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Plumbing information sheet No.5

Cold Water Pipe Sizing, Testing and Commissioning

Introduction

The aim of this technical solution is to clarify the requirements for sizing, testing and commissioning of a cold water plumbing installation.

G12 – Water Supplies

NZBC G12 provides the mandatory objective, function and performance requirements for water supplies in NZ. *G12/AS3* cites *AS/NZS 3500.1* which includes the 'Informative' Appendix D: Sizing method for supply piping for dwellings.

Pipework Systems

There is an increasing variety of materials and products for the supply of cold (and heated) water. It's important when using unfamiliar products to ensure pipe sizing is correct for adequate performance of the installation.

Before the plumber installs pipework, they should ensure the installation design meets mandatory the NZBC requirements.

Cold Water Pipe Sizing Method

To follow the method outlined in '**Appendix D'** you will need to know the following:

- ***The index length****:* The length in metres from the water meter to the most disadvantaged outlet.
- ***The height in metres***: The height in metres above the water meter/inlet connection point.
- ***The pressure available at the outlets***. AS/NZS 3500.1 (Clause 3.3.2) requires a minimum pressure of 50 kPa (5m head) at the most disadvantaged outlet.
- ***The available pressure***: If the water authority will specify the minimum pressure available, use that figure.
- ***Flow rates and loading units***. AS/NZS 3500.1 (Table 3.2.1) specifies flow rates and loading units of fixtures and appliances. (note there are slight variances between AS/NZS 3500.1 and Table 3 of G12/AS1)

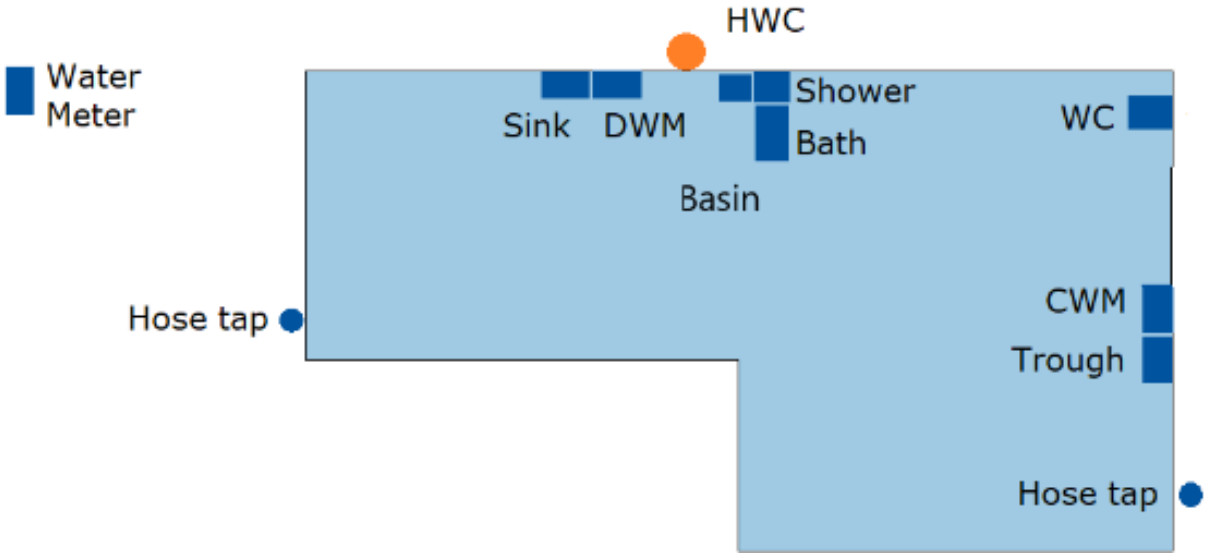
Note: When sizing piping to supply multiple dwellings, use Appendix C.

Steps

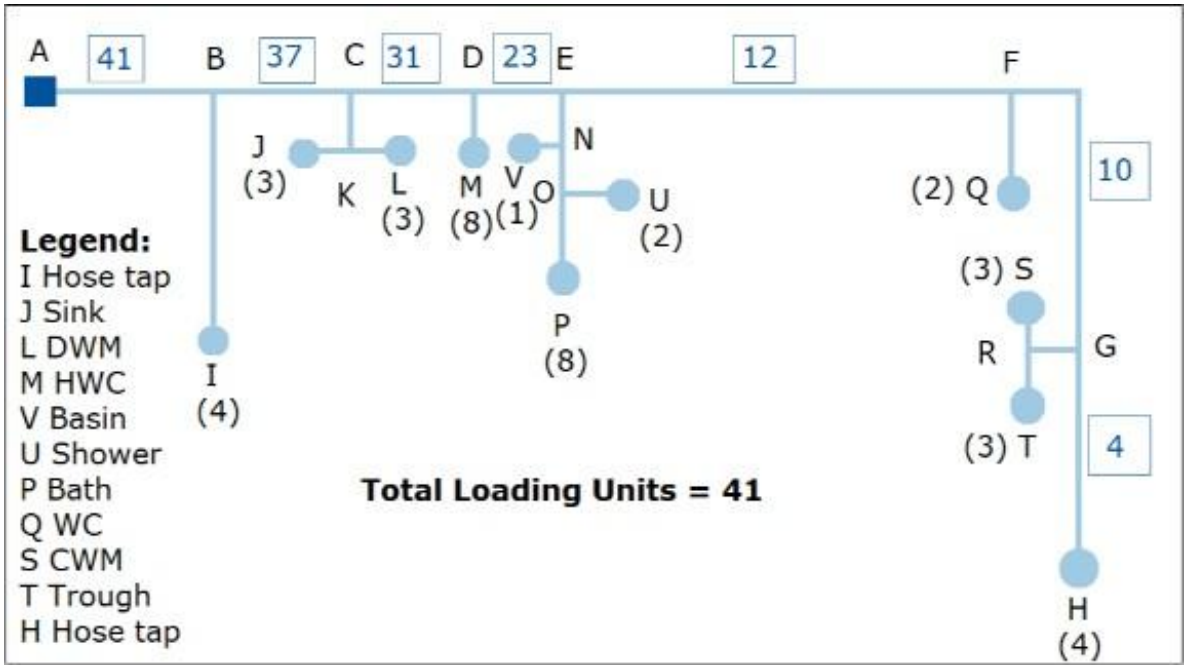
1. Draw a sketch of the installation

The sketch should include the fixtures, their loading units and pipe sections identified by lettering.

For example, a typical fixture installation:



The sketch could look like:



2. Determine the index length.

In this case we will use 50m

3. Determine the available pressure

In this case we will use 48 meters head

4. Determine the pressure drop

Pressure drop	*= Hm – Hs – Hx*
Hm	*= minimum available head* *= In this case 48m*
Hs	*= height of the highest outlet* *= In this case 8m*
Hx	*= minimum head required at any outlet* *=in this case 5m*

Therefore:

Pressure drop	*= Hm – Hs – Hx*
	= 48 – 8 – 5 *= 35m head (343 kPa)*

5. Draw a table with the headings

- Pipe Section
- Loading Units
- Probable simultaneous flow rate (PSFR) L/s
- Nominal pipe size

(See table on the following page)

6. For each section of pipe within the dwelling determine the PSFR.

- If the section supplies only one fixture outlet use Table 3.2.1 of 3500.1
- If the section supplies more than one fixture outlet use Table 3.2.4 of 3500.1.

7. Once the estimated PSFR has been added to the table the pipe size can be obtained from 'Table C.1', Appendix C, 3500.1.

Make sure you use the correct table for the pressure drop.

See the example on the following page.

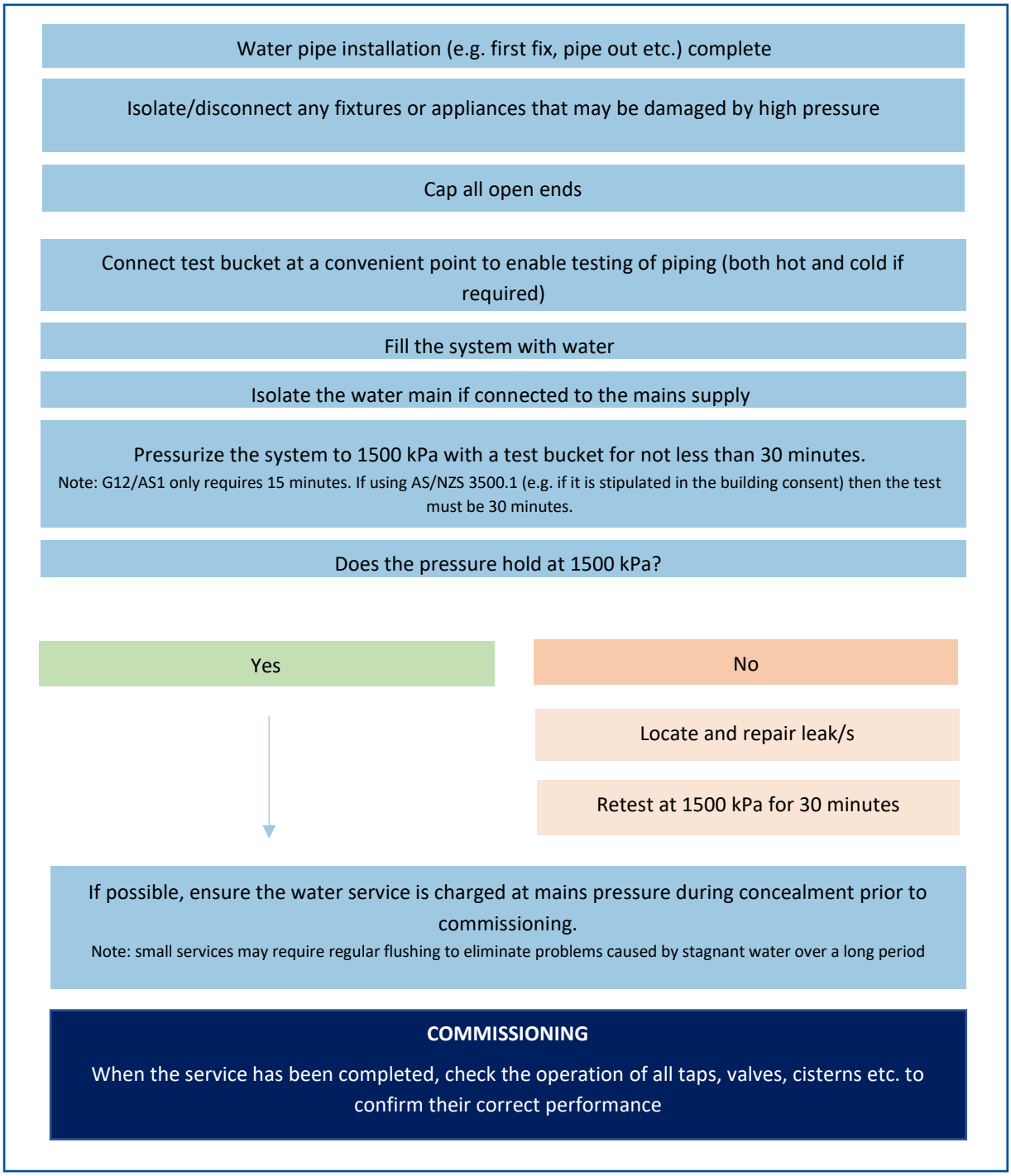
Index length= 50m		Pressure available = 35m head (343 kPa)	
Pipe Section	**Loading units**	**PSFR**	**Nominal Pipe Size (DN)**
A-B	41	0.55	20
B-C	37	0.52	20
C-D	31	0.48	20
D-E	23	0.41	20
E-F	12	0.29	18
F-G	10	0.26	18
G-H	4*	0.20	18
B-I	4*	0.20	18
C-K	6	0.20	18
K-L	3*	0.20	18
K-J	3*	0.12	15
D-M	8*	0.20	18
E-N	11	0.28	18
N-V	1*	0.10	15
N-O	10	0.26	18
O-U	2*	0.10	15
O-P	8*	0.30	18
F-Q	2*	0.10	15
G-R	6	0.20	18
R-S	3*	0.20	18
R-T	3*	0.12	15

** denotes sections supplying one outlet*

Note: Consider the Equivalent Pipe Sizes

The nominal pipe work sizes (DN) must be checked against AS/NZS 3500.1 Appendix A to ensure the correct size for material other than copper. Failure to do this may result in pressures, flow rates and velocities not complying with the mandatory requirements of the NZBC.

Figure 1. Testing procedure



Version management

Details	Last revision date
TE20005	23 May 2025