shall be as recommended by the manufacturers for the type and class of pipe in use.

All pipe barrels shall be evenly supported over their entire length by the trench floor or other suitable bedding material placed before the pipe is laid.

Collars shall be unsupported. The open ends of pipes shall be kept covered to prevent the ingress of foreign matter and all pipes shall be inspected and cleared as laying proceeds.

Where possible, when pipes are installed in existing roadways, underground drilling or thrusting of road carriageways, driveways and footpaths shall be utilised. Depths of pipes that are drilled or thrust, shall comply with Clause 6.1.10.

No joints shall be made in pipes under driveways or footpaths.

Where any new main crosses any other service, a minimum clearance of 200mm shall be maintained.

Where pipes are laid in existing paved or grassed areas, backfilling of the trench and reinstatement of the ground surface shall be in accordance with Clause 3.4.12 of Section 3 of this standard.

6.2.9 VALVE AND HYDRANT MARKERS

Marker posts shall be installed vertically in the ground within 200mm of the road boundary to show the location of all valves and fire hydrants in other than urban areas in accordance with the details shown on Standard Drawing WS 04.

The position of hydrants in urban areas shall be marked with a painted or heat welded triangle on the carriageway surface in accordance with NZS 4501 : 1972 – “Code of Practice for the Location Marking of Fire Hydrants” Where the carriageway is not permanently surfaced, hydrant marker posts shall be used.

Hydrant indicator posts, valve indicator posts and toby boxes shall be painted with road marking paint complying with Transit New Zealand specifications.

6.2.10 TESTING

The subdivider shall be responsible for testing all lines and fittings and for providing all the necessary equipment, water and materials for such testing.

All pipes and fittings shall be subjected to a pressure test after laying, jointing and anchoring with backfill. The section to be tested shall be capped or flanged off at either end. The blanked off ends and all bends, tees, etc, shall be securely strutted or otherwise prevented from movement before applying any pressure.

The subdivider shall provide means of bleeding air from both ends of the pipeline. Pipes shall be slowly filled with water allowing all air to escape and left for 24 hours to allow any take-up. The pressure shall then be slowly raised by means of a pump to the test pressures indicated below. The test pressure shall be measured at the lowest point of the line under test and for steel pipe lines, shall be maintained for a period of 30 minutes during which time the leakage shall not exceed 750ml per 100mm of pipe diameter per kilometre of pipe.

Testing of uPVC pipe shall be in accordance with the requirements of Section 9 Procedure B of NZS 7643: 1979, except for pipes of diameter less than 100mm NB which shall be tested in accordance with Procedure A. Test pressures shall be as shown in Table 6.3 below:

Table 6.3: Test Pressures

Table 6.3 : Test Pressures for Pressure Lines		
Class of Pipe	Test Pressure	
	Meter Head	kPa
Class B uPVC	90	900
Class C uPVC	135	1350
Class D uPVC	180	1800

Any faulty pipes, joints or fittings shall be replaced by the subdivider and the line shall be retested. All pipes are to be tested so that the specified test pressures are achieved but not exceeded in such lengths of pipe as may be approved by the Engineer. All pipes shall be pre-tested by the subdivider before testing in the presence of the Engineer. Should any section of pipe fail this latter test, the cost of attendance by the Engineer at the subsequent test or tests shall be charged at cost. Test sections shall not be longer than 1000 metres.

As a minimum, a 100mm diameter test pressure gauge manufactured to NZS/BS 1780: 1985, "Specification for Bourdon Tube Pressure and Vacuum Gauges, Section 1 – Industrial" with an accuracy of less than 1% error, in good working order is required, holding current test certification (within last 12 months).

6.2.11 CONNECTION TO EXISTING RETICULATION

After the system has passed the pressure test, a connection to the existing distribution system will be made. It will be necessary for the contractor to give at least 48 hours notice to the Council in accordance with Clause 1.4.12 that a connection is required, and the work shall be carried out under Council supervision.

6.2.12 FLUSHING AND STERILISING

All pipes, valves, service connection and other fittings in the reticulation shall be fully disinfected and flushed in the presence of the Engineer, before being put into service. The Developer shall give at least 24 hours advance notice of his intention to disinfect a pipeline.

Disinfection chemicals shall be applied to achieve a free chlorine concentration of between 10mg/litre and 100mg/litre. (The pH should not be higher than 9.0)

The disinfectant requires time to be effective. The required contact time is a function of concentration. The product of free chlorine concentration (mg/litre) and contact duration (minutes) shall be not less than 7,200. Eg a satisfactory treatment regime would involve a free chlorine concentration of 10mg/litre with a contact duration of 720 minutes.

At the end of the disinfection period the free chlorine concentration shall be not less than 10mg/litre.

If at the end of the disinfection period the free chlorine concentration is less than 10mg/litre, the pipeline shall be thoroughly flushed and the disinfection process shall be repeated.

If the disinfection process is being applied to a pipeline with consumer connections, each service pipeline shall be closed at the supply point prior to the disinfectant being administered.

The quantity of available chlorine varies for each chemical so it is not appropriate to apply 'rules of thumb' as to how to achieve a particular concentration.

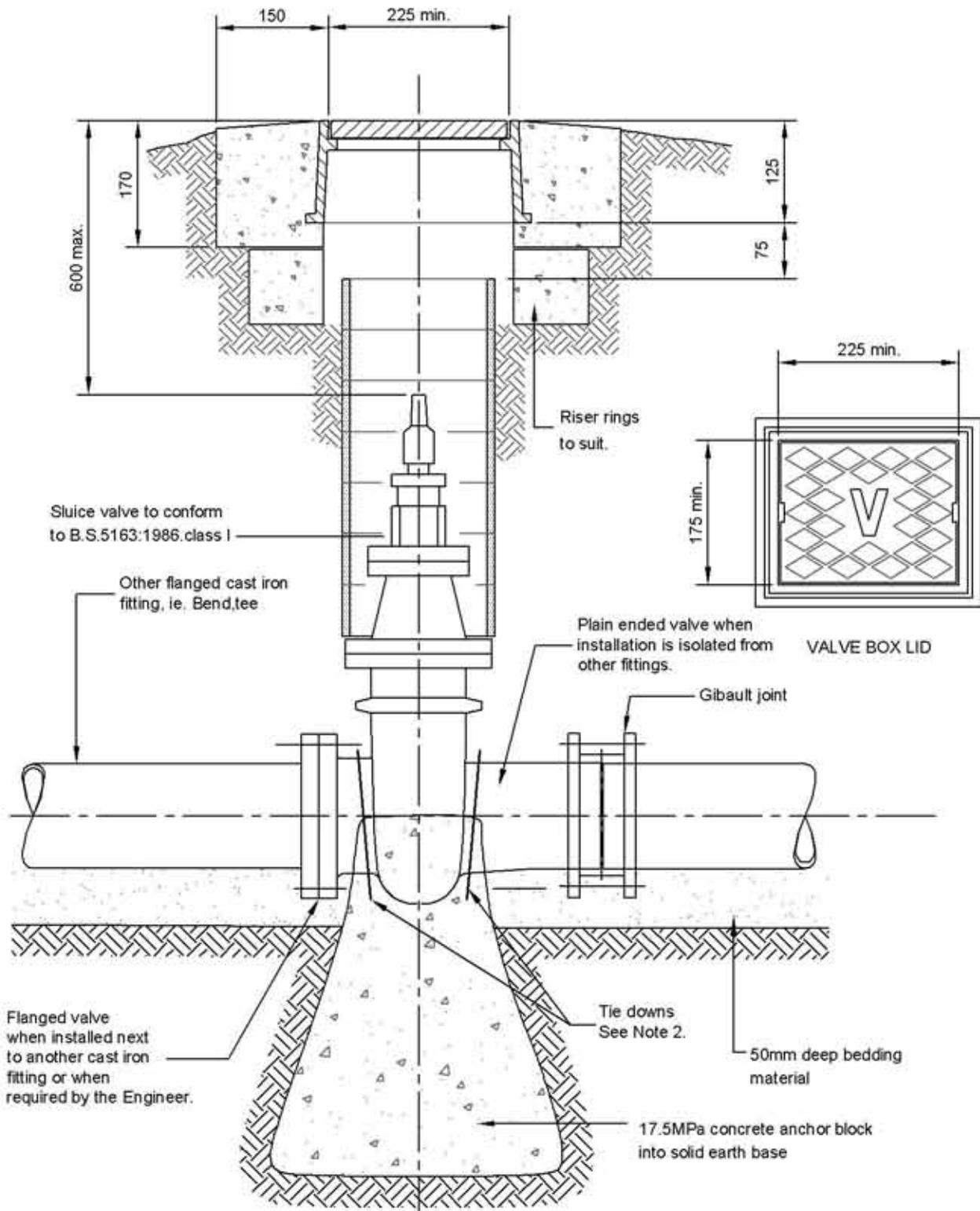
All mains shall be kept at working pressure on completion of testing and flushing to ensure any subsequent damage caused by installation of other services is detected.

CHAPTER 6

WATER SUPPLY

STANDARD DRAWINGS

WS 01.....	Service Valve Installation
WS 02.....	Fire Hydrant Installation
WS 03.....	Hydrant Box
WS 04.....	Valve and Hydrant Markers
WS 05.....	Service Connection Domestic
WS 06.....	Service Connection Rural/Industrial
WS 08.....	Heavy Duty Metered Connection
WS 10.....	Cast Iron Water Meter Box
WS 11.....	Thrust Block Details
WS 13.....	Watermain Locations at Intersections
WS 14.....	Water Connections



NOTE

1. Allow to paint valve lid with two coats of white road marking paint to TNZ specifications.
2. For valves 150mm Ø and over tie down straps cast into the anchor block shall be installed.
3. Valves isolated from other fittings may be plain ended. In all other cases they shall be flanged.

WHAKATANE DISTRICT COUNCIL

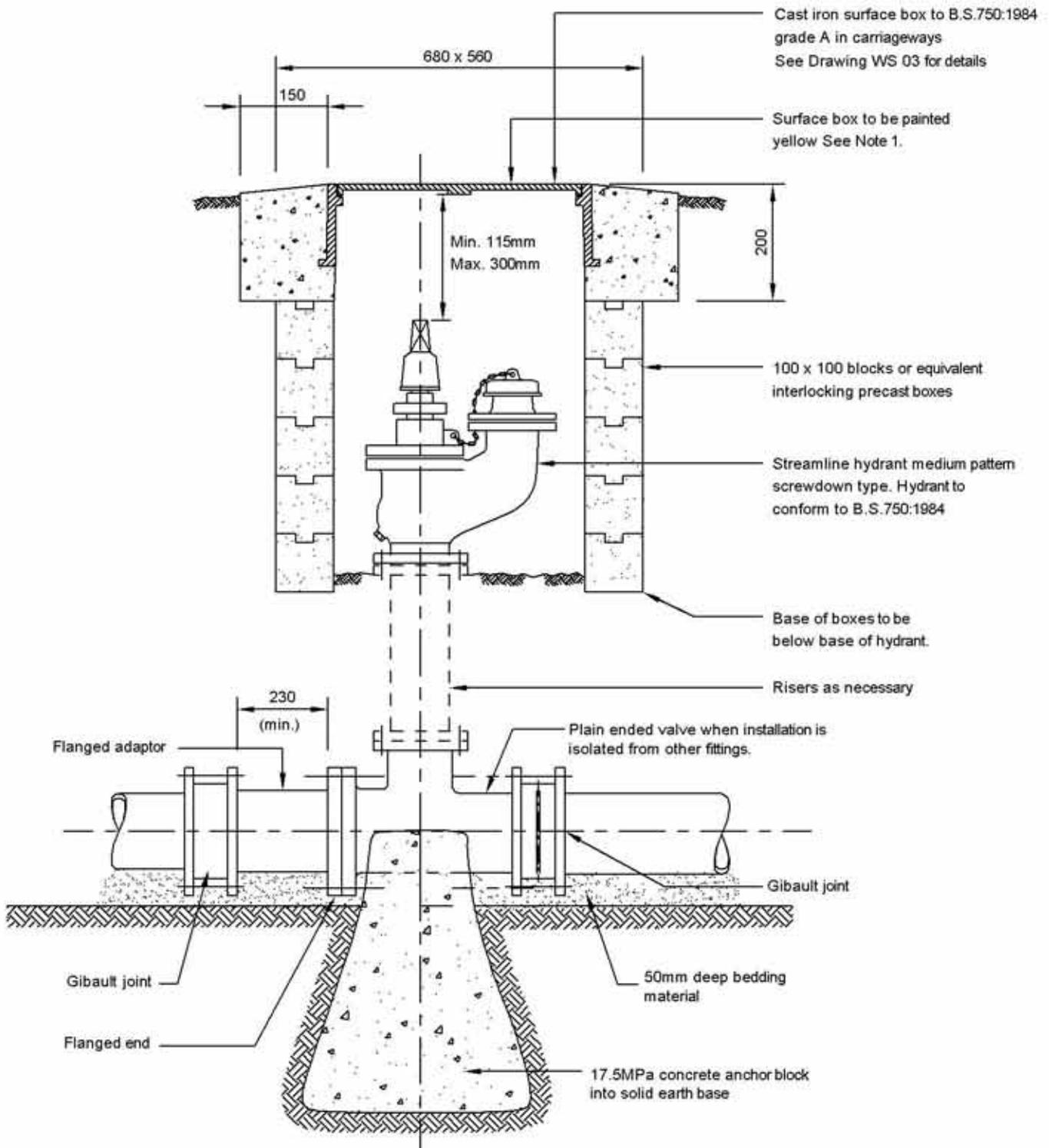
PREPARED BY OPHS

STANDARD DRAWING

NOT TO SCALE

SERVICE VALVE INSTALLATION

WS 01
ISSUE 7.0
SEPTEMBER 2007



NOTE

1. Allow to paint valve lid with two coats of yellow road marking paint to TNZ specifications.
2. For valves 150mm \varnothing and over tie down straps cast into the anchor block shall be installed.
3. Valves isolated from other fittings may be plain ended. In all other cases they shall be flanged.
4. Frost drain plug to be plugged.
5. When mains are constructed in PVC, use standard cast iron hydrant tee and step gibault joint.

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY OPHS

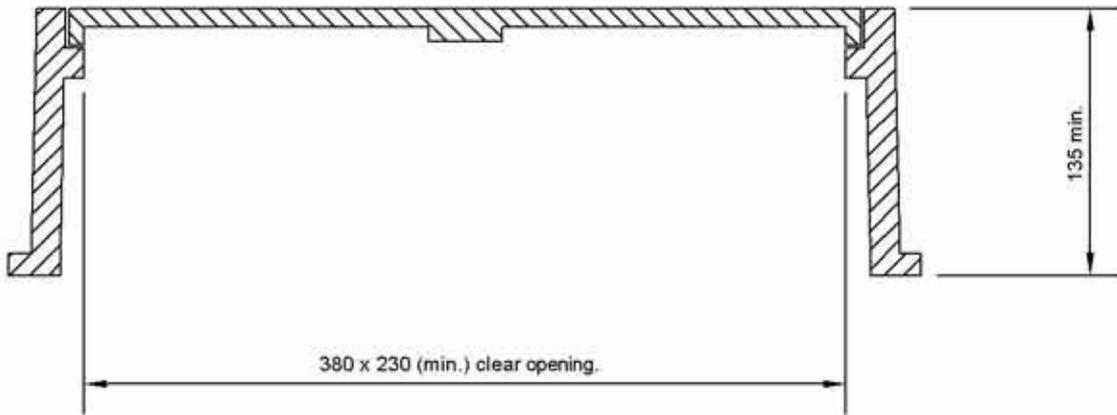
STANDARD DRAWING

NOT TO SCALE

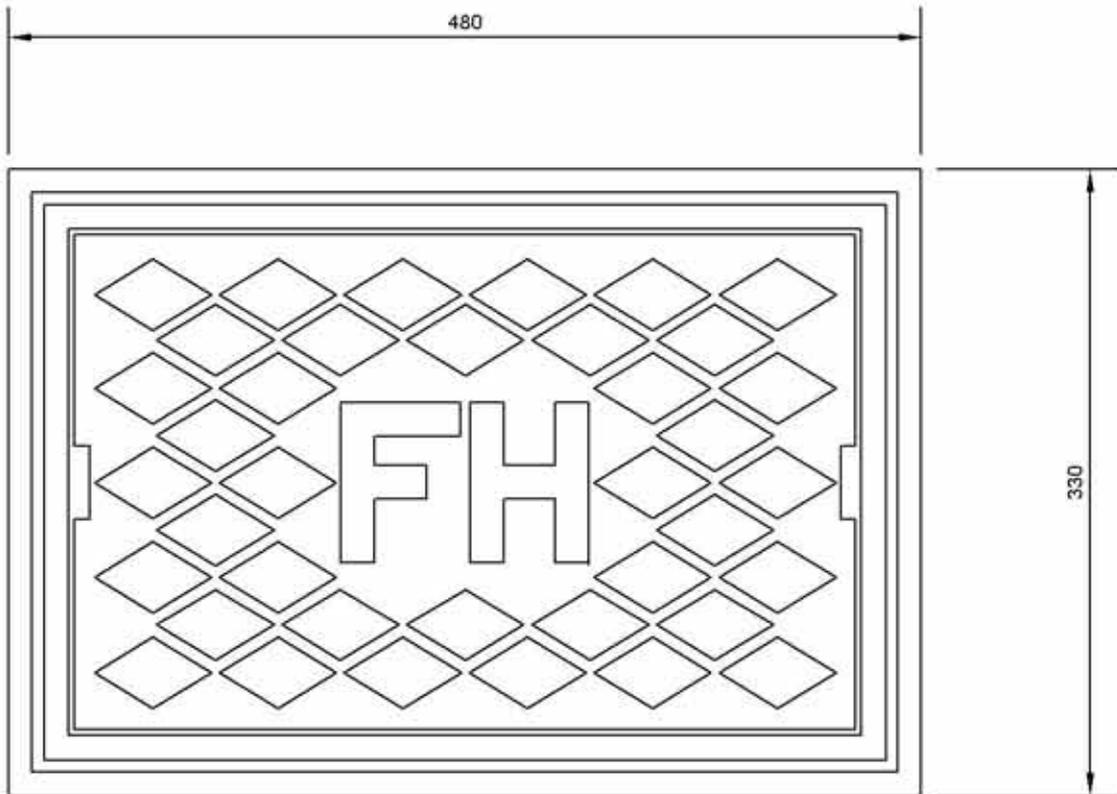
FIRE HYDRANT INSTALLATION

WS 02

ISSUE 7.0
SEPTEMBER 2007



SECTION THROUGH FRAME & COVER



PLAN

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY  OPHS

STANDARD DRAWING

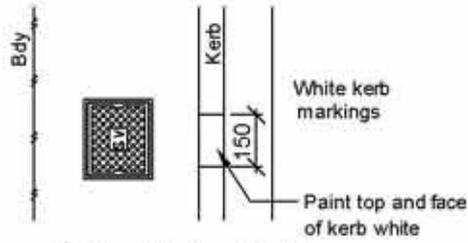
NOT TO SCALE

HYDRANT BOX

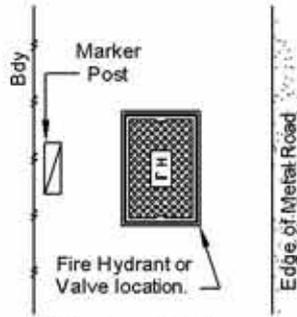
WS 03

ISSUE 7.0
SEPTEMBER 2007

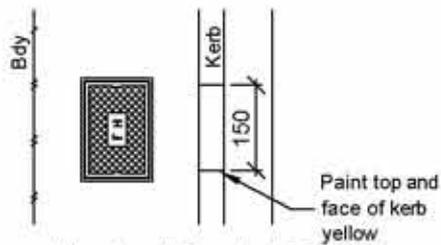
Carriageway



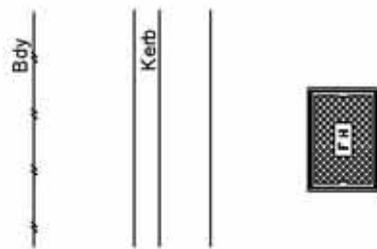
Sluice Valve Marking
Sealed Road Berm



Hydrant/Valve Unsealed Road Berm

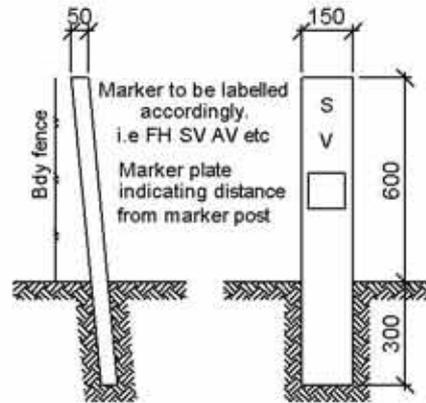
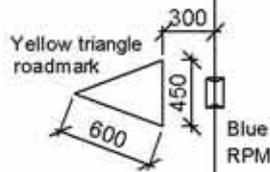
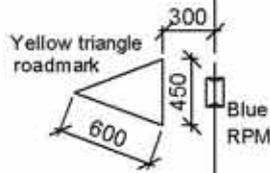


Hydrant Sealed Road Berm



Hydrant in Carriageway

HYDRANT MARKINGS



NOTE: To be constructed using 50mm thick concrete.

HYDRANT/SLUICE VALVE
MARKER POSTS

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY OPUS

STANDARD DRAWING

NOT TO SCALE

VALVE AND HYDRANT MARKERS

WS 04

ISSUE 7.0
SEPTEMBER 2007

Boundary

Class C Kent water meter.
(Installed by Council)

HDPE/polypropylene moulded meter box (Draper universal tall DRA box, base with manifold insert, & blue lid with "WATER" moulded into top - or equivalent). Lid is to be secured to box via a short length of stainless steel chain.

265mm Long
230mm Wide
260mm High

300mm Approx

50mm Min

Lid

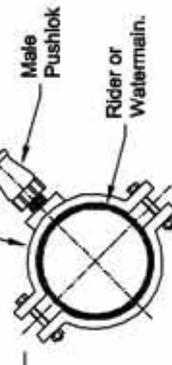
isolating valve

25mm Ø MDPE Pipe

Pushlok TP 1225 (or similar approved)
male threaded adaptor 25mm x 3/4"
BSP thread

(RMC) BSP 3/4" female thread both ends
with inbuilt double-check valve
(or similar approved)

Point of supply



750 Min. Cover in Road
600 Min. Cover in Berm

Note:

1. For all new subdivisions independent of existing mains the subdivider shall connect and provide all service connections as shown, excluding the water meter. (Manifold to include pressure cap.)
2. For infill subdivisions the subdivider shall arrange for WDC approved contractor to carry out this work.
3. When a connection is made to an existing watermain, a gunmetal self-tapping female shall be installed directly on the tapping saddle prior to the installation of other fittings.

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY



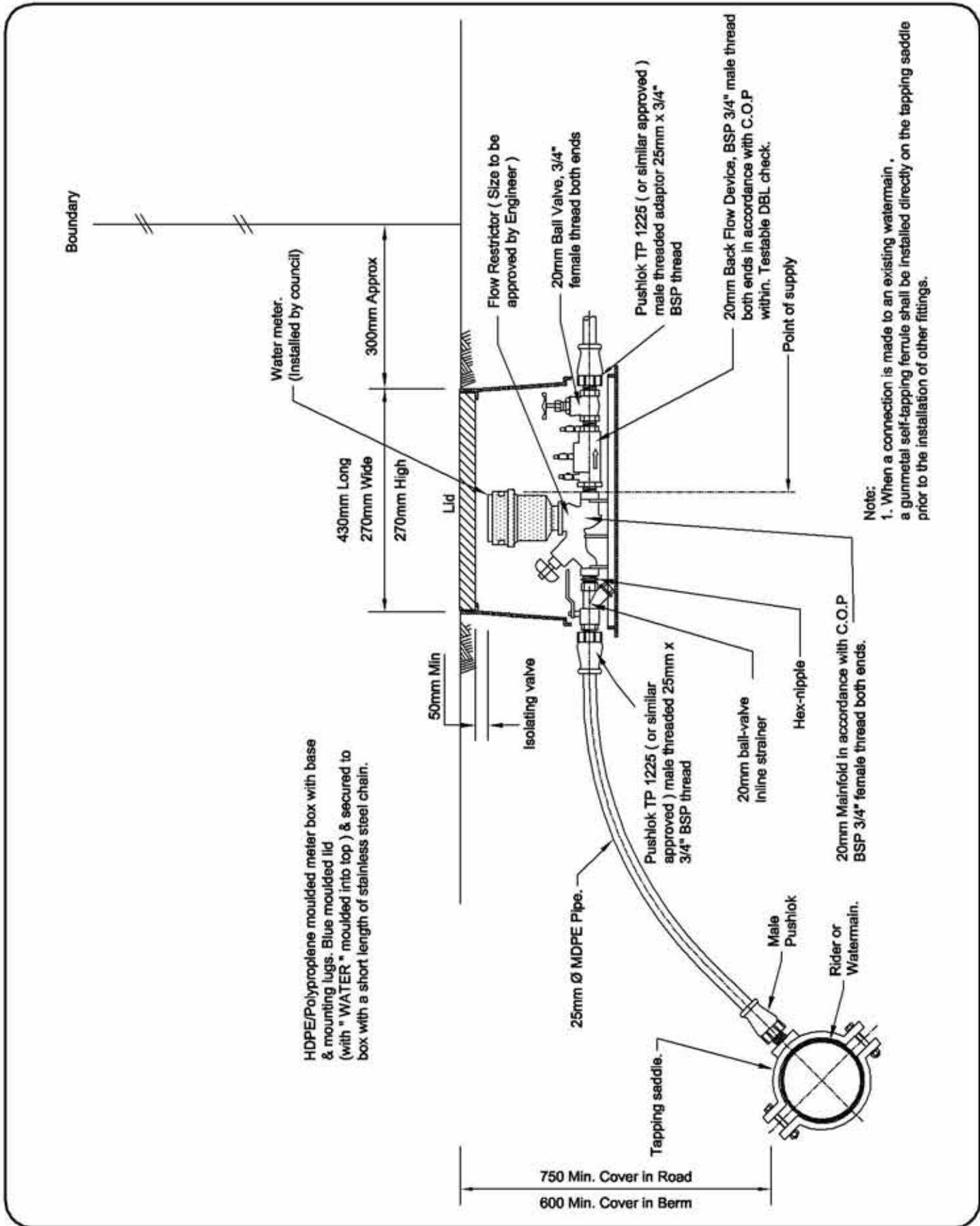
STANDARD DRAWING

NOT TO SCALE

SERVICE CONNECTION
DOMESTIC

WS 05

ISSUE 7.0
SEPTEMBER 2007



WHAKATANE DISTRICT COUNCIL

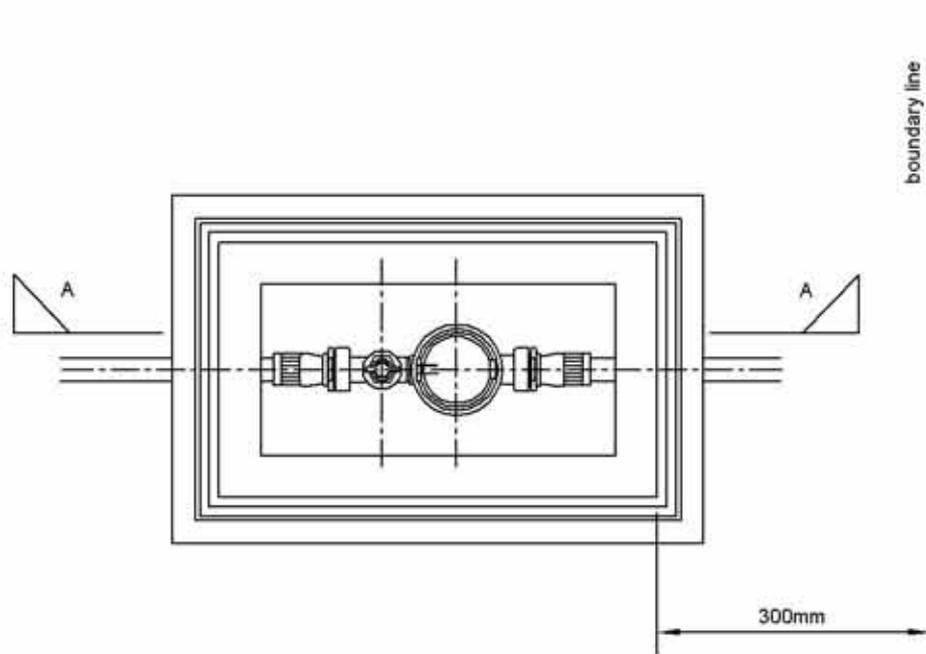
PREPARED BY OPUS

STANDARD DRAWING

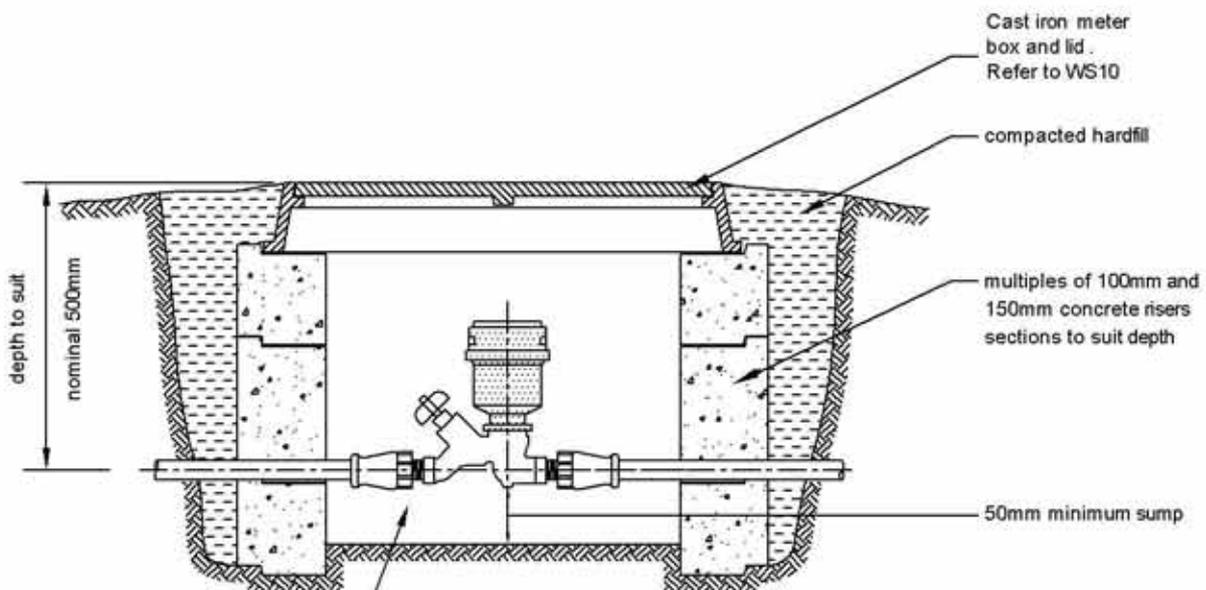
NOT TO SCALE

SEVICE CONNECTION
RURAL/INDUSTRIAL

WS 06
ISSUE 7.0
SEPTEMBER 2007



PLAN



SECTION A-A

NOTE:

For installation in vehicle crossings or in areas where a standard meter box would not be suitable or where directed by the Engineer.

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY  OPHS

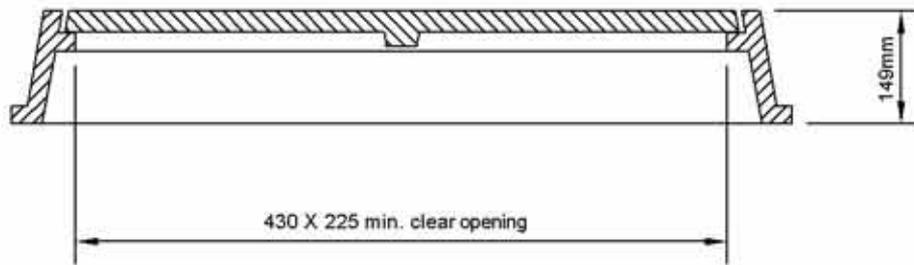
STANDARD DRAWING

NOT TO SCALE

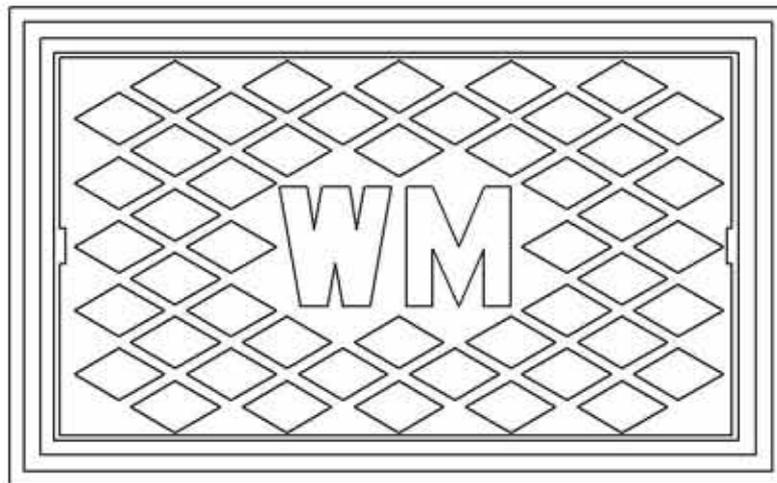
**HEAVY DUTY
METERED CONNECTION**

WS 08

ISSUE 7.0
SEPTEMBER 2007



SECTION THRU' FRAME & COVER



PLAN

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY  OPHS

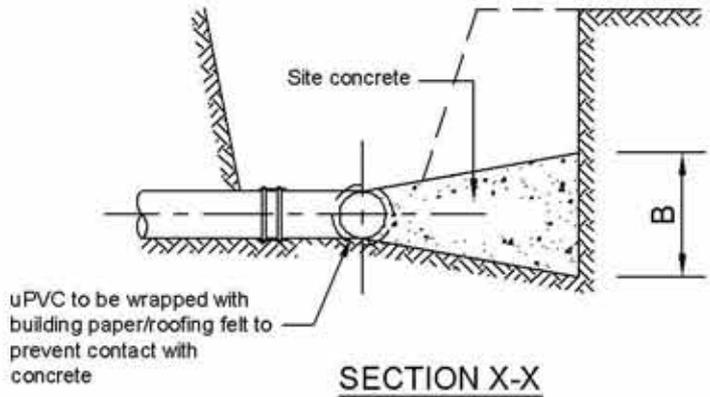
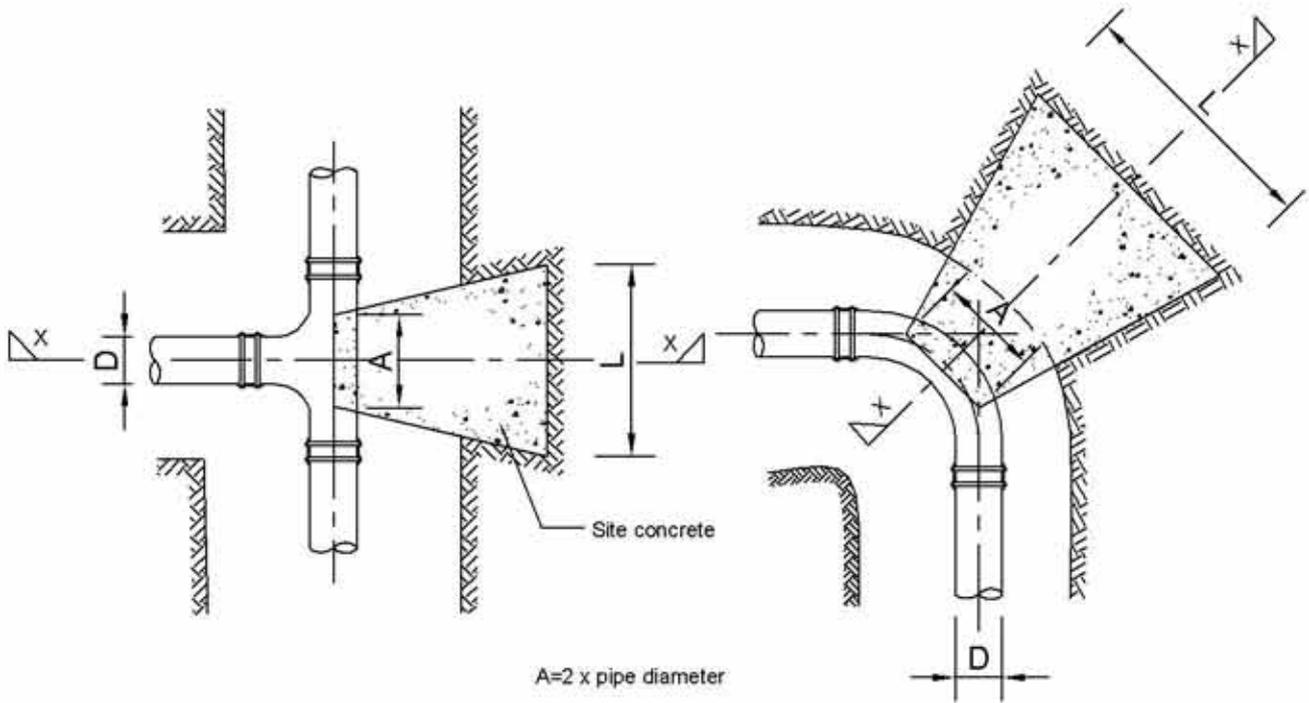
STANDARD DRAWING

NOT TO SCALE

CAST IRON
WATER METER BOX

WS 10

ISSUE 7.0
SEPTEMBER 2007



D	Tee		90°		45°		22.5°		11.25°		BEC	
	L	B	L	B	L	B	L	B	L	B	L	B
40	150	150	150	150							150	150
50	300	150	300	150	150	150	150	150	150	150	300	150
100	450	300	600	300	300	300	300	150	150	150	450	300
150	600	300	600	600	600	300	450	300	300	300	600	450
200	600	450	1000	600	600	450	600	300	450	300	600	600
225	600	600	1300	600	600	600	900	300	450	300	900	600
250	1000	600	1300	600	900	600	900	300	600	300	1000	600
300	1150	900	1300	900	1000	600	1000	300	600	300	1150	900
375	1150	1000	1600	1000	1000	1000	1000	450	600	450	1150	1000

1. Concrete strength : 17.5MPa
2. Concrete thickness: 150mm
3. Bedding against solid natural ground .

WHAKATANE DISTRICT COUNCIL

PREPARED BY OPUS

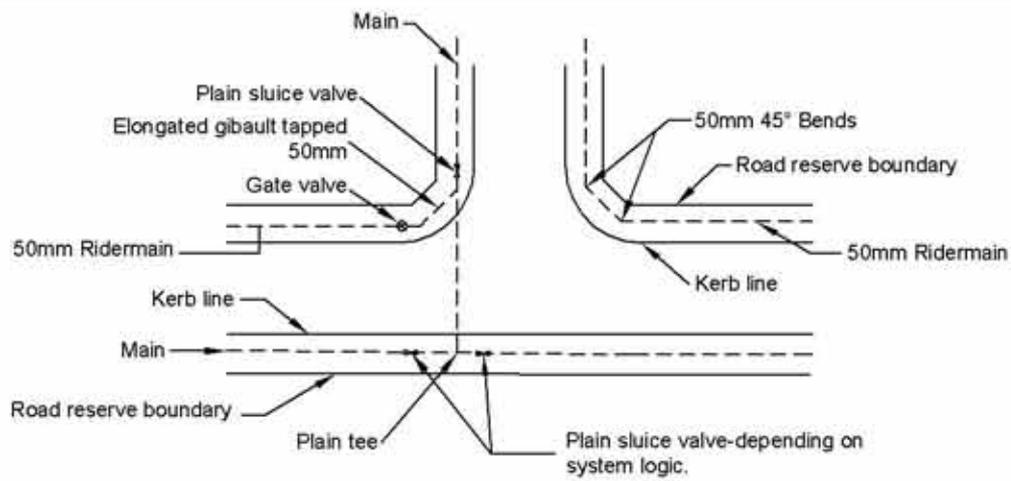
STANDARD DRAWING

NOT TO SCALE

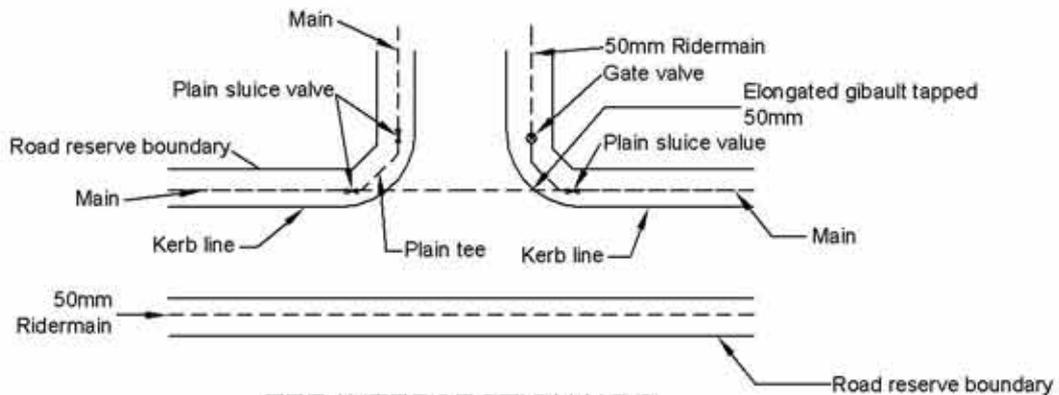
THRUST BLOCK DETAILS

WS 11

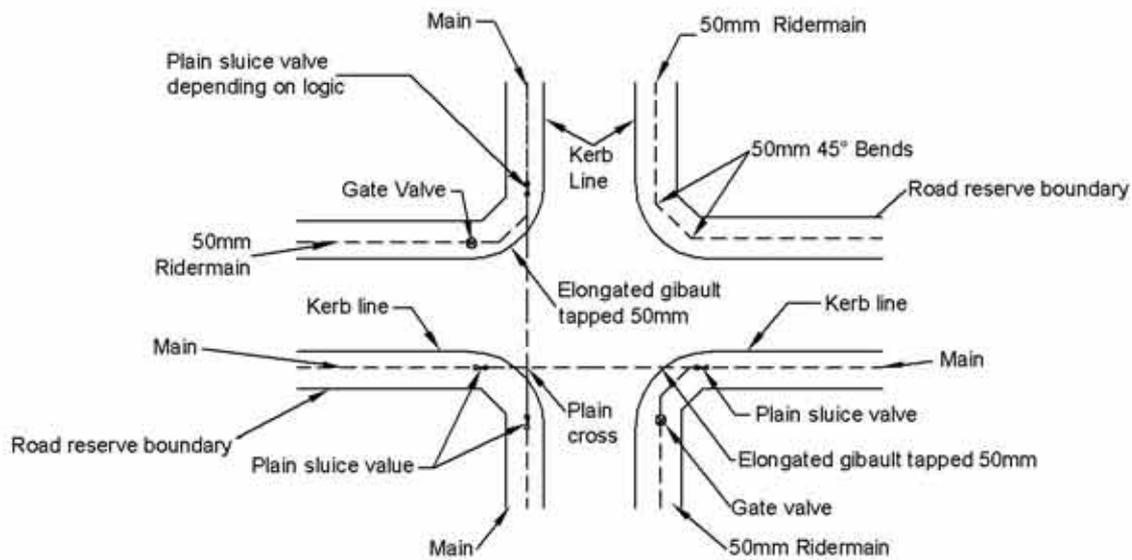
ISSUE 7.0
SEPTEMBER 2007



TEE INTERSECTION NO.1



TEE INTERSECTION NO.2



CROSS INTERSECTION

NOTE:

1. Valves to be located adjacent to change in boundary direction where practicable.

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY **OPHS**

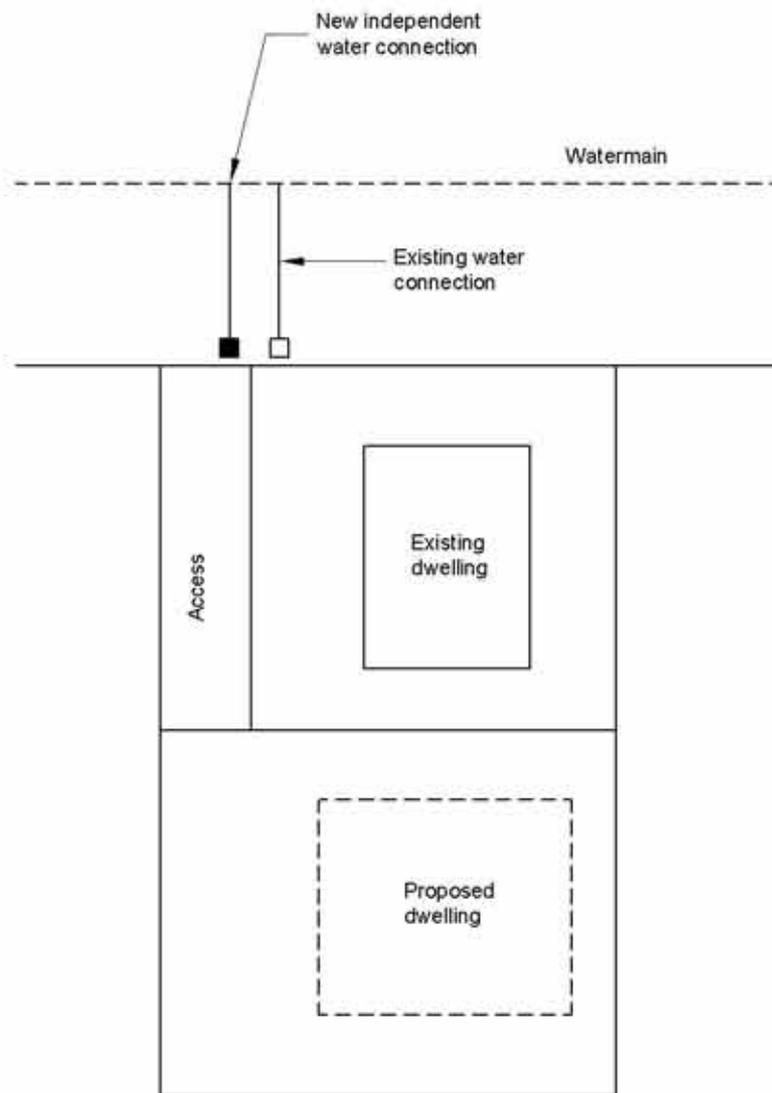
STANDARD DRAWING

NOT TO SCALE

**WATERMAIN LOCATIONS AT
INTERSECTIONS**

WS 13

ISSUE 7.0
SEPTEMBER 2007



1. All new lots shall be supplied with a connection at the road boundary.

WHAKATANE
DISTRICT
COUNCIL



PREPARED BY  OPHS

STANDARD DRAWING

NOT TO SCALE

WATER CONNECTIONS

WS 14

ISSUE 7.0
SEPTEMBER 2007

