New Zealand Asset Metadata Standard – Wastewater

Volume 1
As-constructed / As-built

New Zealand Treasury – National Infrastructure Unit

Release Version 1.0
August 2017

New Zealand Government

METADATA STANDARD

New Zealand Asset Metadata Standard
Wastewater
Volume 1 As-constructed / As-built

MONTH/YEAR

August 2017

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ACKNOWLEDGEMENTS

A group of experts has developed and produced this standard. The disciplines include product engineers, process engineers, design engineers, CAD/BIM experts, engineering scientists, 3-water engineers, hydraulic engineers, builders, construction specialists, metadata specialists, data experts, asset software systems specialists, asset owners, asset managers, network repair and maintenance specialists, network operations specialists, network refurbishment specialists, financial analysts, data scientists and portfolio or network managers. Combined, this extensive body of knowledge and experience in 3-water management and investment practice has been sought from central government agencies, local government authorities and private sector partners, and has informed the data requirements within this document, on behalf of all NZ Inc.

As noted, the ‘as constructed’ or ‘as-built’ volume of the wastewater asset metadata standard has been developed from a variety of sources. The New Zealand Treasury National Infrastructure Unit also specifically acknowledges this contribution and the role of GISSA International in facilitating and producing this standard.

This standard has been prepared for the National Infrastructure Unit as part of its work to promote improved infrastructure outcomes by providing expert technical input on infrastructure issues across New Zealand.

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Effective Date: August 2017

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Abstract

The metadata standard for 3-water assets provides asset managers, and their suppliers, with a specification for asset data that supports data creation, collection and storage, and analytical capabilities to make evidence-based investment decisions. This applies to both capital and operating environments. The standard establishes a common understanding of the meaning of asset data, and it ensures all stakeholders use and interpret the data correctly and properly. The standard recognises various levels of sophistication in the data and provides relevant guidance on data attributes in this regard. Accordingly, the standard will benefit any 3-water asset manager who uses data for analytics to inform funding and investment priorities; research and research investment; policy development and national, regional or local reforms; national, regional or local reporting and benchmarking; shared services and inter-organisational collaborations.

KEYWORDS metadata; standards; assets; wastewater, sewerage

Executive Summary

Introduction

The wastewater metadata standard[1] is one in a suite of asset standards used by asset managers and others to manage public infrastructure assets. The objective for asset managers is to maximise the service delivery outcomes envisaged when investments are made in public assets. Evidence-based decision-making is the only sustainable way those with public asset stewardship and custodianship responsibilities can successfully continue to deliver public value.

To achieve these types of investment decisions (both capital and operating), data and information must be standardised (within datasets) and harmonised (across datasets). This should also be done nationally, for the maximum value to be extracted across disciplines, agencies, authorities, sectors and regions. These standards provide a foundation to enable this.

In developing these standards, it was recognised the ***lifecycle of asset data*** is intrinsic to the *whole of life* management of assets, as are the *lifecycle of assets* themselves. For this reason, these specifications have been developed with two purposes in mind. First, they ensure a geospatially enabled digital data standard for any newly constructed asset is captured at source, immediately after construction is completed (Volume 1). Second, these specifications ensure that any asset management interventions (or works) undertaken to maintain the asset have a similar approach. That is, the required information for all of the interventions is collected simultaneously. This process will enable asset managers and others to manage assets through the life of the asset at source, and in a common and harmonised way for the asset's whole life (Volume 2).

Another objective of this standard is to streamline the transfer of digital data when managing wastewater assets with consideration of the specific asset types – as each is different. This objective must be shared by all those who support wastewater asset owners in delivering the outcomes specified by the asset owners. This will extend to several processes, including creating, storing, capturing and/or analysing data. Adopting this standard will increase the efficiency of information access and result in greater customer satisfaction when dealing with inquiries from engineering consultants, surveyors, developers and asset managers by:

- **eliminating duplication of effort** – significant duplication exists in the digitising of as-constructed / as-built information. This duplication occurs between the private sector (which captures as-constructed / as-built information) and council, utility and water authority staff (who may digitise that information from paper plans)
- **improving process efficiency**, in the process of accepting and processing lodgements, and in checking existing data against design criteria and/or design plans
- **improving customer service** to both internal and external customers of asset information
- **improving the quality** of wastewater information held in council, utility and water authority systems for audit and financial requirements, as well as operational and business requirements

[1] Alongside wastewater, standards are in place for potable water, stormwater, residential housing, light commercial buildings and roading.

- **providing a structure** for the consistent recording of all council, utility and water authority owned assets, including those created through internal programmes such as capital works and renewals
- **managing assets better** to reduce the need for capital works and/or to reduce ongoing maintenance costs.

Wastewater data is characterised as having an infrastructure role by:

- functioning as reference data – which means other kinds of information can and will be linked to the core data
- being of interest for many different kinds of applications (and being a common denominator and integrator between different data suppliers and product and service providers)
- containing information of specific interest for the public sector in its role to support asset management, efficient design and construction, network management planning and community outcomes
- having a structure that is stable over time (even if parts of the data content change because of user input).
- having specific interest for cross border (across local, national or international boundaries) applications.

Use of the Specifications

Volume 1 of this standard is for all who undertake wastewater land development or capital works (new and renewal or replacement) activities for or on behalf of all asset owners of public wastewater assets. Volume 2 is for all who undertake work on the network and who require the exchange of data to update the current information about that asset as a result of the work.

This document includes a specification of common features (feature types, attribute types and attribute value domains). It also contains generalisation rules for the graphical representation of the features, that is, water assets, geodetic reference system and rules for validating the data supplied to ensure compliance.

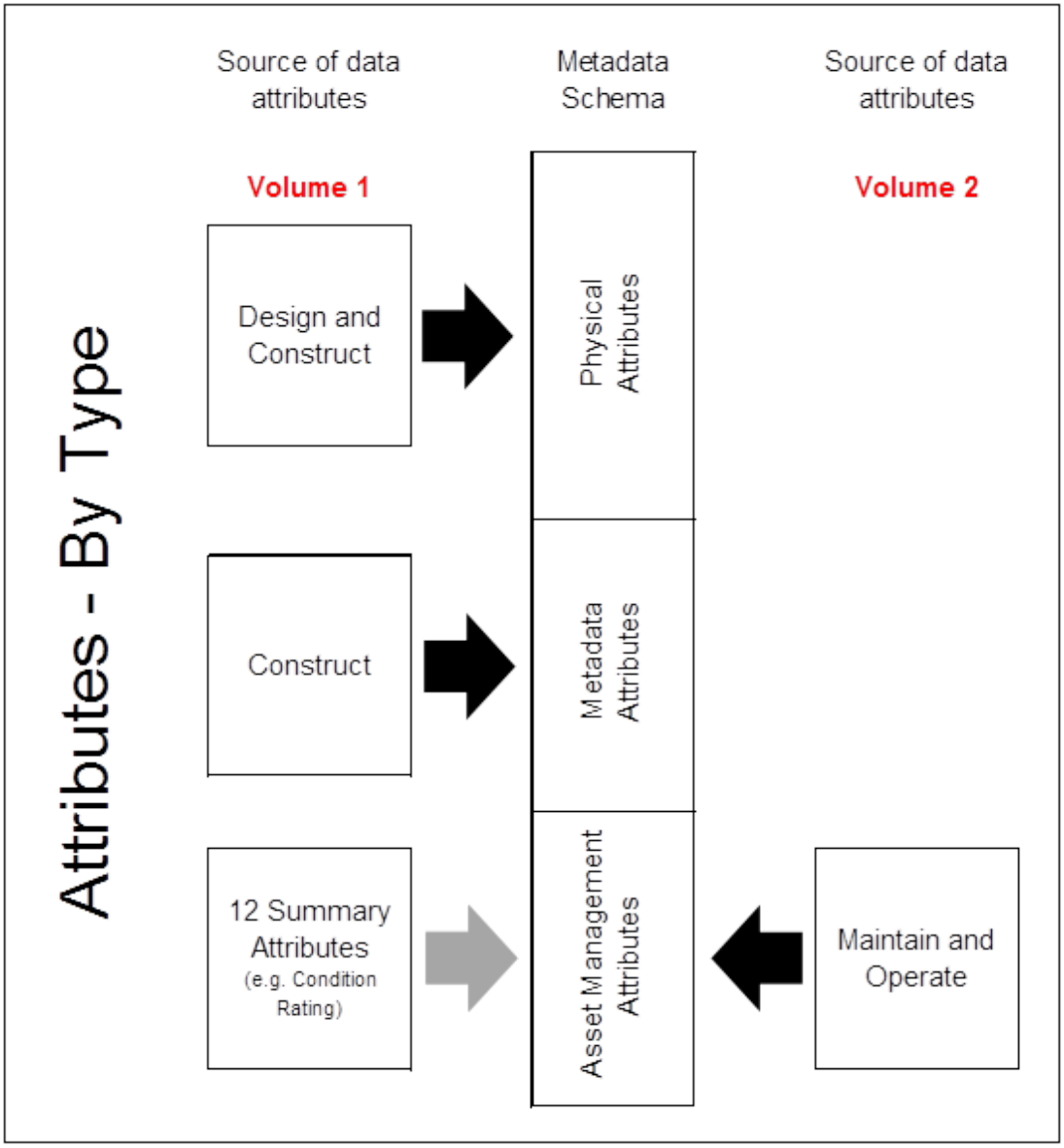
The **as-constructed / as-built** information is to be supplied as features and attributes. Storing the information as attributes means attaching the information directly to the features. This document is a guide on what features to supply and which attributes to attach to the various features.

The relationship between Volume 1 (As-constructed / As-built) and Volume 2 (Asset Management and Performance) is both implicit and explicit in nature. It is implicit in that the data required to manage assets requires an appropriate level of knowledge about the asset itself, in a digital sense. Volume 1 specifically defines the description of assets for this first digital environment (See Figure 1)

Volume 2 is more explicit in that stewards of assets also know it is as much about the asset's environment and services provided that requires monitoring and management as it is about the assets themselves. Volume 2 specifically defines the assets for the second digital environment.

These two volumes connected by the inclusion of calculable fields defined in Volume 2 into Volume 1 (for example condition or criticality). Each of the 12 decision elements defined in Volume 2 has these 'digital keys'. In order for a digital environment to capture these important pieces of information, it is necessary to recognise they require a place in the data stored about the asset. These fields have therefore been included in the tables of Volume 1. This provides the required foundations for interoperability analytics.

Figure 1: Relationship of attributes in metadata scheme – Volume 1 and 2



In Summary

The main objective of this standard specification is to provide information for dealing with any public asset owner. This document outlines the specific requirements for the submission of all digital data that relates to any newly constructed wastewater assets as defined by asset managers in New Zealand. In fulfilling on this objective it will create a common language framework to facilitate the sharing of asset information throughout NZ enabling interoperability, consistency and confidence to make evidence based decisions.

The public asset owners will use the digital data supplied to incorporate into their geographic information systems and their asset management systems.

While all care has been taken with the preparation of this document, it is the responsibility of the consultants to confirm that all details are current and relevant and they are responsible for ensuring they are using the relevant current metadata standard specification.

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1 Submission of Digital "As-constructed / As-built" Information

The objective of Volume 1 is to provide geospatially ready "as-manufactured" and "as-constructed / as-built" digital data on wastewater assets. The objective of Volume 2 is to provide geospatially ready "as-managed" digital data on wastewater assets.

This volume outlines the specifications for the delivery of digital data on: water pipes, access points, service mains, water fittings, pumping stations, and other structures as well as the boundary showing the extent of the works. This data is to be provided for each asset, as outlined in Table 3 (section 1.8).

1.1 Register

The New Zealand Treasury National Infrastructure Unit will list organisations that have registered to use the asset metadata standards, and will provide updates or revisions as necessary. You are advised to read this volume carefully. Any comments or suggestions you have about it are welcomed.

Consultants who have registered will be listed on the **National Infrastructure Unit**

website: www.infrastructure.govt.nz.

1.2 Standards Adoption Contacts

All inquiries relating to the format of the digital information should be directed to either the National Infrastructure Unit or your local point of contact for the organisation you are dealing with.

1.3 Intellectual Property

All public sector asset owners own the intellectual property of the developed specifications. Intellectual property rights are not to be sold, transferred or assigned to any other party.

All standard specifications will be available to the consulting and development industries only in New Zealand.

These Standards are not to be distributed outside of New Zealand or used for any other purpose.

1.4 Disclaimer

On occasion, asset managers may supply consultants with digital data to help them with their planning and design phases. The National Infrastructure Unit accepts no liability for the accuracy or completeness of the information, and it is the responsibility of the consultants to ensure that the data supplied is appropriate and applicable to the end use intended.

1.5 Deliverables

The following lists the various formats that data may be delivered. Arrange with the asset owner the appropriate method of delivery for them.

It is acceptable to provide the digital data files by:

- emailing them to the asset owner
- supplying them on portable devices (USB memory stick or portable hard drive)
- supplying them through cloud mediums (FTP, Dropbox, Google Drive etc.).

Table 1 lists the information to be provided as a text file that will be used as part of validating the data submission. It must accompany *every* digital data submission.

Table 2: Information Used in Data Validation Process

Label	Description	Example
COMPANY	Company name taking responsibility for the data	
CONTACT	Contact name for this project	
TELEPHONE	Telephone number	
FACSIMILE	Facsimile number (if applicable)	
EMAIL	Email address	
PHYSICAL ADDRESS	Physical business address	
MAILING ADDRESS	Mailing address (if different to physical address)	
ASSET OWNER	Participating Authority	
DATE SUBMITTED	Date the digital data submitted to asset owner	
DOCUMENT VERSION	Version of the document used	
SOFTWARE FORMAT & VERSION	The software used to create the digital data	
PROJECT or SUBDIVISION	Project or Subdivision name	
STAGE	Subdivision Stage Name (if applicable)	
DESIGN COMPANY	Design Company Name	
PLAN NUMBER	As-constructed / As-built Plan Number set/s	
CONSTRUCTION COMPANY	Construction Company Name	
CONSTRUCTION DATE	Date the asset was constructed/ built/installed	
HORIZONTAL COORDINATE SYSTEM	The coordinate system the data is in	
VERTICAL DATUM	Vertical Height Datum	
TRANSFORMATION	The coordinate system the data was transformed from	
TRANSFORMATION BY	Who carried out the transformation from the original coordinate system to the relevant system	
SOURCE OF DATA	Data source or method that was used to collect the data and populate the attributes	
NOTES/COMMENTS	Important notes or information to be included here.	

1.6 Global Schemas

1.6.1 Context

The metadata standards describe and define the data required for evidence-based investment decision-making in an asset management environment.

The standards support the professional judgement that comes with experience when making investment decisions: analytics do not remove the responsibility of the decision-maker.

Each standard outlines the underpinning definitions, logic and foundations for the resulting analytics and *standardises and harmonises* the data and science across the asset management disciplines.

The rationale is to create a platform for interoperability. The opportunities available with big data and sophisticated machine learning analytics are endless but are also out of reach for most asset managers, unless a common data platform is created to enable this. The standards provide a platform so stewards of public sector assets have access to common-pool resources (for example, analytics).

Asset management has many layers of complexity, from the condition of a metadata attribute, such as a water pipe, to the National Policy Statement for Freshwater Management that gives national guidance on managing the freshwater environment. They are tightly coupled.

Figure 2 shows the global metadata schemas and how the standards sit within a wider asset management framework. Each layer has a role in the development of an integrated, learning asset management environment. These layers and the five volumes of metadata standards are described below.[2]

1.6.2 Metadata Standard (Volumes 1 and 2)

This asset metadata standard is presented in two volumes: As-constructed / As-built (Volume 1) and Asset Management and Performance (Volume 2).

As-constructed / As-built (Volume 1)

This volume describes the data to be captured on the creation of a new asset at an assetID (component) level. The data at this level has three attributes that define the characteristics of the asset:

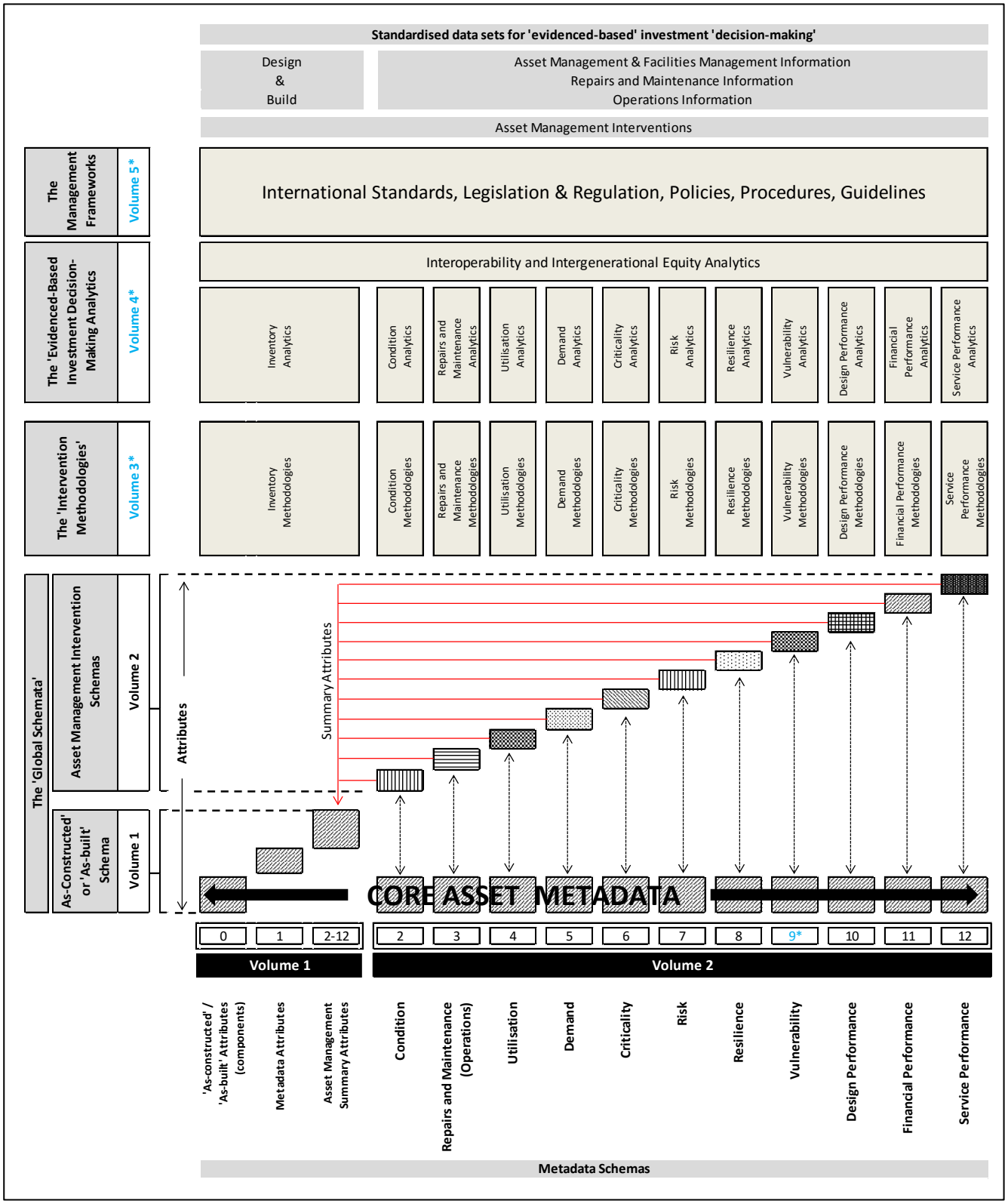
- *physical* (for example, material or diameter)
- *metadata* (for example, date of construction or builder)
- *asset management* (for example, condition).

Asset management attributes are: condition; repairs, maintenance and operations; utilisation; demand; criticality; risk; resilience; vulnerability; design performance; financial performance; and service performance (note these are summary attributes in this volume).

The full schema for each attribute is defined in Volume 2 (Asset Management and Performance).

[2] Volumes 3, 4 and 5 are not yet developed but are still an integral part of the goal to have a suite of national standards for managing public assets.

Figure 2: Global Asset Metadata Schemas



Asset Management and Performance (Volume 2)

This volume describes the **decision elements** required for making evidence-based investment decisions. The elements are defined as:

- **condition:** the physical state of the asset, which may affect its ability to deliver the service and level of service intended in its design
- **repairs, maintenance and operations:** activities undertaken to ensure the asset continues to deliver the service and level of service intended in its design
- **utilisation:** the proportion being used of an asset's available capacity
- **demand:** the call on an asset's capacity at any given time
- **vulnerability:** the susceptibility or flaw,[3] which in certain events could diminish an asset's ability to deliver the service and level of service intended in its design
- **criticality:** the significance of the removal of any individual component or asset to the ability of any part of a network or portfolio to deliver the service it was designed to perform
- **risk:** the potential to gain or lose something of value, that is, the probability or threat of quantifiable damage, injury, liability, loss, or any other negative occurrence caused by external or internal vulnerabilities, and that may be avoided through pre-emptive action
- **resilience:** resilience of an asset is defined as the capacity of an asset to absorb disturbance, return from disruption, act effectively in a crisis and adapt to changing conditions over time
- **design performance:** an asset's ability to deliver the service within the functional limits as intended in its design
- **financial performance:** an asset's ability to deliver the service within the financial limits as intended in its design
- **service performance:** an asset's ability to deliver the service within the levels of service limits as intended in its design.

Each element is required to inform investment decisions in public sector assets – whether for operational investment (for example, prioritising a work programme for condition assessments) or a capital investment programme for renewals (for example, the replacement of mains water pipes).

Their use and application will vary significantly, depending on the circumstances of the specific decision and the accessibility of information to help develop supporting analytics. In time, the documents referenced in the Management Frameworks – Volume 5 will describe decision-making best practice (for example, Water New Zealand's Pipe Renewal Guidelines).

1.6.3 Intervention Methodologies, Evidence-based Investment Decision-making Analytics and Asset Management Frameworks – not in scope

The layers referred to in Figure 2 (intervention methodologies; evidence-based investment decision-making analytics; and asset management frameworks) are not yet developed, but for context an explanation is provided for how they fit into an integrated, learning asset management environment.

[3] Susceptibility refers to environmental factors, such as liquefaction zone; flaw refers to physical factors, such as material type.

Intervention Methodologies (Volume 3)

Many interventions are needed to manage the life of an asset. They range from *direct non-invasive* interrogations for condition (for example, visual inspections or CCTV assessments from video footage) to *direct invasive* interventions of materials testing (for example, pipe wall thickness and strength tests in a mains water pipe). They also range from *indirect non-invasive* desktop-type interventions for financial performance (for example, the economic yield of a pipe investment proposal) to *indirect invasive interventions* that hardwire water quality monitoring solutions at a wastewater outfall (for example, sensors measuring turbidity or *Escherichia coli*).

Irrespective of the intervention, each requires its own standard methodology. This includes a metadata schema that collects the requisite data and stores it in a standardised metadata format that can be analysed using standardised algorithms and analytical frameworks.

The intervention methodologies must be repeatable. This maintains the intent of both the standard and supporting analytic; otherwise the logical intent of the metadata standard is reduced to a point where it could be assumed the analytics are not standard. While the standard recognises we do not work in a perfect world, it also attempts to maintain consistency in the methodologies used to interrogate assets throughout their life.

The standard is silent on which interventions are appropriate to interrogate assets, because that is for the relevant sectors to determine through their own processes relevant to the specific circumstances of any environment.

Evidence-based Investment Decision-making Analytics (Volume 4)

This is sometimes referred to as the ‘engine-room’ of strategic asset management planning. Within it are four levels of analytical complexity that can be considered as having standardised the data.

The first relates to analytical endeavours within any one of the suite of elements (for example, condition). Here, analytics into condition modelling across a water network have the ability to prioritise organisational activities (for example, condition investigation work programmes). These types of analyses, although necessary and extremely useful, are also ‘one dimensional’.

The second level considers asset-specific interoperability (for example, network optimisation analytics). Network optimisation analytics can interrogate pipe capacity, connection frequency and hydraulic competency within the same analysis. It is now easy to mix other decision-making elements (for example, criticality, resilience or risk) into these optimisation analytics to prioritise them (for example, optimising a renewals programme relating to criticality or risk). These ‘two-dimensional’ analytics are relatively unsophisticated but can add substantial value to an asset management environment.

The third level is where the interdisciplinary nature of strategic asset management planning can be demonstrated. Here, core-asset data is analysed with other information related to asset management to help other disciplines, such as financial and spatial planning, in their endeavours. Spatial planning relies heavily on core infrastructure to enable development. Analytics that uncover economic yield and infrastructure affordability indices for capital widening or capital deepening planning strategies are instrumental in how cities might plan for economic growth. These ‘three-dimensional’ interoperability analytics require highly collaborative approaches across the disciplines.

The fourth level is the most sophisticated. The ‘fourth-dimensional’ element, *time*, allows for analytics that reach not only within and across decision-making elements and disciplines for interoperability, but also across generations. Strategic asset planning has several principles that should be followed in

public infrastructure investment decision-making; consideration against the *whole of asset life* is one.[4] Analytics, such as long-life economic yield and intergenerational equity, provide guidance on long-term infrastructural affordability and sustainability. These analytics also underpin the numerous financial forecasting and predictive analytics being used in demand-type models.

The models. Much discussion occurs about the variety of models used to support strategic asset management planning. These models are defined as static, dynamic and real-time, and the analytics described above exercise themselves over all three.

Static: analytics supporting these models are invariably point solutions and do not contain a temporal element. Sensitivity and scenario analyses often support these models and the evidence being developed for an investment decision. The most sophisticated are also underpinned by stochasticity analytics, which provide levels of confidence in any analysis.

Dynamic: analytics supporting these models include time. They are also able to support both sensitivity and scenario analyses and should be underpinned with stochasticity analytics. The more sophisticated include predictive analytics in forecasts, using what has been recorded in the past to inform decisions in the future.

Real-time: the powerful analytics engines of today and big data analytical capability that comes with these emerging technologies allow data to be collected and analysed in real time. These analytical tools mean networks can respond to real-time circumstances with real-time solutions (for example, demand-driven pressure regulation across a water network).

Asset Management Frameworks (Volume 5)

The asset management frameworks are the systems and processes asset managers use to manage their portfolios. Quite specific legislative requirements are in place that asset managers must adhere to as part of their responsibility for managing these assets (for example, health and safety standards).

[4] Other principles are: do the basics first, make evidence-based decisions, for the whole of an asset's life, always maximise value and measure real benefits.

1.7 Hierarchy

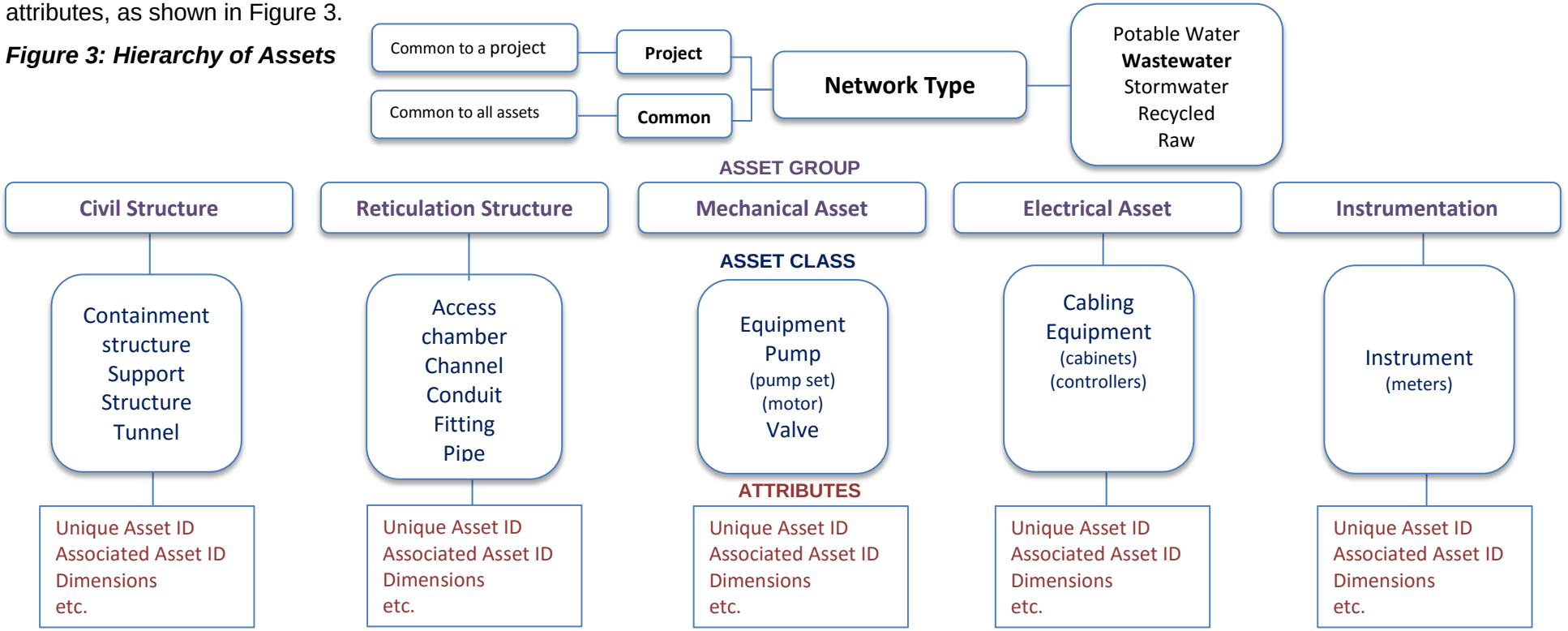
The hierarchy has been developed to list the relationship of the various asset types and their functions. It can be used to determine:

- a single classification system for all assets
- the level of commonality of data requirements across various networks
- the level of commonality of data requirements across asset classes
- the level of detail to be collected for each asset type
- any differences between asset types across networks.

The hierarchy and associated data structure standardise the requirements and provide a guide to suppliers when they are providing digital as-constructed / as-built asset data to the asset owners.

At the top of the hierarchy is the network type, followed by the asset groups and then the associated asset class with their respective attributes, as shown in Figure 3.

Figure 3: Hierarchy of Assets



1.8 Theme Structure

The theme structure presented in Table 3: Theme Structure as a Guide to Arranging Digital Datais a guide for suppliers of asset information when arranging their digital data for asset managers. The main requirements are that each asset type must be delivered on a separate level/layer and the files must be clearly labelled in accordance with the "**Universal File Name**" indicated in the table.

Depending on the asset to be captured, not all levels/layers indicated here may appear in the submitted data.

It is important to note that each layer of data is to contain only the listed features. The presence of any other features will impede the automatic acceptance testing and may result in non-conformance with the requirements.

Table 3: Theme Structure as a Guide to Arranging Digital Data

Asset Class	Asset Group	Example	Universal File name	Data Type	Description	Attribute Table
Access Chamber	Reticulation	Maintenance holes Inspection openings Manholes Access points	Chamber	Point	Point representing the central location of the asset	Yes
Access Chamber	Reticulation	A Polygon representing the perimeter of the asset must be provided where the structure is not a regular shape (eg round or square) to indicate the extents of the asset	Chamber	Polygon	Polygon representing the perimeter of the asset	No
Area of Work	Project Work	Polygon representing the extents of the Project work (subdivision development or capital works)	AreaOfWork	Polygon	Polygon representing the extents of the Project work	Yes
Channel	Reticulation	Channels Table Drains Swales Spillways	Channel	Polygon	Polygon representing the perimeter of the asset	Yes
Conduit	Reticulation	Conduit for cabling	Conduit	Polyline	Line or polyline representing the alignment of the asset	Yes
Containment Structure	Civil Structure	Tanks Reservoirs	Containment	Polygon	Polygon representing the perimeter of the asset	Yes
Electrical Cabling	Electrical	Cabling to and from Cabinets (from supply to asset)	ElecCabling	Polyline	Line or polyline representing the alignment of the asset	Yes
Electrical Equipment	Electrical	Cabinets Controllers Motors Emergency power supply Generators SCADA	ElectEquip	Point	Point representing the central location of the asset	Yes
Fitting	Reticulation	Bend Flange Reducer	Fitting	Point	Point representing the central location of the asset	Yes
Instrument	Instrument	Meters Telemetry Sensors	Instrument	Point	Point representing the central location of the asset	Yes

Asset Class	Asset Group	Example	Universal File name	Data Type	Description	Attribute Table
Mechanical Equipment	Mechanical	Surge vessels Aerator Actuators	MechEquip	Point	Point representing the central location of the asset	Yes
Miscellaneous Graphics	Supplementary Data	Cartographic text Change of Grade text	Graphics	Text	Miscellaneous text relevant to the asset feature	No
Pipe	Reticulation	Gravity mains Pressure mains Vacuum mains Syphons Laterals Service mains	Pipe	Polyline	Line or polyline representing the alignment of the asset	Yes
Pipe	Reticulation	Siphon Vacuum	PipeSupp	No Graphics	Supplementary details of location of horizontal or vertical alignment changes on Siphon and Vacuum systems	Yes Optional
Problem	Supplementary Data	Problems with matching to existing infrastructure	Problems	Polygon	Circle of radius 10m and associated comments listing all problems/issues to address.	Yes
Pump	Mechanical	Pumps	Mechanical	Point	Point representing the central location of the asset	Yes
Pumping Station	Reticulation	Polygon representing the area being managed	PStation	Polygon	Polygon representing the perimeter of the management area containing the various asset components	Yes
Support Structure	Civil Structure	Anchor Block Thrust Block	SStructure	Polygon	Polygon representing the perimeter of the asset	Yes
Tunnel	Civil Structure	Access Tunnel under a dam wall	Tunnel	Polygon	Polygon representing the perimeter of the asset	Yes
Valve	Mechanical	Air Solenoid Ball Hydrant	Valve	Point	Point representing the central location of the asset	Yes

1.8.1 Other Asset Classes in the Precinct of a Wastewater Network

In some instances, other asset classes may be constructed as part of a wastewater project, such as a treatment plant or a large pumping station compound.

Where this occurs, please refer to the relevant standard specifications to ensure compliance with the delivery of "**as-constructed / as-built**" data. Table 4 lists some of the specifications available.

Table 4: Standard Specifications for Some Other Asset Classes in a Wastewater Network

Pathways and Roads	Please refer to NZAMS – Roading specification requirements
Retaining Walls	Refer to NZAMS – Roading Specification
Kerbs and Channels	Please refer to NZAMS – Roading specification requirements
Stormwater Pipes	Please refer to NZAMS – Stormwater specification for

	requirements

1.9 Data Principles

An accepted practice to visualise assets and capture their specific characteristics (attributes) is to combine their geospatial location reference with their attributes in a table. This data is linked through unique identifiers that are used as primary keys between systems.

As the sector evolves from a typical two-dimensional GIS view of the world based on tables to an object-oriented view, it will become possible to gather the required asset details from three-dimensional models that represent the real world. This will include but not be limited to:

- location data through geospatial referencing
- creating and maintaining specific and common asset characteristics through the attribution incorporated into the Object Data Libraries.

Table 5 offers a guide to three-dimensional information for different asset classes.

Table 5: Three-dimensional Information by Asset Class

Wastewater asset class	BIM enabled	Geospatial representation		
	3D object	Polygon	Polyline	Point
Access chamber	✓	✓	N/A	✓
Channel	✓	✓	N/A	N/A
Conduit	✓	✓	√	N/A
Containment	✓	✓	N/A	✓
Electrical cabling	✓	N/A	✓	N/A
Electrical equipment	✓	N/A	✓	✓
Fitting	✓	N/A	N/A	✓
Instrument	✓	N/A	N/A	✓
Mechanical equipment	✓	✓	N/A	✓
Pipe	✓	✓	✓	N/A
Pump	✓	N/A	N/A	✓
Pump station	✓	✓	N/A	N/A
Support Structures	✓	✓	N/A	✓
Tunnel	✓	✓	N/A	N/A
Valve	✓	N/A	N/A	✓

1.10 Graphical Data Construction Principles

Each of the following sections details the graphical data construction principles that must be followed for all linework, polygons and points provided. Where practicable, the alignment of all data, whether “as-constructed” or “as-built” measurements, must be related to the title/property boundaries abutting the road reserve.

- Please use sound computer-assisted design (CAD) practices when recording data, such as snapping to lines and closing polygons.

1.11 Acceptance Testing

All graphical information will be checked against the relevant attribute table. Please refer to section 2 for guidelines for suppliers when putting together attribute information.

It is mandatory that each supplier checks that their plans and data conform to the specification before submitting the data to an asset owner.

Following the acceptance of the digital data, the relevant certificates will be issued and the ownership of the digital data reverts to the asset owner.

2 Attribute and Validation File Format Specifications

2.1 Technical Reference Information

2.1.1 Accuracy Requirements for Locating Assets

‘‘As-constructed / as-built” data provides infrastructure managers with two key pieces of information about each asset they will be managing – **what** it is and **where** it is. The accuracy of ‘where’ information needs to be considered at three levels.

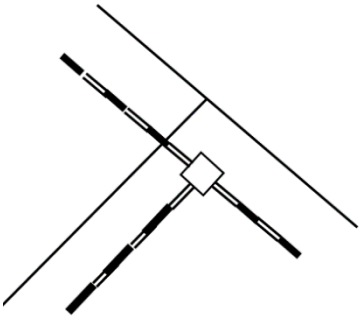
- **Spatial accuracy** refers to how the point is located. **Precision** refers to the level of recording of the point, for example, nearest metre or nearest centimetre.
- **Absolute accuracy** refers to how close the record of a location is to its true spatial location.
- **Relative accuracy** refers to how an object’s location is stored in terms of its relationship with nearby objects.

Information may vary in terms of its accuracy across these levels. For example, the position of a road and pole may have been recorded relatively to correctly represent the spatial relationship between the road and pole. However, both the pole and road may be metres out of position, in absolute terms. Relative accuracy is good but absolute accuracy is poor.

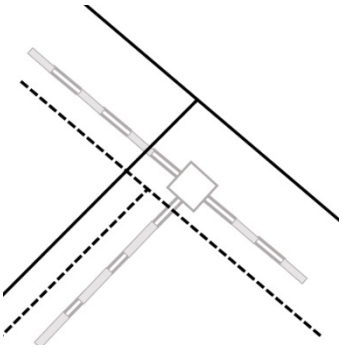
While the supply of ‘where’ information may appear to be simple, it can be problematic when considering the integration of highly accurate data with existing data of a lesser accuracy (Figure 4). Mixing data of different accuracies needs careful and considered management to meet requirements for relative accuracy.

Contemporary surveying techniques, such as satellite positioning, are providing easy access to positioning with good levels of absolute accuracy to satisfy asset management requirements. This volume outlines accuracy requirements for the supply of “as-constructed / as-built” data.

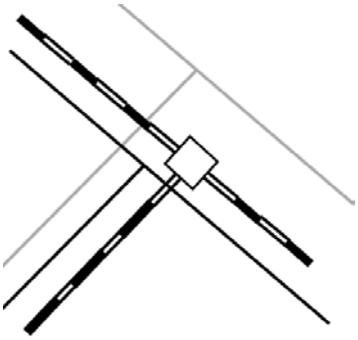
Figure 4: Impact of Combining Data of Varying Accuracy in Absolute Terms



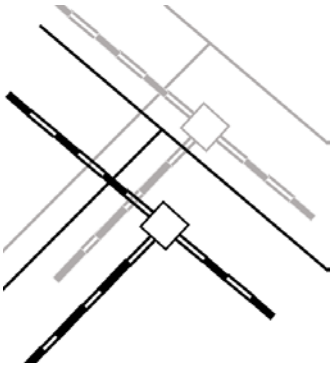
Existing mapbase and wastewater assets showing good relative accuracy between assets and property boundaries



Relationship between existing mapbase property boundary (solid) and boundary in correct location in absolute accuracy terms (dashed).



Potential impact of adopting property boundary in correct location in absolute accuracy terms without proper regard for other assets of poorer absolute accuracy. Relative accuracy may be lost, in this case incorrectly indicating wastewater asset is on the other side of the northwest–southeast boundary. (Original locations in grey.)



Correct outcome, both wastewater and property boundary upgraded to a higher level of absolute accuracy while retaining relative accuracy through adjustment at same time. (Original locations in grey.)

2.1.2 Projections and Datums

A key requirement in supplying the "as-constructed / as-built" information is that it meets the accuracy requirements of **central government agencies and local government authorities**.

Land Information New Zealand (LINZ) is the authoritative source of cadastral information for New Zealand.

The consultant will inform the receiver of "as-constructed / as-built" information of discrepancies between the digital cadastral map-base and the location of assets supplied as "as-constructed / as-built" information. These discrepancies include where the relative accuracy of the asset is not being correctly represented with respect to digital cadastral boundaries.

Digital spatial data, relating to asset locations, is to be supplied on the New Zealand Transverse Mercator 2000 projection (NZTM2000) with the exception of data from New Zealand's offshore islands or its continental shelf (refer to LINZ for the appropriate projections to be used for these exceptions). Supply coordinates in metres, to a precision of at least two decimal places.

Vertical heights are to be supplied to the New Zealand Vertical Datum 2016 (NZVD2016). Supply heights in metres, to a precision of at least two decimal places.

2.1.3 Precision Codes

The following precision codes define the precision data is to be provided for various Asset Classes.

Code	Horizontal Precision	Vertical Precision
A	±15 mm	±10 mm
B	±20 mm	±15 mm
C	±50 mm	±20 mm
D	±100 mm	±40 mm
E	±200 mm	±50 mm
F	±500 mm	±100 mm
G	› 500 mm	› 100 mm
NA	Not Applicable	Not Applicable

2.1.4 Asset Class Precision Requirements

Asset Classes are to be provided to the following precision codes:

Asset Class	Asset Group	Data Type	Attribute Table	Horizontal Precision Code	Vertical Precision Code
Access Chamber	Reticulation	Point	Yes	D	C
Access Chamber	Reticulation	Polygon	No	D	C
Area of Work	Project Work	Polygon	Yes	F	NA
Channel	Reticulation	Polygon	Yes	D	C
Conduit	Reticulation	Polyline	Yes	D	C
Containment	Civil Structure	Polygon	Yes	E	E
Electrical Cabling	Electrical	Polyline	Yes	D	D
Electrical Equipment	Electrical	Point	Yes	D	D
Fitting	Reticulation	Point	Yes	D	D
Instrument	Instrument	Point	Yes	D	D
Mechanical Equipment	Mechanical	Point	Yes	D	D
Miscellaneous Graphics	Supplementary Data	Text	No	NA	NA
Pipe	Reticulation	Polyline	Yes	D	C
Problem	Supplementary Data	Polygon	Yes	D	C
Pump	Mechanical	Point	Yes	D	D
Pumping Station	Reticulation	Polygon	Yes	D	D
Support Structure	Civil Structure	Polygon	Yes	D	NA
Tunnel	Civil Structure	Polygon	Yes	E	E
Valve	Mechanical	Point	Yes	D	D

2.1.5 Attribute Data Fields

The attribute data to be provided for each asset is made up of three components:

1. project specific attributes (section 2.1.9) – information that is collected at a project level
2. common attributes (section 2.1.10) – information that is collected for all asset types
3. specific attributes (section 2.2) – information that is particular to that asset type.

Please note that the tables on attributes and validation in section 2 present all three components as an example of the level of detail that is required to be collected for each asset.

In practice, the project-related data needs to be provided once only, as shown in Data Table 1.

The following are other requirements for the structure of the data to be provided to the asset owner.

- Specify maximum field widths for Alpha / Numeric and Alpha data.
- Provide dates as dd/mm/yyyy – for example, 07/06/2001.
- Populate all fields in accordance with the notes supplied for each field.
- For all attribute files supplied, use the ***Column Names – Abbreviated*** set out in each asset's attribute and validation file format instruction table.
- Follow the validation checks for each data field as set out in each asset's attribute and validation file format instruction table.
- Use the harmonised code lists given in section 3 to standardise the information captured in the attribute fields.
- Please take note of default values for specific fields.
- Please note that every attribute name is case sensitive. Use the given name format when creating the fields to supply the data.

2.1.6 Attribute Data Type Definitions

Table 6: Attribute Data Type Definitions

Name	Technical Specification	Definition
Alpha / Numeric	varchar(m)	[a-z], [A-Z],[0-9],[-] letter and digits where m is the maximum number of characters allowed, e.g. 10 chars could be "Abcdef_123" but not "Abcdef_1234"
Boolean	boolean	a data type with only two possible values: `true` or `false`
Boolean using Alpha	varchar(m)	[a-z],[A-Z],[-] Alphabetical (letters only), where m is the maximum number of characters allowed. E.g. 1 char "Y"
Date	date	format DD/MM/YYYY
Decimal	decimal	Please note may be a negative number when dealing with Invert levels of pipes. The precision required is listed, for example "2 decimal places" The total number of digits to be stored is not specified to accommodate different systems.
Integer	integer	Positive whole number (0 to 18,446,744,073,709,551,615)
Time	time	Must be in format hh:mm

2.1.7 Metadata Definitions

Table 7: Metadata Definitions

Metadata Element Name	Definition
Attribute Name - Abbreviated	An abbreviated name for the attribute field adopting the "underscore_case" structure, e.g. *"Unique_ID"*. Note sometimes this will include the name of the class to differentiate it from other similar names with different definitions. The field name is limited to 10 characters to enable the delivery of data in ESRI Shape file format if required.
Attribute Name – Full	A meaningful name adopting "upper and lower case" structure for the attribute field, e.g. *"Unique Identifier".* Note sometimes this will include the name of the class to differentiate it from other similar names with different definitions.
Data Type	Defines the type of data the field is to hold, for example *"Alpha / Numeric"* Please refer to Section 2.1.6 Attribute Data Type Definition.
Unit of Measure	Where relevant the unit of measure for the attribute field is provided, for example *"Metres", "Time",* and *"Millimetres".*
Max Length	Where relevant the maximum length of the Data Type is provided, for example "*10 chars*" (representing 10 characters).
Comment	Additional information provided to fully describe what the data type will consist of, for example *"2 decimal places"*, *"No commas included"* and *"Yes or No field".*
Contents	Information to fully describe what the attribute field is for. For example *"The current operational state of the asset"*. Sometimes an example is included as a sample value. *"ABN"* a value from the codelist.
Example	Sometimes an example will be provided as an example of a valid entry.
General Validation Rule	Lists one or more general rules that must be applied, for example the *"Field cannot be empty."* Sometimes a default value will be provided as an example of a valid entry.

Metadata Element Name	Definition
Specific Validation Rule	Lists one or more specific rules that must be applied, for example the *"Entry must be from the CODELIST"*. (applicable where a codelist is referenced.) Conditional where an attribute field will only be populated under specific circumstances, for example *"Conditional.* *Only to be populated if the asset is a CIRCULAR* *Default = -9999"*
Codelist Reference	A list of allowable values will be provided for attribute fields where the item must be constrained to one of a particular set of values. E.g. the list of allowable materials that a Pipe can be described by such as *"uPVC"* The field is limited to 10 characters.
Legend	This information identifies if the Attribute can be described as a *"Physical Characteristic"* a *"Metadata Characteristic"* or an *"Asset Management Characteristic"* of the asset.

2.1.8 Attribute Data Validation Requirements

In Data Table 1, please note the two columns General Validation Rule and Specific Validation Rule outline the validation checks to be carried out and have been provided as a guide for developers, consultants and contractors when putting together information for digital data submissions.

2.1.9 Project Attributes across Whole Network

Data Table 1 presents the attributes that are common across an entire project. Complete this information and provide it as part of the area of work extent requirement.

Record attributes that are common across all of the network at a project level.

Data Table 1: Project Attribute and Validation File Format Instructions

Project Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Permit_No	Permit Number	Alpha / Numeric		20 chars	No commas included	Jurisdictions to use local references as appropriate. This can include the consent number		Field cannot be empty	Default = N/A		M
Permit_Exp	Permit Expiry Date	Date	Time		dd/mm/yyyy	Indicates the expiry date of the permit or consent issued		Field cannot be empty	Default = N/A		M
Proj_Name	Project Name	Alpha / Numeric		100 chars	No commas included	Field can be used for either a subdivision or capital works project. Subdivision or Project Name	Rockbank Rise	Field cannot be empty			M
Proj_Type	Project Type	Alpha		10 chars	No commas included	Project Type	Capital Works	Field cannot be empty	Entry must be from CODELIST	Project Type	M
Design_Co	Design Company	Alpha / Numeric		100 chars	No commas included	Design company name only	Fred Charles and Associates	Field cannot be empty			M
Plan_No	Plan Number	Alpha / Numeric		20 chars	No commas included	Reference to the As-constructed / As-built drawing plan numbers As-constructed / As-built Plan number/s	6080R212	Field cannot be empty			M
Const_Co	Construction Company	Alpha / Numeric		100 chars	No commas included	Construction company name.	Jamieson Construction	Field cannot be empty. (Please Note in future each company may be provided with a code number for ease of data entry)			M
Net_Type	Network Type	Alpha		10 chars	No commas included	Network Type	(Potable)	Field cannot be empty	Entry must be from CODELIST	Network Type	M
Surveyed	Surveyed Date	Date	Time		dd/mm/yyyy	Indicates the date of a survey before or after an event (e.g. earthquake)		Field cannot be empty	Default = N/A		M

2.1.10 Common Attributes across All Asset Classes

Data Table 2 represents the attributes that are common across an entire network and apply to all asset classes. The attributes represent metadata elements and asset management elements and will be specific to each asset group.

Record attributes that are common across all asset types for each asset.

Data Table 2: Common Attribute and Validation File Format Instructions

Common Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		AM
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Common Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		250 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Common Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM

2.2 Asset Categories

This section, along with sections 2.3 to 2.7 that follow, outlines the specific requirements identified for each asset class and its respective asset types. The tables show the combination of attributes that must be provided and the validation rules to be applied.

2.2.1 Area of Work Extent

General

This feature is to represent the extent of the areas of work from subdivisional development **or** areas of capital works. It will be used specifically to identify where works have been or are intended to be, and will be populated with the common project attributes.

Graphical Representation (Polygon)

- Capture a polygon representing the extent of the area.
- Supply a polygon of the **"area of work"** on a separate layer.

The objective of this boundary is to provide **central government agencies and local government authorities** with an overview of the area being developed. This data will also assist them to monitor the progress of staged developments.

Figure 5 shows a boundary where all work has been completed within a subdivision development. Ideally you should place the boundary around the properties (that is, using the property boundaries as a reference).

Figure 5: A Polygon Representing the Extent of the Project Area

Attribute and Validation File Format Instructions

Provide a polygon representing the perimeter of the area of the work extent.

Data Table 3: Area of Work Extent and Project Attribute and Validation File Format Instructions

Area_of_Work_Extent & Project Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Permit_No	Permit Number	Alpha / Numeric		20 chars	No commas included	Jurisdictions to use local references as appropriate. This can include the consent number		Field cannot be empty	Default = N/A		M
Permit_Exp	Permit Expiry Date	Date	Time		dd/mm/yyyy	Indicates the expiry date of the permit or consent issued		Field cannot be empty	Default = N/A		M
Proj_Name	Project Name	Alpha / Numeric		100 chars	No commas included	Field can be used for either a subdivision or capital works project. Subdivision or Project Name	Rockbank Rise	Field cannot be empty			M
Proj_Type	Project Type	Alpha		10 chars	No commas included	Project Type	Capital Works	Field cannot be empty	Entry must be from CODELIST	Project Type	M
Design_Co	Design Company	Alpha / Numeric		100 chars	No commas included	Design company name only	Fred Charles and Associates	Field cannot be empty			M
Plan_No	Plan Number	Alpha / Numeric		20 chars	No commas included	Reference to the As-constructed / As-built drawing plan numbers As-constructed / As-built Plan number/s	6080R212	Field cannot be empty			M
Const_Co	Construction Company	Alpha / Numeric		100 chars	No commas included	Construction company name.	Jamieson Construction	Field cannot be empty. (Please Note in future each company may be provided with a code number for ease of data entry)			M
Net_Type	Network Type	Alpha		10 chars	No commas included	Network Type	Wastewater	Field cannot be empty	Entry must be from CODELIST	Network Type	M

2.3 Civil Structure

2.3.1 Containment Structure

General

The following general information applies to this specific asset class.

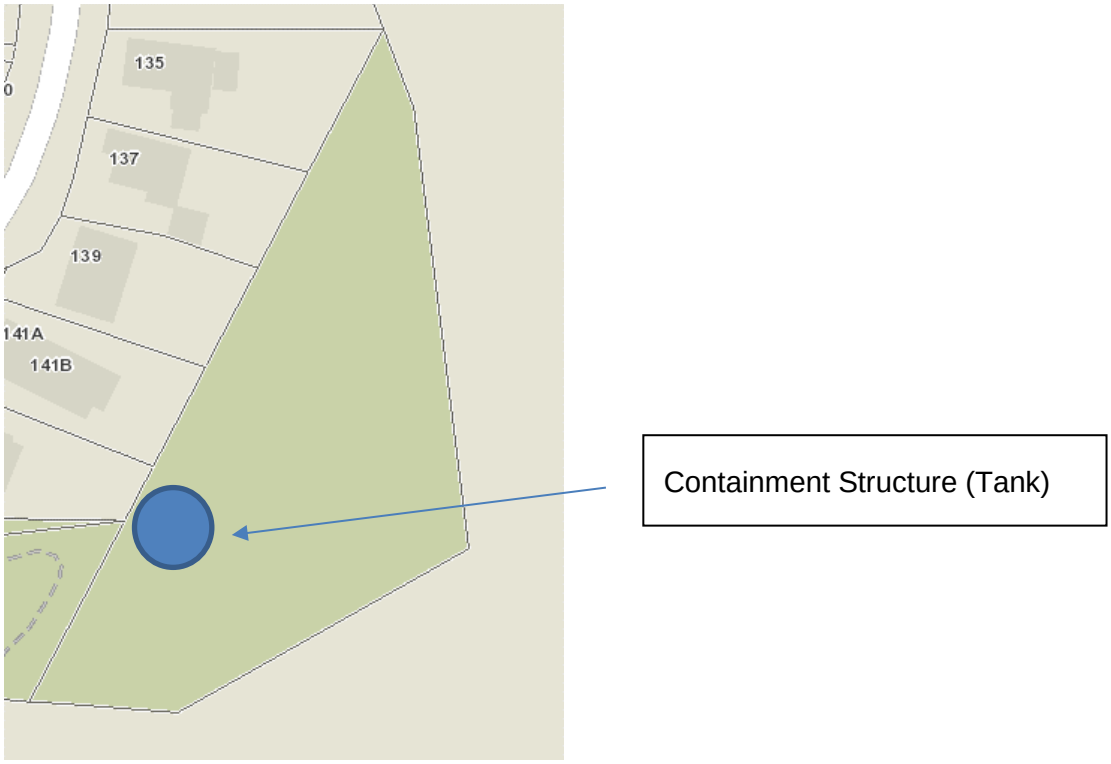
This feature is to represent the location of containment structures (enclosed structures), such as water tanks, related to the potable water network (see Figures 6 to 8 for examples).

Graphical Representation (Polygon)

- Provide a polygon feature representing the extent of the asset and attach all attributes to this polygon.

Figure 6: Example of a Containment Structure

Figure 7: Example of a Tank Captured as a Polygon Feature



Attribute and Validation File Format Instructions

Provide a polygon feature representing the perimeter of the asset.

Data Table 4: Containment Structure Attribute and Validation File Format Instructions.

Containment_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Containment_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field cannot be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Containment_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Cont	Containment Structure Type	Alpha / Numeric		10 chars	No commas included	Type of asset	Reservoir, Holding Tank	Field cannot be empty	Entry must be from CODELIST	Containment Structure Type	M
Name	Name	Alpha / Numeric		100 chars	No commas included	Asset name.	Chester Road	Field cannot be empty	Default = N/A		M
Media	Media	Alpha / Numeric		10 chars	No commas included	Indicates the contents in the asset		Field cannot be empty	Entry must be from CODELIST	Content Type	P
Length_m	Length metres	Decimal	Metres	n/a	2 decimal places	Asset length in metres	100.55	Conditional Field cannot be empty	If the asset is circular please populate this field with the default Default = -9999.99		P

Containment_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Height_m	Height Metres	Decimal	Metres	n/a	2 decimal places	Height of the asset in metres	3.78	Conditional Field cannot be empty	Default = -9999.99		P
Width_m	Width Metres	Decimal	Metres	n/a	2 decimal places	Width of the asset in metres		Field cannot be empty	If the asset is circular please populate this field with the diameter Default = -9999.99		P
Buried	Buried status	Alpha / Numeric		10 chars	No commas included	Indicates whether asset is Above Ground, Below Ground or Partially Buried	AG	Field cannot be empty	Entry must be from CODELIST	Buried Status	P
Out_Shut	Outlet Shut Off Valve	Alpha		1 char	Yes or No field	Indicates whether there is an outlet shut off valve		Field cannot be empty	Valid input: Y,N		P
Fill	Form Of Filling	Alpha / Numeric		100 chars	No commas included	Form of filling the asset	Pumping from Grenada North Reservoir, Gravity feed from Chester Zone	Field cannot be empty			M
InletType	Inlet Type	Alpha / Numeric		10 chars	No commas included	Type of inlet	B	Field cannot be empty	B for Bottom feed T for Top Feed		
InletProt	Inlet Protection	Alpha / Numeric		10 chars	No commas included	Inlet protection	NRV	Field cannot be empty	Entry must be from CODELIST	Inlet Protection	
Material	Material	Alpha / Numeric		10 chars	No commas included	Material of the asset	Steel	Field cannot be empty	Entry must be from CODELIST	Containment Structure Material	P
Partition	Partitioned Status	Alpha		1 char	Yes or No field	Indicates whether the asset is partitioned		Field cannot be empty	Valid input: Y,N		
Lining_Mat	Lining Material	Alpha / Numeric		10 chars	No commas included	Lining material of the asset		Field cannot be empty	Entry must be from CODELIST	Lining Material	P
Ext_Coat	External Coating	Alpha / Numeric		10 chars	No commas included	External coating for tanks		Field cannot be empty	Entry must be from CODELIST	External Coating	P
Max_Wtr_RL	Maximum Water Level	Decimal	Metres	n/a	2 decimal places	Maximum water level – Metres	222.15	Field cannot be empty	Default = -9999.99		P
Min_Op_RL	Minimum Water Level	Decimal	Metres	n/a	2 decimal places	Minimum operating Level in metres		Field cannot be empty	Default = -9999.99		P
Dis_Cap	Discharge Capacity	Integer	Cubic metres per hour	n/a	Whole number	Discharge Capacity (Conditional if gravitational)		Field cannot be empty	Default = -9999		M
Base_RL	Base Level	Decimal	Metres	n/a	2 decimal places	Level of base of asset in metres	15.27	Field cannot be empty	Default = -9999.99		P
Max_Cap	Maximum Capacity	Integer	Cubic Metres	n/a	Whole number	Maximum storage capacity of the asset in cubic metres.	4500m3	Field cannot be empty	Default = -9999		P
Op_Cap	Operating Capacity	Integer	Cubic Metres	n/a	Whole number	Operating Capacity of the asset in cubic metres.	3800m3	Field cannot be empty	Default = -9999		P

Containment_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
OS_RL	Overflow Level	Decimal	Metres	n/a	2 decimal places	The RL of the feature's overflow point in metres	16.23	Field cannot be empty	Default = -9999.99		P
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Model	Model Number	Alpha / Numeric		25 chars	No commas included	The model number of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Lid	Lid	Alpha		1 char	Yes or No field	Indicates whether there is a lid present		Field cannot be empty	Valid input: Y,N		P
Lid_Lock	Lid Lock	Alpha		1 char	Yes or No field	Indicates whether there is a lid lock present		Field cannot be empty	Valid input: Y,N		P
Fall	Fall Protection	Alpha		1 char	Yes or No field	Indicates whether there is fall prevention present		Field cannot be empty	Valid input: Y,N If Y, then Health and Safety Issues attribute MUST be populated.		P
Seismic	Seismic Performance Status	Integer	Percentage	n/a	Whole number	The Seismic Performance status of the asset as defined by the relevant NZ standard at time of capture represented as an accurate measure of %NBS (New Building Standard)		Field cannot be empty	Default = -9999		M
Seis_Std	Seismic Standard	Alpha / Numeric		30 chars	No commas included	The NZ standard used to define Seismic Performance	NZS 3106-2009	Field cannot be empty	Default = N/A		M
Seis_Calc	Seismic Calculation	Alpha / Numeric		100 chars	No commas included	Information to qualify the % NBS value as seen in this layout: [Standard: Year],[Importance level], [design life],[ULS and SLS return periods]	NZS 1170.5:2004 IL4 100 year life ULS 1:2500 SLS2 1:1000	Field cannot be empty	Default = N/A		M

2.3.2 Support Structures

General

The following general information applies to this specific asset class.

This feature is to represent the location of support structures such as thrust blocks related to the (fill in relevant network) network.

Graphical Representation (Polygon)

- Provide a polygon feature representing the perimeter of the asset and attach all attributes to this polygon.

Figure 8 - Example of a Regular shaped Thrust Block indicated by the yellow arrow

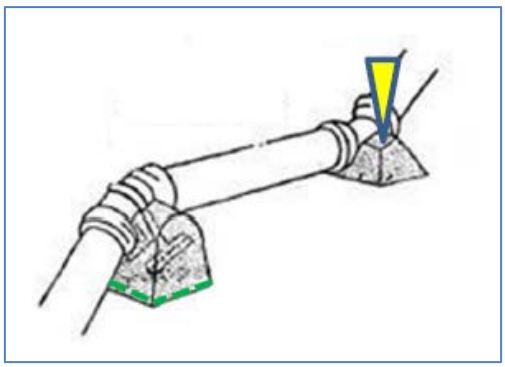


Image courtesy Christchurch City Council

Figure 9 - Example of a Non Standard sized Thrust Block bounded by the green line

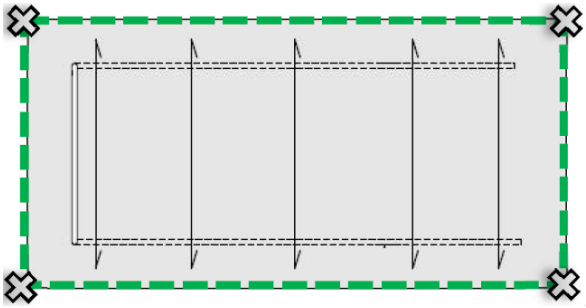


Image courtesy Christchurch City Council

Attribute and Validation File Format Instructions

Provide a polygon feature representing the perimeter of the asset.

Data Table 5: *Support* ***Structure Attribute and Validation File Format Instructions.***

Support_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M

Support_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Support_Structure Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type	Type of Support Structure	Alpha		10 chars		The type of support structure this is	NonStd	Entry must be from CODELIST		Support Structure Type	P
Supp_Mat	Support Structure Material	Alpha		10 chars		Predominant material of the structure	Conc	Entry must be from CODELIST		Support Structure Material	P
Reinforced	Reinforced	Alpha		1 char	Yes or No field	Indicates if the structure is reinforced	N	Field cannot be empty	Valid input: Y,N		P
Volume	Volume of Material	Integer	Cubic Metres	n/a		Volume of predominant material in cubic metres					P

2.3.3 Tunnel

General

This feature is to represent the location of a tunnel, for example that may be part of a dam or weir wall and used for access to the asset related to the potable water network.

These attributes have been derived from the Tunnel Asset Class in NZAMS – Roading.

- Provide a polygon feature representing the extent of the asset and attach all attributes to this polygon.
- Roading features are to be captured as per NZAMS – Roading Metadata Standard

Graphical Representation (Polygon)

- Provide a polygon feature representing the extent of the asset and attach all attributes to this polygon.

Figure 10: Tunnel Cross-section

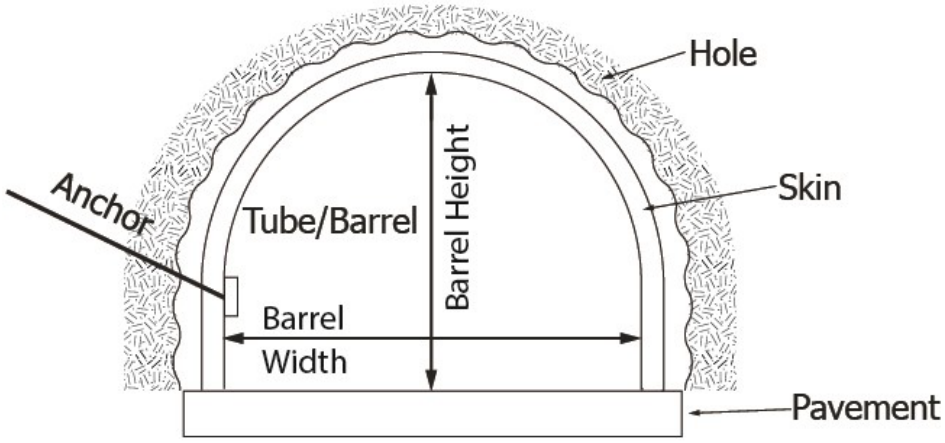
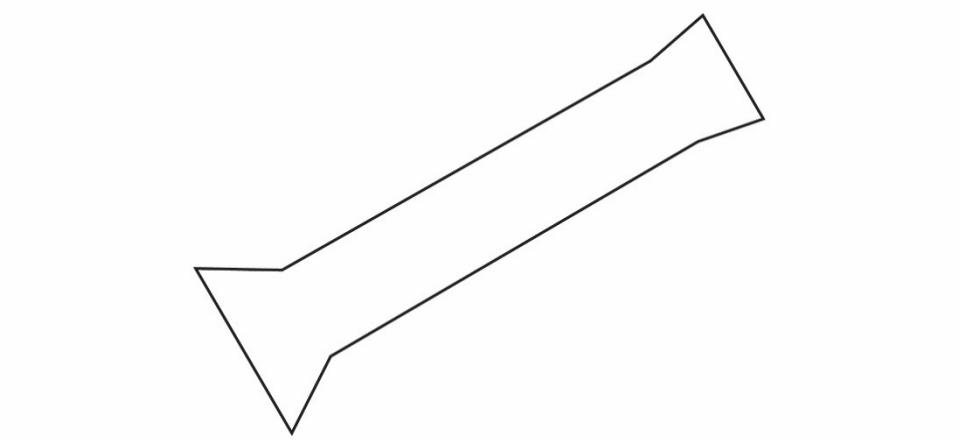


Figure 11: Tunnel represented as a Polygon



Attribute and Validation File Format Instructions

Provide a polygon feature representing the perimeter of the asset.

Data Table 6: Tunnel Attribute and Validation File Format Instructions

Tunnel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Tunnel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Tunnel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Tun	Tunnel Type	Alpha / Numeric		10 chars	No commas included	Type of asset	PED	Field cannot be empty	Entry must be from CODELIST	Tunnel Type	P
Tun_Clear	Tunnel Clearance	Decimal	Metres	n/a	1 decimal place	Clearance height of the tunnel. Values to be in the range 1-10		Field cannot be empty	Default = -9999.9		P
Length_m	Length metres	Decimal	Metres	n/a	2 decimal places	Asset length in metres.	100.55	Field cannot be empty	Default = -9999.99		P
But_Mat	Buttress Material	Alpha / Numeric		10 chars	No commas included	Buttress material		Field cannot be empty	Entry must be from CODELIST	Support Structure Material	P
But_Height	Buttress Height	Decimal	Metres	n/a	1 decimal place	Buttress height		Field cannot be empty	Default = -9999.9		P
Bl_Mat	Barrel Material	Alpha / Numeric		10 chars	No commas included	Barrel material		Field cannot be empty	Entry must be from CODELIST	Chamber Material	P
Bl_Width	Barrel Width	Decimal	Metres	n/a	1 decimal place	Barrel width		Field cannot be empty	Default = -9999.9		P
Bl_Height	Barrel Height	Decimal	Metres	n/a	1 decimal place	Barrel height		Field cannot be empty	Default = -9999.9		P
Bl_Thick	Barrel Thickness	Integer	Millimetres	n/a	Whole millimetres	Barrel/Skin thickness		Field cannot be empty	Default = -9999		P
Bl_Streat	Barrel Surface	Alpha / Numeric		10 chars	No commas included	Barrel surface treatment type	Paint	Field cannot be empty	Entry must be from CODELIST	Barrel Treatment	P

Tunnel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Foun_Type	Foundation Type	Alpha / Numeric		10 chars	No commas included	Foundation Type		Field cannot be empty	Entry must be from CODELIST	Foundation Type	P
Access_Req	Access Requirement	Alpha / Numeric		250 chars	No commas included	Specific instructions to access the asset.	Traffic Management	Field cannot be empty	Default = N/A		M
Em_Exits	Emergency Exits	Integer		n/a	Whole number	Number of emergency exits		Field cannot be empty	Default = -9999		P

2.4 Reticulation Structure

2.4.1 Access Chamber (Chamber)

General

The following general information applies to this specific asset class.

This feature is to represent the location of access chambers, such as valve pits, related to the wastewater network.

Graphical Representation (Point and Polygon)

- Provide a point feature representing the central location of the asset (for regular shaped assets) and attach all attributes to this point (Figure 12).
    - The central location is to be representative of the intersection of the pipework in the access chamber, typically this is often the centre of a regular shaped structure but is likely to be offset for an irregular shaped structure.
- Also provide a polygon as a **graphics only** component with no attributes attached to indicate the actual size, location and orientation of the asset (Figure 13).

Figure 12: Access Chamber

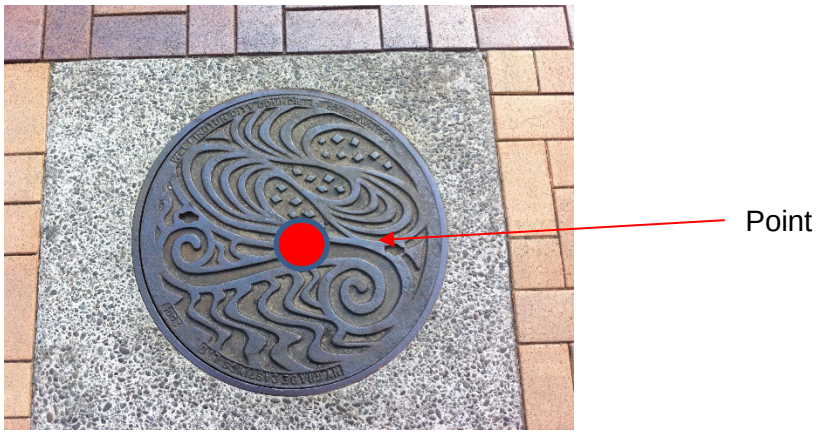


Figure 13: Example of Irregular-shaped Access Chamber Provided as Polygon

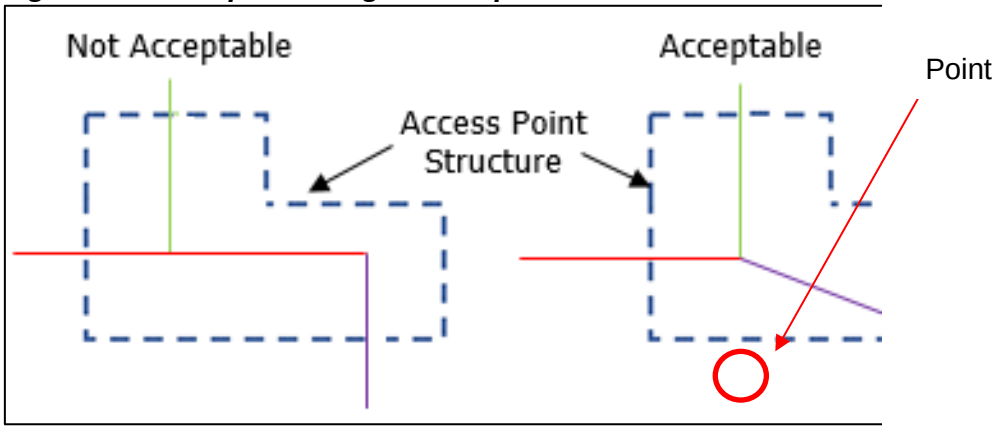


Figure 14: Example of a Pump Station Asset Configuration

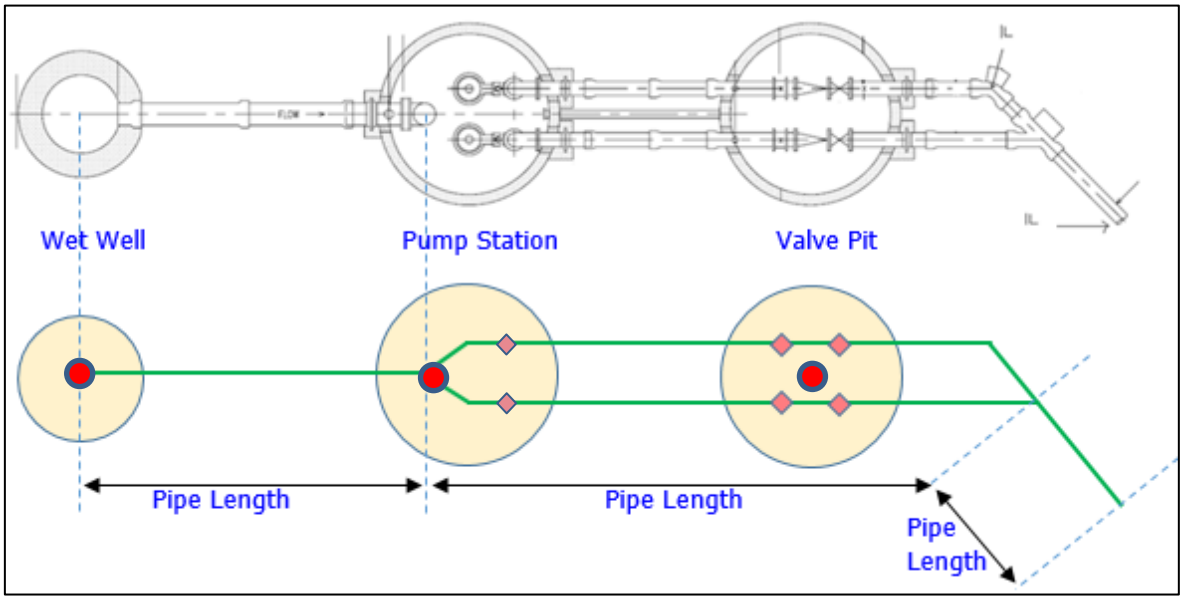


Figure 14 illustrates how you would provide a point feature, as shown in red, as well as a polygon for each of the wet well, pump station chamber and valve pit assets.

Store the attributes against the points.

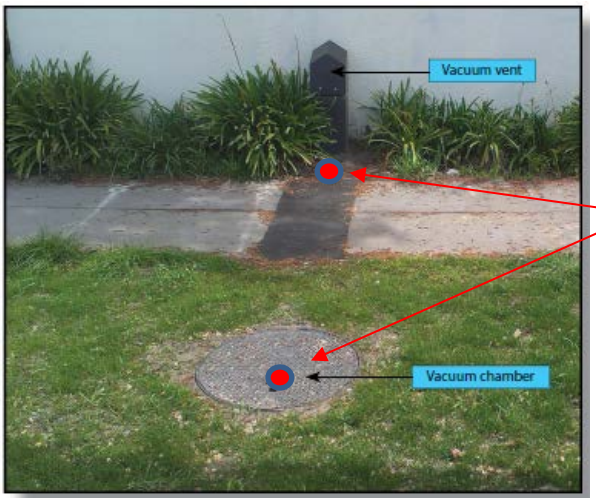
Create the polygons to show the extent of the assets.

Vacuum Systems

Figure 15: Example of a Vacuum Chamber

Image Source Christchurch City Council

Figure 16: Installed Vacuum Chamber and associated Vent



Point

Image Source SCIRT Vacuum Information Sheet

Attribute and Validation File Format Instructions

Provide the asset as two objects

1. a point representing its central location
2. a polygon representing the perimeter of the access chamber.

Data Table 7: *Access Chamber Attribute* and *Validation File Format Instructions*

Access_Chamber Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Access_Chamber Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Access_Chamber Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Chamb	Chamber Type	Alpha / Numeric		10 chars	No commas included	Type of asset	JP, SEP	Field cannot be empty	Entry must be from CODELIST	Access Chamber Type	P
Con_Mtd	Construction Method	Alpha / Numeric		10 chars	No commas included	Construction Method.	Insitu	Field cannot be empty	Entry must be from CODELIST	Construction Type	P
Lid_Type	Cover Type	Alpha / Numeric		10 chars	No commas included	Access chamber lid type.	Grate	Field cannot be empty	Entry must be from CODELIST	Access Chamber Cover Type	P
AC_Length	Acces Chamber Length	Integer	Millimetres	n/a	Whole millimetres	Side length of chamber if not circular	900	Conditional Field cannot be empty	If the chamber is circular use the default value Default = -9999		P
AC_Width	Access Chamber Width	Integer	Millimetres	n/a	Whole millimetres	The width of the asset or diameter if circular	600	Conditional Field cannot be empty	To be populated for both circular and non-circular chambers Default = -9999		P
Lid_Mat	Lid Material	Alpha / Numeric		10 chars	No commas included	Access chamber lid material	uPVC	Field cannot be empty	Entry must be from CODELIST	Chamber Material	P

Access_Chamber Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Lid_Length	Lid Length	Integer	Millimetres	n/a	Whole millimetres	Side length of lid if not circular	900	Field cannot be empty	Populate only if the lid is not circular. For circular lids, Default = -9999		P
Lid_D_W	Lid Width	Integer	Millimetres	n/a	Whole millimetres	Side width of lid or diameter if circular	600	Field cannot be empty	Default = -9999		P
Lid_RL	Lid Level	Decimal	Metres	n/a	2 decimal places	Lid Reduced Level of the asset in metres		Field cannot be empty	Default = -9999.99		P
Lid_Cl	Lid Class	Alpha / Numeric		10 chars	No commas included	The class of the lid		Optional Field cannot be empty	Entry must be from CODELIST	Lid Class	P
Lid_Std	Lid Standard built to	Alpha / Numeric		30 chars	No commas included	The NZ standard used at time of construction		Optional Field cannot be empty			M
Sealed	Sealed	Alpha		1 char	Yes or No field	Indicates if the asset has been sealed		Field cannot be empty	Valid input Y or N		P
Seal_Type	Seal Type	Alpha / Numeric		10 chars	No commas included	The seal type on the cover		Optional Field cannot be empty	Entry must be from CODELIST	Seal Type	P
Frame_Cl	Frame Class	Alpha / Numeric		10 chars	No commas included	The class of the frame		Optional Field cannot be empty	Entry must be from CODELIST	Frame Class	P
Frame_Std	Frame Standard built to	Alpha / Numeric		30 chars	No commas included	The NZ standard used at time of construction		Optional Field cannot be empty			M
RL	Reduced Level	Decimal	Metres	n/a	2 decimal places	Reduced Level at the bottom of the chamber		Field cannot be empty	Default = -9999.99		P
FSL	Finished Surface Level	Decimal	Metres	n/a	2 decimal places	Ground FSL in metres		Field cannot be empty	Default = -9999.99		P
Step_Irons	Step Irons	Alpha		1 char	Yes or No field	Indicates if the asset has step irons		Field cannot be empty	Valid input: Y,N		P
Fall	Fall Protection	Alpha		1 char	Yes or No field	Indicates whether there is fall prevention present		Field cannot be empty	Valid input: Y,N		P
Ladder	Ladder	Alpha		1 char	Yes or No field	Indicates if the asset has a ladder		Field cannot be empty	Valid input: Y,N		P
Acc_Rest	Access Restriction	Alpha / Numeric		10 chars	No commas included	The type of access restriction to the asset		Field cannot be empty	Entry must be from CODELIST If there is a Restriction populate the Health & Safety field	Access Restriction	P
Ext_Load	Load Rating	Decimal	Tonnes	n/a	1 decimal place	External Load Rating		Field cannot be empty	Default = N/A		M
Litter_Trp	Litter Trap	Alpha / Numeric		10 chars	No commas included	Type of litter trap	GRATE	Field cannot be empty	Entry must be from CODELIST	Litter Trap Type	P

Access_Chamber Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Material	Material	Alpha / Numeric		10 chars	No commas included	Material of the asset	Steel	Field cannot be empty	Entry must be from CODELIST	Chamber Material	P
Lining_Mat	Lining Material	Alpha / Numeric		10 chars	No commas included	Lining material of the asset		Field cannot be empty	Entry must be from CODELIST	Lining Material	P

2.4.2 Channel

General

The following general information applies to this specific asset class.

This feature is to represent the location of a channel related to the wastewater network.

Graphical Representation (Polygon)

- Provide a polygon feature representing the extent of the asset and attach all attributes to this polygon.

<No Diagram Provided>

Attribute and Validation File Format Instructions

Provide a polygon feature representing the perimeter of the asset.

Data Table 8: *Channel Attribute* and *Validation File Format Instructions*

Channel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Channel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Channel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Chann	Channel Type	Alpha / Numeric		10 chars	No commas included	Type of asset	SWALE	Field cannot be empty	Entry must be from CODELIST	Channel Type	P
Func_Ch	Channel Function	Alpha / Numeric		10 chars	No commas included	Function of the asset	Outfall	Field cannot be empty	Entry must be from CODELIST	Channel Function	M
DS_IL	Downstream IL	Decimal	Metres	n/a	2 decimal places	Downstream end-of-feature Invert Level		Field cannot be empty	When recording the invert levels, downstream invert level must be lower than the upstream invert level. Default = -9999.99		P
US_IL	Upstream IL	Decimal	Metres	n/a	2 decimal places	Upstream end-of-feature Invert Level		Field cannot be empty	When recording the invert levels, downstream invert level must be lower than the upstream invert level. Default = -9999.99		P
S_Length	Surface Length	Decimal	Metres	n/a	2 decimal places	Total surface length of asset in metres (m).	25.45	Field cannot be empty	Represents the total length of feature Note:-For swales take into account not to include driveway cuttings that the feature may be in-between. Therefore if there's a feature either side of a driveway or driveways then it is expected that length of each feature is tallied for total length to be recorded Default = -9999.99		P

Channel Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Top_Width	Top Width	Decimal	Metres	n/a	2 decimal places	Width of top of asset in metres (m)	1.32	Field cannot be empty	Default = -9999.99		P
Base_Width	Base Width	Decimal	Metres	n/a	2 decimal places	Width of base of feature in metres (m)	5.32	Field cannot be empty	Default = -9999.99		P
S_Depth	Depth Metres	Decimal	Metres	n/a	2 decimal places	Depth of the asset in metres.	3.75	Field cannot be empty	Default = -9999.99		P
CShape	Shape Of Channel	Alpha / Numeric		10 chars	No commas included	Cross section shape of channel	V Shaped	Field cannot be empty	Entry must be from CODELIST	Channel Shape	P
Veg_type	Vegetation Type Planted	Alpha / Numeric		100 chars	No commas included	Vegetation type planted on the surface of the feature		Field cannot be empty			P
Dr_Liner	Drain Liner Material	Alpha / Numeric		10 chars	No commas included	Drain liner used for the feature	Rock	Field cannot be empty	Entry must be from CODELIST	Drain Liner Material	P
Filt_Mat	Filter Media Material	Alpha / Numeric		10 chars	No commas included	Filter media material used in the feature	sandy loam	Field cannot be empty	Entry must be from CODELIST	Filter Material	P
Filt_Depth	Filter Media Material Depth	Integer	Millimetres	n/a	Whole millimetres	Filter media material depth in millimetres.		Field cannot be empty	Default = -9999		P
Filt_Vol	Filter Volume	Integer	Cubic Metres	n/a		Filter Volume in cubic metres	Quantity of media	Field cannot be empty	Default = -9999		P
Trans_mat	Transition Layer Material	Alpha / Numeric		10 chars	No commas included	Transition layer material (geo fabric) used for the feature		Field cannot be empty	Entry must be from CODELIST	Geofabric Material	P
Trans_dep	Transition Layer Material Depth	Integer	Millimetres	n/a	Whole millimetres	Transition layer material (geo fabric) depth in millimetres.	100	Field cannot be empty	Default = -9999		P
Dr_mat	Drainage Layer Material	Alpha / Numeric		10 chars	No commas included	Drainage layer material (geo fabric) used for the feature		Field cannot be empty	Entry must be from CODELIST	Geofabric Material	P
Dr_dep	Drainage Layer Material Depth	Integer	Millimetres	n/a	Whole millimetres	Drainage layer material (geo fabric) depth in millimetres.	100	Field cannot be empty	Default = -9999		P
Foun_Mat	Foundation Material	Alpha / Numeric		10 chars	No commas included	Foundation material		Field cannot be empty	Entry must be from CODELIST	Foundation Material	P
Batters	Grade Of Batter Slopes	Decimal	Gradient	n/a	2 decimal places	Grade of batters of the asset	A grade of 1 in 8.5 to be recorded as 8.5	Field cannot be empty	Provided as confirmation of meeting design criteria. If not a swale, Default = -9999.99		P
Infiltrate	Maximum Infiltration Rate	Integer	Millimetres per hour (mm/hr)	n/a	Whole number	Maximum infiltration rate reaching the pipe in millimetres/hour (mm/hr)	180	Field cannot be empty	Use Default = -9999 if a) the rate is estimated as zero or, b) there is no pipe system to connect to		P

2.4.3 Conduit

General

The following general information applies to this specific asset class.

This feature is to represent the location of conduits related to the wastewater network.

Graphical Representation (Polyline)

- Provide a polyline feature representing the alignment of conduit assets and attach all attributes to this polyline .

Linework

Capture a polyline representing each section of conduit as per the requirements below.

- Show each conduit as a single continuous line or polyline representative of the centreline of the conduit section.
- Run each conduit section continuously between access chambers or other features at the start or end of the conduit.
- In all instances, the polyline representing the conduit must faithfully represent its alignment.
- Do not break the conduit section by laterals.
- Make the conduit network a single continuous file/drawing (not tiled or split in any form) except where nodes are placed.
- Give each layer of data in the digital files only one graphical asset type and give layer names that correspond to those provided within this specification.
- 'Snap' all lines to point features where applicable – for example, snap conduits to the centre of the access chambers or other features at the start or end of the conduit.
- Provide eastings and northings for:
    - tangent points of curved conduit sections
    - changes in horizontal direction
    - changes in vertical direction

Attribute and Validation File Format Instructions

Provide an asset as a line/polyline representing the centreline of the conduit.

Data Table 9: Conduit Attribute and Validation File Format Instructions

Conduit Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier. Typically this will be the concatenation of the From_Asset and To_Asset identifiers	12A-12B	Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Conduit Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field cannot be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Conduit Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Cond_Mat	Conduit Material	Alpha / Numeric		10 chars	No commas included	Conduit Material		Field cannot be empty	Entry must be from CODELIST	Conduit Material	P
Instl_Mthd	Installation Method	Alpha / Numeric		10 chars	No commas included	Pipe installation method.	TR	Field cannot be empty	Entry must be from CODELIST	Pipe Installation Method	P
Protection	Protective Material	Alpha / Numeric		10 chars	No commas included	Protective material enveloping the asset to protect it from damage or intrusion	Fusion Bonded Epoxy	Field cannot be empty	Entry must be from CODELIST	Protective Material	P

Conduit Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Bed_Type	Bedding Type	Alpha / Numeric		10 chars	No commas included	Bedding type		Field cannot be empty	Entry must be from CODELIST	Bedding_Backfill Material	P
Backfill	Backfill Material	Alpha / Numeric		10 chars	No commas included	The material used to backfill the excavation.	CR	Field cannot be empty	Entry must be from CODELIST	Bedding_Backfill Material	P
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
From_Asset	From Node	Alpha / Numeric		15 chars	No commas included	The asset identifier at the start point of the conduit section.	12A	Field cannot be empty	This number must form part of the Pipe unique identifier number.		M
From_IL	From Node Invert Level	Decimal	Metres	n/a	2 decimal places	The invert level at the start point of the conduit.		Field cannot be empty	Default = -9999.99		P
To_Asset	To Node	Alpha / Numeric		15 chars	No commas included	The asset identifier at the end point of the conduit section.	12B	Field cannot be empty	This number must form part of the Pipe unique identifier number.		M
To_IL	To Node Invert Level	Decimal	Metres	n/a	2 decimal places	The invert level at the end point of the conduit.		Field cannot be empty	Default = -9999.99		P
Length_m	Length Metres	Decimal	Metres	n/a	2 decimal places	Asset length in metres.	100.55	Field cannot be empty	Default = -9999.99		P
Cond_Dia	Conduit Diameter	Integer	Millimetres	n/a	Whole millimetres	Conduit internal diameter in millimetres (mm)	150	Field cannot be empty	Default = -9999		P

2.4.4 Fitting

General

The following general information applies to this specific asset class.

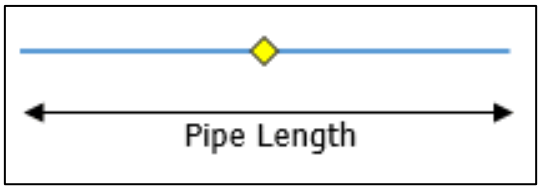
This feature is to represent the location of various types of fittings related to the wastewater network.

Graphical Representation (Point)

- Provide a point feature representing the central location of the asset and attach all attributes to this point
- 'Snap' the point feature to the pipe asset it is associated with.

Figure 17: Example of a Fitting – a Flange

Figure 18: Example of Data Capture of a Fitting



Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the asset.

Data Table 10: *Fitting Attribute* and *Validation File Format Instructions*

Fittings Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Fittings Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available.		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM

Fittings Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Fit	Fittings Type	Alpha / Numeric		10 chars	No commas included	Type of asset	BEND, ECAP etc.	Field cannot be empty	Entry must be from CODELIST	Fittings Type	P
Nom_Size	Nominal Size	Integer	Millimetres	n/a	Whole millimetres	Indicates the Nominal Size of the asset		Field cannot be empty	Default = -9999		P
Material	Material	Alpha / Numeric		10 chars	No commas included	Material of the asset	Steel	Field cannot be empty	Entry must be from CODELIST	Equipment Material	P
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = NA		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Manu_Std	Manufacturing Standard	Alpha / Numeric		30 chars	No commas included	The NZ standard used at time of construction		Optional Field cannot be empty	Default = NA		M
TP_QA	Third Party Quaslity Assurance	Alpha / Numeric		100 chars	No commas included	The name of the party that issued the Quality Assurance		Optional Field cannot be empty	Default = NA		M

Fittings Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Bel_Grnd	Below Ground	Alpha		1 char	Yes or No field	If the fitting is below ground.		Field cannot be empty	Valid input: Y,N		P
Fitting_RL	Fitting RL	Decimal	Metres	n/a	2 decimal places	RL of fitting in metres.	0.25	Field cannot be empty	Default = -9999.99		P
Joint_Type	Joint Type	Alpha / Numeric		10 chars	No commas included	Joint Type	WELD	Field cannot be empty	Entry must be from CODELIST	Joint Type	P
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M
Link_Feat2	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of the second feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID2	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the second asset its associated with		Field cannot be empty	Default = N/A		M
Link_Feat3	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of third feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID3	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the third asset its associated with		Field cannot be empty	Default = N/A		M

2.4.5 Pipe

General

The following general information applies to this specific asset class.

This feature is to represent the location of various types of pipes related to the wastewater network.

Graphical Representation (Polyline)

- Provide a polyline feature representing the alignment of pipe assets and attach all attributes to this polyline.

Linework

This feature is to represent linework of all pipes such as a pressure mains, gravity mains and service main.

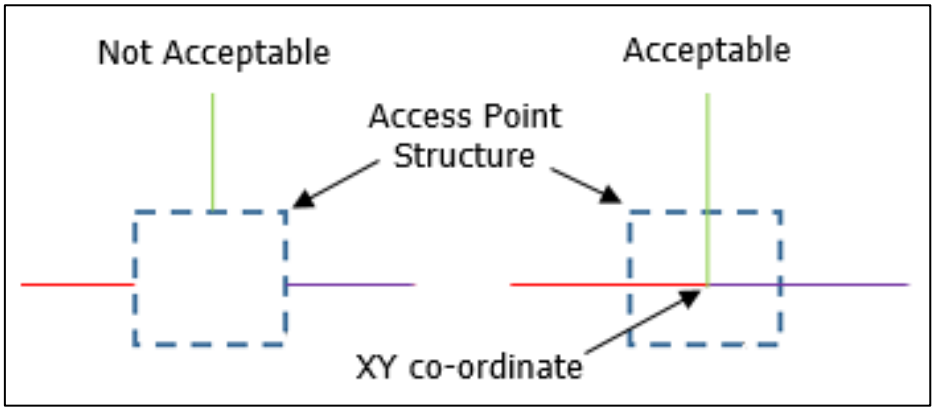
Capture a polyline representing each section of pipe as per the requirements below.

- Show each pipe by a single continuous line or polyline representative of the centreline of the pipe section.
- Run each pipe section continuously between access chambers or other features that will depict the start or end of a pipe such as a pipe end/blank end or wing wall.
    - The exception is where the attributes of the pipe change then a new section will be created.
- Capture each pipe section in the direction of its primary flow.
- In all instances the polyline representing the pipe must faithfully represent the alignment of the pipe.
- Do **not** break the pipe section service mains or service connections.
- Make the pipe network a single continuous file/drawing (not tiled or split in any form).
- Give each layer of data in the digital files only one graphical asset type and give layer names that correspond to those provided within this specification.
- ‘Snap’ all lines to point features where applicable – for example, snap pipes to the centre of the access chamber points or other features that will depict the start end of a pipe such as a pipe end/blank end or wing wall.
- Provide eastings and northings for:
    - tangent points of curved pipe sections
    - changes in horizontal direction
    - changes in vertical direction.

Joining Pipe Linework at Access Chambers

Figure 19 shows acceptable and unacceptable approaches to joining pipe linework in a regular-shaped access point.

Figure 19: Example of Pipe Joining in Regular-shaped Access Chamber – Square

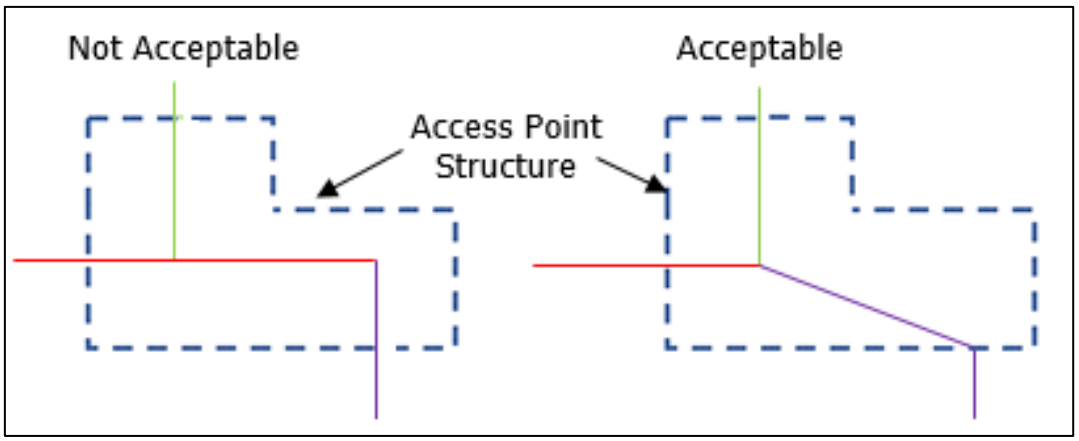


For irregular-shaped access chambers, Figure 20 illustrates how to address the pipe joins.

All pipes must come to a common intersection. Therefore you must extend or adjust each pipe section to meet at a common point without changing the original alignment of the pipe section.

Note: Record pipe length as the physical length of the pipe section. Typically, this is from edge of access chamber to edge of access chamber.

Figure 20: Example of Pipe Joining in Irregular-shaped Access Chambers



Pressure System for Laterals / Property Connections

A pressure sewer system is installed to properties that cannot be serviced by gravity systems. Because of its particular configuration, the property sanitary drains or property service drains are connected to a collection tank, which in turn pumps the wastewater to a pressure sewer via a boundary assembly (please refer to Figure 21, 15 and 16 for further detail).

Figure 21: Typical Pressure Sewer System Configuration in a Property

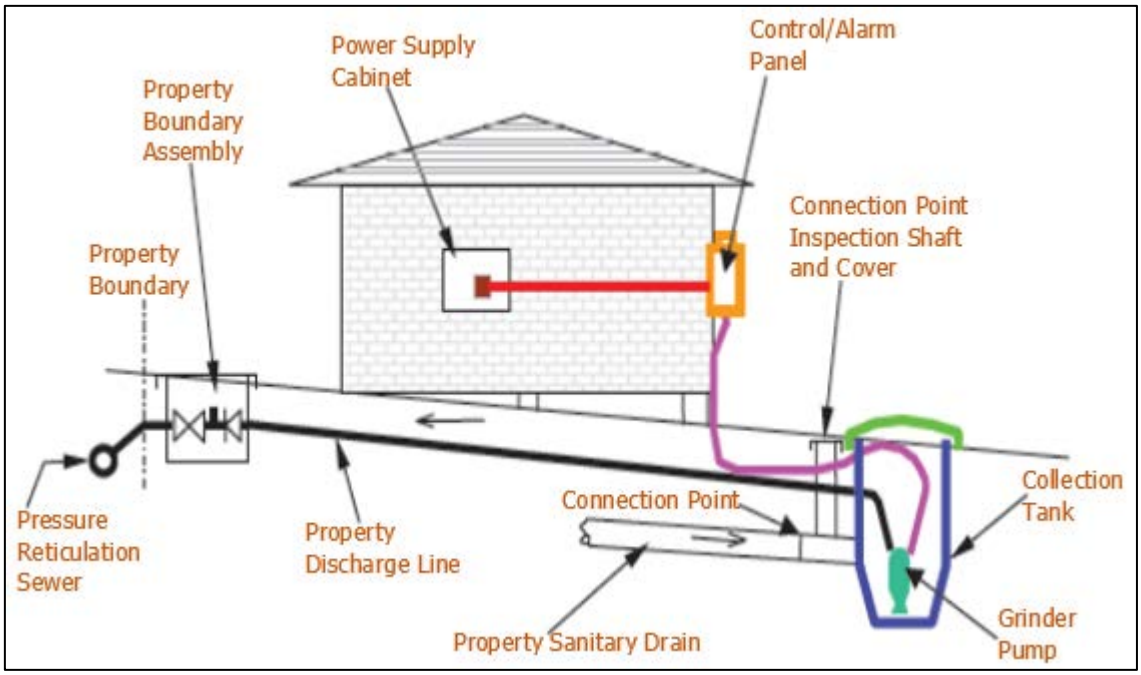


Image Source: Southern Water

Figure 22: Plan view of components of a Pressure Sewer System of a Property

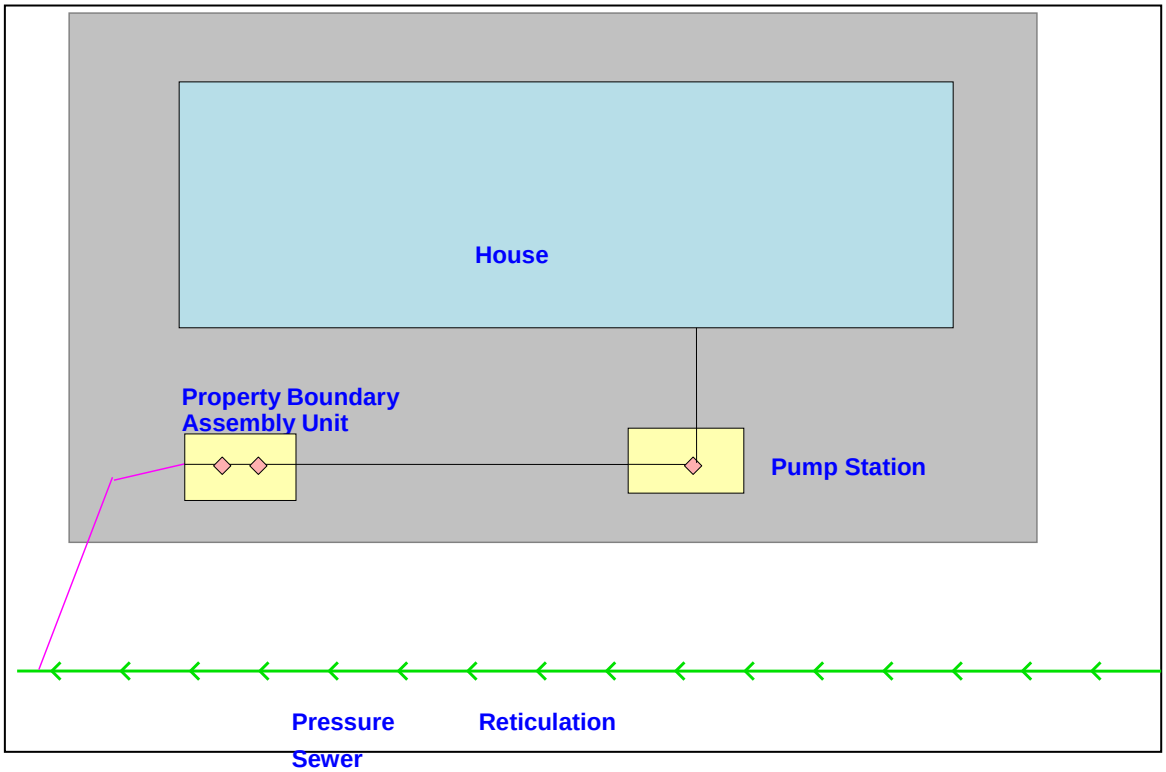
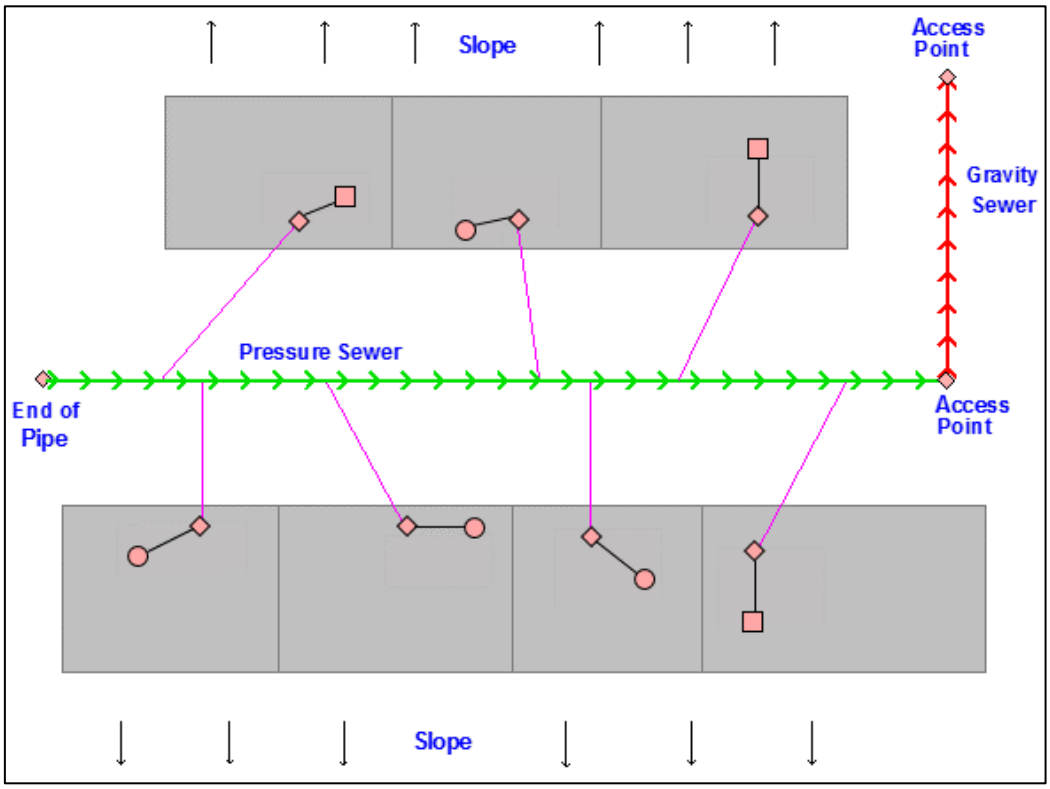


Figure 23: Typical Flow Direction of the Pressure Sewer System



In Figure 24, components of a Pressure main System servicing a Typical Household are shown.

Pressure main characteristics may change, such as pipe diameter, pipe type or pipe construction date. In such cases, create a new section.

Figure 24: Plan View of a Pressure Main with Locations of Other Assets

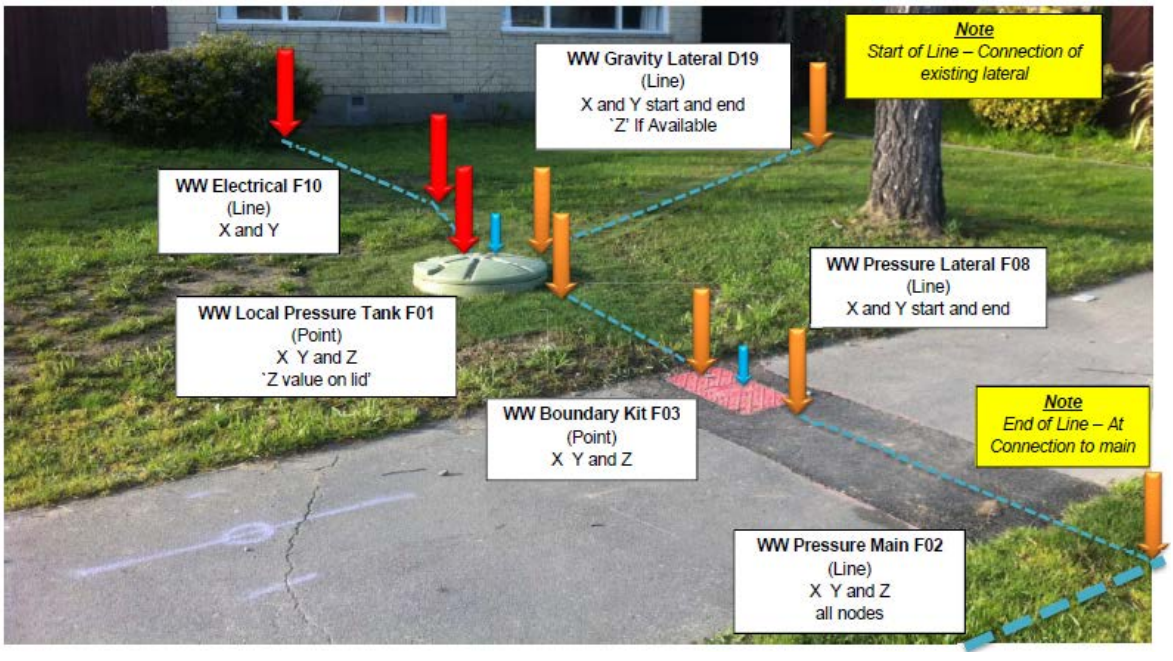


Image Source: Christchurch City Council

Figure 25: Example of a Control Panel for a Pressure System

Figure 26: Components for a Pressure System for Typical Household

Image Source: Christchurch City Council

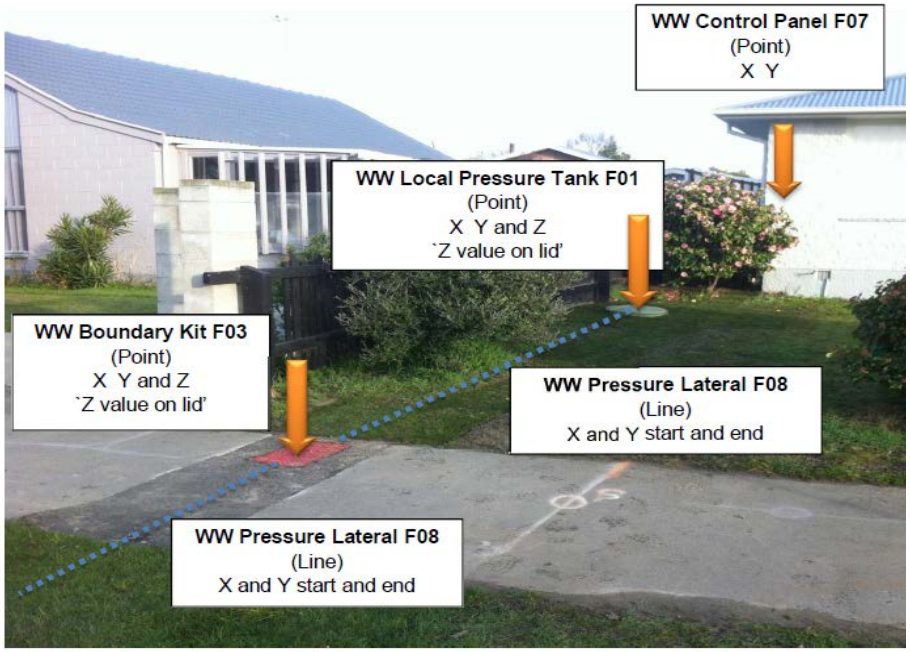


Image Source: Christchurch City Council

Figure 27: Typical Cross-section of a Trench

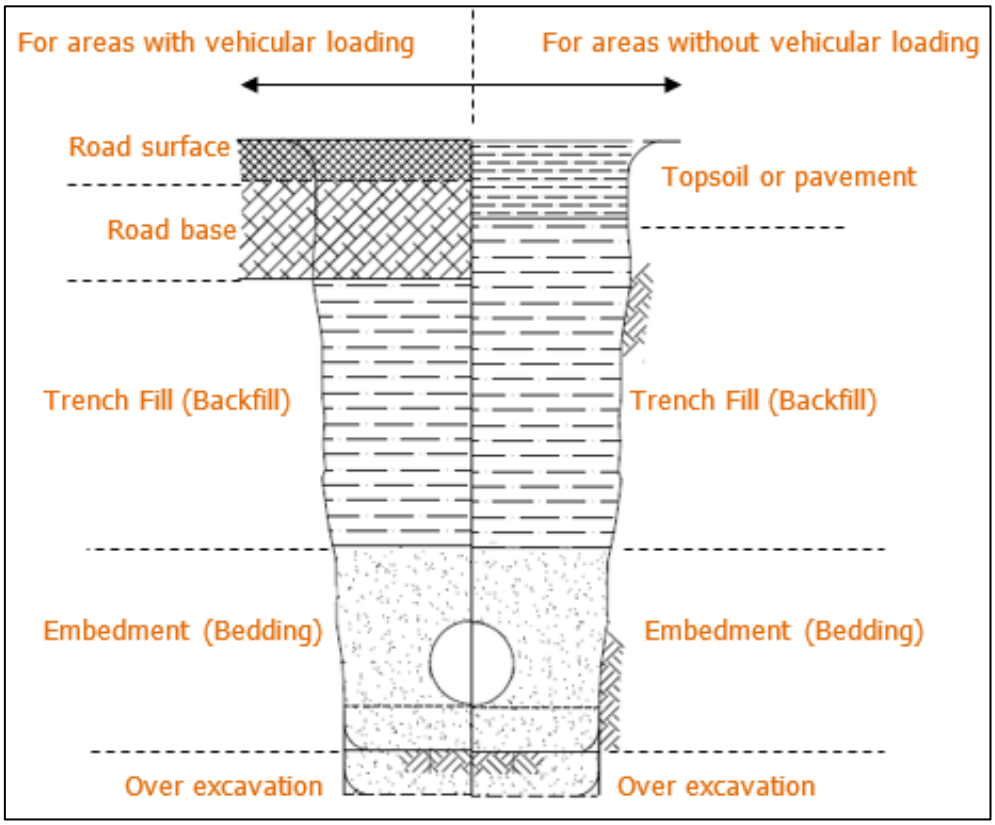


Image Source: Water Services Association of Australia Indicating how the makeup of the trench may alter with various surfaces.

Attribute and Validation File Format Instructions

Provide a polyline feature representing the centreline alignment of the asset.

Data Table 11: Pipe Attribute and Validation File Format Instructions

Pipe Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset created by the data provider. Derived from the combination of the From and To Node numbers.	37-38A	Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Pipe Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Pipe Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Media	Media	Alpha / Numeric		10 chars	No commas included	Indicates the contents in the asset		Field cannot be empty	Entry must be from CODELIST	Content Type	P
Purpose	Purpose	Alpha / Numeric		10 chars	No commas included	The purpose of the asset	Pressure, Gravity, Siphon	Field cannot be empty	Entry must be from CODELIST If Pipe Type = Siphon or Vacuum complete the Supplementary table 2.4.6 Pipe –Siphon and Vacuum Sewer Systems	Pipe Purpose	M
Type_Pipe	Pipe Type	Alpha / Numeric		10 chars	No commas included	Type of asset	Pipe, service main	Field cannot be empty	Entry must be from CODELIST	Pipe Type	P
Rig_Flex	Rigid or Flexible	Alpha		1 char	Rigid or Flexible field	Indicates whether the pipe is Rigid or Flexible		Field cannot be empty	Valid input: R, F		P
RM_Std	Rigid Material Standard	Alpha / Numeric		30 chars	No commas included	The NZ standard used at time of construction		Optional Field cannot be empty	Default = NA		M
RM_QA	Rigid Material Qualirty Accreditation	Alpha / Numeric		100 chars	No commas included	The name of the party that issued the Quality Assurance		Optional Field cannot be empty	Default = NA		M
FM_Std	Flexible Material Standard	Alpha / Numeric		30 chars	No commas included	The NZ standard used at time of construction		Optional Field cannot be empty	Default = NA		M
FM_QA	Flexible Material Qualirty Accreditation	Alpha / Numeric		100 chars	No commas included	The name of the party that issued the Quality Assurance		Optional Field cannot be empty	Default = NA		M
From_Node	From Node	Alpha / Numeric		15 chars	No commas included	The asset at the start point of a pipe section. Typically for a pressure pipe this may be at the pumping point or a new section of pipe. For a Gravity pipe this will be the upstream point		Field cannot be empty	This number must form part of the Pipe unique identifier number.		M

Pipe Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
From_IL	From Node Invert Level	Decimal	Metres	n/a	2 decimal places	For a gravity system this is the upstream end of the pipe. For a pressurised system this is the pumping end of a pipe		Field cannot be empty	Default = -9999.99		P
To_Node	To Node	Alpha / Numeric		15 chars	No commas included	The asset at the end point of pipe section. Typically this is the discharge point on a pressure pipe or the downstream point on a gravity pipe.		Field cannot be empty	This number must form part of the Pipe unique identifier number.		M
To_IL	To Node Invert Level	Decimal	Metres	n/a	2 decimal places	For a gravity system this is the downstream end of the pipe. For a pressurised system this is the discharge end of a pipe		Field cannot be empty	Default = -9999.99		P
PShape	Pipe Shape	Alpha / Numeric		10 chars	No commas included	Shape of the pipe.		Field cannot be empty	Entry must be from Codelist	Pipe Shape	P
Length_m	Length Metres	Decimal	Metres	n/a	2 decimal places	Asset length in metres.	100.55	Field cannot be empty	Default = -9999.99		P
Int_Dia	Internal Diameter	Integer	Millimetres	n/a	Whole millimetres	Diameter of the asset in millimetres.	450	Field cannot be empty	Conditional To be determined by the asset owner if required Default = -9999		P
Nom_Dia	Nominal Diameter	Integer	Millimetres	n/a	Whole millimetres	Nominal Diameter of the asset in millimetres	450	Field cannot be empty	Conditional To be determined by the asset owner if required Default = -9999		P
Ext_Dia	External Diameter	Integer	Millimetres	n/a	Whole millimetres	External pipe diameter **or** Width (indicated as W1 in the diagrams in table 3.7) if the feature is not circular	480	Field cannot be empty	Conditional To be determined by the asset owner if required Default = -9999		P
P_Height	Pipe Height	Integer	Millimetres	n/a	Whole millimetres	Height of the asset in millimetres		Conditional Field cannot be empty	(This field is to be used for non-circular pipes, in conjunction with the width field. Refer to diagram. For circular pipes, Default = -9999		P
P_Width	Pipe Width	Integer	Millimetres	n/a	Whole millimetres	2nd pipe diameter when non-circular.	Egg shaped pipe (W1 = Diameter; W2 = Width; H = Height)	Conditional Field cannot be empty	Populate ONLY when the pipe type is non-circular and has two diameters. For circular pipes, Default =-9999		P
Material	Material	Alpha / Numeric		10 chars	No commas included	Material of the asset	Steel	Field cannot be empty	Entry must be from CODELIST Select NOT APPLICABLE from CODELIST if the pipe is being renewed, relined or rehabilitated.	Pipe Material	P
Surf_Mat	Surface Material	Alpha / Numeric		10 chars	No commas included	Surface Material surrounding the asset	Steel	Field cannot be empty	Entry must be from CODELIST Select NOT APPLICABLE from CODELIST if the pipe is being renewed, relined or rehabilitated.	Surface Material - Pipe	P
Drp_Type	Drop Type	Alpha		1 char	No, Internal, External field	If there's a drop structure on the outlet.		Field cannot be empty	Valid input: N,I,E		P

Pipe Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Drp_IL	Drop Invert Level	Decimal	Metres	n/a	2 decimal places	Drop structure lowest pipe Invert Level.		Field cannot be empty	Default = -9999.99		P
Class_Load	Load Class	Alpha / Numeric		10 chars	No commas included	Pipe load class as specified by the manufacturer.	Class 4	Conditional Field cannot be empty	Entry must be from CODELIST	Pipe Load Class	M
Class_Sn	Stiffness Class	Alpha / Numeric		10 chars	No commas included	Pipe nominal stiffness class as specified by the manufacturer.	SN 4	Conditional Field cannot be empty	Entry must be from CODELIST	Pipe Stiffness Class	M
Class_Pn	Pressure Class	Alpha / Numeric		10 chars	No commas included	Pipe pressure class as specified by the manufacturer.	PN 6	Conditional Field cannot be empty	Entry must be from CODELIST	Pipe Pressure Class	M
Joint_Type	Joint Type	Alpha / Numeric		10 chars	No commas included	Joint Type	WELD	Field cannot be empty	Entry must be from CODELIST	Joint Type	P
Rock_Excav	Rock Excavation	Alpha		1 char	Yes or No field	Indicates whether rock excavation was required when laying the pipe.		Field cannot be empty	Valid input: Y,N		P
Instl_Mthd	Installation Method	Alpha / Numeric		10 chars	No commas included	Pipe installation method.	TR	Field cannot be empty	Entry must be from CODELIST	Pipe Installation Method	P
Protection	Protective Material	Alpha / Numeric		10 chars	No commas included	Protective material enveloping the asset to protect it from damage or intrusion	Fusion Bonded Epoxy	Field cannot be empty	Entry must be from CODELIST	Protective Material	P
Bed_Type	Bedding Type	Alpha / Numeric		10 chars	No commas included	Bedding type		Field cannot be empty	Entry must be from CODELIST	Bedding_Backfill Material	P
Thrust	Thrust Block	Alpha		1 char	Yes or No field	Indicates whether thrust blocks were required when laying the pipe.	'Y' for Yes 'N' for No	Conditional Field cannot be empty	Valid input: Y,N If Y then populate the Support Structure Table 2.3.2		P
L_or_IP	Locator or IP Cable	Alpha		1 char	Yes or No field	Is there a locator or IP cable taped to the pipe along this section?		Optional Field cannot be empty	Valid input Y or N		P
Haunching	Haunching	Alpha		1 char	Yes or No field	Indicates whether haunching was required thrust blocks were required when laying the pipe.	'Y' for Yes 'N' for No	Field cannot be empty	Valid input: Y,N		P
Backfill	Backfill Material	Alpha / Numeric		10 chars	No commas included	The material used to backfill the excavation.	CR	Field cannot be empty	Entry must be from CODELIST	Bedding_Backfill Material	P
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Rl_Rn_Mtd	Renewal Method	Alpha / Numeric		10 chars	No commas included	Relining or renewal method.	Cured in place, Pipe burst, Slip lined	Field cannot be empty	Entry must be from CODELIST Select NOT APPLICABLE from CODELIST if the pipe is NOT being renewed, relined or rehabilitated.	Renewal Method	P
Rl_Rn_Mat	Renewal Material	Alpha / Numeric		10 chars	No commas included	Relined or renewed material.	Fibreglass	Field cannot be empty	Entry must be from CODELIST Select NOT APPLICABLE from CODELIST if the pipe is NOT being renewed, relined or rehabilitated.	Renewal Material	P
Test_Type	Testing Type	Alpha / Numeric		10 chars	No commas included	The type of testing carried out on the asset		Field cannot be empty	Entry must be from CODELIST	Test Type	M

Pipe Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Observed	Observation	Alpha / Numeric		250 chars	No commas included	Observations at time of construction. May include results from testing of asset eg compaction tests etc		Optional Field cannot be empty	Default = NA		M

2.4.6 Pipe - Siphon and Vacuum Systems Supplementary Information

General

The following general information applies to this specific feature..

This feature is to represent the location of horizontal or vertical changes in direction on a pipe section related to the wastewater network.

Graphical Representation (Point)

- Provide a point feature representing the central location of the horizontal or vertical change in direction and attach all attributes to this point.

Figure 28: This diagram provides Examples of where X,Y coordinates and Invert Levels are to be captured for a 'Spoon Bill' Siphon.

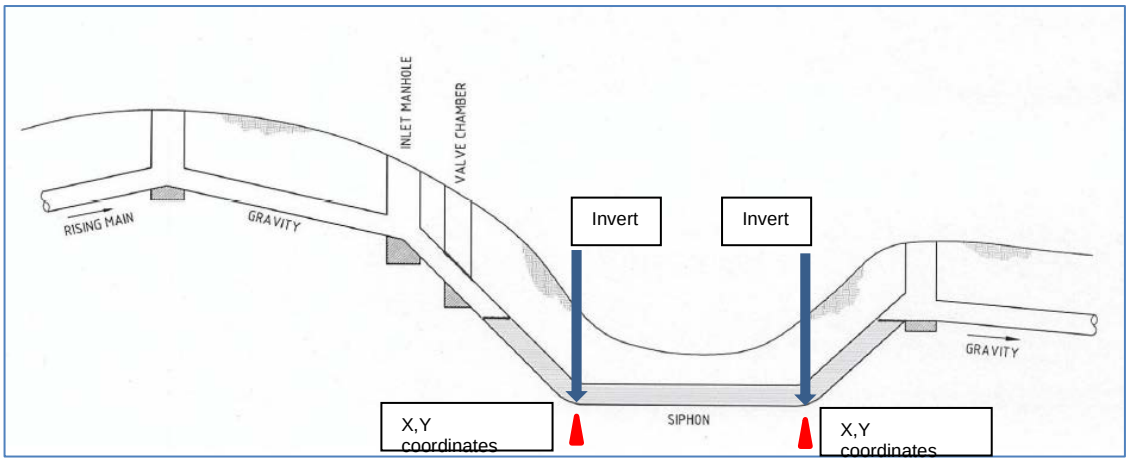


Image source: www.waternz.org.nz Paper presented by J Miles et al "Solving operational problems with Inverted siphons"

Figure 29: This diagram provides Examples of where X,Y coordinates and Invert levels are to be captures where more than 1 pipe exists as part of a Siphon System

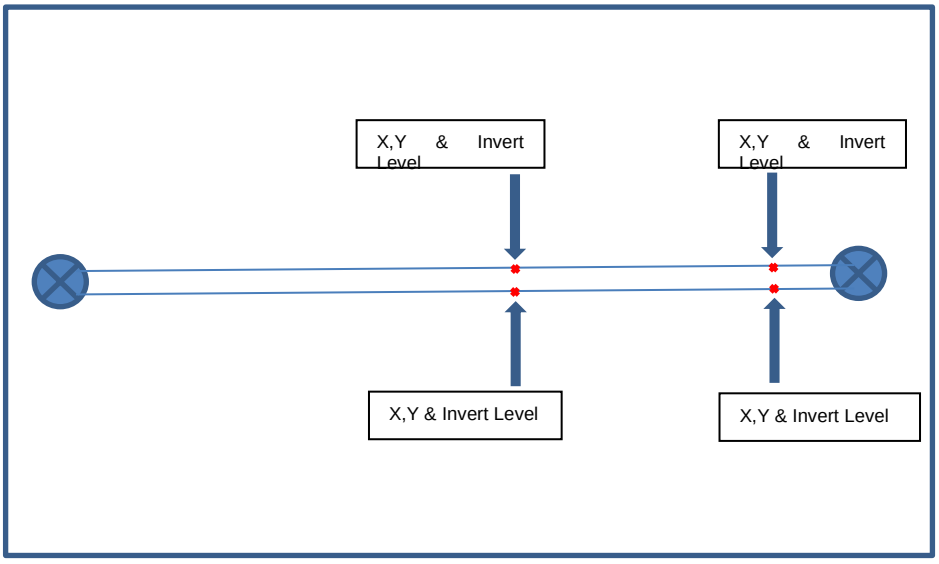


Figure 30: This diagram provides Examples of where X,Y coordinates and Invert Levels are to be captured for a Vacuum System for a lateral.

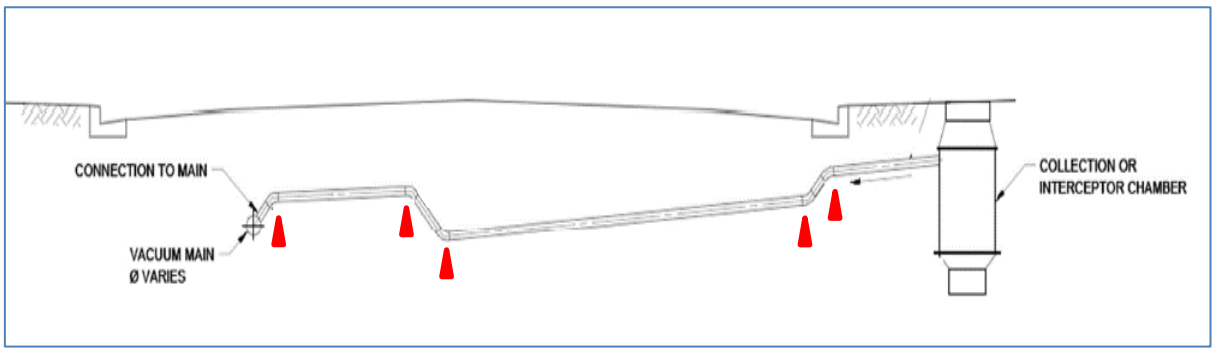
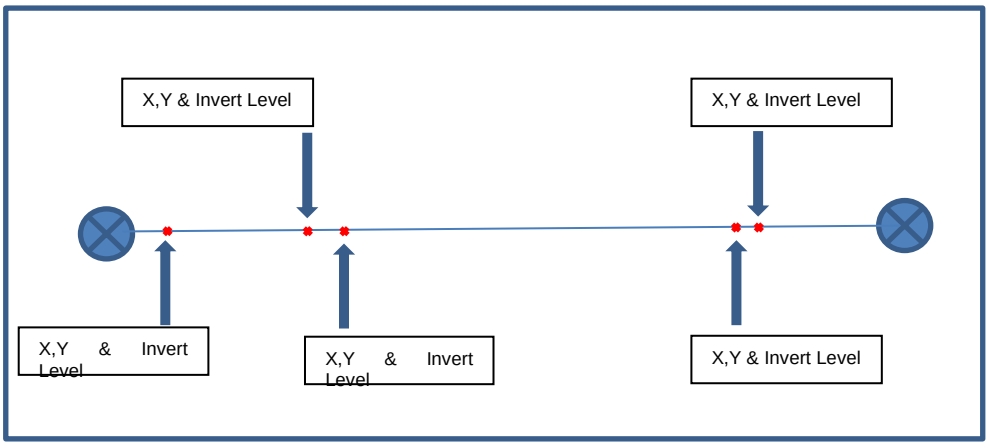


Image Source: Reproduced courtesy of Christchurch City Council

Figure 31: The red crosses on this diagram indicate where X,Y coordinates and Invert Levels are to be captured for a Vacuum System and corresponds to the diagram above



Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the feature.

Data Table 12: Siphon and Vacuum Systems Supplementary Attribute and Validation File Format Instructions

Siphon_and_Vacuum_Systems Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the feature created by the data provider.	37-38A	Field cannot be empty			M
Asset_ID	Media	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset this feature is linked to created by the data provider.		Field cannot be empty			M
Invert	Invert Level	Decimal	Metres	n/a	2 decimal places	The invert level at the point of change in direction		Field cannot be empty			P

2.4.7 Pump Station Site

General

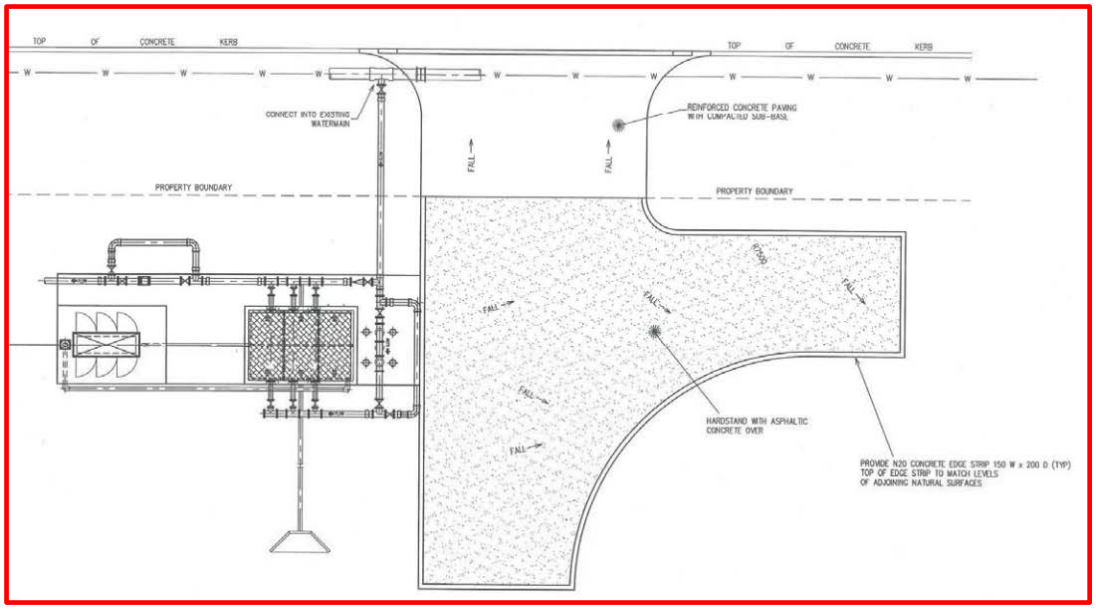
The following general information applies to this specific asset class

This feature is to represent the location of a pump station site related to the wastewater network.

Graphical Representation (Polygon)

- Provide a polygon feature representing the central location of the asset site and attach all attributes to this polygon.

Figure 32: Example of a Pump Station Site



Capture asset components within the site as separate asset classes as defined within this standard.

Attribute and Validation File Format Instructions

Provide a polygon feature representing the perimeter of the asset.

Data Table 13: Pump Station Site Attribute and Validation File Format Instructions

Pump_StationAttribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Pump_StationAttribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Pump_StationAttribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
PS_Type	Pump Station Type	Alpha / Numeric		10 chars	No commas included	Pump station type.	Conventional (CON) or submersible (SUB) Inground or Above Ground	Field cannot be empty	Entry must be from CODELIST	Pump Station Type	P
PS_No	Pump Station Number	Alpha / Numeric		10 chars	No commas included	Number of Sewerage Pumping Station.	WDPS42	Field cannot be empty			M
PS_Name	Pump Station Name	Alpha / Numeric		100 chars	No commas included	Pumping Station Name.	Wanake Pumping Station	Field cannot be empty			M
Opp_Zone	Operation Zone	Alpha / Numeric		100 chars	No commas included	Operation Zone -Catchment Area Name or Pressure Zone		Field cannot be empty			M
ICP_No	Electrical Supplier's Reference Number	Alpha / Numeric		25 chars	No commas included	Electrical retailers account number		Field cannot be empty	Default = N/A		M
P_Con_No	Power Connection Number	Alpha / Numeric		25 chars	No commas included	Power connection number		Field cannot be empty	Default = N/A		M
Power_back	Power Backup	Alpha / Numeric		10 chars	No commas included	Indicates the type of backup this unit has should there be a power outage	UPS, Generator, Battery	Conditional Field cannot be empty	Entry must be from CODELIST	Backup Power Type	P
Port_Gen	Portable Generator	Alpha		1 char	Yes or No field	Indicates if the pump station is able to connect to a portable generator		Field cannot be empty	Valid input: Y,N		M
Access	Pump Station Access Details	Alpha / Numeric		250 chars	No commas included	Pump station access details		Field cannot be empty	Default = N/A		M
Telemetry	Telemetry	Alpha		1 char	Yes or No field	Indicates if the asset is connected to a telemetry system.		Field cannot be empty	Valid input: Y,N		P

Pump_StationAttribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Cont_Type	Controller Type	Alpha / Numeric		10 chars	No commas included	Control Type	SCADA, Local	Field cannot be empty	Entry must be from CODELIST	Control Type	P
Wetwell	Wet well	Alpha		1 char	Yes or No field	If a wet well exists		Field cannot be empty	Valid input: Y,N		P
Valve_Pit	Valve Pit	Alpha		1 char	Yes or No field	If a valve pit exists		Field cannot be empty	Valid input: Y,N		P
No_Motors	Number Of Motors	Integer		n/a	Whole number	Number of Motors	5	Field cannot be empty	Default = -9999		P
No_Pumps	Number Of Pumps	Integer		n/a	Whole number	Number of Pumps	5	Field cannot be empty	Default = -9999		P
Lift	Lift Type	Alpha / numeric		10 chars	No commas included	Type of lift		Field cannot be empty	Entry must be from CODELIST	Lift Type	P
Lift_Manu	Lift Manufacturer	Alpha / Numeric		100 chars	No commas included	Crane/Lift Manufacturer		Field cannot be empty	Default = N/A		M
Lift_Model	Lift Model	Alpha / Numeric		25 chars	No commas included	Crane/Lift Model Number		Field cannot be empty	Default = N/A		M
Lift_Ser	Lift Serial Number	Alpha / Numeric		25 chars	No commas included	Crane/Lift Serial Number		Field cannot be empty	Default = N/A		M
Lift_Cap	Lift Capacity	Integer	Tonnes	n/a	Whole number	Crane/Lift lifting capacity	5	Field cannot be empty	Default = -9999		M
Filt_Manu	Filter Manufacturer	Alpha / Numeric		100 chars	No commas included	Filter Bed manufacturer		Field cannot be empty	Default = N/A		M
Filt_Mod	Filter Model	Alpha / Numeric		25 chars	No commas included	Filter Bed model		Field cannot be empty	Default = N/A		M
Filt_Type	Filter Type	Alpha / Numeric		10 chars	No commas included	Filter type	Nylon Bags, Coalescer, Grease, Flat Panel, Cardboard disposable	Field cannot be empty	Entry must be from CODELIST	Filter Type	P
Filt_Area	Filter Area	Decimal	Square metres	n/a	1 decimal place	Filter bed area		Field cannot be empty	Default = -9999.9		P
Filt_Depth	Filter Media Material Depth	Integer	Millimetres	n/a	Whole millimetres	Filter media material depth in millimetres.		Field cannot be empty	Default = -9999		P
Filt_Qnt	Filter Quantity	Integer	Kilograms	n/a		Filter Volume in kilograms (Kg)	Quantity of activated carbon filter media	Field cannot be empty	Default = -9999		P
Overflow	Overflow	Alpha		1 char	Yes or No field	Indicates if the asset has an overflow		Field cannot be empty	Valid input Y, N		P
Seismic	Seismic Performance Status	Integer	Percentage	n/a	Whole number	The Seismic Performance status of the asset as defined by the relevant NZ standard at time of capture represented as an accurate measure of %NBS (New Building Standard)		Field cannot be empty	Default = -9999		M
Seis_Std	Seismic Standard	Alpha / Numeric		30 chars	No commas included	The NZ standard used to define Seismic Performance	NZS 3106-2009	Field cannot be empty	Default = N/A		M

Pump_StationAttribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Seis_Calc	Seismic Calculation	Alpha / Numeric		100 chars	No commas included	Information to qualify the % NBS value as seen in this layout: [Standard: Year],[Importance level], [design life],[ULS and SLS return periods]	NZS 1170.5:2004 IL4 100 year life ULS 1:2500 SLS2 1:1000	Field cannot be empty	Default = N/A		M

2.5 Mechanical Asset

2.5.1 Mechanical Equipment

General

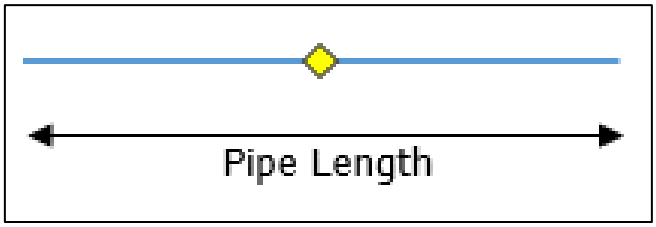
The following general information applies to this specific asset class.

This feature is to represent the location of various types of mechanical equipment that may be used as part of the wastewater network.

Graphical Representation (Point)

- Provide a point feature representing the central location of the asset and attach all attributes to this point.
- 'Snap' the point feature to the pipe asset it is associated with.

Figure 33: Example of Data Capture for Mechanical Equipment



Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the asset.

Data Table 14: Mechanical Equipment Attribute and Validation File Format Instructions

Mechanical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Mechanical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Mechanical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_M_Eq	Mechanical Equipment Type	Alpha / Numeric		10 chars	No commas included	Type of asset		Field cannot be empty	Entry must be from CODELIST	Mechanical Equipment Type	P
Purpose	Purpose	Alpha / Numeric		10 chars	No commas included	The purpose of the asset	Monitoring	Field cannot be empty	Entry must be from CODELIST	Equipment Purpose	M
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Vendor	Vendor	Alpha / Numeric		100 chars	No commas included	Vendor of the asset		Field cannot be empty	Default = N/A		M
Model	Model Number	Alpha / Numeric		25 chars	No commas included	The model number of the asset		Field cannot be empty	Default = N/A		M
Serial_No	Serial Number	Alpha / Numeric		25 chars	No commas included	Serial Number of the asset		Field cannot be empty	Default = N/A		M
Installer	Installer	Alpha / Numeric		100 chars	No commas included	Name of the individual or company who installed the asset		Field cannot be empty	Default = N/A		M

Mechanical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Weight	Weight	Integer	Kilograms	n/a	Whole number	Weight of asset in kg	5	Field cannot be empty	Default = -9999		P
Voltage	Voltage	Integer	Volts	n/a	Whole number	Voltage of cable		Field cannot be empty	Default = -9999		M
Current_MR	Current Maximum Rating	Integer	Ampere (Amp)	n/a	Whole number	The Current maximum rating		Field cannot be empty	Default = -9999		M
Out_Rate	Output Rating	Integer	Kilo-volt ampere (kVA)	n/a	Whole number	Output Rating in kVA		Field cannot be empty	Default = -9999		M
Power_Rate	Power Rating	Integer	Kilowatt (kW)	n/a	Whole number	The power rating of the asset		Field cannot be empty	Default = -9999		M
Isolation	Isolation	Alpha		1 char	Yes or No field	Indicates if an Isolation switch has been installed		Field cannot be empty	Valid input: Y,N		P
Phase	Power Supply	Alpha / Numeric		10 chars	No commas included	The voltage type	1-phased 3-phased Low voltage	Field cannot be empty	Entry must be from CODELIST	Voltage Type	M
IP_Rating	Ingress Protection Rating	Integer		n/a	Whole number	Ingress Protection rating recorded to IEC 60034-5 standard IP67 to be recorded as 67		Field cannot be empty	Must be 2 digits long. Default = -9999		M
Internal	Internal	Alpha		1 char	Internal or External field	Is this an internal or external asset?		Field cannot be empty	Valid input: I,E		P
Cont_Type	Controller Type	Alpha / Numeric		10 chars	No commas included	Control Type	SCADA, Local	Field cannot be empty	Entry must be from CODELIST	Control Type	P
Telemetry	Telemetry	Alpha		1 char	Yes or No field	Indicates if the asset is connected to a telemetry system.		Field cannot be empty	Valid input: Y,N		P
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M

2.5.2 Pump

General

The following general information applies to this specific asset class.

This feature is to represent the location of a pump related to the wastewater network.

Graphical Representation (Point)

- Provide a point feature representing the central location of the asset and attach all attributes to this point.

Figure 34: Example of a Pump Station Asset Configuration

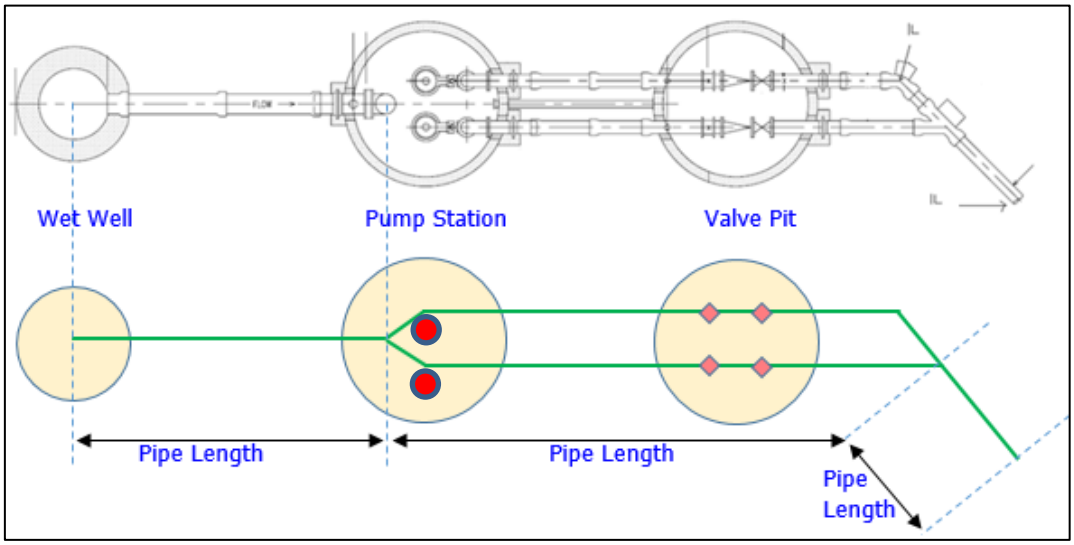


Figure 34 shows the location of the pumps as point features (red circles) snapped to the pipe assets.

Figure 35: Example of a Typical Detailed Configuration of a Pump Station

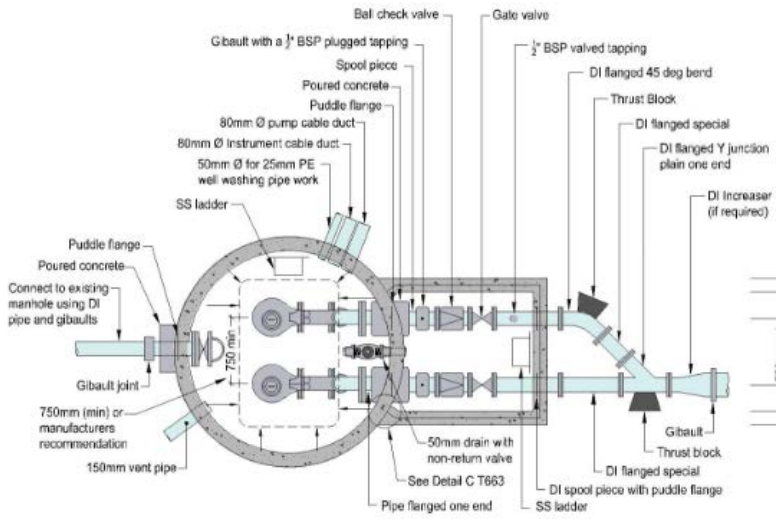


Image courtesy of Tauranga City Council

Please note measurements may vary according to an organisation's requirements

Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the asset.

Data Table 15: Pump Attribute and Validation File Format Instructions

Pump Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Pump Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Pump Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Pump_Type	Pump Type	Alpha / Numeric		10 chars	No commas included	Pump type.	Conventional (CON) or submersible (SUB)	Field cannot be empty	Entry must be from CODELIST	Pump Type	P
Vendor	Vendor	Alpha / Numeric		100 chars	No commas included	Vendor of the asset		Field cannot be empty	Default = N/A		M
P_Manu	Pump Manufacturer	Alpha / Numeric		100 chars	No commas included	Pump Manufacturer.	Netafim Australia	Field cannot be empty			M

Pump Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
P_Model	Pump Model	Alpha / Numeric		25 chars	No commas included	Pump Model Number		Field cannot be empty			M
P_Serial	Pump Serial Number	Alpha / Numeric		25 chars	No commas included	Serial Number of the Pump		Field cannot be empty			M
P_Des_Rate	Design Pump Flow Rate	Integer	Litres per second (l/sec)	n/a	Whole number	Design Pump Flow Rate cubic metres per hour	100	Field cannot be empty	Default = -9999		M
P_Rate	Actual Pump Rate	Integer	Litres per second (l/sec)	n/a	Whole number	Actual Pump Flow Rate cubic metres per hour	80	Field cannot be empty	Default = -9999		M
P_ConDate	Pump Construction Date	Date	Time	n/a	dd/mm/yyyy	Pump construction date	37115	Field cannot be empty	Default = 31/12/9999		M
P_Usage	Pump Usage	Alpha / Numeric		10 chars	No commas included	Pump usage	STANDBY, NON-STANDBY	Field cannot be empty	Entry must be from CODELIST	Pump Usage	P
P_Purpose	Pump Purpose	Alpha / Numeric		10 chars	No commas included	Pump purpose	BOOSTER, SUCTION	Field cannot be empty	Entry must be from CODELIST	Pump Purpose	M
P_Multi	Multi Stage	Alpha		1 char	Yes or No field	Is pump a vertical multi stage?		Field cannot be empty	Valid input: Y,N		P
P_RPM_Norm	Pump Normal Operating RPM	Integer	Revolutions per minute (RPM)	n/a	Whole number	Pump normal operating RPM		Field cannot be empty	Default = -9999		M
P_RPM_Min	Pump Minimum RPM	Integer	Revolutions per minute (RPM)	n/a	Whole number	Pump minimum RPM		Field cannot be empty	Default = -9999		M
P_RPM_Max	Pump Maximum RPM	Integer	Revolutions per minute (RPM)	n/a	Whole number	Pump maximum RPM		Field cannot be empty	Default = -9999		M
M_Manu	Motor Manufacturer	Alpha / Numeric		100 chars	No commas included	Motor Manufacturer.	Netafim Australia	Field cannot be empty			M
M_Model	Motor Model	Alpha / Numeric		25 chars	No commas included	Motor Model Number		Field cannot be empty			M
M_Serial	Motor Serial Number	Alpha / Numeric		25 chars	No commas included	Serial Number of the Motor		Field cannot be empty			M
M_ConDate	Motor Construction Date	Date	Time	n/a	dd/mm/yyyy	Motor Construction date	37115	Field cannot be empty	Default = 31/12/9999		M
M_Phase	Motor Phase	Alpha / Numeric		10 chars	Whole number	The voltage type	1-phased 3-phased Low voltage	Field cannot be empty	Entry must be from CODELIST	Voltage Type	M
M_KW_Rat	Motor kW Rating	Integer	Kilowatts (kW)	n/a	Whole number	Engine (Motor) KW Rating		Field cannot be empty	Default = -9999		M
IP_Rating	Ingress Protection Rating	Integer		n/a	Whole number	Ingress Protection rating recorded to IEC 60034-5 standard IP67 to be recorded as 67		Field cannot be empty	Must be 2 digits long. Default = -9999		M
M_Fuel_T	Motor Fuel Type	Alpha / Numeric		10 chars	No commas included	Engine (Motor) fuel type		Field cannot be empty	Entry must be from CODELIST	Fuel Type	P

Pump Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
M_Fuel_Use	Motor Fuel Usage	Decimal	Litres per hour (l/hr)	n/a	2 decimal places	Engine (Motor) fuel usage		Field cannot be empty	Default = -9999.99		M
Fuel_Tnk_L	Tank Location	Alpha / Numeric		10 chars	No commas included	Fuel Tank Location	Above Ground	Field cannot be empty	Entry must be from CODELIST	Tank Location	P
Fuel_Tnk_C	Tank Capacity	Integer	Litres	n/a	Whole number	Fuel tank Capacity		Field cannot be empty	Default = -9999		P
M_RPM_Min	Motor Min RPM	Integer		n/a	Whole number	Engine (Motor) minimum RPM		Field cannot be empty	Default = -9999		M
M_RPM_Max	Motor Max RPM	Integer		n/a	Whole number	Engine (Motor) maximum RPM		Field cannot be empty	Default = -9999		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Pressure	Pressure	Integer	Kilopascals (kPa)	n/a	Whole number	Indicates the required pressure of the asset	112	Field cannot be empty	Default = -9999		M
Max_Flow	Maximum Flow	Integer	Litres per second (l/sec)	n/a	Whole number	Maximum Flow Rate litres per second	100	Field cannot be empty	Default = -9999		M
Min_Flow	Minimum Flow	Integer	Litres per second (l/sec)	n/a	Whole number	Minimum Flow Rate litres per second	10	Field cannot be empty	Default = -9999		M
Weight	Weight	Integer	Kilograms	n/a	Whole number	Weight of pump and motor in kg	45	Field cannot be empty	Default = -9999		M
Auto_Strk	Auto Stroke Controller	Alpha		1 char	Yes or No field	Is an auto stroke controller fitted?		Field cannot be empty	Valid input: Y,N		P
Imp_Type	Impeller Type	Alpha / Numeric		10 chars	No commas included	Impeller Type		Field cannot be empty	Entry must be from CODELIST	Impeller Type	P
Imp_Diam	Impeller Diameter	Integer	Millimetres	n/a	Whole millimetres	Internal diameter of the impeller		Field cannot be empty	If no impeller, Default = -9999		P
Imp_Mat	Impeller Material	Alpha / Numeric		10 chars	No commas included	Impeller Material		Field cannot be empty	Entry must be from CODELIST	Impeller Material	P
Inlet_Diam	Inlet Diameter	Integer	Millimetres	n/a	Whole millimetres	Internal diameter of the inlet pipe		Field cannot be empty	Default = -9999		P
Outlt_Diam	Outlet Diameter	Integer	Millimetres	n/a	Whole millimetres	Internal diameter of the outlet pipe		Field cannot be empty	Default = -9999		P
P_Orient	Pump Orientation	Alpha		1 char	Horizontal or Vertical field	Is the pump oriented horizontally or Vertically?		Field cannot be empty	Valid input: H,V		P
P_Rise	Pump Rising Column	Decimal	Metres	n/a	2 decimal places	Rising Column Length in metres	10.25	Field cannot be empty	Default = -9999.99		P
P_Pull_Dia	Pump Pullet Diameter	Integer	Millimetres	n/a	Whole millimetres	Pump pulley diameter if belt driven		Field cannot be empty	Default = -9999		P
No_Air_Ves	Number Of Air Vessels	Integer		n/a	Whole number	Number of Air Vessels		Field cannot be empty	Can be 0 Default = -9999		P
Ves_Vol	Vessel Volume	Decimal	Cubic Metres	n/a	2 decimal places	Total Air Vessel Volume		Field cannot be empty	Default = -9999.99		P

Pump Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Ves_Press	Vessel Pressure	Integer	Kilopascals (kPa)	n/a	Whole number	Air vessel operating pressure		Field cannot be empty	Default = -9999		M
Comp_Manu	Compressor Manufacturer	Alpha / Numeric		100 chars	No commas included	Compressor manufacturer		Conditional	Must be present if there is an air vessel		M
Comp_Mod	Compressor Model Number	Alpha / Numeric		20 chars	No commas included	Compressor model number		Conditional	Must be present if there is an air vessel		M
Comp_Ser	Compressor Serial Number	Alpha / Numeric		25 chars	No commas included	Compressor Serial Number		Conditional	Must be present if there is an air vessel		M
DG_License	Dangerous Goods License	Alpha / Numeric		20 chars	No commas included	Dangerous Goods License Number		Field cannot be empty			M
Bund	Bund	Alpha		1 char	Yes or No field	Is there a bund?		Field cannot be empty	Valid input: Y,N		P
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M

2.5.3 Valve

General

The following general information applies to this specific asset class.

This feature is to represent the location of a valve related to the wastewater network.

Graphical Representation (Point)

- Provide a point feature representing the central location of the asset and attach all attributes to this point.
- 'Snap' the point feature to the pipe asset it is associated with.

Figure 36: Plan View of a Valve Pit and Its Related Data Capture

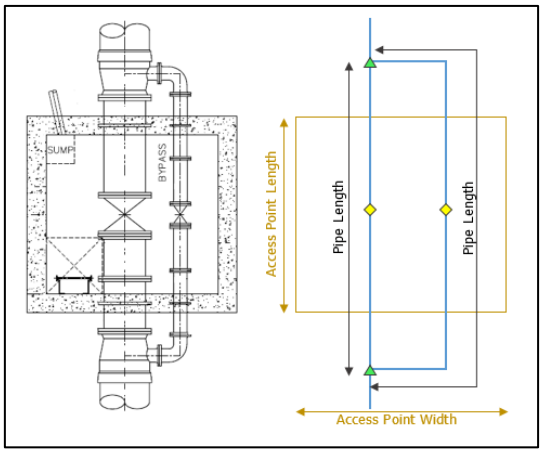
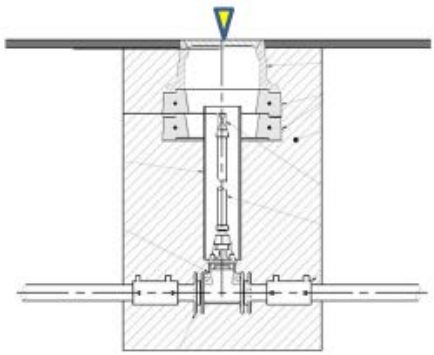


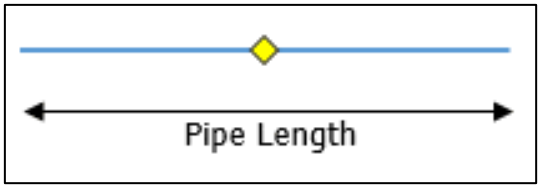
Figure 37: Example of a Valve

Figure 38: Example of a Valve indicating the point for Data Capture



Images courtesy of Christchurch City Council

Figure 39: Data Capture of Valve as a Point



Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the asset.

Data Table 16: Valve Attribute and Validation File Format Instructions

Valve Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M

Valve Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM

Valve Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Valve	Valve Type	Alpha / Numeric		10 chars	No commas included	Type of asset	AIR	Field cannot be empty	Entry must be from CODELIST	Valve Type	P
Purpose	Purpose	Alpha / Numeric		10 chars	No commas included	The purpose of the asset	Sample	Field cannot be empty	Entry must be from CODELIST	Valve Purpose	M
Valv_Con	Valve Configuration	Alpha / Numeric		10 chars	No commas included	Configuration of the asset		Field cannot be empty	Entry must be from CODELIST	Valve Configuration	M
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturers Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M

Valve Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Manu_Std	Manufacturing Standard	Alpha / Numeric		30 chars	No commas included	The NZ standard used at time of construction		Optional Field cannot be empty	Default = NA		M
TP_QA	Third Party Quaslity Assurance	Alpha / Numeric		100 chars	No commas included	The name of the party that issued the Quality Assurance		Optional Field cannot be empty	Default = NA		M
Installer	Installer	Alpha / Numeric		100 chars	No commas included	Name of the individual or company who installed the asset		Field cannot be empty	Default = N/A		M
Inst_W	Installer Warranty	Date	Time	n/a	dd/mm/yyyy	Installer warranty end date		Field cannot be empty	Default = 31/12/9999		M
Model	Model Number	Alpha / Numeric		25 chars	No commas included	The model number of the asset		Field cannot be empty	Default = N/A		M
Op_Mode	Mode	Alpha / Numeric		10 chars	No commas included	What activates the valve control	Manual	Field cannot be empty	Entry must be from CODELIST	Valve Control	P
Auto_Cont	Automatic Control	Alpha / Numeric		10 chars	No commas included	If the valve is automatic, what makes it activate	Pressure	Conditional Field cannot be empty	Entry must be from CODELIST	Automatic Control	P
Valve_P	Valve Powered By	Alpha / Numeric		10 chars	No commas included	How the asset is powered	Hydraulic	Optional Field cannot be empty	Entry must be from CODELIST	Valve Power	P
Op_Mode	Mode	Alpha		1 char	Manual or Activated field	Indicates if the valve is manually operated or is activated		Field cannot be empty	Valid input: M,A		P
Press_Rate	Pressure Rating Of Valve	Decimal	Kilopascals (kPa)	n/a	2 decimal places	Maximum Pressure Rating of Valve in kilopascals		Field cannot be empty	Default = -9999.99		M
Press_In	Incoming Pressure	Integer	Kilopascals (kPa)	n/a	Whole number	Incoming pressure of the valve during normal operation in kilopascals		Field cannot be empty	Default = -9999.99		M
Press_Out	Outgoing Pressure	Integer	Kilopascals (kPa)	n/a	Whole number	Ougoing pressure of the valve during normal operation in kilopascals		Field cannot be empty	Default = -9999.99		M
Head_Loss	Head Loss	Integer	Kilopascals (kPa)	n/a	Whole number	Pressure head loss through the valve at peak flow in kilopascals. Please note – not when the valve is shut		Field cannot be empty	Default = -9999.99		M
Max_Flow	Maximum Flow	Integer	Litres per second (l/sec)	n/a	Whole number	Maximum Flow Rate litres per second	100	Field cannot be empty	Default = -9999		M
Protection	Protective Material	Alpha / Numeric		10 chars	No commas included	Protective material enveloping the asset	Fusion Bonded Epoxy	Field cannot be empty	Entry must be from CODELIST	Protective Material	P
Telemetry	Telemetry	Alpha		1 char	Yes or No field	Indicates if the asset is connected to a telemetry system.		Field cannot be empty	Valid input: Y,N		P
Serial_No	Serial Number	Alpha / Numeric		25 chars	No commas included	Serial Number of the asset		Field cannot be empty	Default = N/A		M
Material	Material	Alpha / Numeric		10 chars	No commas included	Material of the asset	Steel	Field cannot be empty	Entry must be from CODELIST	Equipment Material	P
Bel_Grnd	Below Ground	Alpha		1 char	Yes or No field	If the fitting is below ground.		Field cannot be empty	Valid input: Y,N		P

Valve Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Valve_RL	Valve Reduced Level	Decimal	Metres	n/a	2 decimal places	RL at top of Valve		Field cannot be empty	Default = -9999.99		P
Size	Internal Diameter	Integer	Millimetres	n/a	Whole millimetres	Internal diameter of the valve. Nominal size (DN value).	150	Field cannot be empty	Default = -9999		P
Close_Dir	Close Direction	Alpha		1 char	A or C field	Close direction of the valve.	Anti-clockwise or Clockwise	Field cannot be empty	Valid input: A,C		P
Damping	Damping	Alpha / Numeric		10 chars	No commas included	Damping material	OIL	Field cannot be empty	Entry must be from CODELIST	Damping Material	P
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M

2.6 Electrical Asset

2.6.1 Cabling

General

The following general information applies to this specific asset class.

This feature is to represent the location of cabling related to the wastewater network.

Graphical Representation (Polyline)

- Provide a polyline feature representing the centreline alignment of the asset and attach all attributes to this polyline.

Figure 40: Example of Lighting and Associated Cabling in a Site Complex (Simplified)

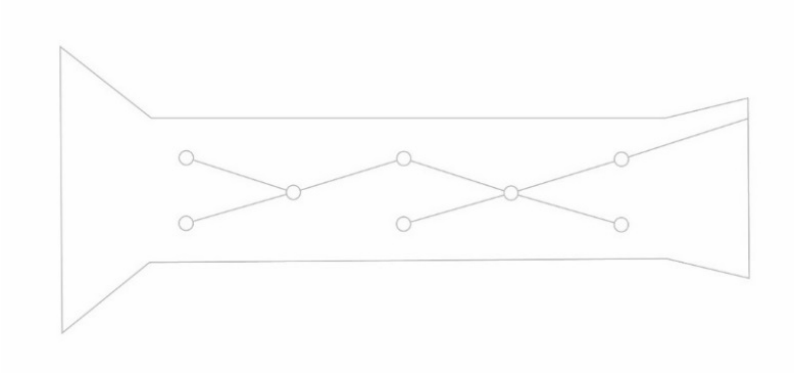
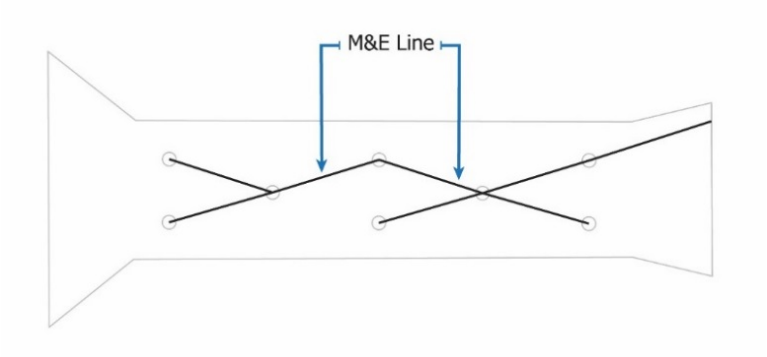


Figure 41: Example of Data Capture of Electrical Cabling in a Site Complex (Simplified)



Attribute and Validation File Format Instructions

Provide a polyline feature representing the centreline alignment of the asset.

Data Table 17: Cabling Attribute and Validation File Format Instructions

Cabling Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Cabling Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Cabling Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_Cable	Cable Type	Alpha / Numeric		10 chars	No commas included	Type of asset		Field cannot be empty	Entry must be from CODELIST	Cable Type	M
Purpose	Purpose	Alpha / Numeric		10 chars	No commas included	The purpose of the asset	Monitoring	Field cannot be empty	Entry must be from CODELIST	Equipment Purpose	M
Emergency	Emergency	Alpha		1 char	Yes or No field	Indicates if this asset is part of the emergency system		Field cannot be empty	Valid input: Y,N		M
Phase	Power Supply	Alpha / Numeric		10 chars	No commas included	The voltage type	1-phased 3-phased Low voltage	Field cannot be empty	Entry must be from CODELIST	Voltage Type	M
Cable_Rate	Cable Rating	Integer	Amperes	n/a	Whole number	Cable Rating in Amps		Field cannot be empty	Default = -9999		M
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Vendor	Vendor	Alpha / Numeric		100 chars	No commas included	Vendor of the asset		Field cannot be empty	Default = N/A		M
Inst_Date	Installation Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed		Field cannot be empty	Default = 31/12/9999		M
Installer	Installer	Alpha / Numeric		100 chars	No commas included	Name of the individual or company who installed the asset		Field cannot be empty	Default = N/A		M

Cabling Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Inst_W	Installer Warranty	Date	Time	n/a	dd/mm/yyyy	Installer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Length_m	Length metres	Decimal	Metres	n/a	2 decimal places	Asset length in metres.	100.55	Field cannot be empty	Default = -9999.99		P
Internal	Internal	Alpha		1 char	Internal or External field	Is this an internal or external asset?		Field cannot be empty	Valid input: I,E		P
Unit_Pos	Unit Position	Alpha / Numeric		10 chars	No commas included	Indicates the position of the asset	Wall	Field cannot be empty	Entry must be from CODELIST	Unit Position of the Asset	P
Cond_Mat	Conduit Material	Alpha / Numeric		10 chars	No commas included	Conduit Material		Field cannot be empty	Entry must be from CODELIST	Conduit Material	P
Cond_Dia	Conduit Diameter	Integer	Millimetres	n/a	Whole millimetres	Conduit diameter in millimetres (mm)	15	Field cannot be empty	Default = -9999		P
No_Cores	Number of cores	Integer		n/a	Whole number	Number of cores in cable		Field cannot be empty	Default = -9999		P
Core_Area	Core Cross-sectional Area	Decimal	Square millimetres	n/a	2 decimal places	Cross-sctional area of core		Field cannot be empty	Default = -9999.99		P
F_Rate_E	Fire Rating	Alpha / Numeric		10 chars	No commas included	Fire Rating of the asset in accordance with AS/NZS 3013		Field cannot be empty	Entry must be from CODELIST	Fire Rating	M
Compliance	Compliance	Alpha		1 char	Yes or No field	Has there been a Compliance certificate issued by installer?		Field cannot be empty	Valid input: Y,N	-	M
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M

2.6.2 Equipment

General

The following general information applies to this specific asset class.

This feature is to represent the location of electrical equipment related to the wastewater network (Figure 42).

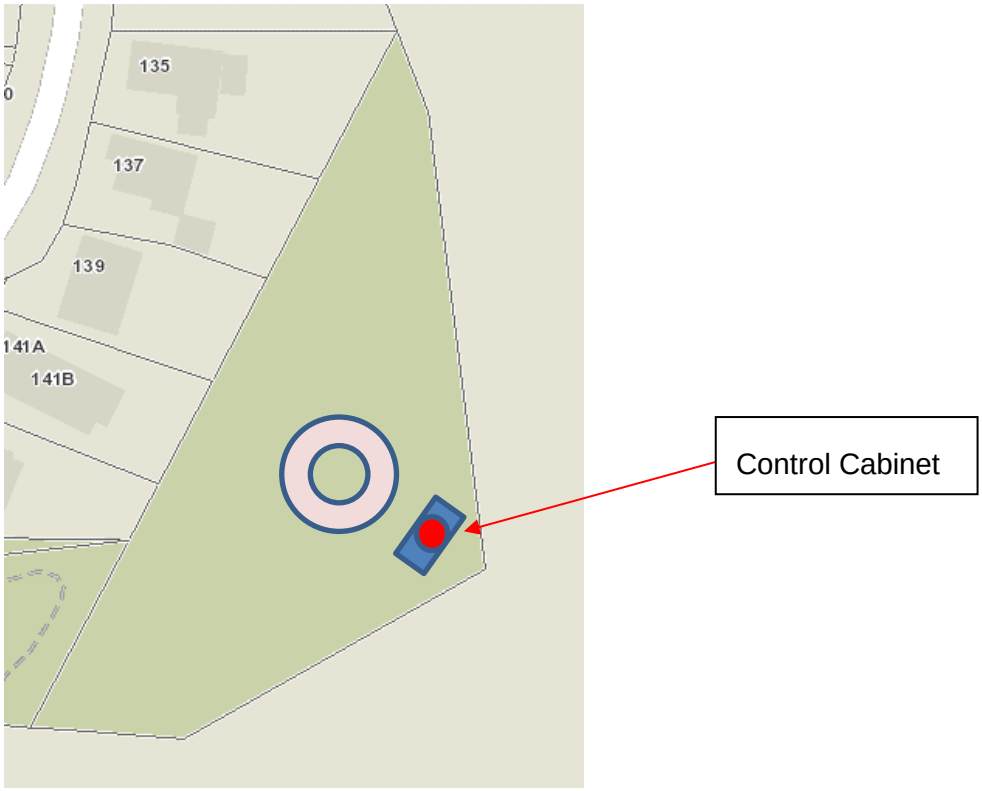
Graphical Representation (Point)

- Provide a point feature representing the central location of the asset and attach all attributes to this point.

Figure 42: Example of Equipment at Wastewater Pump Station Site

Image Source: GISSA International

Figure 43: Example of Control Cabinet Captured as a Point Feature (Red Point)



Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the asset.

Data Table 18: Electrical Equipment Attribute and Validation File Format Instructions

Electrical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Electrical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Electrical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Type_E_Eq	Electrical Equipment Type	Alpha / Numeric		10 chars	No commas included	Type of asset	RTU, PLC, FAN, BMS	Field cannot be empty	Entry must be from CODELIST	Electrical Equipment Type	P
Purpose	Purpose	Alpha / Numeric		10 chars	No commas included	The purpose of the asset	Monitoring	Field cannot be empty	Entry must be from CODELIST	Equipment Purpose	M
Voltage	Voltage	Integer	Volts	n/a	Whole number	Voltage of cable		Field cannot be empty	Default = -9999		M
Current_MR	Current Maximum Rating	Integer	Ampere (Amp)	n/a	Whole number	The Current maximum rating		Field cannot be empty	Default = -9999		M
Capacity_T	Capacity Time	Decimal	Time		2 decimal places	The Capacity of the asset in time as ampere hours		Field cannot be empty	Default = -9999.99		M
Out_Rate	Output Rating	Integer	Kilo-volt ampere (kVA)	n/a	Whole number	Output Rating in kVA		Field cannot be empty	Default = -9999		M
Power_Rate	Power Rating	Integer	Kilowatt (kW)	n/a	Whole number	The power rating of the asset		Field cannot be empty	Default = -9999		M
Isolation	Isolation	Alpha		1 char	Yes or No field	Indicates if an Isolation switch has been installed		Field cannot be empty	Valid input: Y,N		P
IP_Rating	Ingress Protection Rating	Integer		n/a	Whole number	Ingress Protection rating recorded to IEC 60034-5 standard IP67 to be recorded as 67		Field cannot be empty	Must be 2 digits long. Default = -9999		M
Phase	Power Supply	Alpha / Numeric		10 chars	No commas included	The voltage type	1-phased 3-phased Low voltage	Field cannot be empty	Entry must be from CODELIST	Voltage Type	M
Internal	Internal	Alpha		1 char	Internal or External field	Is this an internal or external asset?		Field cannot be empty	Valid input: I,E		P
Purch_Date	Purchase Date	Date	Time	n/a	dd/mm/yyyy	The date the item was purchased		Field cannot be empty	Default = 31/12/9999		M

Electrical_Equipment Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Vendor	Vendor	Alpha / Numeric		100 chars	No commas included	Vendor of the asset		Field cannot be empty	Default = N/A		M
Model	Model Number	Alpha / Numeric		25 chars	No commas included	The model number of the asset		Field cannot be empty	Default = N/A		M
Serial_No	Serial Number	Alpha / Numeric		25 chars	No commas included	Serial Number of the asset		Field cannot be empty	Default = N/A		M
Installer	Installer	Alpha / Numeric		100 chars	No commas included	Name of the individual or company who installed the asset		Field cannot be empty	Default = N/A		M
Weight	Weight	Integer	Kilograms	n/a	Whole number	Weight of asset in kg	5	Field cannot be empty	Default = -9999		P
Inhibit	Inhibit Level	Decimal	Metres	n/a	2 decimal places	Inhibit level		Conditional Field cannot be empty	Default = -9999.99		P
Telemetry	Telemetry	Alpha		1 char	Yes or No field	Indicates if the asset is connected to a telemetry system.		Field cannot be empty	Valid input: Y,N		P
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M

2.7 Instrumentation

2.7.1 Instrument

General

The following general information applies to this specific asset class.

This feature is to represent the location of various types of instruments that may be used as part of the wastewater network.

Graphical Representation (Point)

- Provide a point feature representing the central location of the asset and attach all attributes to this point.
- 'Snap' the point feature to the pipe asset it is associated with.

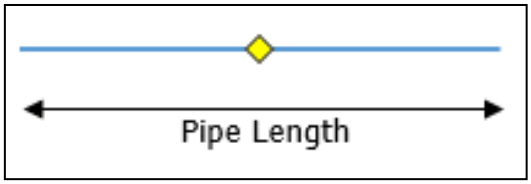
Figure 44: Example of an Instrument – a Conductivity Transmitter

Image Source: Analytical Technologies Inc. brochure

Figure 45: Example of an Instrument Mounted on a Flange

Image Source: Flowcontrolnetwork.com

Figure 46: Example of Data Capture of Instruments



Attribute and Validation File Format Instructions

Provide a point feature representing the central location of the asset.

Data Table 19: Instrument Attribute and Validation File Format Instructions

Instrument Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Unique_ID	Unique Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset. Created by the data supplier.		Field cannot be empty	If asset owner provides it then this must be used.		M
Owner	Owner	Alpha / Numeric		100 chars	No commas included	Name of the asset owner.	Wellington City Council	Field cannot be empty			M
Status	Status	Alpha / Numeric		10 chars	No commas included	The current operational state of the asset.	ABN	Field cannot be empty	Entry must be from CODELIST Default = INUSE	Asset Status	M
Const_Date	Construction Date	Date	Time	n/a	dd/mm/yyyy	Date the asset was constructed/built/installed/relined/renewed	EG: 12/03/2000	Field cannot be empty	Default = 31/12/9999		M
Source	Source	Alpha / Numeric		10 chars	No commas included	Data source or method that was used to collect the data and populate the attributes	Field	Field cannot be empty	Entry must be from CODELIST	Source	M
H_Prec	Horizontal Precision	Alpha / Numeric		10 chars	No commas included	Horizontal Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Horizontal Precision	M
V_Prec	Vertical Precision	Alpha / Numeric		10 chars	No commas included	Vertical Precision to which the asset has been captured.		Field cannot be empty	Entry must be from CODELIST	Vertical Precision	M
Des_Life	Design Life	Integer	Time	n/a	Whole number	Indicates the Manufactured Life / expected life on use. Design Life length in years		Field cannot be empty	Default = -9999		AM
Cost	Cost	Decimal	Currency	n/a	2 decimal places	Link field to Volume 2. Cost of the asset determined at time of construction in dollars	130.25	Field cannot be empty	Default = -9999.99		AM
Con_Ass_T	Condition Assessment Type	Alpha / Numeric		10 chars	No commas included	Condition Assessment Type	Desktop or Physical Inspection	Field cannot be empty	Entry must be from CODELIST	Condition Assessment Type	AM
Comments	Comments	Alpha / Numeric		250 chars	No commas included	Any additional comments that relate to this asset		Field may be empty			M
OMA	Operational Management Area	Alpha / Numeric		10 chars	No commas included	The specific management area that is applicable to this asset		Field cannot be empty	Entry must be from CODELIST	Operational Management Area	M
Photo_Ref	Photographic Reference	Alpha / Numeric		250 chars	No commas included	Details relating to photographic records of the asset or its features. This may be a reference to another document that has a catalogue of the photographs required. Provide photographic references for all new and existing assets. For assets and features that are not practical to photograph apply the default		Optional Field cannot be empty	Default = Not Available		M

Instrument Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Hlth_Sfty	Health And Safety Issues	Alpha / Numeric		10 chars	No commas included	Health and safety Issues that need to be known	Specific instruction to access the asset	Field may be empty	Entry must be from CODELIST	Health and Safety Issues	M
Cdn_Rating	Condition Rating	Integer		n/a	Whole number	To be populated with the Volume 2 calculation. Condition of Asset. The physical state of the asset, which may or may not affect its ability to deliver its intended design performance. A 1 to 5 scale where 1 is considered to be very good condition and 5 is considered very poor condition	1	Field cannot be empty	Entry must be from CODELIST	Condition Rating	AM
R_M_Rating	Repairs And Maintenance Rating	TBD				To be populated with the Volume 2 calculation. Repairs and maintenance activities undertaken to ensure the asset continues to deliver its intended design performance.					AM
Ut_Av_D	Utilisation Average Day	Decimal		n/a		To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak hour	75.5	Field cannot be empty			AM
Ut_Pk_D	Utilisation	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Percentage of the available capacity being used during the peak day	75.5	Field cannot be empty			AM
De_Av_Hr	Average Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Indicates the demand on an assets capacity at any given time, both negative and positive.	10	Field cannot be empty			AM
De _Pk_Hr	Peak Hourly Demand	Integer		n/a		To be populated with the Volume 2 calculation. Peak hourly demand on asset	20	Field cannot be empty			AM
Vul_Rating	Vulnerability Rating	TBD				To be populated with the Volume 2 calculation. Vulnerability Rating – rating based on the outcome of Global Vulnerability Rating	2	Field cannot be empty	Entry must be from CODELIST	Global Vulnerability Rating	AM
Crit	Criticality Rating	Integer		n/a		To be populated with the Volume 2 calculation. Criticality. The significance of the removal of any individual asset on the ability of the network or portfolio to deliver the service performance. Determined by the highest of facility importance or number of residents affected	1	Field cannot be empty	Entry must be from CODELIST	Global Criticality Rating	AM
Risk_Rt_Ov	Risk Rating Overall	Integer		n/a		To be populated with the Volume 2 calculation. Overall risk rating identified by likelihood and consequence	1	Field cannot be empty	Entry must be from CODELIST	Likelihood Rating	AM

Instrument Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Res_Rating	Resilience Rating	TBD		n/a		To be populated with the Volume 2 calculation. Resilience. The ability of an asset to recover from disruption to deliver the service as was intended upon design. Performance rating of the asset based upon the design criteria from As-Constructed or the current requirement from the asset. Expressed in %	50.2	Field cannot be empty	Entry must be from CODELIST	Global Resilience Rating	AM
Per_Rating	Performance Rating	Decimal		n/a	2 decimal places	To be populated with the Volume 2 calculation. Design Performance. The ability of the asset to deliver the service within the functional limits as was intended upon design.		Field cannot be empty			AM
Fin_Rating	Financial Performance Rating	TBD				To be populated with the Volume 2 calculation. Financial Performance. The ability of the asset to deliver the service within the financial limits as was intended upon design.		Field cannot be empty			AM
Ser_Rating	Service Performance Rating	TBD				To be populated with the Volume 2 calculation. Service Performance. The ability of the asset to deliver the service within the levels of service limits as was intended upon design.		Field cannot be empty			AM
Inst_Type	Instrument Type	Alpha / Numeric		10 chars	No commas included	Type of the instrument	Actuator	Field cannot be empty	Entry must be from CODELIST	Instrument Type	P
Network	Network	Alpha / Numeric		10 chars	No commas included	Specified network type	Water	Field cannot be empty	Entry must be from CODELIST	Network Type	P
Manu	Manufacturer	Alpha / Numeric		100 chars	No commas included	Manufacturer of the asset		Field cannot be empty	Default = N/A		M
Manu_W	Manufacturer Warranty	Date	Time	n/a	dd/mm/yyyy	Manufacturer's warranty end date		Field cannot be empty	Default = 31/12/9999		M
Model	Model Number	Alpha / Numeric		25 chars	No commas included	The model number of the asset		Field cannot be empty	Default = N/A		M
Vendor	Vendor	Alpha / Numeric		100 chars	No commas included	Vendor of the asset		Field cannot be empty	Default = N/A		M
Serial_No	Serial Number	Alpha / Numeric		25 chars	No commas included	Serial Number of the asset		Field cannot be empty	Default = N/A		M
Installer	Installer	Alpha / Numeric		100 chars	No commas included	Name of the individual or company who installed the asset		Field cannot be empty	Default = N/A		M
Calib_Auth	Calibration Authority	Alpha / Numeric		25 chars	No commas included	Calibration Authority		Field cannot be empty			M
Calib_Exp	Calibration Expiry Date	Date	Time	n/a	dd/mm/yyyy	Calibration Expiry Date		Field cannot be empty	Default = 31/12/9999		M

Instrument Attribute & Validation File Format Instructions											
Attribute Name - Abbreviated	Attribute Name - Full	Data Type	Units of Measure	Max Length	Comments	Contents	Example	General Validation Rule	Specific Validation Rule	CODELIST Reference	Legend Physical attribute - P Metadata attribute - M Asset Management Attribute - AM
Calib_Ref	Calibration Reference	Alpha / Numeric		20 chars	No commas included	Calibration Reference Number		Field cannot be empty			M
Nom_Dia	Nominal Diameter	Integer	Millimetres	n/a	Whole millimetres	Nominal Diameter of the asset in millimetres	450	Conditional Field cannot be empty	Default = -9999		P
Inst_Rng	Instrument Range	Integer		n/a	Whole number	Instrument Range		Field cannot be empty	Default = -9999		P
IP_Rating	Ingress Protection Rating	Integer		n/a	Whole number	Ingress Protection rating recorded to IEC 60034-5 standard IP67 to be recorded as 67		Field cannot be empty	Must be 2 digits long. Default = -9999		M
Current_MR	Current Maximum Rating	Integer	Ampere (Amp)	n/a	Whole number	The Current maximum rating		Field cannot be empty	Default = -9999		M
Capacity_T	Capacity Time	Decimal	Time		2 decimal places	The Capacity of the asset in time as ampere hours		Field cannot be empty	Default = -9999.99		M
V_In	Input Voltage	Integer	Volts	n/a	Whole number	Voltage Input		Field cannot be empty	Default = -9999		M
V_In_Type	Input Voltage Type	Alpha / Numeric		10 chars	No commas included	Voltage Input Type		Field cannot be empty	Entry must be from CODELIST	Voltage Type	M
V_Out	Output Voltage	Integer	Volts	n/a	Whole number	Voltage output		Field cannot be empty	Default = -9999		M
Out_Volt_T	Output Voltage Type	Alpha / Numeric		10 chars	No commas included	Voltage Output Type		Field cannot be empty	Entry must be from CODELIST	Voltage Type	M
Out_Curr	Output Current	Integer	Amperes	n/a	Whole number	Output Current		Field cannot be empty	Default = -9999		M
Out_Pulse	Output Pulse	Alpha		1 char	Yes or No field	If the Output Current is pulsed.		Field cannot be empty	Valid input: Y,N		P
Out_Rate	Output Rating	Integer	Kilo-volt ampere	n/a	Whole number	Output Rating in kVA		Field cannot be empty	Default = -9999		M
Power_Rate	Power Rating	Integer	Kilowatt (kW)	n/a	Whole number	The power rating of the asset		Field cannot be empty	Default = -9999		M
Bel_Grnd	Below Ground	Alpha		1 char	Yes or No field	If the fitting is below ground.		Field cannot be empty	Valid input: Y,N		P
Material	Material	Alpha / Numeric		10 chars	No commas included	Material of the asset	Steel	Field cannot be empty	Entry must be from CODELIST	Equipment Material	P
Weight	Weight	Integer	Kilograms	n/a	Whole number	Weight of asset in kg	5	Field cannot be empty	Default = -9999		P
Telemetry	Telemetry	Alpha		1 char	Yes or No field	Indicates if the asset is connected to a telemetry system.		Field cannot be empty	Valid input: Y,N		P
Link_Feat	Link Feature	Alpha / Numeric		10 chars	No commas included	Type of feature to which the asset is attached		Field cannot be empty	Entry must be from CODELIST	Feature Type	M
Link_ID	Link Identifier	Alpha / Numeric		20 chars	No commas included	Unique ID of the asset its associated with		Field cannot be empty	Default = N/A		M

2.8 Supplementary Data

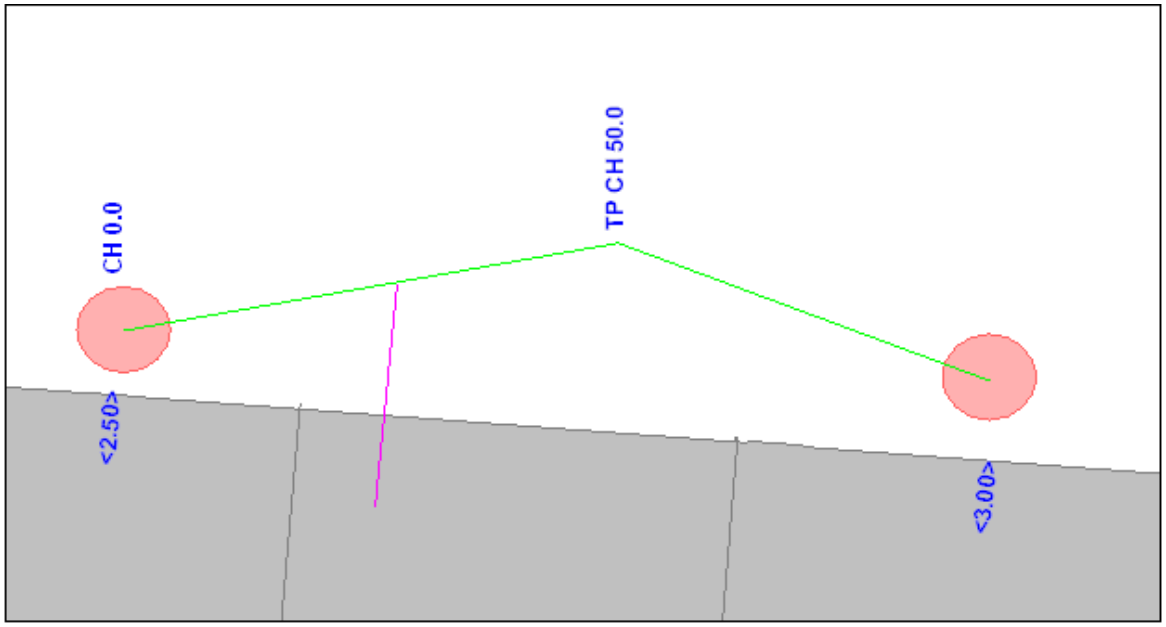
2.8.1 Text and Miscellaneous Graphics Specifications

- Generally, where you provide text in the graphics files, use it for cartographic representation only. This may include using text in offsets to show relativity to property boundaries.
- If you are providing offset distances to assist with the location of the asset, give them to two decimal places of a metre.
- Please note that only licensed surveyors are authorised to establish the location of a title boundary.

Identification of Tangent Point or Change of Grade

Reference a chainage from the downstream access point as shown in Figure 47.

Figure 47: Example of Placement of Chainage as Graphics Only



2.8.2 Matching to Existing Infrastructure, Mismatches or Problems

General

Position **"as-constructed / as-built"** digital data of the assets:

1. relative to the respective map bases
2. relative to (that is, connecting with where practicable) the existing digital water data.

If you find any discrepancies in matching data to the existing infrastructure data provided by the client, complete a problem log as instructed in Section 1.8. Where an asset does not readily match to existing infrastructure, draw a circle around it with a 10-metre radius.

Data Table 20. This log will inform central government agencies and local government authorities of any discrepancies that the relevant party needs to investigate and rectify.

In the context of this conversation a discrepancy is described as a difference in the location of an asset's location from data provided by the asset owner.

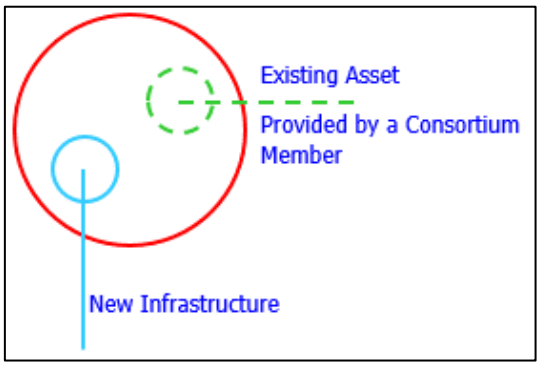
It is the consultant's responsibility to relate the **"as-constructed / as-built"** digital data of the assets to the current digital water data held in the asset information systems of central government agencies and local government authorities. If requested and the data is available, these bodies will make available an extract of any digital water data held in their respective asset management environments covering the specific project area.

Use attachment 1 to obtain this extract.

With these measures, all new assets will be recorded relative to the existing datasets (Figure 48). By this means, it will be possible to:

1. integrate the data into the asset management environments of central government agencies and local government authorities
2. confirm the location of the assets
3. apply a continuous improvement process.

Figure 48: Example of How to Place the Problem Circle



Problems Attribute and Validation File Format Instructions

Where an asset does not readily match to existing infrastructure, draw a circle around it with a 10-metre radius.

Data Table 20: Problems Attribute and Validation File Format Instructions

Problem Attribute & Validation File Format Instructions						
Attribute Name - Abbreviated	Attribute Name - *Full*	Data Type	Max Length	Details	Description	QA Validation
Problem_No	Problem Number	Integer	N/A	No commas included	Problem Number **EG:1**	Field cannot be empty. If more than one problem logged the numbers are to be sequential.
Asset_Type	Asset Type	Alpha / Numeric	20 chars	No commas included	Type of asset that has a problem	Field cannot be empty.
Unique_ID	Unique Identifier	Alpha / Numeric	20 chars	No commas included	The Unique identifier of the asset as assigned	Field cannot be empty.
Comment1	Comment Initial	Alpha / Numeric	250 chars	No commas included	Comments about the problem	Field can be empty.
Comment2	Comment Additional	Alpha / Numeric	250 chars	No commas included	Additional comments about the problem	Field can be empty.
Photo_Ref	Photographic Reference	Alpha / Numeric	100 chars	No commas included	Reference photograph of the asset. **EG: 12345abcd67ef.jpg**	Field cannot be empty. Provide photographic references for all new and existing assets
Project	Project Name	Alpha / Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise**	Field can be used for either subdivision or capital works project.

3 Wastewater Code Lists

Code lists standardise terminology by providing a range of item descriptions for a particular attribute. For a number of attributes specified in the data tables, you must input a code list entry, as set out in Code Lists.

Consultants please note that if an entry does not exist within the code list, you should get in touch with your client manager contact to arrange for its inclusion.

The code list entries will be constantly reviewed, added to and amended as the need arises.

Code List 1: Access Chamber Lid Type

Code	Description
CAST	Cast Insitu
FIBER	Fibreglass
GR	Grate
PC	Precast

Code List 2: Access Chamber Type

Code	Description
DRY	Dry Well
IS	Inspection Shaft
JP	Junction Pit
MH	Maintenance Hole
PUMP	Pump Pit
SEP	Side Entry Pit
VP	Valve Pit
WET	Wet Well

Code List 3: Access Restriction

Code	Description
CONFINED	Confined Space
NONE	No Restriction
RESTRICT	Restricted Access

Code List 4: Asset Status

Code	Description
ABN	Abandoned or Disused
FILL	Filled (for access points/pits etc.)
INUSE	In Use
OTHER	Other Use (for cables etc.)
REM	Removed

Code List 5: Automatic Control

Code	Description
PRS	Pressure
DEPTH	Depth
FLOWR	Flow Rate

Code List 6: Backup Power Type

Code	Description
BAT	Battery
EUPS	UPS
GEN	Generator
SOLAR	Solar Panels

Code List 7: Barrel Treatment

Code	Description
CATH	Cathodic
FBE	Fusion bonded epoxy
GAL	Galvanised
PE	Polyethylene
PNT	Paint
SINTK	Sintakote
UNC	Uncoated

Code List 8: Bedding Backfill Material

Code	Description	Code	Description
AGGR	Aggregate	QWST	Quarry Waste
BENT	Bentonite Sand Mixture	RC0	Reinforced Concrete –
CBLOCK	Concrete Blocks	RECON	Reinforced Concrete
CGLASS	Crushed Glass	SAND	Sand
CLAY	Clay	SCOR	Scoria
CLSLRY	Clay Slurry	SEMAT	Selected Excavated
CONCH	Concrete Haunching	SLCSLRY	Sand Lime Cement
CR	Crushed Rock	TOPGS	Toppings
CSROCK	Cement Stabilised Crushed Rock		
EXCAV	Excavated Material	TRSAND	Trench Refill Sand
GROUT	Grout	UCON	Unreinforced
PKGSAND	Packing Sand		

Code List 9: Buried Status

Code	Description
AG	Above Ground
BG	Below Ground
PB	Partially Buried

Code List 10: Cable Type

Code	Description	Code	Description
BUR	Buried	PORT	Portable
FLEX	Flexible	RBN	Ribbon
HLX	Heliax	SHLD	Shielded
MCORE	Multicore	SNG	Single
MTLSTH	Metallic sheathed	SUB	Submersible
NMTLSTH	Non-metallic sheathed	TWNL	Twin lead
PAIR	Paired	TWNX	Twinax

Code List 11: Chamber Material

Code	Description	Code	Description
BRK	Brick	GEW	Glazed Earthenware
CCONC	Coloured Concrete	ICONC	In-situ concrete
CONCM	Concrete Masonry	IRON	Iron
CORR	Corrugated Steel/Aluminium	PCONC	Precast concrete
FCEM	Fibre Cement Sheets	PSTYB	Polystyrene blocks

Code List 12: Channel Function

Code	Description
BAS	Basin
BIORET	Bio retention
GRDN	Rain Garden
RTRBAS	Retarding Basin
SUMP	Sump
SWALE	Swale
WETL	Wetlands

Code List 13: Channel Shape

Code	Description
CIRC	Circular
IRREG	Irregular
PARN	Parabolic (Narrow)
RECT	Rectangular
TRAP	Trapezoidal
TRI	Triangular

Code List 14: Channel Type

Code	Description
LND	Lined
PARTLINE	Partially lined
UNLND	Unlined

Code List 15: Condition Assessment Type

Code	Description
DSKTP	Desktop
PINSP	Physical Inspection
CCTV	CCTV Camera
LASRP	Laser Profiling

Code List 16: Conduit Material

Code	Description
AC	Asbestos Cement
BRASS	Brass
CI	Grey Cast Iron
FRC	Fibre Reinforced Cement
FRP	Fibre Reinforced Plastic
FSP	Fibre Reinforced Pipe
NYL	Nylon

Code List 17: Construction Type

Code	Description
CAST	Cast Insitu
INSITU	Insitu
UNK	Unknown

Code List 18: Containment Structure Material

Code	Description
CLAY	Clay
CONC	Concrete
EARTH	Earth
RC0	Reinforced Concrete – No Class/Unknown
RC1	Reinforced Concrete – Class 1
RC2	Reinforced Concrete – Class 2
RC3	Reinforced Concrete – Class 3
RC4	Reinforced Concrete – Class 4
RCK	Rock
UCON	Un-reinforced Concrete

Code List 19: Containment Structure Type

Code	Description
DETN	Detention Tank
LAKE	Lake
POND	Pond
RESV	Reservoir
RETN	Retention Tank

Code List 20: Content Type

Code	Description
POT	Potable
STRMW	Stormwater
WSTW	Wastewater

Code List 21: Control Type

Code	Description
AUTO	Automatic
LOCAL	Local
MAN	Manual
SCADA	SCADA
SEMI	Semi-automatic

Code List 22: Damping Material

Code	Description
GREASE	Grease
OIL	Oil
PASTE	Paste
SILCON	Silicon compounds

Code List 23: Drain Liner Material

Code	Description
CLRK	Clay and Rock
CLSN	Clayey Sand
PAM	Polyamide
POLY	Polyester

Code List 24: Electrical Equipment Type

Code	Description
CAB	Cabinet
CONT	Controller
CONTP	Control panel
DRV	Drive
EGSB	Generator Set – Batteries
HWR	Hardware
PMP	Pump
SFTW	Software
SUPPLY	Supply
SWITCHB	Switchboard

Code List 25: Equipment Material

Code	Description
BRASS	Brass
DI	Ductile Iron
FBE	Fusion Bonded Epoxy
FBPE	Fusion Bonded PE
GWI	Galvanised Wrought Iron (Also known as
HA	Helicore Aluminium
LDPE	Low Density Polyethylene
MI	Malleable Iron
MSW	Mild Steel Welded
WI	Wrought Iron

Code List 26: Equipment Purpose

Code	Description
COMM	Communication
DISP	Display
LIGHT	Light
MON	Monitor
POWER	Power
SOUND	Sound

Code List 27: External Coating

Code	Description
FBE	Fusion bonded Epoxy
GAL	Galvanised
PE	Polyethylene
PNT	Paint
SINTK	Sintakote
UNC	Uncoated

Code List 28: Feature Type

Code	Description
CEIL	Ceiling
DOOR	Door
ENDWALL	Endwall
FLOOR	Floor
HEADWALL	Headwall
LFT	Lift
MTR	Motor
PIPE	Pipe
ROOF	Roof
VALVE	Valve
WINDOW	Window

Code List 29: Filter Material

Code	Description
CR	Crushed Rock
GRVL	Gravel
SAND	Sand
SNGR	Sandy Gravel

Code List 30: Filter Type

Code	Description
CART	Cartridge Filter
CLSCR	Coalescer
CRDISP	Cardboard Disposable
DCSN	Debris control screen
FBED	Filter Bed
FLTP	Flat panel
NYLB	nylon bags
UPFL	Upflow
WAIR	Wairora

Code List 31: Fittings Type

Code	Description	Code	Description
BEND	Bend	HC	House Cock
BEND11.25	11.25° Bend	JOINT	Normal Joint
BEND22.5	22.5° Bend	MTAP	Main Tap
BEND45	45° Bend	RED	Reducer
BEND90	90° Bend	SABP	Sabbing point
BLANK	Blank End	SCR	Scour
BYP	Bypass	STDP	Stand pipe
CHLOR	Chlorination Point	STRAIN	Strainer
CROSS	Cross joint	SWB	Swabbing Point
DEC	Dead End Cap	T	T Junction
DISMANTL	Dismantling joint	TAPER	Taper
EXPAN	Expansion joint	TAPP	Tapping Arm
FLANGE	Flange	TAPRC	"Tap-Recycled
FLPT	Flushing Point	[AS 5488 – 2013 Component]"	
GIBJ	Gibault Joint	WASH	Wash Out Bend

Code List 32: Foundation Material

Code	Description
CLAY	Clay
CONC	Concrete
EARTH	Earth
RC0	Reinforced Concrete – No Class/Unknown
RC1	Reinforced Concrete – Class 1
RC2	Reinforced Concrete – Class 2
RC3	Reinforced Concrete – Class 3
RC4	Reinforced Concrete – Class 4
UCON	Un-reinforced Concrete

Code List 33: Frame Class

Code	Description
A	Footpaths and Areas only accessible by pedestrians and pedal cyclists
B	Footpaths that may be mounted by a vehicle or livestock and light tracker paths
C	Malls and pedestrian areas open to slow moving commercial vehicles
D	Carriageways of roads and areas open to commercial vehicles
E	General docks and aircraft pavements

Code List 34: Fuel Type

Code	Description
DIES	Diesel
ELEC	Electricity
GAS	Gas
PETROL	Petrol
SFUEL	Solid Fuel

Code List 35: Geofabric Material

Code	Description
PAM	Polyamide
PE	Polyethylene
POLY	Polyester
PP	Polypropylene
PVC	Polyvinylchloride

Code List 36: Health and Safety Issues

Code	Description
CONFINED	Confined Spaces
ENERG_SRC	Energy Source
EXCAVATION	Excavation and Trenching
FORKLIFTS	Forklifts Operating
HAZ_SUB	Hazardous Substances
HEIGHT	Working At Height
HIGH_VOLT	High Voltage
LIFT_EQUIP	Cranes and Lifting Equipment
NIL	No Requirement
PLANT	Mobile Plant
POWER_EQ	Power Plant and Equipment
RESTRICTED	Restricted Space
TRAFFIC	Live Traffic
VEHICLES	Driving Motor Vehicles

Code List 37: Horizontal Precision

Code	Description
A	±15 mm
B	±20 mm
C	±50 mm
D	±100 mm
E	±200 mm
F	±500 mm
G	› 500 mm

Code List 38: Impeller Type

Code	Description
CENSC	Centrifugal screw
CLCH	Closed channel
HHCLCC	High head closed channel
MFLOW	Mixed flow
PRPL	Propeller
SEMIOP	Semi-open
SHRED	Shredder
SLUR	Slurry
VOR	Vortex

Code List 39: Impeller Material

Code	Description
AL	Aluminium
BRASS	Brass
BRONZE	Bronze
IRON	Iron
PLSTC	Plastic
RUB	Rubber
STEEL	Steel

Code List 40: Inlet Protection

Code	Description
ASV	Automatic Shutoff Valve
NRV	Non-Return Valve

Code List 41: Instrument Type

Code	Description
ANALYT	Analytical
CONT	Controllers
FMET	Flowmeters
LEVEL	Level
MET	Meters
POS	Position
PRS	Pressure
RDLV	Radar levels
TEMP	Temperature switch
TRQ	Torque
TRNSMTR	Transmitters
VIBR	Vibration
WEAT	Weather
WEIGHT	Weight

Code List 42: Joint Type

Code	Description	Code	Description
BAIO	BAIO Flangeless Coupling System	PF	Push Fit
BFJ	Butt Fusion Weld Joint (PE)	PFJ	Polyester Fairing Joint
BSWJ	Ball and Socket Weld Joint (Steel)	PJ	Plumbite Joint
BWJ	Butt Weld Joint (Steel)	PUJ	Polyurethane Joint
CJ	Compression Joints	RRJ	Rubber Ring Joint
CWJ	Collar Weld Joint	RRJL	Rubber Ring Joint embedded with metallic locking segments (EG: Tyton-Lock)
EFJ	Electro fusion Coupling Weld Joint (PE, Steel)	SCJ	Solvent Cement Joint
FJ	Flanged Joint (Iron, PE)	SPWJ	Spherical Slip-In Weld Joint (Steel)
LJ	Lead Joint	TL	Tyton Lock
MCJ	Mechanical Coupling Joint	WM	Welded - Metal

Code List 43: Lid Class

Code	Description
A	Footpaths and Areas only accessible by pedestrians and pedal cyclists
B	Footpaths that may be mounted by a vehicle or livestock and light tracker paths
C	Malls and pedestrian areas open to slow moving commercial vehicles
D	Carriageways of roads and areas open to commercial vehicles
E	General docks and aircraft pavements

Code List 44: Lift Type

Code	Description
CABLE	Cable
GRIND	Grinder
HYDRL	Hydraulic
PNEUM	Pneumatic
SHAND	Solid Handling

Code List 45: Lining Material

Code	Description	Code	Description
ABC	Acronytrile Butadiene Styrene	EN	Enamel
ALS	Aluminium Spray	GF	Glass Fibre
AS	Asbestos	GRER	Glass Reinforced Epoxy Resin
BITP	Bitumen Paint	GRP	Glass Reinforced Plastic
BRK	Brick	GUNN	Gunnite
CADP	Cadmium Plated	PLHS	Plastic Heat Shrink Sleeve
CL	Cement Mortar Spun Lining	PVCP	PVC – Plastalon
CML	Cement Mortar Lining	PVCS	PVC – Sintacote
CTEW	Coal Tar Enamel & Wrapped	ZNP	Zinc Plate
EEN	Epoxy Enamel	ZNS	Zinc Spray

Code List 46: Litter Trap Type

Code	Description
CDSU	Continuous deflection separator
DTRP	Floating Debris Trap
ENCL	Enclosed
FBLT	Floatable Boom
OPEN	Open
SEDT	Sediment

Code List 47: Mechanical Equipment Type

Code	Description
ACTU	Actuator
BLW	Blower
CMP	Compressor
GRB	Gearbox
SCRN	Screens

Code List 48: Network Type

Code	Description
POTABLE	Potable Water
RAW	Raw
RECYCLED	Recycled
STRMW	Stormwater
WSTW	Wastewater

Code List 49: Operational Management Area

Code	Description
CMA	Catchment
DMA	Demand Management Area

Code List 50: Pipe Installation Method

Code	Description
ABG	Above Ground
BORED	Bored
TR	Trench
TU	Tunnel

Code List 51: Pipe Load Class

Code	Description
CLASS2	Class 2
CLASS3	Class 3
CLASS4	Class 4
CLASS6	Class 6
CLASS8	Class 8
CLASS10	Class 10

Code List 52: Pipe Material

Code	Description	Code	Description
AG	AG Drains	HDPE	High Density PE (PE100)
BRASS	Brass	mPVC	Modified Polyvinyl Chloride
BLBRUTE	Black Brute	NA	Not Applicable
CI	Grey Cast Iron	NYL	Nylon
CICL	Cast Iron Cement Lined	oPVC	Oriented PVC (EG: Blue Brute)
CLAY	Clay	PE	Polyethylene
CLIS	Cement Lined In-Situ	PVC	Polyvinylchloride
CLS	Concrete Lined Steel	RC0	Reinforced Concrete – No Class/Unknown
CLSC	Cement Lined Steel Coat	RC1	Reinforced Concrete – Class 1
CO	Copper	RC2	Reinforced Concrete – Class 2
CONC	Concrete	RC3	Reinforced Concrete – Class 3
CORR	Corrugated Steel/Aluminium	RC4	Reinforced Concrete – Class 4
DI	Ductile Iron	RCPL	Reinforced Concrete
FBPE	Fusion Bonded PE	SSTEEL	Stainless Steel
FIBER	Fibreglass	SSTEEL316	Stainless Steel (grade 316)
FRC	Fibre Reinforced Cement	STEEL	Steel
FRP	Fibre Reinforced Plastic	UCON	Un-Reinforced Concrete

Code	Description	Code	Description
FSP	Fibre Reinforced Pipe	uPVC	Un-plasticised PVC
GEW	Glazed Earthenware	uPVC-S	Un-plasticised PVC - Sewer grade
GSW	Glazed Stoneware	VC	Vitreous Clay (or Earthen Ware)

Code List 53: Pipe Pressure Class

Code	Description	Code	Description
PN4.5	0.45 MPa	PN12.5	1.25 MPa
PN6	0.6 MPa	PN15	1.5 MPa
PN8	0.8 MPa	PN16	1.6 MPa
PN9	0.9 MPa	PN18	1.8 MPa
PN10	1 MPa	PN20	2.0 MPa
PN12	1.2 MPa		

Code List 54: Pipe Purpose

Code	Description
GRAVITY	Gravity
PRS	Pressure
SIPHON	Siphon
VAC	Vacuum

Code List 55: Pipe Shape

Code	Description
ARCH	Arch shaped pipe
EGG	Egg shaped pipe (Touching Circle)
EGG2	Egg shaped pipe (not touching)
OVAL	Oval
PARB	Parabolic (Broad)
USCH	U-shaped channel
UTOP	U-shaped pipe
VSCH	V-Shaped Channel

Code List 56: Pipe Stiffness Class

Code	Description
SN2500	Relining, Buried
SN5000	Minor roads
SN10000	Landfill, Well pipes

Code List 57: Pipe Type

Code	Description
FIRE	Fire Service
PRVT	Private
PDIST	Primary Distribution
PSUPP	Primary Supply
REGM	Regional Main
SDIST	Secondary Distribution
SSUPP	Secondary Supply
SITE	Site Assets
HOUSE	House Connection

Code List 58: Project Type

Code	Description
CMH	Community Handover
RLN	Relining
RNW	Renewal
SBDV	Sub-Division

Code List 59: Protective Material

Code	Description
BRASS	Brass
BRK	Brick
DICL	Ductile Iron Cement Lined
FBE	Fusion Bonded Epoxy
GUNN	Gunnite
GWICL	GWI Cement Lined
PLSTC	Plastic

Code List 60: Pump Purpose

Code	Description
BOOST	Booster
SUCTN	Suction

Code List 61: Pump Station Type

Code	Description
CNVNT	Conventional
ING	Inground

Code List 62: Pump Type

Code	Description
BORE	Bore
CENS	Centrifugal – Single Stage
ES	End Suction
ESCS	End Suction – Centrifugal – Single Stage
HM	Horizontal Multistage
JET	Jet
PRS	Pressure
VM	Vertical Multistage

Code List 63: Pump Usage

Code	Description
NONSTDBY	Non-Standby
STDBY	Standby

Code List 64: Renewal Material

Code	Description
BRK	Brick
EEN	Epoxy Enamel
GUNN	Gunnite
NA	Not Applicable

Code List 65: Renewal Method

Code	Description
CPLACE	Cured in Place
NA	Not Applicable
PBURST	Pipe Burst
SLPL	Slip Lined

Code List 66: Seal Type

Code	Description
BOLT	Security Bolt-Down
BOLTWATER	Bolted and Water Tight
DOUBLE	Double Sealed
NS	Not Sealed
WM	Welded Metal

Code List 67: Source

Code	Description
10000P	1:10000 Plans
25000P	1:25000 Plans
2500P	1:2500 Plans
40INP	1':40' Plans
5000P	1:5000 Plans
500P	1:500 Plans

Code	Description
ARPHOTO	Aerial Photography
CHNOFF	Chainage and Offset
CONDRAW	As Constructed Drawing
DESPLAN	Design Plan
DESPLANC	Design Plans issued for Construction
FIELD	Field Survey

Code List 68: Support Structure Material

Code	Description	Code	Description
AL	Aluminium	RC3	Reinforced Concrete – Class 3
CI	Grey Cast Iron	RC4	Reinforced Concrete – Class 4
CONC	Concrete	SPIR	Spiral Wound Steel/Aluminium
GWI	Galvanised Wrought Iron (Also known as	SSTEEL	Stainless Steel
IRON	Iron	SSTEEL316	Stainless Steel (grade 316)
MI	Malleable Iron	STEEL	Steel
MSW	Mild Steel Welded	TMBR	Timber
RC0	Reinforced Concrete – No Class/Unknown	UCON	Un-reinforced Concrete
RC1	Reinforced Concrete – Class 1	WI	Wrought Iron
RC2	Reinforced Concrete – Class 2		

Code List 69: Support Structure Type

Code	Description
ANCHOR	Anchor Block
ANCHORNSTD	Anchor Block Non-Standard
ANTISCOUR	Anti Scour Block
NONSTD	Thrust Block Non-Standard
RECTANGLE	Thrust Block Rectangular
TRIANGLE	Thrust Block Triangular

Code List 70: Surface Material - Pipe

Code	Description
FIBER	Fibreglass
MINERAL	Mineral Wool
SPRAY	Spray Foam

Code List 71: Tank Location

Code	Description
ABG	Above Ground
BLG	Below Ground

Code List 72: Test Type

Code	Description
DEFLECT	Deflection
COMPACT	Compaction

Code List 73: Unit Position

Code	Description
BLG	Below Ground
CEILCAV	Ceiling Cavity
SUSF	Suspended under floor
WALLCAV	Wall Cavity

Code List 74: Valve Control

Code	Description
AUTO	Automatic
MANUAL	Manual
SCADA	SCADA
REMOTE	Remote

Code List 75: Valve Configuration

Code	Description
I	Inline
B	Bypass
C	Cross-Connection

Code List 76: Valve Power

Code	Description
BATTERY	Battery
HYDRAULIC	Hydraulic
MAINS	Mains Electricity
MANUAL	Manual
PNEUMATIC	Pneumatic
SPRING	Spring

Code List 77: Valve Purpose

Code	Description	Code	Description
AIRIN	Air In	FLTP	Flushing Point
AIROUT	Air Out	IRRIG	Irrigation
AIRINOUT	Air In & Out	ISO	Isolation
PRESBDY	Boundary Press Zone	LATSUP	Lateral Supply
BURSTC	Burst Control	NONE	No Special Function
BYPASS	Bypass	NRV	Non-return/Backflow
CTRLFLOW	Control - Flow	PRESREDU	Pressure Reducing
CTRLPRESS	Control - Pressure	PRESRG	Pressure Regulation
CTRLFLPR	Control Flow & Press	PRESRELF	Pressure Relief
SERV	Customer Service	PRM	Pressure Maintaining

Code	Description	Code	Description
DF	Drinking Fountain	PRV	Pressure Reducing
DMABDY	DMA Boundary Isolation	PTR	Transducer
EMRO	Emergency Only	SAMPLE	Sampling Point
EMWR	Emergency Waste Removal	SCOUR	Scour
FIREFIGHT	Fire Fighting	TAP	Tap
FIRE	Fire Service Connection	VACSO	Vacuum Shut Off

Code List 78: Valve Type

Code	Description	Code	Description
AF	Auto flush	KN/GATE	Knife Gate
AIR	Air Release	L/C	Level Control
AIRRC	Air-Recycled	L/GATE	Lift Gate
ALT	Altitude	MOTOR	Motorised
ALT/NRV	Altitude/Non-Return	NEEDLE	Needle
ALT/PR	Altitude/Pressure Reducing	NRV	Non Return / Reflux / Check
ALT/PS	Altitude/Pressure Sustaining	P/RLF	Pressure Relief
ALT/PS/PR	Altitude / Pressure Sustaining / Reducing	PEN	Penstock
B/F	Butterfly	PILOT	Pilot
BACKFP	Backflow Prevention	PRV	Pressure Reducing
BACKFPRPZ	Backflow Prevention RPZ	PSV	Pressure Sustaining
BALL	Ball	PTR	Transducer
BURSTC	Burst Control	R/F	Ring Follower
D/BAR	Drop Bar	REGR	Regulator
DAIR	Double Air	REVS	Reverse
DIAPH	Diaphragm	S/C	Swing Check
FC	Flow Control	S/COCK	Stopcock
FERRULE	Ferrule	SAIR	Single Air
FGAP	Flap Gap	SLEEVE	Sleeve
FLOAT	Float	SLUICE	Sluice
FOOT	Foot	SOLENOID	Solenoid
GATE	Gate	STOP	Stop [AS 5488 – 2013 Component]
HYOFF	Hydrant-Offset [AS 5488 – 2013 Component]	STOPRC	Stop-Recycled [AS 5488 – 2013 Component]
ISO	Isolation	TC	Test Cock
KEYGATE	Key Gate	W	Wheel

Code List 79: Vertical Precision

Code	Description
A	±10 mm
B	±15 mm
C	±20 mm
D	±40 mm
E	±50 mm
F	±100 mm
G	› 100 mm

Code List 80: Voltage Type

Code	Description
1PHASE	Single Phase
3PHASE	Three Phase
LOWVOLT	Low Voltage

4 Wastewater Document Control

Project Name	3Waters Metadata Standards
Document Type	Metadata Standard Data Specification
Document Number	
File Name	Wastewater Digital Data Specifications-Version xxxx**.docx**
Version Date	30 June 2017
Written by	GISSA International Pty Ltd
Reviewed by	George Havakis, Haydn Read
Authorised by	LINZ – Land Information New Zealand

5 Document Revision History

Revision Number	Date	Comments
1.2	15 July 2016	Issue of initial draft to technical working group
PILOT DRAFT V1	31 March 2017	Renamed and Input added from sector feedback
PILOT DRAFT V1	17 May 2017	Input added from sector workshop feedback
PILOT FINAL DRAFT	30 June 2017	Input added from sector workshop feedback and final edit

5.1.1 Summary of Specification Changes

Item #	

Attachment 1: Request for Digital Wastewater Asset Data

Please refer to the supplier website for relevant contact details.

Date:	
Supplier Contact:	
Developer, Consultant or their Representative's Name:	
Developer, Consultant or their Representative's Contact Name:	
Address:	
Suburb:	**Post code:**
Telephone:	
E-mail:	
Development project(s) reference(s):	

I, the representative named above, request from _____ an extract

(Insert name of supplier)

from their water digital map base covering the area as described in the following sections. As a condition of using this data, I agree to acknowledge the ownership of _____

(Insert name of supplier)

over this data and agree to be bound by the restriction that the data is only to be used for the nominated development projects.

Please make a selection indicating the method of delivery and the type of media the data is to be supplied on.

Requested method of data delivery	Requested media format
❑ E-mail	
❑ Post	❑ CD-ROM / DVD
❑ To be collected	❑ CD-ROM / DVD

Please complete one of the sections below. You must provide sufficient information to allow the area of interest to be easily identified.

Description

For example, “the area bounded by La Trobe, Swanston, Bourke and Spencer Streets”.

Bounding Coordinates

For example, the area within (294081m E, 5802320m N), (294430m E, 5802315m N), (294449m E, 5801990m N), (294094m E, 5801991m N).

Area Shaded in Attached Picture

For example, the area shown shaded in an extract from a street directory.

Glossary

With the introduction of additional jurisdictions, in some instances different terms or words will be used to describe identical features.

This glossary defines terms in alphabetical order. They are used in this specification only with the meaning listed here. This section will be updated as other terms are identified and added.

Please note that it is not the intention to detail every term in this glossary as many terms have already been pre-defined in existing codes of practice and land development manuals as well as by organisations such as standards organisations, and state, regional and central agencies that develop the policies and practice notes for areas that cover planning, design and construction.

Wastewater, also known as ‘sewage’, originates from household activities (toilets, kitchens, bathrooms and laundries) and commercial and industrial premises. It is predominantly water but also includes organic matter such as human waste, food scraps, fats, oil and grease, and pharmaceuticals, chemicals, paint and other debris.

Sewage – Historical overview

Source: Wikipedia (*http://en.wikipedia.org/wiki/Sewage*)

Sewage is water-carried waste, in solution or suspension that is intended to be removed from a community. Also known as wastewater, it is more than 99% water and is characterized by volume or rate of flow, physical condition, chemical constituents and the bacteriological organisms that it contains. In loose American English usage, the terms 'sewage' and 'sewerage' are sometimes interchanged. Both words are descended from Old French *assewer*, derived from the Latin *exaquare*, "to drain out (water)".

A medieval waste pipe in Stockholm Old Town formerly deposited sewage on the street to be flushed away by rain.

Term	Description
Access chamber	may also be referred to as a **chamber**, **manhole**, **access point** or **maintenance hole**
AMIS	is the abbreviation for **Asset Management Information System**. May also be referred to as **Asset Management System (AMS)**
As-constructed information	may also be referred to as **work as executed**, **work as constructed**, **work as built**, **as cons** or **as Laid**
As Constructed data	relates to data supplied for newly constructed assets. Also takes into account renewed or rehabilitated assets
Asset Class	relates to a grouping of asset that can be covered by a specific classification and can be described by the same attributes.
Asset Group	relates to a high level classification grouping of asset classes
Asset Type	relates to a specific type of asset within an asset class
Consultants	a term that includes but is not exclusive to all private sector organisations such as Property Developers or their agents, consulting engineers, surveyors town planners, landscape architects, contractors. In the context of this document typically the Consultants are responsible for the supply of As Constructed data for all new or existing infrastructure assets.
CCTV	is the abbreviation for **closed circuit television**
LINZ	is the abbreviation for **Land Information New Zealand**
End of pipe	may also be referred to as **blank end**
Gravity pipes	may also be referred to as a **main** or a **trunk main**
Installation date	may also be referred to as c**onstruction date**
Maintenance hole	may also be referred to as a **junction pit**
NIU	is the abbreviation for the **National Infrastructure Unit of Treasury New Zealand**
NZTM2000	is the abbreviation for the **New Zealand Transverse Mercator 2000 projection**
NZVD2016	is the abbreviation for the **New Zealand Vertical Datum** published

Term	Description
	in 2016
Pressure mains	may also be referred to as **rising mains**
Property connection	may also be referred to as a **lateral connection**, **service connection**, **service line**, **property discharge lines** or **house connection branch (HCB)**
Property sanitary drain	may also be referred to as **property service drain**
RL	Is the abbreviation for the reduced level based on a vertical datum
Sewer maintenance shaft	may also be referred to as an **inspection shaft or lamphole**
Wastewater	may also be referred to as **sewage**
Wastewater system	may also be referred to as a **sewerage system**