



**Section 4
Water Supply**

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SCOPE

4.1.1.1. This part of the Code sets out the engineering requirements for the supply of water associated with land development projects, including performance standards, methods for design and construction, and material specifications.

4.2. PERFORMANCE STANDARDS

4.2.1. General

4.2.1.1. Council, with input from Community Boards, has developed and agreed on the Levels of Service to be provided for each water scheme. The applicant is to provide the performance standard as required by the Levels of Service adopted for that community.

4.2.1.2. A reticulation system that meets the requirements of the New Zealand Fire Service – Fire Fighting Water Supplies Code of Practice SNZ PAS 4509, is to be provided. The above Code shall be applied based on District Plan zoning. An example (this list is not complete) of the areas which shall comply with Class D requirements due to zoning are;

- a. Thames Town Centre
- b. Kopu Industrial Area
- c. Whitianga Town Centre

4.2.1.3. A successful pressure test is required prior to a watermain being allowed to be connected to the existing water supply system.

4.2.1.4. All through streets shall be serviced by a minimum of one fire fighting main in the berm.

4.2.1.5. All mains are to be provided with isolation valves to enable independent isolation of each berm main between carriageway intersections.

4.2.1.6. The reticulation system shall be designed and constructed for a functional design life of 50 years and for the full development potential of the land it serves. Domestic demand shall be taken as 250 litres per person per day, with an instantaneous peaking factor of 5.



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- 4.2.1.7. In order to co-ordinate the supply network on an urban supply area basis, the Water Services group will undertake overall network analysis of the system. Information on the likely feeder main sizes within a supply district should be made available on request to the Water Services group.
- 4.2.1.8. All parts of the system shall be designed to satisfy the requirements of SNZ PAS 4509 and the following:
- 4.2.1.9. Fire flow as required by Performance Standards above
- 4.2.1.10. Peak hourly domestic flow with a minimum residual pressure of 200 kPa at the highest elevation in the supply area.
- 4.2.1.11. Minimum domestic flow with a maximum residual pressure of 1,200 kPa at the lowest elevation in the supply area as per table 4.1 below
- 4.2.1.12. 24 hours of storage at the peak flow (maximum daily flow).

Class of Pipe	Maximum Working Pressure	
	Metre/Head	kPa
PN12	120	1200
PN15	150	1500
PN16	160	1600

4.3. MEANS OF COMPLIANCE

4.3.1. Properties

- 4.3.1.1. Every residential property shall receive a normal minimum flow and service pressure as specified in SNZ PAS 4509.
- 4.3.1.2. Every commercial and industrial property shall receive a minimum head and flow designed in accordance with specific approved parameters.



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4.3.1.3. Developments in rural areas may be adequately served by individual rainwater tanks, or where an adequate aquifer exists, by individual privately owned bores or wells. Such systems must comply with the regional council consents.

4.3.2. Reticulation Layout

4.3.2.1. A water main (principal main) fitted with fire hydrants shall be laid in the road as shown on the standard drawings. To supply lots on each side of the road, a rider main shall be laid in the berm on the opposite side to the main. Rider mains down jointly owned accessways remain private.

4.3.2.2. The layout shall be designed so that as far as possible mains or rider mains shall normally be laid continually from one street intersection to the next, being supplied with water at each end, and will not be cross connected to the main in the street between these points. In the case of cul-de-sac roads, the rider mains will continue around the head of the cul-de-sac and up the other side of the road to the next road intersection.

4.3.2.3. Where construction is staged and mains are laid to a dead-end for any stage, with the intention of connecting to this dead-end in any subsequent stage, the end is to be fitted with an approved flushing device.

4.3.2.4. In the case of some main routes such as dual carriageways, two fire fighting mains are required.

4.3.2.5. All mains shall be located in the road as shown on the standard drawings, except at road intersections. The maximum out of alignment tolerance acceptable is 50mm on straights and 100mm on bends.

4.3.2.6. Where a dispensation is granted to install a main in a non-standard location, and on all road crossings, an approved metallic detection tape shall be laid along the pipe alignment.

4.3.2.7. The minimum cover to all mains from the finished ground level shall be 600mm in berm areas and 800mm under carriageways.

4.3.2.8. Where the new reticulation is to connect to the existing system, careful consideration is to be given to the most appropriate point of connection to the



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existing reticulation. The depth of the existing system will need to be ascertained to ensure correct alignment with the new reticulation.

4.3.2.9. Where any pipe passes under a building or is required by the Roothing Network Utility Operator to be installed using a trenchless method, the carrier pipe shall be 50mm larger than the maximum dimension of the pipe, including collars.

4.3.2.10. Where any public main passes through privately owned residential, commercial or industrial property, then the main should be installed outside of the building envelope. An easement shall be provided in favour of the Thames-Coromandel District Council to allow for access and repairs to the main at all times.

4.3.2.11. Where any public main is laid within a private way, right of way, or private road, the water main is to be laid within the grass verge and a scour valve shall be provided at the end.

4.3.3. Trunk Mains

4.3.3.1. Trunk mains shall have a nominal internal diameter of not less than 100mm and shall be fitted with fire hydrants.

4.3.3.2. All trunk mains and fittings shall be designed and manufactured to working pressure (120m) or better.

4.3.3.3. Trunk mains construction materials and all fittings such as tees, hydrant tees, crosses, tapers, blank caps, bends and gibaults shall be as defined in the Council's Approved Materials Schedule. Approved uPVC fittings will be permitted where they are not in direct contact between two cast iron or ductile iron fittings.

4.3.3.4. Adjacent "specials" and fittings shall be flanged and bolted together to form a single unit. Stand-alone fittings shall be, where possible, socket jointed to avoid the use of "gibault jointing".

4.3.3.5. All joints on pipes and fittings shall comply with the relative New Zealand standard.



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4.3.3.6. Lubricants for all Rubber Ring Joints shall use and contain an anti-bactericidal agent for potable water use.

4.3.4. Rider Main

4.3.4.1. Rider mains for residential areas shall be 50mm internal diameter, serving up to 15 household units on a double-ended feed, and up to 7 household units for a single-ended feed. Rider mains and jointing material acceptable shall be as defined in the Council's Approved Materials Schedule.

4.3.4.2. The layout and valving of the rider mains shall allow for the flushing of the rider main through the nearest hydrant. Where this is not possible, a flushing point may be required to be installed.

4.3.5. Bedding and Anchorage

4.3.5.1. All mains installed by trenching shall be thoroughly bedded, haunched and surrounded in accordance with NZS 7643. Other forms of installation utilising trenchless technology will only be on a specific approval basis.

4.3.5.2. In all cases the manufacturer's recommendations for pipe storage, handling, protection and laying techniques shall be followed.

4.3.5.3. The entry of clay, bedding, runoff and other foreign material into the pipeline shall be avoided by the use of end caps, and diligence during the construction phase.

4.3.5.4. Cast in situ concrete anchor blocks shall be provided at all points where an unbalanced thrust occurs. Such anchors are to be designed according to the soil bearing capacity and installed so as not to impair access to bolts or fittings. All concrete shall be a minimum of 17.5 MPa at 28 days and shall never encase the fitting. Restrained joints in lieu of concrete anchor blocks may be acceptable if approved by the Council.

4.3.5.5. All fittings and anchors shall be left exposed for inspection during the course of the acceptance test.



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4.3.5.6. For pipelines laid at grades steeper than 10% (including service connections) the bedding and surround material shall be of a low grade weak concrete (not exceeding 5MPa). For lines exceeding 20% in grade, anchor blocks should be located at pipe joints, not exceeding 6m spacing.

4.3.5.7. For uPVC rider mains the anchor block shall extend for the length of the bend or tee and shall have a minimum 180 degree encasement of the pipe. There shall be an insulating membrane between the concrete and the pipe.

4.3.6. Service Connections

4.3.6.1. Service connections are required to be provided to the boundary at the time of the subdivision or development

4.3.6.2. A water connection consisting of a water meter box, a meter manifold and all associated fittings shall be provided to all connections. All fittings are to be as per the Council's Approved Materials Schedule.

4.3.6.3. Where water meters are required, meters shall be as per the Council's Approved Materials Schedule (refer to Council's Water Services Manager).

4.3.6.4. All industrial/ commercial service connections shall be provided with a water meter, as per the Council's Approved Materials Schedule.

4.3.6.5. Backflow prevention shall be provided at the point of supply with a low hazard, non-testable device suitable for domestic use on all domestic service connections.

4.3.6.6. Industrial/commercial connections shall include backflow preventers as specified in the Council's Approved Materials Schedule.

4.3.6.7. A 100mm duct shall be installed to traffic islands for an irrigation connection and shall terminate clear of future driveways.

4.3.6.8. For servicing multi-unit or multi-lot developments the rider main shall be extended into the site in the following situations:



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- a. Residential developments of 3 or more rear lots or units or 4 or more front lot units
 - b. Industrial and commercial developments with 3 or more units
 - c. In situations where by virtue of the layout of access and possible buildings, it is desirable to provide a public water supply.
- 4.3.6.9. Rider mains for multi-unit or multi-lot developments may be installed by means of a duct and access chamber system as per the standard drawings.
- 4.3.6.10. Multi-unit or multi-lot developments shall be serviced by individual meters. Meter banks may be utilised with specific approval by the Council. Otherwise, each unit shall have an individual connection from the watermain located in the public road reserve.
- 4.3.6.11. All subdivision connections shall be located:
- a. Adjacent to each other for front lots wherever possible
 - b. At least 100mm clear of other utility connections
 - c. At least 300mm clear of any future driveways
 - d. At least 300mm clear of, but close to, the projection of the side boundary
 - e. 500mm from the front boundary, inside the road reserve.
- 4.3.7. Hydrants**
- 4.3.7.1. All mains shall be provided with hydrants for fire fighting, air release, charging and emptying the system for maintenance purposes.
- 4.3.7.2. Hydrants shall be clockwise closing, screw down, standard pattern with a screwed outlet and comply with NZS/BS 750. The stem gland shall have PTFE packing or "O" ring seals and the sealing cup washer shall be made of Polyurethane as specified in the Council's Approved Materials Schedule.
- 4.3.7.3. Hydrants shall be mounted on an approved type socketed hydrant tee, with risers if necessary, so that the top of the spindle of the valve is between 100 and 250mm from the finished surface level.



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- 4.3.7.4. Hydrants shall be located to comply with the following:
- a. Maximum spacing in residential areas – 135m
 - b. Maximum spacing in industrial areas – 90m
 - c. Maximum distance from the end of a terminating street – 135m from the centre of the farthest building site measured along the route of a fire hose, or not more than 65m from the end of the road, whichever is the least.
- 4.3.7.5. If a hydrant is at the end of a line the hydrant shall be positioned at least 6m or 1 pipe length - whichever is the greater - from the end of the line that shall be capped.
- 4.3.7.6. Where any residential private way is more than 65m long, a hydrant shall be sited at the road end of the private way, or on the other side of the road immediately opposite the entrance.
- 4.3.7.7. If necessary, a 100mm diameter (ID) principal main shall be constructed and a hydrant placed within the private way in order to ensure that the rear of any site is within 135m of a hydrant.
- 4.3.7.8. Hydrants must be readily accessible for fire appliances and should generally be positioned near road intersections, and no closer to any building than 6m.



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4.4. VALVES

4.4.1.1. Valves shall be located in accordance with Table 4.2.

4.4.1.2.

Type of Main	Valving
Trunk mains and 100mm and greater	Shut off valves shall be provided at each junction no more than 500m apart, and shall be capable of isolating no more than 50 dwellings. Scour valves may be required at the lowest elevation in the system subject to having a suitable discharge location. All valves to NZS/BS 5163.
Rider mains	Globe on stop valves to NZS/BS 5152.
Service connections	Grade 316 stainless steel globe or stop valves to NZS/BS 5152.

4.4.1.3. Air release valves and scour valves shall be either a hydrant or a suitably sized ferrule. A permanent cover is required for the latter. Automatic air release valves shall be provided where required by the Council, and positioned so that ground water can not enter the main at negative pressure.

4.4.2. Surface Boxes and Markers

4.4.2.1. All valves shall be provided with an approved surface box in accordance with Table 4.3 and a section of 150mm diameter PVC ducting pipe from the valve bonnet to 80mm below the finished surface. The duct pipe shall be supported so as not to transfer any loads to the main.

4.4.2.2. All hydrants shall be provided with an approved surface box, set on approved precast concrete sections down to the level of the hydrant base flange, placed so as not to transfer loads to the main.



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Table 4.3	
Type of Main/Valve	Surface Box
Trunk main or valve in road	Cast iron top capable of carrying Class 1 vehicles with either "FH" or "V" marked on it
Rider mains in berm or path	Round or square aluminium or PVC with a minimum of 200mm one way and 300mm the other way with positive capture lid
Service connections	Round or square PVC with a minimum of 200mm one way and 300mm the other way with positive capture lid

4.4.2.3. The tops of all surface boxes shall finish flush with the final ground surface. Valve boxes shall be blue. Hydrant boxes shall be yellow. Where the hydrant is located off the roadway a yellow arrow and a blue cats-eye adjacent to the arrow is required (as per MOTSAM (Manual of Traffic Signs and Markings)).

4.4.2.4. All valves shall be identified with a V cut into the top surface of the kerb pointing to the valve.

4.4.2.5. All hydrants shall be identified with an H cut into the top surface of the kerb.

4.4.3. Pipe Bedding

4.4.3.1. Water main pipes shall be bedded on suitable fine granular material. All water mains under the carriageway shall have sand or fine granular bedding and surround. The requirement for bedding and surrounding of uPVC pipe is set out in NZS 7643.

4.4.3.2. The same bedding and surround shall also be used in rock country or where the trenching has brought out hard lumpy clay. There shall be no sharp stones or large clay lumps in the bedding or surround. Each pipe shall be laid so that the barrel of the pipe is supported for 60 degrees to 90 degrees of its circumference along its entire length. The bottom of the trench shall be cut out



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to sufficient size to permit jointing of the pipes, and all pipes shall be supported upon their barrels only.

4.4.3.3. All mains installed by trenching shall be thoroughly bedded, haunched and surrounded as detailed on the standard drawings. Other forms of installation utilising trenchless technology will be considered on a specific approval basis only. In all cases the manufacturer's recommendations for pipe storage, handling, protection and laying techniques shall be followed.

4.4.3.4. When a main is to go under an existing road, trenchless installation methods shall be used unless a Street Opening Notice is issued (refer to Appendix F7 for application form).

4.4.3.5. The entry of clay, bedding, runoff and other foreign material into the pipeline shall be avoided by the use of end caps, and diligence during the construction phase.

4.4.4. Booster Stations

4.4.4.1. Booster stations are to be avoided where possible, however where they are absolutely necessary and where approved by the Council, all stations are to be constructed to the standards required by TCDC. Particular attention is to be paid to the electrical controls and ancillary equipment which is to be designed in a similar fashion to other Council station installations.

4.4.5. Testing

4.4.5.1. Before fittings and anchors are covered, each section of main together with all fittings shall be visually inspected and pressure tested by the developer/ applicant or their representative in the presence of the Council Representative. The test shall be carried out, and all necessary apparatus supplied, by the developer/ applicant.

4.4.5.2. Field hydrostatic pressure testing must be carried out as described in NZS 4404:2010 Appendix C3.

4.4.5.3. All pipes, valves, house connections and other fittings shall be disinfected using a method approved by the Council.



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4.4.6. Connection to Council's System

- 4.4.6.1. Only the Council Water Services Operations and Maintenance Contractor may make the connection to the existing Council water reticulation.
- 4.4.6.2. Water connections direct to any raw water pipelines prior to treatment works is not permitted.

4.4.7. Acceptability of Pipe Materials

- 4.4.7.1. Asbestos cement pipes are not permitted.
- 4.4.7.2. Concrete lined steel pipes may be required in potentially unstable ground, for lengths of exposed pipe or in other special cases, and should be the subject of specific design. Except where corrosive ground conditions exist, concrete lined steel pipes may be laid under road carriageways and access to industrial and commercial premises.
- 4.4.7.3. Galvanised steel pipes shall not be used.
- 4.4.7.4. Ductile Iron (Cast iron) pipes may be appropriate for lengths of exposed pipe, or in other special cases. Their use shall require specific approval by the Council. All cast iron pipes or fittings shall be concrete or epoxy lined.
- 4.4.7.5. PVC, and uPVC pipes of not less than PN12.
- 4.4.7.6. The installation shall be to AS 2032 and AS/NZS 2566 with particular attention to the anchoring of valves, hydrants and bends against displacement in operation.
- 4.4.7.7. Polyethylene (PE) pipes shall be to AS 4130. PE pipes for in ground installation shall be blue in colour unless permitted otherwise by the Engineer.
- 4.4.7.8. The use of uPVC, mPVC and MDPE pipe may not be permitted in the following situations:



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- a. Principal mains larger than 200mm
- b. Crossings of road carriageways that are 12.2m wide or greater
- c. Reticulation in fully paved areas
- d. In close proximity to service stations.
- e. In industrial/ commercial locations where there is a likelihood of large amounts of a product being used or produced that may infiltrate through the pipe wall (e.g. solvents).

4.4.8. Backfilling and Reinstatement

4.4.8.1. Carriageways and Driveways

- a. In general open cutting of existing paved carriageways and existing paved driveways will not be permitted where pipes can be horizontally bored or thrust under them. Paved surfaces include chipseal, asphalt, concrete and paving stones.
- b. If open cutting cannot be avoided, saw-cuts shall be made along both edges of the trench in continuous lines parallel to the pipeline. Areas surfaced with paving stones will require careful dismantling and reinstatement. Trenches shall be reinstated using GAP65 from immediately above the pipe surround and compacted in layers not exceeding 150mm in depth. The depth of basecourse and type of seal shall conform to the standard of the existing road construction and to the Engineer's requirements.

4.4.9. Berms

- 4.4.9.1. Pipe trenches under grass berms and footpaths shall be backfilled in accordance with the requirements of the standard drawings.

4.4.10. Trenchless Installation of Pipes

- 4.4.10.1. Trenchless installation methods include guided boring, directional drilling, impact moling and ramming, pipe jacking and micro-tunnelling.
- 4.4.10.2. Trenchless techniques shall be carried out by appropriate specialists using means approved by the Council.



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- 4.4.10.3. Trenchless installation shall be carried out in such a manner as to give as little disturbance as possible to tree roots.