



Consultant/Developer Specifications for the  
Delivery of Digital Data to  
Local Government and Authorities

**Version 2.0.5 Final - Summary**  
31<sup>st</sup> May 2019



# A-SPEC Members

Victoria	WA	NSW
                                   	                  	     

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# EXECUTIVE SUMMARY

## Introduction

### A-SPEC Program

**A-SPEC** is the acronym for the program involved in developing specifications for the delivery of newly constructed assets as Digital Data in a GIS ready format to Asset Owners and Managers in Local Governments, Utilities and Water Authorities around the world.

The **A-SPEC** management model enables Local Governments, Utilities and Water Authorities around the world to participate in the development and use of the standard specifications developed under this program.

The key objectives of the **A-SPEC** initiative is to streamline stake holders' (local government/utilities/water authorities) processes for receiving, handling and storing of data related to newly constructed infrastructure assets either from subdivision developments or internal programs (e.g. capital works) in their GIS and AMIS.

This process will increase the efficiency of information access and result in greater customer satisfaction when dealing with inquiries from engineering consultants, surveyors, developers and prospective residents.

- **Eliminate duplication of effort.** Significant duplication of effort exists in the digitising of as constructed information. This duplication exists between the private sector (who capture as constructed information), and council, utility and water authority staff (who may digitise that information from paper plans);
- **Improve process efficiency**, in the process of accepting and processing lodgements, and in checking existing data against design criteria and/or design plans;
- **Improve customer service** to both internal and external customers of asset information;
- **Improve the quality** of Water information held in council, utility and water authority systems for audit and financial requirements, as well as operational and business requirements;
- **Provide a structure** for the consistent recording of all council, utility and water authority owned assets, including those created through internal programs such as capital works and renewals;
- And ultimately **manage assets better** to reduce the need for capital works and/or to reduce ongoing maintenance costs.

**A-SPEC data is characterised as having an infrastructure role by:**

- functioning as reference data - which means that 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 transportation, traffic safety, to handle environmental and social planning, etc
- having a structure that is stable over time (even if parts of the data content changes due to user input).
- having specific interest for cross border (across State or National/International boundaries) applications.

## W-Spec Standard Specification

The **W-Spec** standard specification (Water assets) was created to enable Local Governments, Utilities and Water Authorities around the world to participate in the use of a single specification when dealing with the creation of new Council, Utilities and Water Authorities' assets. This enables Councils, Utilities and Water Authorities to deal more efficiently with Land Development and Industry Consultants in relation to subdivision developments and capital works programs within their local jurisdiction.

The **W-Spec** standard specification was developed to streamline the processes undertaken to display all new Water assets within each **A-SPEC** member's geographic information system (GIS) and asset management information system (AMIS).

A common specification for the supply of digital water data was identified as a major opportunity for the members to achieve efficiency and cost savings in the process of maintaining their corporate GIS and AMIS. Moreover, a common specification shared between Councils, Utilities and Water Authorities would also provide efficiencies to the Land Development Industry by removing the need to maintain separate processes, standards and software tools for numerous Councils, Utilities and Water Authorities.

The **W-Spec** standard specification will enable consultants to provide "**As-Constructed/As Built**" data with the specific characteristics required as GIS ready data to comply with **W-Spec**.

The framework will consist of specifications for data content enabling data exchange. **W-Spec** will enable data to be collected and available in a harmonised, interoperable and quality assured way.

## Use of the Specifications

This standard specification is for use by Private Developers, the representatives of Private Developers, engineering consultants and surveyors (hereafter referred to as "Consultants") who undertake Land Development or Capital Works activities for one or more members of the **A-SPEC** Consortium.

**This specification is not to be used for any other purpose.**

Where applicable please refer to the section of the document that stipulates the specific requirements of the relevant region that you are conducting your business in within Australia. It is the responsibility of the consultants to understand the specific requirements of their local government, utility or water authority clients. Assistance will be provided wherever possible to clarify any issues or concerns.

It should also be noted that as there are similar elements in **W-Spec** that also appear in **D-Spec**, **S-Spec**, **R-Spec**, **B-Spec** and **O-Spec**, then the standard specification for those asset classes are to be used to prepare the **As-Constructed/As Built information** digital data to be delivered along with the water digital data requested.

This document, along with the accompanying A-SPEC 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 i.e. 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.

**W-Spec** will lay the foundation for Water asset data infrastructure built on identified user requirements through a specification framework.



Please note the changes in this specification are indicated as follows:

1234	Blue highlighted text and text struck out	Text to be deleted
5678	Green Highlighted text	Existing attribute moved to another table
9101	Yellow highlighted text	New or modified text

An attribute which is specified as "Conditional" means, it is to be populated if certain conditions are met.

Example: The attribute 'Source' is to be populated in the Area of Work Extent table only if the 'Source' of the information is the same for the whole project. If the asset doesn't meet this condition, then the Code 'REFER', is to be used and each table is to be populated accordingly.

Read attribute descriptions carefully to ensure the conditions are met before populating.

## The A-SPEC Accompanying Document

A document has been created called the **A-SPEC DDS – Introduction and Overview ("A-SPEC DDS")**. Where applicable please refer to the section of the document that stipulates the specific requirements of the relevant region where you are conducting your business.

It should also be noted that the **A-SPEC DDS** document contains a list of all asset types covered by the various specifications to enable easier identification for the detailed information.

It is the responsibility of the data providers to understand the specific requirements of their local government, utility or water authority clients. Assistance will be provided wherever possible by GISSA to clarify any issues or concerns.

To log a request for further information, the Data Provider may contact GISSA through the website [www.a-specstandards.com.au](http://www.a-specstandards.com.au).

The **A-SPEC DDS** document along with this document, provides the necessary information relating to common features (asset classes, feature types, attribute types and attribute value domains) that are required.

Including

1. generalisation rules for the graphical representation of each feature,
2. geodetic reference systems and
3. rules for validating the data supplied to ensure adherence and compliance.

The Already Constructed data 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.

## In Summary

The key objective of this standard specification is to provide information to the Consultants that will be dealing with A-SPEC Consortium members. This document outlines the specific requirements for the submission of "As-Constructed/As Built Information" of works as GIS Ready digital data of newly constructed water assets as defined by the A-SPEC Consortium members in Australia.

Whilst 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. For example, there are specific references in this document that only relate to particular jurisdictions.

Note the requirement for Western Australian A-SPEC users to record the WAPC reference number "WAPC\_No", is now accommodated within the "Permit\_No" attribute field as the "WAPC\_No" attribute field was renamed to "Permit\_No".

The project to determine the suitability of the W-Spec standard specification was developed and is being managed by GISSA International Pty Ltd.

The Atrium Suite 10, 476 Canterbury Road, Forest Hill Victoria 3131.

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## Glossary of Terms and Definitions

With the introduction of additional jurisdictions there will be instances where different terms or words are used to describe identical features.

We have included this glossary to define terms; all defined words are in an alphabetical order. They are not used in this specification with any other meaning. As other terms are identified they will be added and therefore this section will be updated from time to time and provided on the relevant specification page on [www.a-specstandards.com.au](http://www.a-specstandards.com.au).

Please note that it is not the intention to detail every term in this glossary as many terms have already been pre-defined in many existing codes of practice, Land Development manuals and organisations such as Standards organisations, State, Regional and central agencies who develop the policies and practice notes for areas that cover planning, design and construction.

### **ACCESS POINTS**

– may also be referred to as a “**Manhole**” or “**Pit**” or “**Maintenance Hole**” or “**Inspection Opening**”

### **AMG**

– refers to “**Australian Map Grid**”

### **AMIS**

– refers to “**Asset Management Information System**”. May also be referred to as “**Asset Management System (AMS)**”

### **AS CONSTRUCTED INFORMATION**

– may also be referred to as “**As Built**” or “**Work as Executed**” or “**Work as Constructed**” or “**As Cons**” or “**As Laid**”

### **CCTV**

– refers to “**Closed Circuit Television**”

### **NODE**

– Node in the context of this specification is used to identify the start and end points of the pressure main pipe network.

### **PIPE**

– may also be referred to as a “**Main**” or “**Pressure Main**”

### **PIT**

– may also be referred to as a “**Manhole**” or “**Access Point**” or “**Maintenance Hole**”

### **POTABLE WATER**

– may also be referred to as “**Drinking**” or “**Drinkable Water**”

### **RAW WATER**

– may also be referred to as “**Untreated Water**”

### **RECYCLED WATER**

– may also be referred to as “**Reuse**” or “**Reclaimed Water**”

### **SERVICE MAIN**

– may also be referred to as to as a “**Lateral**” or “**Service Connection**” or “**Property Connection**” or “**House Connection**”



## Submission of “As Constructed Information” as GIS Ready Data

The key objective of the specification is to provide “As Constructed Information” as digital data of Water assets in a GIS ready format to the Consortium of members using the **W-Spec** standard specification.

This document outlines the specifications for the delivery of digital data containing: 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 to the **A-SPEC** Consortium members as outlined in the Asset Table in [Section 1.3 Theme/Layer Structure](#).

## Consultant Register

The **A-SPEC** Consortium will list Consultants who have registered through the **A-SPEC** website and will provide updates or revisions as necessary. You are advised to read this specification carefully and any comments or suggestions you have regarding this specification are welcomed.

- Consultants who have registered will be shown on the **A-SPEC** website;  
[www.a-specstandards.com.au](http://www.a-specstandards.com.au) (formerly [www.dspec.com.au](http://www.dspec.com.au))

## A-SPEC Member Contact

All inquiries relating to the format of the digital information should be directed to the **A-SPEC** representative of the relevant organization:

- Please either contact GISSA International on +613 9877 6972 or by email at [info@gissa.com.au](mailto:info@gissa.com.au) or your local point of contact with the organisation you are dealing with

## Intellectual Property

The **A-SPEC** Consortium members own the intellectual property of the developed specifications in conjunction with **GISSA International** and Intellectual Property rights are not to be sold, transferred or assigned to any party (other than a new participating **A-SPEC** Consortium member) without the prior written approval of the **A-SPEC** Consortium and **GISSA International**.

The **W-Spec** Standard Specification will be available free of charge to the consulting & development industries. **A-SPEC** data structures are only to be used for the delivery of As Constructed data to **A-SPEC Consortium members only**.

**All material is copyrighted and under a trademark.**

## Disclaimer

On occasion **A-SPEC** Consortium members may supply consultants with digital data to assist them with their planning and design phases. The **A-SPEC** Consortium 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.

## Deliverables

The following are acceptable media for providing the digital data files.

- Email files to **A-SPEC** member representative.
- USB memory device, portable hard drive
- Cloud Mediums (FTP, Dropbox, Google Drive etc.)

## Certification Form - Readme / Metadata File

The readme.txt is a simple text file that contains information about the project the digital data is being provided for and must accompany **EVERY** digital data submission.

It is an expectation of the **A-SPEC** Consortium that all data be verified by the developer or their representatives (consultants) with relation to its completeness and graphical accuracy prior to submission.

Errors and omissions will result in the data being returned to the consultant for correction and may result in a non-conformance being placed on the data submission.

The following information will be used as part of validating the data submission.

Label	Description	Example
COMPANY	Company name taking responsibility for the data	GISSA International
CONTACT	Contact name for this project	George Havakis
TELEPHONE	Telephone number	(03) 9877 6972
FACSIMILE	Facsimile number	NA
EMAIL	Email address (as applicable)	<a href="mailto:george@gissa.com.au">george@gissa.com.au</a>
MAILING ADDRESS	Mailing address	Suite 10, 476 Canterbury Rd, Forest Hill VIC 3131
PHYSICAL ADDRESS	Physical business address	'As Above'
A-SPEC MEMBER	Participating Authority	Wannon Water Wyndham City Council
DATE SUBMITTED	Date the digital data submitted to A-SPEC member	20 November 2018 31/1/2014
DOCUMENT VERSION	Version of the document used	W-Spec Digital Data Specifications – V2.0.5
SOFTWARE FORMAT & VERSION	The software used to create the digital data	QCIS
PROJECT or SUBDIVISION	Project or Subdivision name	Boggy Creek Main Extension Wyndham Estate
STAGE	Subdivision Stage Name	N/A Stage 3B
DESIGN COMPANY	Design Company Name	Fred Charles & Associates
PLAN NUMBER	As Constructed Plan Number	6080R212
CONSTRUCTION COMPANY	Construction Company Name	Jamieson Construction
CONSTRUCTION DATE	Date the asset was constructed /built /installed	10 November 2018 12/03/2017
COORDINATES/DATUM	The coordinate system the data is in	GDA94 Zone 49 54
DATUM	Vertical Height Datum	AHD71
TRANSFORMATION	The coordinate system the data was transformed from	N/A Perth Coastal Grid to GDA94 Zone 49
TRANSFORMATION BY	Who carried out the transformation from the original coordinate system to the relevant system	N/A City of Gosnells – Jack Dowling
SOURCE OF DATA	The type of capture used	Field Asset Capture Surveyed
NOTES/COMMENTS	Important notes or information to be included here.	Information provided in this submission is a combination of data picked up in the field along with confirmation by the contractor responsible ICANDOIT Pty Ltd

## 1.3 Theme/Layer Structure

The following level/layer structure is intended as a guide to assist Consultants when arranging their graphical information for members of the **A-SPEC** Consortium. The key principal is that each asset class must be delivered on a separate level/layer and the files must be clearly labelled in accordance with the **“Universal File Name”** indicated below.

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 level/layer should only contain the listed features; any other features present will impede the automatic acceptance testing and may result in non-conformance with the requirements.

Feature	Universal File Name	Data Type	Description	Attribute Table
Area of Work Extent	Area_Extent	Polygon	Polygon representing the extents of the subdivision development or capital works	Yes
Pressure Main	Pressure Main	Line/Polyline	Line indicating the centreline position of the water pressure main.	Yes
Service Main	Service Main	Line/Polyline	Line indicating the centreline position of the water service main	Yes
Access Points / Pits / Manholes & Other Structures	Pit_Points	Point	Point representing the central location of pit.	Yes
Access Points / Pits / Manholes & Other Structures	Pit_Polys	Polygon	Polygon representative the actual size (perimeter), location and rotation of the pit	No. Graphics Only
Water Hydrants	Hydrant	Point	Point representing the location of hydrant	Yes
Meter	Meter	Point	Point representing the location of meter	Yes
Valves	Valve	Point	Point representing the location of valve	Yes
Fittings	Fitting	Point	Point representing the location of a fitting used to connect, cap or plug a pipe carrying water	Yes
Pumps	Pump	Point	Point representing the location of a pump	Yes
Reservoir	Reservoir	Polygon	Polygon representing facilities designed to store/distribute water. The shape must be representative of its actual size and location.	Yes
Cathodic Protection	Cath_Protection	Polygon	Polygon representing the actual size and location of the cathodic protection assets	Yes
Conduits	Conduits_W	Line/Polyline	Line indicating the centreline position of the conduits	Yes
Tanks	Tanks	Polygon	Polygon representing the actual size and location of the tanks	Yes
Electrical Cabling	Elec_Cables	Line/Polyline	Line indicating the centreline position of the electrical cables	Yes
Electrical Equipment	Elec_Equips	Point	Point representing the central location of the electrical equipment	Yes
Instrumentation	Instruments	Point	Point representing the central location of the instrumentation	Yes
Mechanical Equipment	Mec_Equips	Point	Point representing the central location of the mechanical equipment	Yes
Pump Station	Pump_Station	Polygon	Polygon representing the actual size and location of the pump station	Yes
Pump Station Site	Pump_Station_Site	Polygon	Polygon representing the actual size and location of the pump station site	Yes
Support Structure	Supp_Strut	Polygon	Polygon representing the actual size and location of the support structure	Yes
Matching to Existing Infrastructure	Problems	Polygon	Circle of radius 10m and associated comments listing all problems with a unique number (i.e. 1,2,3 etc)	Yes

### 1.3.1 Other Asset Types that may be found in the Precinct of a Water Network

There may be instances where other asset types are constructed as part of a water project such as a treatment plant or a large pumping station compound.

Where this occurs please refer to the relevant **A-SPEC** standard specifications to ensure compliance with the delivery of “**As Constructed Information**”. The table below lists some of the specifications available.

Pathways and Roads	Please refer to <b>R-Spec</b> for requirements
Kerbs and Channels	Please refer to <b>R-Spec</b> for requirements
Stormwater Pipes and other infrastructure	Please refer to <b>D-Spec</b> for requirements
Sewerage Pipes and other infrastructure	Please refer to <b>S-Spec</b> for requirements

This will be updated from time to time so please do not hesitate to contact GISSA International on +61 3 9877 6972 or refer to the website on [www.a-specstandards.com.au](http://www.a-specstandards.com.au).

## 1.4 Graphical Data Construction Principles

This section details the graphical data construction principles that consultants must adhere to for all linework, polygons and points provided. Where practicable, the alignment of all data; whether “As Constructed Measurements” in Victoria or Survey Enhanced “As Constructed” data in Western Australia, must be related to the title/property boundaries abutting the road reserve.

- Please use sound CAD practices when recording data, such as snapping to lines and closing polygons.

The following sample drawings depict text labelling requirements for water elements for the graphical component of this specification.

## 1.5 Graphical Representation Principles

Each of the following sections details the requirements for how the graphics for each asset is to be provided. As mentioned in the previous section all data that is provided is to be a:

- Point
- Line (Polyline where multiple vertices are required) or a
- Polygon

## 1.6 Acceptance Testing

All graphical information will be checked against the Attribute file/table. Please refer to Section 2 for guidelines designed to assist Consultants when putting together attribute information.

It is mandatory that each Consultant implement checks to ensure that their plans and data conform to the specification and that they run these checks prior to the submission of data to an **A-SPEC** Consortium member. Members will undertake random in-house testing to ensure compliance.

Following the acceptance of the digital data the, relevant Certificates will be issued and the ownership of the digital data reverts to the **A-SPEC** Consortium member.

## 1.7 Match to AS 5488 – 2013

**Please note an update to this standard was released by Standards Australia on 26 May 2019 and created into 2 parts. Following a review of the changes and their application to W-Spec, changes will be incorporated into W-Spec and distributed as an addendum.**

### Australian Standard Classification of Subsurface Utility Information (SUI)

The following is an extract from Section 1 of the Standard

#### SECTION 1 – SCOPE AND GENERAL

##### 1.1 SCOPE

This Standard provides a framework for the classification of subsurface utility location and attributes information in terms of specified quality levels. This Standard applies to subsurface utilities and associated surface features that facilitate the location and identification of subsurface utility infrastructure. These features may include access chambers, stop valves, terminal pads and other surface related facilities. This Standard does not apply to utility infrastructure that is above the surface, such as overhead wires. This Standard applies to all existing (including redundant) and under-construction subsurface utility infrastructure. For the purpose of this Standard, the term ‘subsurface’ includes ‘submerged’ (see Clause 1.4.21).

##### 1.2 APPLICATION

###### 1.2.1 Intended audience

This Standard is intended to be used by those agencies and organizations that own, operate or regulate subsurface utility infrastructure and those that collect, depict and map such infrastructure. This Standard is also intended to be used by developers and consent authorities involved in the planning, approval and installation of subsurface utility infrastructure.

###### 1.2.2 Depiction of Subsurface Utilities

The depiction of subsurface utilities on maps, plans and electronic records, in terms of symbology, line types and colours is the prerogative of the entity that owns or operates the utility. Although this Standard recommends how this information should be recorded (see Appendix B), nothing in this Standard is intended to prevent or encumber an entity that maps subsurface utilities from using its own symbology, line types and colours to depict and record subsurface utilities in its own geographic information systems, mapping databases, plans, drawings or other records.

This standard provides a framework for consistency through information classification for utility owners, locators and operators for identification of subsurface utilities.

The table below ‘B1 (modified)’ which forms part of AS 5488 – 2013 Standard specifies formats for attribute information and metadata requirements for practitioners to adopt. GISSA International has reviewed these requirements and has aligned the relevant **A-SPEC** standard data specifications to them.

Our review identified that the requirements outlined in the AS 5488 – 2013 document appear as either fields within our current data model structure or as codes which can be selected to describe characteristics of asset types.

As AS 5488 – 2013 is not intended to prevent or encumber any entity that maps subsurface utilities from using its own symbology in its own systems, this section has been created with the distinct purpose and objective to provide a succinct **ROAD MAP** to comply with the **A-SPEC** requirements.

In using this **Road Map** organisations will be able to deliver digital data to an **A-SPEC Consortium member** by directly linking their work with the **A-SPEC digital data model** in this document.

Please note where a term in the AS 5488 – 2013 Standard is not specific in its description of an asset type, an **A-SPEC default** term has been used.

Please note: AS 5488 – 2013 Table B1 (modified) –

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**Table B1 (modified):**

Attribute Information from AS5488	A-SPEC Coverage
Type of Utility/Asset	<b>S-Spec</b> – wastewater/sewerage; <b>W-Spec</b> – Potable water, re-use (recycled); <b>D-Spec</b> – Stormwater/Raw water. Agnostic of colour and line styles. Therefore can accommodate directly.
Owner of the Utility/ Asset	Included as an attribute in appropriate tables in every specification
Codes for Features	Coding for all required features are specified in CODELISTS in every specification
Size/Measurements	Included as an attribute in relevant attribute tables in every specification
Status of the Asset	Included as an attribute in relevant attribute tables in every specification
Material Type	Included as an attribute in relevant attribute tables in every specification
Asset Configuration	Layouts of required features are included under ‘ <b>Section 1.4 – Graphical Data Construction Principles</b> ’ in every specification if required to be provided as digital data
Drawing showing the approximate location of the Utility/Asset	Layouts of required features are included under ‘ <b>Section 1.4 – Graphical Data Construction Principles</b> ’ in every specification if required to be provided as digital data
Drawing showing the possible location of the Utility/Asset	Layouts of required features are included under ‘ <b>Section 1.4 – Graphical Data Construction Principles</b> ’ in every specification if required to be provided as digital data
Horizontal Position relative to a structure	Layouts of required features are included under ‘ <b>Section 1.4 – Graphical Data Construction Principles</b> ’ in every specification if required to be provided as digital data
Vertical Position relative to a structure	Layouts of required features are included under ‘ <b>Section 1.4 – Graphical Data Construction Principles</b> ’ in every specification if required to be provided as digital data
Absolute Spatial Location/ Coordinates	Covered in every specification
Quality Level	This information can be provided in ‘ <b>Source</b> ’ and ‘ <b>Comments</b> ’ fields
Information Source	This information can be provided in the ‘ <b>Comments</b> ’ field
Date information obtained/recorded	This information can be provided in the ‘ <b>Comments</b> ’ field
Locating Methods	This information can be provided in the ‘ <b>Comments</b> ’ field
Survey Control Information	Not required in <b>A-SPEC</b> however, all data is provided on the correct projection and datum and is specified



The following table indicates how the A-SPEC standard data specifications W-Spec has been mapped to Table B3 in the AS 5488 Draft

AS 5488			W-Spec	
Entity	AS 5488 Term	Field Name	Code or Descriptor	Notes
Fire Service	Fire Hydrant	Hydr_Type	FPDR FPOFF	<p>'Fire Hydrant' is included as an attribute ('Hydrant Type') in <b>Hydrant Type</b> attribute &amp; validation table under section 2 and as a descriptor in <b>Hydrant Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.6.2 – Hydrant Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to hydrants required in <b>W-Spec</b>.</p>
	Fire Service	Pipe_Type	FIRE	<p>'Fire Service' is included as an attribute ('Pipe Type') in <b>Pressure Main</b> and <b>Service Main</b> attribute &amp; validation tables under section 2 and as a descriptor in <b>Pipe Type</b> CODELIST under section 3.</p> <p>Please refer to attribute tables <b>2.3.2 – Pressure Main Attribute &amp; Validation File Format Instructions</b> and <b>2.4.2 – Service Main Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to hydrants required in <b>W-Spec</b>.</p>
Recycled Water	Hydrant – Recycled	Hydr_Type	RECYCLED	<p>'Hydrant-Recycled' is included as an attribute ('Hydrant Type') in <b>Hydrant Type</b> attribute &amp; validation table under section 2 and as a descriptor in <b>Hydrant Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.6.2 – Hydrant Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to hydrants required in <b>W-Spec</b>.</p>
	Main – Recycled	Pipe_Type	REC	<p>This is included as an attribute ('Pipe Type') in <b>Pressure Main</b> and <b>Service Main</b> attribute &amp; validation tables under section 2 and as a descriptor ('Recycled') in the <b>Water Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.3.2 – Pressure Main Attribute &amp; Validation File Format Instructions</b> and <b>2.4.2 – Service Main Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to mains required in <b>W-Spec</b>.</p>
	Meter – Recycled	Meter_Type	REC	<p>This is included as an attribute ('Meter Type') in <b>Meter</b> attribute &amp; validation tables under section 2 and as a descriptor ('Recycled') in the <b>Water Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.7.2 – Meter Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to meters required in <b>W-Spec</b>.</p>
	Stop valve – Recycled	Valve_Type	STOPRC	<p>This is included as an attribute ('Valve Type') in <b>Valve</b> attribute &amp; validation tables under section 2 and as a descriptor ('Stop-Recycled') in the <b>Valve Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.8.2 – Valve Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to valves required in <b>W-Spec</b>.</p>

AS 5488			W-Spec	
Entity	AS 5488 Term	Field Name	Code or Descriptor	Notes
Water	Tap – Recycled	Fitt_Type	TAPRC	<p>This is included as an attribute (<b>'Fitting Type'</b>) in <b>Fitting</b> attribute &amp; validation tables under section 2 and as a descriptor (<b>'Tap-Recycled'</b>) in the <b>Fitting Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.9.2 – Fitting Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to fittings required in <b>W-Spec</b>.</p>
	House Connection	Pipe_Type	HOUSE	<p>A 'House Connection' is referred to as 'Service Main' in <b>W-Spec</b>.</p> <p>This is included as an attribute (<b>'Pipe Type'</b>) in <b>Service Main</b> attribute &amp; validation table under section 2 and as a descriptor (<b>'House Connection'</b>) in <b>Pipe Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.3 2.4.2 – Service Main Attribute &amp; Validation File Format Instructions</b> for complete set of attributes relating to house connections required in <b>W-Spec</b>.</p>
	Hydrant	Hydr_Type	HYDR HYOFF	<p>This is included as an attribute (<b>'Hydrant Type'</b>) in <b>Hydrant Type</b> attribute &amp; validation table under section 2 and as descriptors in <b>Hydrant Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.6.2 – Hydrant Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to hydrants required in <b>W-Spec</b>.</p>
	Main	Pipe_Type	-	<p>This is included as an attribute (<b>'Pipe Type'</b>) in <b>Pressure Main</b> and <b>Service Main</b> attribute &amp; validation tables under section 2 and different pipe types are mentioned in the <b>Pipe Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.3.2 – Pressure Main Attribute &amp; Validation File Format Instructions</b> and <b>2.3 – Service Main Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to mains required in <b>W-Spec</b>.</p>
	Meter	Meter_Type	-	<p>This is included as an attribute (<b>'Meter Type'</b>) in <b>Meter</b> attribute &amp; validation tables under section 2 and different meter types are mentioned in the <b>Meter Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.7.2 – Meter Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to meters required in <b>W-Spec</b>.</p>
	Stop Valve	Valve_Type	STOP	<p>This is included as an attribute (<b>'Valve Type'</b>) in <b>Valve</b> attribute &amp; validation tables under section 2 and as a descriptor (<b>'Stop Valve'</b>) in the in <b>Valve Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.8.2 – Valve Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to valves required in <b>W-Spec</b>.</p>
	Tap	Fitt_Type	MTAP	<p>This is included as an attribute (<b>'Fitting Type'</b>) in <b>Fitting</b> attribute &amp; validation tables under section 2 and as a descriptor (<b>'Main Tap'</b>) in the <b>Fitting Type</b> CODELIST under section 3.</p> <p>Please refer to attribute table <b>2.9.2 – Fitting Attribute &amp; Validation File Format Instructions</b> for the complete set of attributes relating to fittings required in <b>W-Spec</b>.</p>

## ROAD MAP TO AND COMPLIANCE WITH W-Spec

The example below shows a table populated with the fields which comply with AS 5488 – 2013. However, all other fields are to be populated when providing data to comply with **A-SPEC** requirements.

### Example:

Pressure Main Attribute & Validation File Format Instructions			
Column Name	Details	Values	Notes
Pipe_Type	CODELIST entry	Pressure	Value derived from AS 5488-2013 requirement
Water_Type	CODELIST entry		To be populated to comply with W-Spec
Status	CODELIST entry	INUSE	Value derived from AS 5488-2013 requirement
Owner	Text	Western Water	Value derived from AS 5488-2013 requirement
Class_P	CODELIST entry		To be populated to comply with W-Spec
Pipe_DesT	Text		To be populated to comply with W-Spec
Location	Text		To be populated to comply with W-Spec
St_Name	Text		To be populated to comply with W-Spec
Pipe_No	Text		To be populated to comply with W-Spec
Joint_Mtd	CODELIST entry		To be populated to comply with W-Spec
From_Node	Text		To be populated to comply with W-Spec
To_Node	Text		To be populated to comply with W-Spec
From_East	3 decimal places		To be populated to comply with W-Spec
From_North	3 decimal places		To be populated to comply with W-Spec
To_East	3 decimal places		To be populated to comply with W-Spec
To_North	3 decimal places		To be populated to comply with W-Spec
Length	2 decimal places		To be populated to comply with W-Spec
Diameter	Whole mm	450	Value derived from AS 5488-2013 requirement
Flow_Rate	Whole number		To be populated to comply with W-Spec
Material	Text	DICL	Value derived from AS 5488-2013 requirement
Manufact	Text		To be populated to comply with W-Spec
Grnd_Water	Yes/No Field		To be populated to comply with W-Spec
Grnd_Type	CODELIST entry		To be populated to comply with W-Spec
Rock_Excav	Yes/ No field		To be populated to comply with W-Spec
Instl_Mtd	CODELIST entry		To be populated to comply with W-Spec
Protection	CODELIST entry		To be populated to comply with W-Spec
Bedding	CODELIST entry		To be populated to comply with W-Spec
Backfill	CODELIST entry		To be populated to comply with W-Spec
RI_Rn_Mtd	CODELIST entry		To be populated to comply with W-Spec
RI_Rn_Mat	CODELIST entry		To be populated to comply with W-Spec
cctv_Ref	Text		To be populated to comply with W-Spec
cctv_Date	dd/mm/yyyy		To be populated to comply with W-Spec
Currency	Text		To be populated to comply with W-Spec
Unit_Cost	2 decimal points		To be populated to comply with W-Spec
Unit_Ref	CODELIST entry		To be populated to comply with W-Spec
Source	CODELIST entry	COMB_1	Value derived from AS 5488-2013 requirement

Pressure Main Attribute & Validation File Format Instructions			
Column Name	Details	Values	Notes
Comments	Text	AS 5488 – 2013 Quality Level A compliance Information from City of Gosnells Information obtained on 14/08/2004 Located by Survey	Data fields populated as a combination of AS 5488-2013 requirements and W-Spec requirements

### Common Project Information

The following information is to be provided for all asset data and is to align with the **Error! Reference source not found.** requirements within this document.

Area of Work Extent Attribute & Validation File Format Instructions			
Column Name	Details	Values	Notes
Permit_No	Text	N/A	To be populated to comply with <b>W-Spec</b>
Sub_Name	Text	Capital Works 2017/033	To be populated to comply with <b>W-Spec</b>
Stage_No	Text	N/A	To be populated to comply with <b>W-Spec</b>
Design_Co	Text	Icandoit Pty Ltd	To be populated to comply with <b>W-Spec</b>
Plan_No	Text	14A-Detail	To be populated to comply with <b>W-Spec</b>
Const_Co	Text	Dunit Pty Ltd	To be populated to comply with <b>W-Spec</b>
Const_Date	dd/mm/yyyy	12/07/2002	Value derived from AS 5488 – 2013 requirement
Origin	Text	N/A	To be populated to comply with <b>W-Spec</b>
Transfrm	Text	N/A	To be populated to comply with <b>W-Spec</b>
Transf_By	Text	N/A	To be populated to comply with <b>W-Spec</b>
Source	CODELIST entry	AS5488-D	To be populated to comply with <b>W-Spec</b>

## 2 Attribute & Validation File Specifications

This section provides details of the attribute fields and their respective validation requirements for each asset table and includes the following information.

All coordinates will be provided in the preferred datum of each individual **A-SPEC** Consortium member as specified on the **A-SPEC** website [www.a-specstandards.com.au](http://www.a-specstandards.com.au) or as otherwise agreed to with the respective Consortium member.

For further detail and definitions of the Attribute Data Types and Column name explanations, please refer to the document **A-SPEC DDS – Introduction & Overview V2.1.0 Final**.

### Attribute Data Field Requirements

This section details the attribute field data entry requirements that data providers are to adhere to for all data submissions of asset types listed in [Section 1.3 – Theme/Layer Structure](#).

Please note that the Project related data needs to be provided only once.

The following are the key requirements for the structure of the data to be provided in each submission.

- Maximum field widths are specified for Alpha/Numeric and Alpha data.
  - These are to be adhered to.
- For decimal data the number of characters after the decimal point are specified.
- Dates are to be provided as dd/mm/yyyy, EG: 07/06/2001
- All fields are to be populated in accordance with the notes supplied for each field
- All Attribute fields are to use the Column Names and structures set out in **Section 2 – Attribute & Validation File Format Instructions**.
- Validation checks for each data field have also been provided in **Section 2 – Attribute & Validation File Format Instructions**.
- A set of CODELISTS are provided to standardise the capture of information in the Attribute files. They can be found in [Section 3 – W-Spec CODELISTS](#). The **A-SPEC** website will also contain the most current CODELISTS.
- If a Code does not exist the new asset feature is to be recorded in the “**Comments**” field and a note sent via the A-SPEC website **ContactUs** form so a new code can be created.
- Fields that are highlighted in grey are common to all tables.
- All fields that are common to all tables are captured in the Area of Work Extent table
- Please take note of default values for specific fields. These have been provided for the relevant fields.
- Please note that every attribute name is case sensitive. Use the given name format when creating your fields to supply the data.

### Attribute Data Validation Requirements

Please note the column QA Validation stipulating the Validation Check to be carried out is provided as a guide to assist Developer/Consultants when putting together information for submission.

## Coordinate fields

The key objective of storing this information is to ensure that the practice of collecting the “As Constructed Information” meets the accuracy requirements of the **A-SPEC** Consortium. The accuracy of the information must be relative to the property boundary.

As all new cadastral information in Australia is placed on the MGA (Map Grid of Australia) grid it is an expectation that all data provided by consultants will be representative of this level of accuracy.

Where significant discrepancy occurs between the digital cadastral mapbase of the affected jurisdiction and the coordinates of the cadastral development as a result of the unavailability of the connection to the MGA grid then the consultant will notify the Consortium member so that steps can be taken to record the adjusted coordinates.

The key objective of having this notification in place is to take into consideration occurrences where the cadastral mapbase exceeds a particular accuracy. This is to ensure that if required the assets can be located via means of a GPS or other distance measurement equipment.

In Australia – All Z coordinates (levels) will be provided in AHD metres in accordance with the jurisdictional requirements.

### 3 W-Spec CODELISTS

CODELISTS are used to standardise terminology by providing a range of item descriptions relating to a particular attribute. A number of attributes specified in the ASCII file require the input of a CODELIST entry number.

Consultants please note that should an entry not exist within a CODELIST please Use the '**SeeComment**' value.

CODELIST entries will be constantly reviewed by the Consortium and additions and amendments made as the need arise.

#### Access Point Access Method

Code	Description
<b>STIRON</b>	Step Iron
<b>STDLAD</b>	Standard Ladder
<b>MONLAD</b>	Monorail Ladder
<b>SeeComment</b>	To be used when a <b>Access Point Access Method</b> is not listed. The <b>new Access Point Access Method</b> is to be listed in the ' <b>Comments</b> ' field.

#### Access Point Material

Code	Description	Code	Description
<b>BRK</b>	Brick	<b>IRON</b>	Iron
<b>CCONC</b>	Coloured Concrete	<b>PCONC</b>	Precast concrete
<b>CONC</b>	Concrete	<b>PSTYB</b>	Polystyrene blocks
<b>CONCM</b>	Concrete Masonry	<b>PVC</b>	Polyvinylchloride
<b>CORR</b>	Corrugated Steel/Aluminium	<b>RC</b>	Reinforced Concrete – No Class/Unknown
<b>FCEM</b>	Fibre Cement Sheets	<b>SeeComment</b>	To be used when a <b>Access Point Material</b> is not listed. The <b>new Access Point Material</b> is to be listed in the ' <b>Comments</b> ' field.
<b>GEW</b>	Glazed Earthenware	<b>STEEL</b>	Steel
<b>ICONC</b>	In-situ concrete	<b>TMBR</b>	Timber

#### Access Point Type

Code	Description
<b>IS</b>	Inspection Shaft
<b>MH</b>	Maintenance Hole
<b>PUMPP</b>	Pump Pit
<b>SeeComment</b>	To be used when a <b>Access Point Material</b> is not listed. The <b>new Access Point Material</b> is to be listed in the ' <b>Comments</b> ' field.
<b>VVP</b>	Valve Pit

#### Asset Status

[AS 5488 – 2013 Component]

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



## Backup Power Type

Code	Description
BATTERY	Battery
EUPS	UPS
GEN	Generator
SOLAR	Solar Panels
SeeComment	To be used when a <b>Backup Power Type</b> is not listed. The <b>new Backup Power Type</b> is to be listed in the 'Comments' field.

## Bedding / Backfill Material

Code	Description	Code	Description
AGGR	Aggregate	QWST	Quarry Waste
BENT	Bentonite Sand Mixture	RC	Reinforced Concrete
CONCB	Concrete Blocks	SAND	Sand
CLAY	Clay	SCOR	Scoria
CLSLRY	Clay Slurry	SeeComment	To be used when a <b>Bedding/Backfill Material</b> is not listed. The <b>new Bedding/Backfill Material</b> is to be listed in the 'Comments' field.
CONC	Concrete (unknown if reinforced)		
CR	Crushed Rock	SEMAT	Selected Excavated Material
EXCMAT	Excavated Material	SLCS	Sand Lime Cement Slurry
GROUT	Grout	TOPP	Toppings
CONCH	Concrete Haunching	TRSAND	Trench Refill Sand
PKGSAND	Packing Sand		

## Cable Type

Code	Description
FLEX	Flexible
HLX	Heliac
MCORE	Multicore
MTLSTH	Metallic sheathed
NMTLSTH	Non-metallic sheathed
PAIR	Paired
PORT	Portable
RBN	Ribbon
SHLD	Shielded
SNG	Single
SUB	Submersible
TWNL	Twin lead
TWNX	Twinax
SeeComment	To be used when a <b>Cable Type</b> is not listed. The <b>new Cable Type</b> is to be listed in the 'Comments' field.

## Cathodic Protection Type

Code	Description
GAL	Galvanised
ICS	Impress Current System
SeeComment	To be used when a <b>Cathodic Protection type</b> is not listed. The <b>new Cathodic Protection Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Chamber Material

Code	Description
BRK	Brick
CCONC	Coloured Concrete
CONCM	Concrete Masonry
CORR	Corrugated Steel/Aluminium
FCEM	Fibre Cement Sheets
GEW	Glazed Earthenware
ICONC	In-situ concrete
IRON	Iron
PCONC	Precast concrete
PSTYB	Polystyrene blocks
SeeComment	To be used when a <b>Chamber Material</b> is not listed. The <b>new Chamber Material</b> is to be listed in the ' <b>Comments</b> ' field.

## Conduit Material

Code	Description
LDPE	Low Density Polyethylene
MDPE	Medium Density PE (PE80B)
mPVC	Modified Polyvinyl Chloride
oPVC	Oriented PVC (EG: Blue Brute)
PE	Polyethylene (Used for UG Conduits)
PVC	Polyvinyl chloride
SeeComment	To be used when a <b>Conduit Material</b> is not listed. The <b>new Conduit Material</b> is to be listed in the ' <b>Comments</b> ' field.
uPVC	Un-plasticised PVC

## Construction Type

Code	Description	Code	Description
AN	Annealed	LB	Lock Bar
CAST	Cast Insitu	MC	Mandrill Cast
CORR	Corrugated	PC	Precast
EX	Extruded	RIV	Riveted
FOLD	Folded	S	Seamless
GC	Gravity Cast	SC	Spun Cast
HD	Hard Drawn	SeeComment	To be used when a <b>Access Point Construction Method</b> is not listed. The <b>new Access Point Construction Method</b> is to be listed in the ' <b>Comments</b> ' field.

## Control Type

Code	Description
AUTO	Automatic
LOCAL	Local
MAN	Manual
SCADA	SCADA
SEMI	Semi-automatic
SeeComment	To be used when a <b>Control Type</b> is not listed. The <b>new Control Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Electrical Equipment Type

Code	Description
CAB	Cabinet
CONT	Controller
CONTP	Control panel
DRV	Drive
EGSB	Generator Set – Batteries
PUMP	Pump
SUPPLY	Supply
SWITCHB	Switchboard
SeeComment	To be used when an <b>Electrical Equipment Type</b> is not listed. The <b>new Electrical Equipment Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Equipment Material

Code	Description	Code	Description
BRASS	Brass	LDPE	Low Density Polyethylene
DI	Ductile Iron	MI	Malleable Iron
FBE	Fusion Bonded Epoxy	MSW	Mild Steel Welded
FBPE	Fusion Bonded PE	NA	Not Applicable
GWI	Galvanised Wrought Iron (Also known as Galvanised Mild Steel)	SeeComment	To be used when a <b>Equipment Material</b> is not listed. The <b>new Equipment Material</b> is to be listed in the ' <b>Comments</b> ' field.
HAL	Helicore Aluminium	WI	Wrought Iron

## Equipment Purpose

Code	Description
COMM	Communication
DISP	Display
LIGHT	Light
MON	Monitor
POWER	Power
SOUND	Sound
SeeComment	To be used when an <b>Equipment Purpose</b> is not listed. The <b>new Equipment Purpose</b> is to be listed in the ' <b>Comments</b> ' field.

## External Coating

Code	Description
FBE	Fusion bonded Epoxy
GAL	Galvanised
PE	Polyethylene
PNT	Paint
SINTK	Sintakote
UNC	Uncoated
SeeComment	To be used when an <b>External Coating</b> is not listed. The <b>new External Coating</b> is to be listed in the ' <b>Comments</b> ' field.

## Feature Type

Code	Description
APOINT	Access Point
CEIL	Ceiling
CONDUIT	Conduit
DOOR	Door
ENDWALL	Endwall
FLOOR	Floor
HEADWALL	Headwall
LIFT	Lift
MTR	Motor
PIPE	Pipe
PUMP	Pump
ROOF	Roof
VALVE	Valve
WINDOW	Window
SeeComment	To be used when a <b>Feature Type</b> is not listed. The <b>new Feature Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Filter Type

Code	Description
CLSCR	Coalescer
DCSN	Debris control screen
FBED	Filter Bed
FLTP	Flat panel
UPFL	Upflow
SeeComment	To be used when a <b>Filter Type</b> is not listed. The <b>new Filter Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Fitting Type

Code	Description	Code	Description
BEND11.25	11.25° Bend	MTAP	Main Tap [AS 5488 – 2013 Component]
BEND22.5	22.5° Bend	REDCR	Reducer
BEND45	45° Bend		
BEND90	90° Bend	SCOUR	Scour
EP	End Cap / End of Pipe / Blank End	SeeComment	To be used when a <b>Fitting Type</b> is not listed. The <b>new Fitting Type</b> is to be listed in the ' <b>Comments</b> ' field.
BYP	Bypass		
CHLOR	Chlorination Point	STDP	Stand Pipe
CROSS	Cross Joint	STRAIN	Strainer
DEC	Dead End Cap	SWB	Swabbing Point
DISMANTL	Dismantling Joint	TEE	Tee Junction
EXPAN	Expansion Joint	TAPER	Taper
FLANGE	Flange	TAPP	Tapping Arm
FLPT	Flushing Point	TAPRC	Tap-Recycled [AS 5488 – 2013 Component]
GIBJ	Gibault Joint		
JOINT	Normal Joint	WASH	Wash Out Bend
HC	House Cock	WYE	Wye Joint

## Fuel Type

Code	Description
DIES	Diesel
ELEC	Electricity
GAS	Gas
PETROL	Petrol
OIL	Oil
SFUEL	Solid Fuel
SeeComment	To be used when a <b>Fuel Type</b> is not listed. The <b>new Fuel Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Ground Soil Type

Code	Description	Code	Description
BAS	Basalt	LOAM	Loam
CLBS	Clay and Basalt	MDSTN	Mudstone
CLGR	Clayey Gravel	RCK	Rock
CLRK	Clay and Rock	SACL	Sandy Clay
CLSI	Clayey Silt	SASI	Sandy Silt
CLSN	Clayey Sand	SeeComment	To be used when a <b>Ground Soil Type</b> is not listed. The <b>new Ground Soil Type</b> is to be listed in the ' <b>Comments</b> ' field.
CLSTN	Clay and Stone		
CLAY	Clay	SHAL	Shale
COBL	Cobble	SICL	Silty Clay
DACT	Dacite	SIGR	Silty Gravel
FILL	Fill	SISN	Silty Sand
GFILL	General Fill	SLST	Siltstone
GRCL	Gravelly Clay	SILT	Silt
GRT	Granite	SAND	Sand

Code	Description	Code	Description
GRSI	Gravely Silt	SNGR	Sandy Gravel
GRSN	Gravely Sand	SNST	Sandstone
GRVL	Gravel	SOIL	Soil
HNFS	Hornfels	SSRF	Sandstone and Reef
LIMES LS	Limestone	STNE	Stone

## Groundwater Classification

Code	Description
ALAQ	Alluvial aquifer
COAQ	Coastal aquifer
FRCK	Fractured rocks
KRST	Karst
PALVAL	Palaeovalleys
SEDBAS	Sediment Basin
SeeComment	To be used when a <b>Groundwater Classification</b> is not listed. The <b>new Groundwater Classification</b> is to be listed in the 'Comments' field.

## 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
SeeComment	To be used when a <b>Health and Safety Issue</b> is not listed. The <b>new Health and Safety Issue</b> is to be listed in the 'Comments' field.
TRAFFIC	Live Traffic

## Hydrant Type

Code	Description
DUAL	Dual Pillar
FPDR	Fire Plug-Direct [AS 5488 – 2013 Component]
FPOFF	Fire Plug-Offset [AS 5488 – 2013 Component]
HYDR	Hydrant-Direct [AS 5488 – 2013 Component]
HYOFF	Hydrant-Offset [AS 5488 – 2013 Component]
RECYCLED	Recycled [AS 5488 – 2013 Component]
SeeComment	To be used when a <b>Hydrant Type</b> is not listed. The <b>new Hydrant Type</b> is to be listed in the 'Comments' field.
WODR	Wash Out-Direct
WOFF	Wash Out-Offset

## Impeller Material

Code	Description
AL	Aluminium
BRASS	Brass
BRONZE	Bronze
IRON	Iron
NA	Not Applicable
PLASTIC	Plastic
RUB	Rubber
SeeComment	To be used when an <b>Impeller Material</b> is not listed. The <b>new Impeller Material</b> is to be listed in the 'Comments' field.
STEEL	Steel

## 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
SeeComment	To be used when an <b>Impeller Type</b> is not listed. The <b>new Impeller Type</b> is to be listed in the 'Comments' field.

## Inlet Protection Type

Code	Description
ASV	Automatic shutoff valve
NRV	Non-return valve
SeeComment	To be used when an <b>Inlet Protection Type</b> is not listed. The <b>new Inlet Protection Type</b> is to be listed in the 'Comments' field.

## 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



Code	Description
VIBR	Vibration
WEAT	Weather
WEIGHT	Weight
SeeComment	To be used when an <b>Instrument Type</b> is not listed. The <b>new Instrument Type</b> is to be listed in the 'Comments' field.

## Jointing Method

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)	PUJ	Polyurethane Joint
BWJ	Butt Weld Joint (Steel)	RRJ	Rubber Ring Joint
CJ	Compression Joints	RRJL	Rubber Ring Joint embedded with metallic locking segments
CWJ	Collar Weld Joint	SCJ	Solvent Cement Joint
EFJ	Electro fusion Coupling Weld Joint (PE, Steel)	SeeComment	To be used when a <b>Jointing Method</b> is not listed. The <b>new Jointing Method</b> is to be listed in the 'Comments' field.
FLGFLG	Flange to Flange	SOCFLG	Socket to Flange
FJ	Flanged Joint (Iron, PE)	SOCSOC	Socket to Socket
LJ	Lead Joint	SPWJ	Spherical Slip-In Weld Joint (Steel)
MCJ	Mechanical Coupling Joint	TL	Tyton Lock
PJ	Plumbite Joint	WM	Welded - Metal

## Lift Type

Code	Description
CABLE	Cable
GRIND	Grinder
HYDRAULIC	Hydraulic
PNEUMATIC	Pneumatic
SHAND	Solid Handling
SeeComment	To be used when a <b>Lift Type</b> is not listed. The <b>new Lift Type</b> is to be listed in the 'Comments' field.

## Lining Material

Code	Description	Code	Description
ABS	Acrylonitrile Butadiene Styrene	GFBR	Glass Fibre
AS	Asbestos	GRER	Glass Reinforced Epoxy Resin
ALS	Aluminium Spray	GRP	Glass Reinforced Plastic
BITP	Bitumen Paint	GUNN	Gunnite
BRK	Brick	NA	Not Applicable
CML	Cement Mortar Lining	PE	Polyethylene
CADP	Cadmium Plated	PLHS	Plastic Heat Shrink Sleeve
CU	Copper	PSTY	Polystyrene
CMSL	Cement Mortar Spun Lining	PVCP	PVC – Plastalon

<b>CTEW</b>	Coal Tar Enamel & Wrapped	<b>PVCS</b>	PVC – Sintacote
<b>EEN</b>	Epoxy Enamel	<b>SeeComment</b>	To be used when a <b>Lining Material</b> is not listed. The <b>new Lining Material</b> is to be listed in the ' <b>Comments</b> ' field.
<b>EN</b>	Enamel	<b>TILE</b>	Tile
<b>FRP</b>	Fibre Reinforced Plastic	<b>uPVC</b>	Un-plasticised PVC
<b>GAL</b>	Galvanised	<b>ZNP</b>	Zinc Plate
		<b>ZNS</b>	Zinc Spray

## Mechanical Equipment Type

Code	Description
<b>ACTU</b>	Actuator
<b>BLW</b>	Blower
<b>CMP</b>	Compressor
<b>GRB</b>	Gearbox
<b>SCRN</b>	Screens
<b>SeeComment</b>	To be used when a <b>Mechanical Equipment Type</b> is not listed. The <b>new Mechanical Equipment Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Meter Type

[AS 5488 – 2013 Component]

Code	Description
<b>FLOW</b>	Flow
<b>MAGFLOW</b>	Magnetic Flow
<b>ORIFICE</b>	Orifice Plate
<b>POSD</b>	Positive Displacement
<b>SeeComment</b>	To be used when a <b>Meter Type</b> is not listed. The <b>new Meter Type</b> is to be listed in the ' <b>Comments</b> ' field.
<b>SUPPLY</b>	Supply
<b>ULTRA</b>	Ultrasonic
<b>VEL</b>	Velocity

## Network

Code	Description
<b>POTABLE</b>	Potable Water
<b>RAW</b>	Raw
<b>RECYCLED</b>	Recycled
<b>STRMW</b>	Stormwater
<b>WSTW</b>	Wastewater
<b>SeeComment</b>	To be used when a <b>Network</b> is not listed. The <b>new Network</b> is to be listed in the ' <b>Comments</b> ' field.

## Pipe Installation Method

Code	Description
ABG	Above Ground
BORE	Bored
SUS	Suspended
TR	Trench
TU	Tunnel
SeeComment	To be used when a <b>Pipe Installation Method</b> is not listed. The <b>new Pipe Installation Method</b> is to be listed in the 'Comments' field.

## Pipe Material

Code	Description	Code	Description
BRASS	Brass	HDPE	High Density PE (PE100)
BKBRT	Black Brute	mPVC	Modified Polyvinyl Chloride
CI	Grey Cast Iron	NA	Not Applicable
CICL	Cast Iron Cement Lined	NYL	Nylon
CLIS	Cement Lined In-Situ	oPVC	Oriented PVC (EG: Blue Brute)
CLS	Concrete Lined Steel	PE	Polyethylene
CLSC	Cement Lined Steel Coat	PVC	Polyvinylchloride
CU	Copper	RC	Reinforced Concrete – No Class/Unknown
CORR	Corrugated Steel/Aluminium	RCPL	Reinforced Concrete Plastic Lined
DI	Ductile Iron	SeeComment	To be used when a <b>Pipe Material</b> is not listed. The <b>new Pipe Material</b> is to be listed in the 'Comments' field.
FBPE	Fusion Bonded PE	SSTEEL	Stainless Steel
FIBRE	Fibreglass	SSTEEL316	Stainless Steel (grade 316)
FRC	Fibre Reinforced Cement	uPVC	Un-plasticised PVC
FRP	Fibre Reinforced Plastic	uPVC-S	Un-plasticised PVC - Sewer grade
FSP	Fibre Reinforced Pipe		

## Pipe Renewal / Lining Material

Code	Description	Code	Description
ABS	Acrylonitrile Butadiene Styrene	GRP	Glass Reinforced Plastic
ALS	Aluminium Spray	GUNN	Gunnite
AS	Asbestos	INC	Incoloy
BITP	Bitumen Paint	IZS	Inorganic Zinc Silicate
CMSL	Cement Mortar Spun Lining	NA	Not Applicable
CML	Cement Mortar Lining	PLHS	Plastic Heat Shrink Sleeve
CTEW	Coal Tar Enamel & Wrapped	PU	Polyurethane
EEN	Epoxy Enamel	PUA	Polyurea
FBE	Fusion Bonded Epoxy	PVCS	PVC – Sintakote

<b>FIBRE</b>	Fibreglass	<b>SeeComment</b>	To be used when a <b>Pipe Renewal Material</b> is not listed. The <b>new Pipe Renewal Material</b> is to be listed in the 'Comments' field.
<b>FRC</b>	Fibre Reinforced Cement	<b>ZNP</b>	Zinc Plate
<b>GRER</b>	Glass Reinforced Epoxy Resin	<b>ZNS</b>	Zinc Spray

## Pipe Renewal Method

Code	Description
<b>BURST</b>	Pipe Burst
<b>CURED</b>	Cured in Place
<b>SeeComment</b>	To be used when a <b>Pipe Renewal Method</b> is not listed. The <b>new Pipe Renewal Method</b> is to be listed in the 'Comments' field.
<b>SLIP</b>	Slip Lined
<b>NA</b>	Not Applicable

## Pipe Pressure Class

Code	Description
<b>PN4.5</b>	0.45 MPa
<b>PN6</b>	0.6 MPa
<b>PN8</b>	0.8 MPa
<b>PN9</b>	0.9 MPa
<b>PN10</b>	1 MPa
<b>PN12</b>	1.2 MPa
<b>PN12.5</b>	1.25 MPa
<b>PN15</b>	1.5 MPa
<b>PN16</b>	1.6 MPa
<b>PN18</b>	1.8 MPa
<b>PN20</b>	2.0 MPa
<b>SeeComment</b>	To be used when a <b>Pipe Pressure Class</b> is not listed. The <b>new Pipe Pressure Class</b> is to be listed in the 'Comments' field.

## Pipe Type

Code	Description
<b>FIRE</b>	Fire Service
<b>PRIVATE</b>	Private
<b>PDIST</b>	Primary Distribution
<b>PSUPP</b>	Primary Supply
<b>REGM</b>	Regional Main
<b>SDIST</b>	Secondary Distribution
<b>SSUPP</b>	Secondary Supply

SITE	Site Assets
HOUSE	House Connection
<b>SeeComment</b>	To be used when a <b>Pipe Type</b> is not listed. The <b>new Pipe Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Position

Code	Description
OVRHD	Overhead
ABG	Above Ground
PRTBRD	Partially Buried
UNDGRD	Underground

## Protection Type

Code	Description
BITUMEN	Bitumen
CATH	Cathodic
DENT	Denso Taped
FBE	Fusion Bonded Epoxy
GAL	Galvanised
PAINT	Painted
PE	Polyethylene
SCEN	Sintakote Concrete Encased
<b>SeeComment</b>	To be used when a <b>Protection Type</b> is not listed. The <b>new Protection Type</b> is to be listed in the ' <b>Comments</b> ' field.
SHETH	Sheathed
SINTK	Sintakote
UNC	Uncoated

## Protective Material Type

Code	Description
BRASS	Brass
BRK	Brick
DICL	Ductile Iron Cement Lined
FBE	Fusion Bonded Epoxy
GUNN	Gunnite
GWICL	GWI Cement Lined
PLASTIC	Plastic
BRASS	Brass
BRK	Brick
DICL	Ductile Iron Cement Lined
FBE	Fusion Bonded Epoxy
<b>SeeComment</b>	To be used when a <b>Protective Material Type</b> is not listed. The <b>new Protective Material Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Pump Purpose

Code	Description
BOOST	Booster
SeeComment	To be used when a <b>Pump Purpose Type</b> is not listed. The <b>new Pump Purpose Type</b> is to be listed in the ' <b>Comments</b> ' field.
SUCTN	Suction

## Pump Station Type

Code	Description
CNVNT	Conventional
ING	Inground
SeeComment	To be used when a <b>Pump Station Type</b> is not listed. The <b>new Pump Station Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Pump Type

Code	Description
BORE	Bore
CENS	Centrifugal – Single Stage
EDS	End Suction
EDSCS	End Suction – Centrifugal – Single Stage
HM	Horizontal Multistage
JET	Jet
PRS	Pressure
SeeComment	To be used when a <b>Pump Type</b> is not listed. The <b>new Pump Type</b> is to be listed in the ' <b>Comments</b> ' field.
SUB	Submersible
VM	Vertical Multistage

## Pump Use

Code	Description
NONSTDBY	Non-Standby
SeeComment	To be used when a <b>Pump Use Type</b> is not listed. The <b>new Pump Use Type</b> is to be listed in the ' <b>Comments</b> ' field.
STDBY	Standby

## Reservoir Type

Code	Description
BANK	Bank-Side
COASTAL	Coastal
SeeComment	To be used when a <b>Reservoir Type</b> is not listed. The <b>new Reservoir Type</b> is to be listed in the ' <b>Comments</b> ' field.
SERVICE	Service Reservoir
VALLEY	Valley-Dammed

## Retention Structure

Code	Description
DETBAS	Detention Basin
GRIP	Grouted Rip Rap
MASS	Mass Block
RENO	Reno Mattress
RETBAS	Retention Basin
RIPR	Rip Rap
SeeComment	To be used when a <b>Retention Structure</b> is not listed. The <b>new Retention Structure</b> is to be listed in the 'Comments' field.

## Source

Code	Description
AS5488	Using the Sub Surface Utility Australian Standard AS5488-2013
ASCON	As Constructed Drawing
CHNOFF	Chainage and Offset
COMB_1	Combination Engineers, Contractors and Field Survey Work
COMB_2	Combination Engineers and Field Survey Work
COMB_3	Combination Contractors and Field Survey Work
COMB_4	Combination Landscape Company and Field Survey Work
CONTRACTOR	Contractor who built the asset
DESPLAN	Design Plan. <b>DESPLAN is only to be used if the asset has not been constructed at time of Practical Completion</b>
DESPLANC	Design Plans issued for Construction. <b>DESPLANC is only to be used if the asset has not been constructed at time of Practical Completion</b>
ENGINEER	Consulting Engineer who designed the asset and or supervised the construction work
FIELD	Field Survey
NA	Not Applicable
REFER	Refer to the individual tables
SeeComment	To be used when a <b>Source</b> is not listed. The <b>new Source</b> is to be listed in the 'Comments' field.

## Structure Material

Code	Description
RCK	Rock
CLAY	Clay
CONC	Concrete
EARTH	Earth
RC	Reinforced Concrete – No Class/Unknown
SeeComment	To be used when a <b>Containment Structure Material</b> is not listed. The <b>new Containment Structure Material</b> is to be listed in the 'Comments' field.



## Support Structure Material

Code	Description
CONC	Concrete
RC	Reinforced Concrete – No Class/Unknown
STEEL	Steel
TMBR	Timber
SeeComment	To be used when a <b>Source</b> is not listed. The <b>new Source</b> is to be listed in the ' <b>Comments</b> ' field.

## 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
SeeComment	To be used when a <b>Support Structure Type</b> is not listed. The <b>new Support Structure Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Tank Type

Code	Description
DETNK	Detention Tank
RESV	Reservoir
RETNK	Retention Tank
TOWER	Tower
SeeComment	To be used when a <b>Containment Structure Type</b> is not listed. The <b>new Containment Structure Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Unit of Measure Reference

Code	Description
AREA	Area
CM	Cubic metre
HA	Hectare
KILO	Kilogram
LM	Linear metre
SCHEDULE	To be used when a schedule of rates is provided
SeeComment	To be used when a Unit of Measure is not listed. The <b>new Unit of Measure</b> is to be listed in the ' <b>Comments</b> ' field.
SQM	Square Metre

## Valve Purpose

Code	Description
AIRIN	Air In
AIROUT	Air Out
AIRINOUT	Air In & Out
PRESBDY	Boundary Press Zone
BURSTC	Burst Control
BYP	Bypass
CTRLFLOW	Control - Flow
CTRLPRESS	Control - Pressure
CTRLFLPR	Control Flow & Press
SERV	Customer Service
DF	Drinking Fountain
EMRO	Emergency Only
EMWR	Emergency Waste Removal
FIREFIGHT	Fire Fighting
FIRE	Fire Service Connection
FLPT	Flushing Point
IRRIG	Irrigation
ISO	Isolation
LATSUP	Lateral Supply
NONE	No Special Function
NRV	Non-return/Backflow
PRESRG	Pressure Regulation
PRM	Pressure Maintaining
PRV	Pressure Reducing
PTR	Transducer
SAMPLE	Sampling Point
SeeComment	To be used when a <b>Valve Purpose</b> is not listed. The new <b>Valve Purpose</b> is to be listed in the 'Comments' field.
SCOUR	Scour
TAP	Tap
VACSO	Vacuum Shut Off

## Valve Type

Code	Description	Code	Description
AF	Auto flush	L/C	Level Control
AIR	Air Release	L/GATE	Lift Gate
AIRRC	Air-Recycled	MOTOR	Motorised
ALT	Altitude	NEEDLE	Needle
ALT/NRV	Altitude/Non-Return	NRV	Non Return / Reflux / Check
ALT/PR	Altitude/Pressure Reducing	PRLF	Pressure Relief
ALT/PS	Altitude/Pressure Sustaining	PEN	Penstock

Code	Description	Code	Description
ALT/PS/PR	Altitude / Pressure Sustaining / Reducing	PILOT	Pilot
B/F	Butterfly	PRV	Pressure Reducing
BACKFP	Backflow Prevention	PSV	Pressure Sustaining
BACKFPRPZ	Backflow Prevention RPZ	PTR	Transducer
BALL	Ball	R/F	Ring Follower
BURSTC	Burst Control	REGR	Regulator
D/BAR	Drop Bar	REVS	Reverse
DAIR	Double Air	S/C	Swing Check
DIAPH	Diaphragm	S/COCK	Stopcock
FC	Flow Control	SAIR	Single Air
FERRULE	Ferrule	SeeComment	To be used when a Valve Type is not listed. The new Valve Type is to be listed in the 'Comments' field.
FGAP	Flap Gap		
FLOAT	Float	SLEEVE	Sleeve
FOOT	Foot	SLUICE	Sluice
GATE	Gate	SOLENOID	Solenoid
HYOFF	Hydrant-Offset [AS 5488 – 2013 Component]	STOP	Stop [AS 5488 – 2013 Component]
ISO	Isolation	STOPRC	Stop-Recycled [AS 5488 – 2013 Component]
KEYGATE	Key Gate	TC	Test Cock
KN/GATE	Knife Gate	W	Wheel

## Voltage Type

Code	Description
1PHASE	Single Phase
3PHASE	Three Phase
LOWVOLT	Low Voltage
SeeComment	To be used when a <b>Voltage Type</b> is not listed. The <b>new Voltage Type</b> is to be listed in the ' <b>Comments</b> ' field.

## Water Type

[AS 5488 – 2013 Component]

Code	Description
POT	Potable
RAW	Raw
REC	Recycled/Reclaimed

## 4 W-Spec Document Control

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<b>Authorised by</b>	W-Spec Technical Working Groups

## 5 Document Revision History

Revision Number	Date	Comments
0.5	31 January 2013	Issue of initial draft to technical working group
1	31/01/2013	Incorporated technical working group comments
1.0.1	14/11/2014	Removal of typographic errors
1.1.0	6/01/2017	Restructure of document to combine Graphical and Attribute requirements by asset class
1.1.0	1/03/2017	Document date changed to coincide with release date NZVD2016 now height datum for NZ
1.1.0	11 April 2017	Updated Bass Coast logo
2.0.0	10 September 2018	Changes adopted and finalised
2.0.5	31 May 2019	Incorporating Addendums and other feedback from members

## 6 Summary of Specification Changes