WATER NZ PRESSURE SEWER GOOD PRACTICE GUIDELINES

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ABSTRACT

In the past 10 years, a significant number of Pressure Sewer Systems have been implemented across New Zealand (NZ). To provide technical consistency, share learnings and promote good engineering practice Water New Zealand and the Water Services Managers Group have embarked on a project to develop National Good Practice Guidelines for Pressure Sewer Systems.

This paper will introduce the Good Practice Guidelines, including giving an overview of the scope and contents of the Guidelines. The Guidelines consist of four main components:

- A Decision Tree Guide – to assist in the selection between Vacuum, Pressure or Gravity Sewer reticulation options;
- Ownership Models & Policies – discussion of common ownership policies including aspects of right of access to properties, easements and service agreements. A generic policy document will be available;
- Technical Issues – technical specifications & design approaches including reference material, technical specifications and design standards relevant to pressure sewer systems. The typical hydraulic design approaches and their limitations will be discussed.
- Operation & Maintenance – this section collates and summarises operation & maintenance issues and benefits of pressure sewer systems. Mitigation measures and methodologies to address or manage known issues will be discussed.

The Good Practice Guidelines (and this paper) will be of interest to a wide range of NZ Water Industry practitioners, including Local Authority Wastewater Planners, Policy & Strategy Officers, Equipment Suppliers, Designers, Specifiers, Consultants and Land Developers.

KEYWORDS

National Guidelines, Good Practice Guidelines, Pressure Sewer, Vacuum Sewer Wastewater, Polices, Standards.

PRESENTER PROFILE

Graeme is a Principal Engineer in GHD's Auckland based water team, and has 19 years' experience in both New Zealand and the United Kingdom. Graeme is considered the pre-eminent leader in pressure sewer systems due to his extensive involvement in pressure sewer projects over the last decade in New Zealand.

1 INTRODUCTION

Pressure sewer systems are an alternative to gravity reticulation and vacuum sewer systems. While pressure sewer schemes have existed for more than forty years in other regions of the world, New Zealand (NZ) has only relatively recently adopted the pressure sewer system. Early adopters of pressure sewer systems in NZ have trialed equipment and developed multiple technical standards, policies and ownership models. The increasing popularity of pressure sewer systems has raised the need for national guidelines and standards. The National Good Practice Guidelines for Pressure Sewer Systems will address inconsistencies in specifications used within New Zealand, and promote good practice to improve the effectiveness of the pressure sewer system. The key sections of the National Guidelines will be the 'Decision Tree' guide, ownership models and policies, technical issues, and operation & maintenance.

The decision tree guide will assist NZ Water Industry Practitioners to assess the appropriateness of pressure sewer systems for a given situation. Technical specifications & design approaches, and operation & maintenance requirements will provide insight on pressure sewer systems. In addition, the National Guidelines will provide Local Authorities with a policy template, developed from recognised international standards such as Water Services Association of Australia (WSAA) and others, to form a basis for a policy document. These sections will provide Practitioners and Local Authorities consistent guidelines across NZ and promote good practice in the design of pressure sewer systems.

2 DECISION TREE GUIDE

The 'Decision Tree' guide will be developed for the purposes of guiding water utility staff in the assessment and selection of a preferred wastewater reticulation option (gravity, pressure sewer or vacuum sewer). The 'Decision Tree' guide will be freely available via Water NZ's website, and it will provide information to identify the drivers that would tend to favour one option over another for a given situation. A few drivers include technical benefits, risks and constraints, topographic and geotechnical benefits, whole of life costs, customer perception, resilience and environmental considerations.

3 OWNERSHIP MODELS & POLICIES

A generic draft policy template for the 'Ownership Model and Policy' will be developed based on case studies of different ownership models for pressure sewer systems from around New Zealand and internationally (with a primary focus on Australia). This generic policy template is suitable for Local Authorities to adopt and form a basis for a policy document. The policy template will include aspects such as the right of access to properties, easements and service agreements, including common practices.

4 TECHNICAL ISSUES

The technical issues will cover 'Technical Specifications' and 'Design Approaches'.

4.1 TECHNICAL SPECIFICATIONS

A list of technical specifications and relevant design standards will be documented in the National Guidelines. This will include international pressure sewer standards such as WSA 07 Pressure Sewer Code of Australia, ANSI:NSF 46 Wastewater Treatment System Components, and British / European Standard BS EN 1671:1 1997 Design of Pressure

Sewer Systems. In addition, the National Guideline will outline key aspects and issues that should be addressed during the stages of project delivery, including design, tendering, and installation and commissioning. This enables water utility staff to refer to recognised standards and specifications, to undertake good practice in the design of pressure sewer systems.

4.2 DESIGN APPROACHES

The design approaches will describe accepted methods used in hydraulic design of pressure sewer systems, and comment on the applicability and limitations of each method.

Currently there are three internationally accepted design approaches:

- Rational Method
- Probability Method
- Dynamic Modelling

5 OPERATION AND MAINTENANCE

Key operational and maintenance issues, and benefits, of pressure systems will be identified in the Operation and Maintenance section of the National Guidelines. Mitigation measures and methodologies to address or manage these issues will also be documented in this section.

6 CONCLUSIONS

The National Good Practice Guidelines for Pressure Sewer Systems will serve to provide New Zealand Water Industry Practitioners a guideline to provide consistency across NZ, and promote good practice in the design of pressure sewer systems. There will be four key sections, namely, the 'Decision Tree' guide, ownership models and policies, technical issues, and operation and maintenance. The 'Decision Tree' guide will assist practitioners in the assessment of the most appropriate wastewater reticulation system for a given situation based on various drivers. A few drivers include technical benefits, whole of life costs and resilience. The generic policy template will be available for Local Authorities to adopt as a basis to form a policy document. This policy template will include aspects such as the right of access to properties, easements and service agreements, including common practices. The National Guidelines will also discuss technical specifications and design approaches. This section outlines key aspects and issues that should be addressed at various stages of the project and limitations of each design approach. The operation and maintenance section will cover mitigation measures and methodologies to address or manage known issues. Overall, the purpose of these guidelines is to promote good practice and improve the effectiveness of pressure sewer systems.

ACKNOWLEDGEMENTS

Water New Zealand

The Water Services Managers Group

The Project Advisory Group