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Add the following new clause 6.2.3

6.2.3 System review

The designer shall undertake a system review to ensure compliance with the requirements of the TA and this Standard and a report to this effect shall be provided.

Compliance shall cover at least the following issues:

- (a) Minimum allowable operating (working) pressure can be maintained at all property connections. This may require zoning;
- (b) Maximum allowable operating (working) pressure will not be exceeded anywhere in the system;
- (c) Pipe class is suitable for the pipeline application (including operating temperature, surge and fatigue);
- (d) Maximum and minimum flow velocities meet TA requirements;
- (e) Pipe and fittings materials are suitable for the particular application and environment;
- (f) Minimal likelihood of water quality problems or water stagnation;
- (g) Valve spacing and positioning allow isolation of required areas;
- (h) Mains layout and alignment meet TA requirements;
- (i) Minimum fire fighting demands.

Control valves and scour systems where required are positioned to give required control of the system.

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6.3.5.2 Network Analysis

6.3.5.2

Add the following new paragraph:

Within the area of Wanganui the developer will provide key design information to allow the Wanganui network model to be analysed, if necessary, at the developer's expense.

6.3.5.2.1

Add the following new paragraph:

6.3.5.2.1 Impact of consequential damage

An assessment and risk analysis shall be conducted to evaluate and address the impact of environmental and property damage in the event of a major water main failure.

AS/NZS 4360 can be used as a guide for this process.

The following aspects should be considered:

- (a) Failure mode of the selected pipeline material;
- (b) Failure mode of the selected pipeline jointing system;
- (c) The topography of the area adjacent to the water main and how it affects the natural flow of surface water;
- (d) The capacity of the local drainage system to cater for a water main failure;
- (e) The type of property development adjacent to the water main and the impact of a water main failure on below ground developments such as basements, below ground car parks or terraced development;
- (f) Impact on community infrastructure;
- (g) Clearance from other services and structures to reduce the likelihood of consequential damage; and
- (h) The provision for future access for operational purposes.

6.3.5.2.1 System test pressure

Add the following paragraph:

The system test pressure is the pressure of hydrostatic testing (static), applied to test the integrity of a pipeline system. The system test pressure generally exceeds the actual design pressure of the system. The excess pressure is accommodated by the inherent design safety factor.

6.3.5.3 Peak Flows

6.3.5.3

Add the following sentence to the end of the clause:

Cross check the results from 6.3.5.3 with 6.5.5 (as modified).

6.3.5.5 Minimum flows

6.3.5.5 Minimum flows

Replace clause (a) with the following new clause:

(a) 15L/min for normal residential sites;

6.3.5.7 Sizing of mains

Table 6.2 Empirical guide for principal main sizing

Add the following Note to the table:

Note: The "Rural Residential" column does not apply to Wanganui.

6.3.8.8 Rider mains and duplicate mains

6.3.8.8 (g) Rider mains and duplicate mains

Delete clause (g).

6.3.12.10.1 Minimum pipe cover

6.3.12.10.1 Pipe cover

Add the following paragraph:

Pipe laying depths: •..... 900mm min cover for service mains
•.....600mm min cover for rider mains in technical specs
•..... 900mm min cover for road crossings

6.3.12.10.2 Minimum trench width

6.3.12.10.2 Trench width

Replace clause with the following:

Pipe trench width design considerations shall be based on the minimum side clearances detailed in Subdivision Supplement to NZS4404 Appendix A Drawing CM-WDC-017.

6.3.14.2 Siting of valves

6.3.14.2 General

Add a new paragraph:

Typical valve installation and chamber details are shown in the standard drawings in Subdivision Supplement to NZS4404 Appendix A.

6.3.14.3.2 Branch mains

6.3.14.3.2 Branch mains

Replace first paragraph 1 with the following new paragraph:

Stop valves shall be located on branch mains adjacent to the through water main. The type of joint to be used (Soc-Soc, FI-Soc or FI-FI) shall be based on the required security of the water mains. For supply mains or reticulation mains <DN250, a tee with a flanged branch and flanged valve shall be used (see Subdivision Supplement to NZS4404 Appendix A Drawings WS-WDC-001 and WS-WDC-002).

6.3.14.6.1 Installation design criteria

6.3.14.6.1 Installation design criteria

Replace paragraph 4 with the following:

The normal size of the large orifice of air valves shall be DN50 for installation on mains.

6.3.14.8 Flushing points

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Replace paragraph with the following new paragraph:

Flushing points should be installed at dead ends on any main or ridermain (see Subdivision Supplement to NZS4404 Appendix A drawing WS-WDC-002). Flushing point can be a fire hydrant.

Connections

6.3.16Toby

Add the following new clause:

Tobies to be positioned outside the vehicle crossing, in order to facilitate maintenance.

6.3.16.2 Property service connections

6.3.16.2 Property service connections

Add the following clause:

See Appendix H for property connection sizes. Where there is a water supply in a Right of Way, WDC ownership is to the boundary of the Right of Way

Add the following clause:

6.3.16.2.1 High risk connection

Specify RPZ Backflow Preventer at road reserve boundary in accordance with Council's Standard detail. See drawing WS-WDC-011 in Subdivision Supplement to NZS4404 Appendix A.

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6.5 Construction of pipelines

Add the following new paragraphs before 6.5.1.

Construction shall be in accordance with WDC's specifications.
Water mains shall only be installed by persons who have had the requisite inoculations.

6.5.3.2 Berms

6.5.3.2. Berms

Replace paragraph with the following new paragraph:

Pipe trenches under grass berms and footpaths shall be backfilled in accordance with the requirements of Subdivision Supplement to NZS4404 Appendix A Drawing CM-WDC-017.

6.5.3.3 Detector tape

6.5.3.3. Detector tape

Delete clause:

Detector tape is not used by WDC.

6.5.3.4 Tracer wire

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Add the following new paragraph:

Tracer wire shall be used for all pipe installations.

6.5.4 Pressure testing of water mains

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Add the following new sentence to the end of the paragraph:

Pressure test shall be carried out in the presence of an authorised representative of Council.

6.5.4 Pressure testing of water mains

Add the following correct equation and criteria at the end of the paragraph:

Appendix C Clause 3.7.4 (c) Field Testing of Pipelines

C3.7.4 Air Volume Assessment

Replace the equation in (c) with the following:

$$\Delta V \text{ max allowable} = 1.2 \times V \times \Delta P \left(\frac{1}{E_w} + \frac{D}{e \times E_R} \right)$$

Add **e** to the equation criteria:

$\Delta V \text{ max allowable}$ is the allowable water loss in litres;

V is the volume of the tested pipeline section in litres;;

ΔP is the measured pressure loss in kilopascals;

E_w is the bulk modulus of water in kilopascals;

D is the internal pipe diameter in metres;

e is the wall thickness of the pipe in metres:

E_R is the modulus of elasticity of the pipe wall in the circumferential direction in kilopascals;

1.2 is an allowance factor (e.g. for air content) during the main test phase

Add the following new clause **6.6 Rural settlements and areas on restricted water supply**:

6.6 Rural settlements and areas on restricted water supply

All of the above users are advised to have 24 hours on-site storage.

These supplies generally do not have fire-fighting capability. The flows to the properties are restricted based on land area and land use.

Testable double check backflow preventors are to be installed on each connection and generally supplies are metered.

Each Scheme has its own Rules, Capital Contributions and connection costs.

Connection manifolds and fittings inside the manifolds are the property of Council.

Add the following new clause **6.7 Storage**

6.7 Storage

Where storage is required for domestic purposes, a days storage based on 500 litres/head/day shall be provided.

For industry it is recommended that a days water usage be provided as storage.

Add the following new clause **6.8 Pump stations**

6.8 Pump stations

Requires specific approval with regard to design, operation, maintenance, safety and compatibility.

Pumps shall be Variable Speed Drive controlled.

Each pump station shall have a standby pump in addition to the duty pump/s.

Pumps, control and telemetry system shall be compatible with other pump stations operated by WDC.