



# Water NZ National Pressure Sewer Guidelines

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# Presentation Overview

- Background of the project
- Objectives of the Guidelines
- Guideline Contents
- Discussion / Questions

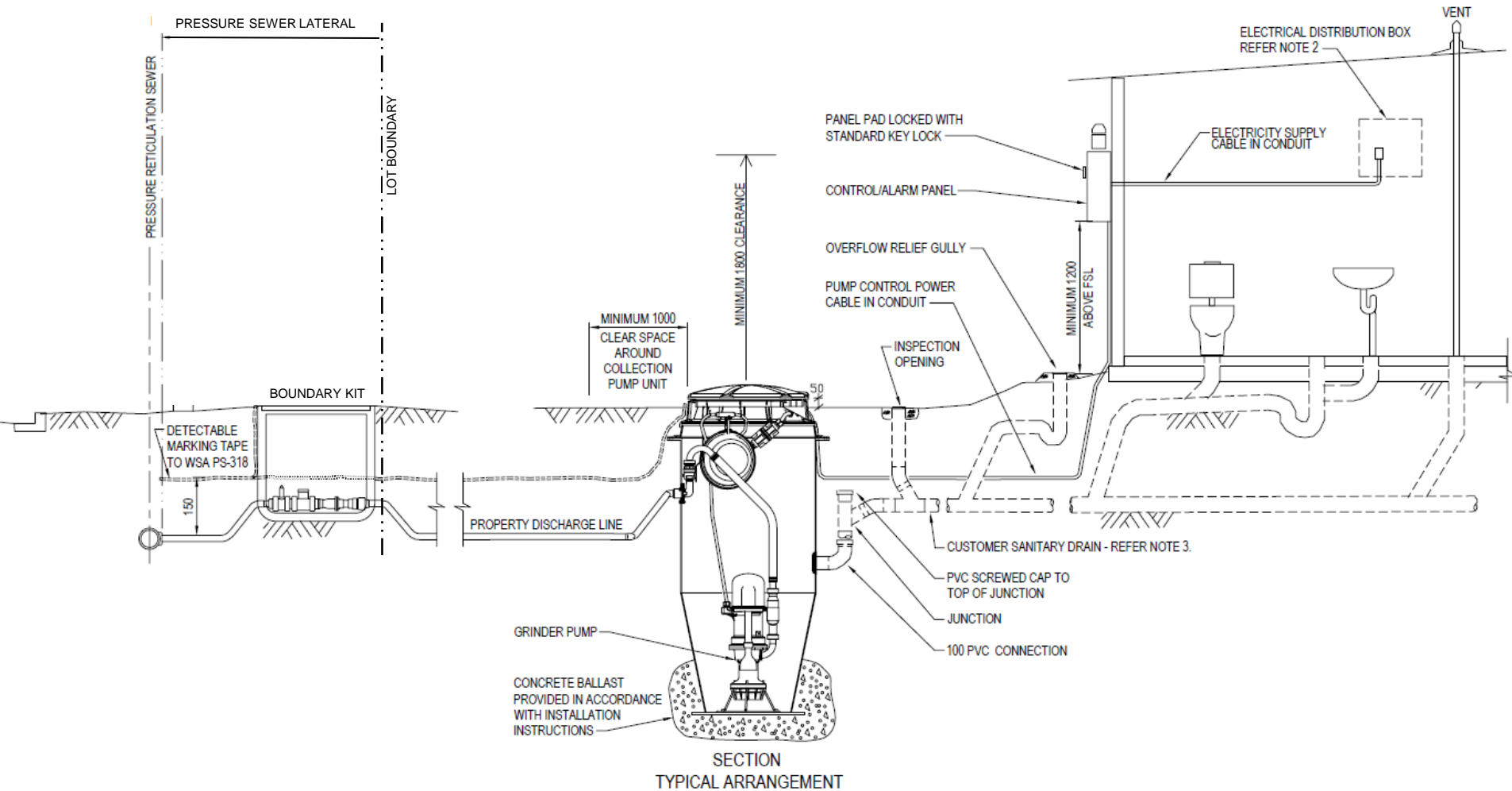


# Background

- Been in NZ for 10 years
- Internationally existed for more than 40 years
- NZ's early adopters have learning points available
- Project initiated by Water NZ
- Funded by Water Services Managers Group



# Typical cross-section



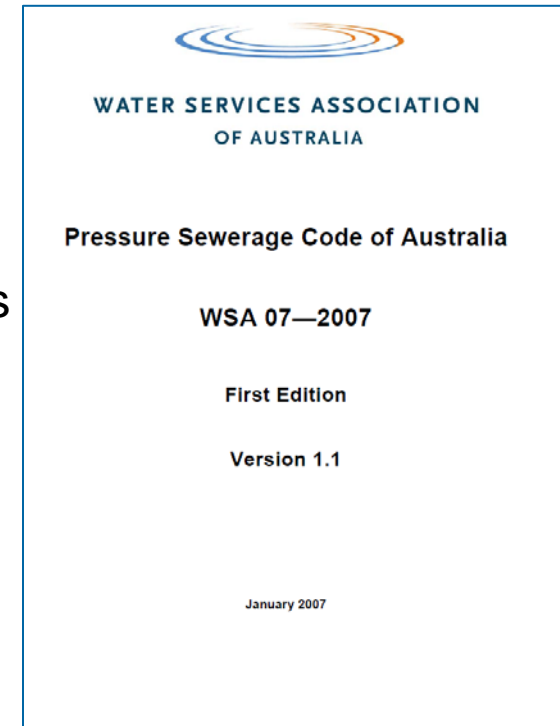
# Objectives - Why

Currently there is no guidance or standard specifications for pressure sewer in New Zealand.

Purpose of the guide is to address this gap in order to:

- Reduce costs in the development of policies & standards
- Resolve inconsistency in specifications
- Reduce compliance cost & complexity for suppliers
- Facilitate the sharing of existing knowledge

Better outcomes for Councils & Communities



# Guideline Contents

1. Literature Review
2. Decision Tree
  - Gravity – Pressure - Vacuum
3. Ownership models and policy
  - Public & Private Ownership models
4. Technical Issues
  - Technical Specifications
  - Design Approaches
5. Operation & Maintenance





# Decision Tree

- Presents attributes of reticulation options
- Flow-chart style decision tree
- Gravity is the default option.
- A compelling reason is required to adopt pressure sewer or vacuum sewer.

## Part 6: Wastewater Drainage

### 6.5.5 Deep pipelines

Limit the maximum pipe depth in Liquefaction Resistance Zones 0, 1 and 2 to 3.5m to invert. Limit the maximum depth in Liquefaction Resistance Zones 3 and 4 to the shallower of 5.0m to invert or 3.0m below the watertable. Pipelines with cover exceeding 4.0m in depth require structural design.

# Reticulation Attributes

		Pressure Sewer	Vacuum Sewer	Gravity Sewer	Comments
Topography	<i>Steep</i>	★	☆	★	
	<i>Moderate</i>	★	☆	★	
	<i>Mild/Flat</i>	★	★	☆	
Geotech	<i>Good / Acceptable Ground</i>	★	★	★	
	<i>Poor Ground</i>	★	★	☆	
Direction of Flow	<i>Generally Uphill</i>	★	★	☆	
	<i>Generally Downhill</i>	☆	★	★	
	<i>Undulating</i>	★	★	★	
	<i>Flat</i>	★	★	☆	
Development Size	<i>Large (2000+)</i>	☆	★	★	
	<i>Medium (500-2000)</i>	★	★	★	
	<i>Small (150 - 500)</i>	★	★	★	
	<i>Minor (&lt;150)</i>	★	☆	★	
Development Type	<i>Greenfield</i>	★	★	★	
	<i>Brownfield</i>	★	★	★	
Density	<i>High (&gt;12 prop/ha)</i>	★	★	★	
	<i>Medium (8-12 prop/ha)</i>	★	★	★	
	<i>Low (&lt;8 prop/ha)</i>	★	★	☆	
	<b>Total</b>				





# Ownership Models & Policies

## Public Ownership

- Council owns, operates & maintains pumps, tanks & equipment on private property

## Private Ownership

- Property owners own tanks & equipment
- Council owns the network
- Delineation at the boundary kit, located on road reserve at the boundary



# Installation Responsibilities

## Public Ownership

Council initiated projects – Council Installs

Private or developer projects:

- Private installation
- Generally private purchase from a pre-approved list of suppliers
- Assets vested to Council

## Private Ownership

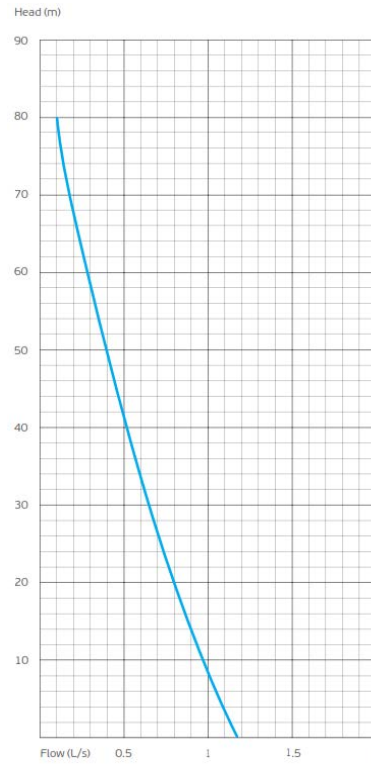
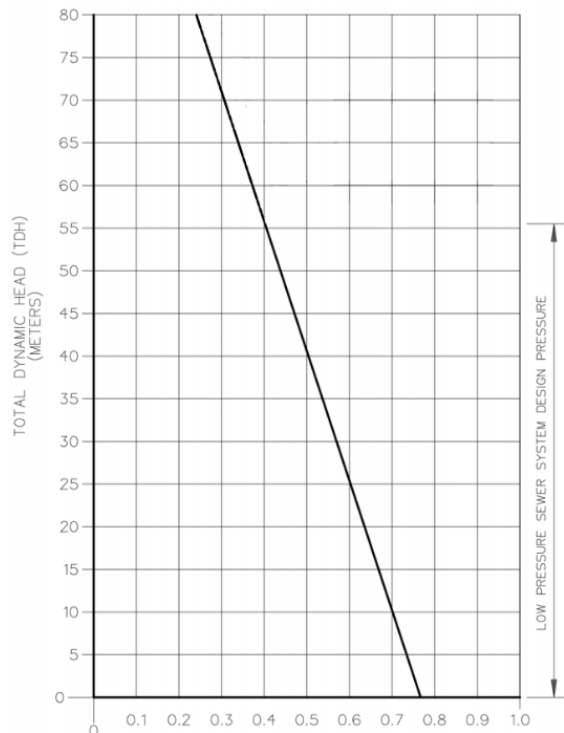
- Private install from pre approved list of suppliers



# Technical Specifications - Pumps

The pump shall have a predictable and constant flowrate across the required pressure head range, and shall comply with the following head and flow capabilities:

- A maximum flowrate of less than 1.2 l/s at zero head
- A minimum flowrate of greater than 0.4 l/s at 55 m head
- Rated for continuous operation at 55 m head, and
- An ability to operate intermittently at between 55 m and 80 m head.



# NSF 46– Household Items Loading Test

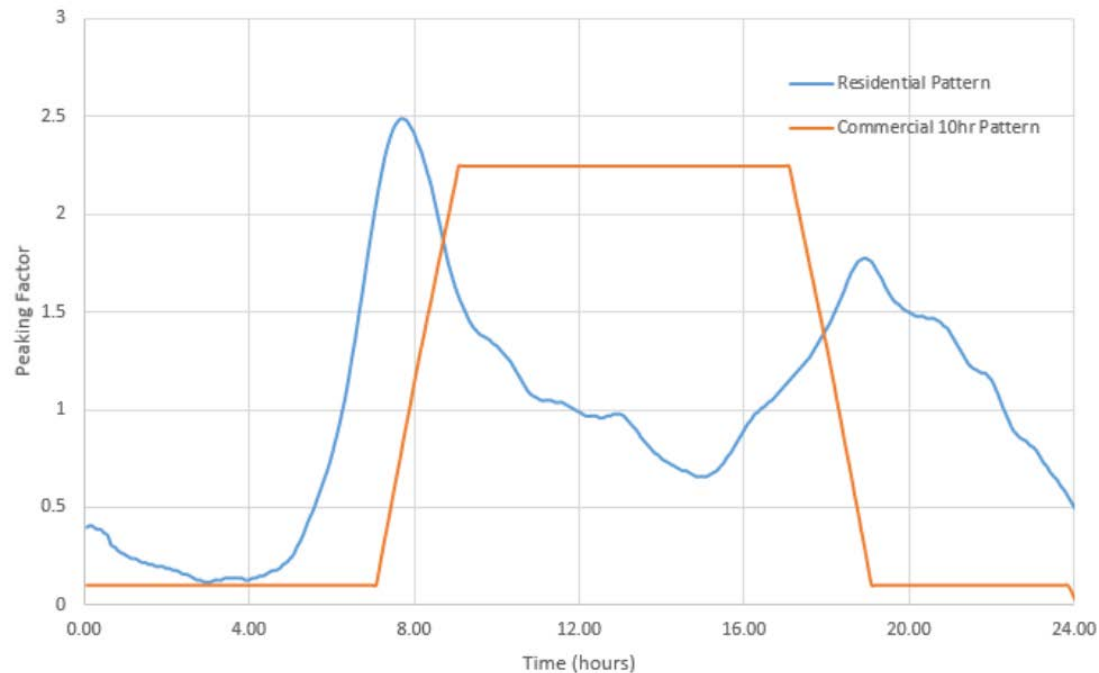
**Table 1 – Household items added to the pump basin**

<b>Item</b>	<b>Frequency</b>
Toilet tissue, 24 perforated sheets (wetted in test water)	4 times per day, 5 days per week
Facial tissue	1 per day, 5 days per week
Filter tip cigarette	1 per day, 5 days per week
Egg	1 per day, 5 days per week
Paper towel <sup>1)</sup>	1 per day, 5 days per week
Condom <sup>1)</sup>	1 per day, 5 days per week
Sanitary napkin <sup>1)</sup> (wetted in test water)	1 per day, 5 days per week
Chlorine laundry bleach <sup>1)</sup> (8 ounces)	1 per day, 5 days per week
Cotton swab <sup>1)</sup> (plastic stick)	1 per day, 5 days per week
Disposable diaper (large children's size) <sup>1)</sup>	1 per day, 5 days per week
Tampon <sup>1)</sup> (plastic applicator added separately)	1 per day, 5 days per week
Adhesive bandage <sup>1)</sup> (paper wrapper added seperately)	
Dental floss (12 inch piece)	1 per day, 5 days per week
Alkali drain cleaner (8 ounces)	1 per week, at random
Handi-wipe <sup>®</sup>	1 per week, at random
Acidic drain cleaner (8 ounces)	1 per week, at random
Liquid animal fat (4 ounces)	1 per week, at random
One pair of nylon panty hose (size large)	1 per week, at random
Cloth diaper (wetted in test water)	1 time during test, at random
Toothbrush	1 time during test, at random
Wood pencil	1 time during test, at random
Plastic table utensil	1 time during test, at random
Metal bottle cap	1 time during test, at random
HDPE bottle cap	1 time during test, at random
Metal, toy car (Matchbox <sup>®</sup> or Hotwheels <sup>®</sup> )	1 time during test, at random
Eight ounce drinking glass (crushed)	1 time during test, at random

# Design Approaches

- Probability Method
- Rational Method
- Dynamic Modelling

Standard Diurnal Patterns



<b>Number of Grinder Pump Cores Connected</b>	<b>Maximum Daily Number of Grinder Pump Cores Operating Simultaneously</b>
1	1
2-3	2
4-9	3
10-18	4
19-30	5
31-50	6
51-80	7
81-113	8
114-146	9
147-179	10





# Operation & Maintenance



Majority of potential issues address by good planning & design

- Provision for pump replacement
- Customer interactions
- O&M Contractor capability
- Odour & Septicity
- Planning of staging & capacity

# Re-Cap

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# Questions?





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