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

Version 2.0.1 Final
15th November 2018

A-SPEC Members

Victoria	WA	NSW
City of Ballarat Department of Environment and Primary Industries RMIT University Bass Coast ESTA 000 Greater Shepparton Baw Baw Shire Council Frankston City South Gippsland Shire Council Benalla Rural City Hume City Council Southern Grampians Shire Council City of Greater Bendigo Latrobe City Shire of Strathbogie Shire of Campaspe Melbourne Water Surf Coast Shire Cardinia City of Melton Rural City of Wangaratta City of Casey Mitchell Shire Council wannonwater Colac Otway Shire MoiraShire Warrnambool City Council Coliban Water Moorabool Shire Council City of Whittlesea Greater Dandenong City of Opportunity Mornington Peninsula Shire wyndhamcity city.coast.country IPM infrastructure d Victorian Planning Authority	City of Armadale City of Mandurah Shire of Augusta Margaret River City of Melville Shire of Broome Shire of Murray City of Busselton Geographe Bay City of Perth City of Canning Shire of Port Hedland Shire of Capel City of Rockingham City of Cockburn serpentine jarrahdale shire City of Greater Geraldton a vibrant future city of swan City of Gosnells City of Wanneroo shire of kalamunda mainroads Western Australia City of Kwinana	The City of Newcastle Orange Penrith City Council Singleton Council Wentworth Shire Council

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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 ~~Australia and New Zealand~~ 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 ~~underground infrastructure~~ 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 ~~Australia and New Zealand~~ 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 ~~or New Zealand~~. 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 types~~ asset classes are to be used to prepare the **As-Constructed/As Built information** digital data to be delivered along with the ~~sewerage~~ 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.

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 ~~Wastewater~~ water assets as defined by the **A-SPEC** Consortium members in Australia ~~and New Zealand~~.

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.

~~**E.g.** WAPC refers to a requirement for Western Australian only. Therefore does not need to be an included field for other 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.

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.

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 (formerly 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 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**.

~~Industry Consultants and Software Vendors are not authorised to distribute any part of the **W-Spec** data model to non **A-SPEC** Consortium members.~~

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. ~~(File size limitation is 5 megabytes)~~
- ~~CD-ROM / DVD~~
- USB memory device, portable hard drive
- Cloud Mediums (FTP, Dropbox, Google Drive etc.)

~~The CD or DVD is to be labeled in the following way.~~

~~***Estate Name and Stage or Project Name:***~~ _____

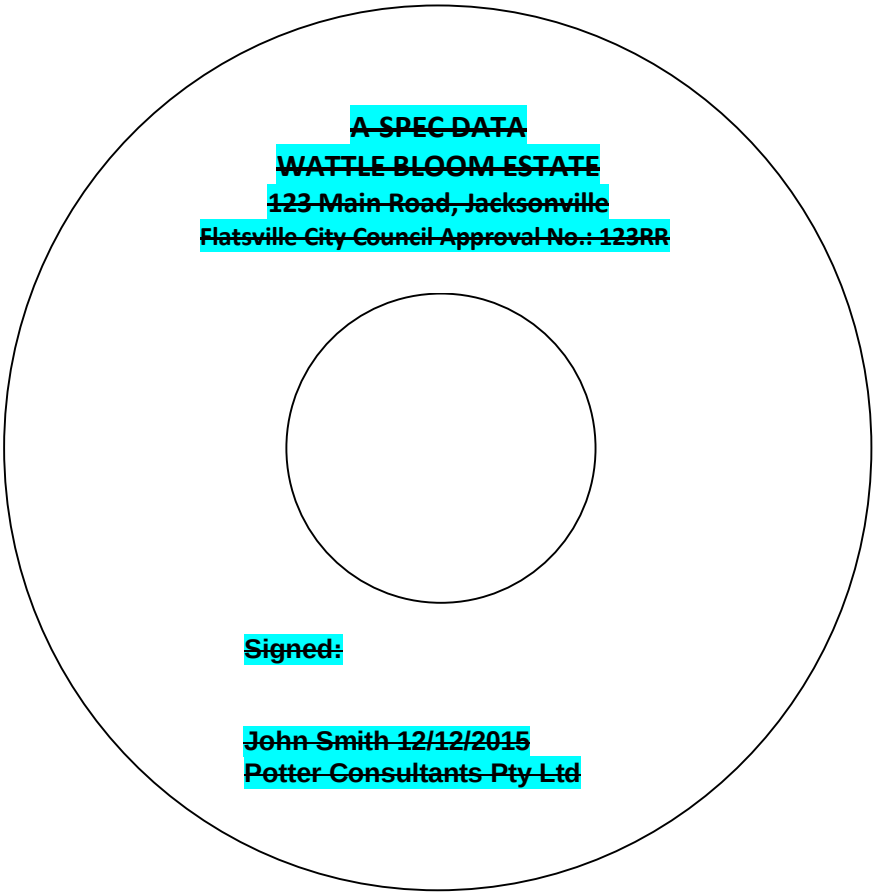
~~***Property Description (prior to subdivision):***~~ _____

~~***Individual Council, Utility and Water Authority Approval Number:***~~ _____

~~***Signed by:***~~ _____ ~~***Date:***~~ _____

~~***Name:***~~ _____

~~***Consultant Company Name:***~~ _____



~~**Figure 1** - Sample CD Label~~ **DIAGRAM TO BE REMOVED**

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)	*george@gissa.com.au*
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	*Wyndham City Council*
DATE SUBMITTED	Date the digital data submitted to A-SPEC member	*31/1/2014*
DOCUMENT VERSION	Version of the document used	*W-Spec Digital Data Specifications – V1.1.1*
SOFTWARE FORMAT & VERSION	The software used to create the digital data	~~*MapInfo v7.5 / AutoCAD Map 2008*~~ *QGIS*
PROJECT or SUBDIVISION	Project or Subdivision name	*Wyndham Estate*
STAGE	Subdivision Stage Name	*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	*12/03/*~~*2000*~~ *2017*
COORDINATES/DATUM	The coordinate system the data is in	*GDA94 Zone 49*
DATUM	Vertical Height Datum	*AHD71*
TRANSFORMATION	The coordinate system the data was transformed from	*Perth Coastal Grid to GDA94 Zone49*
TRANSFORMATION BY	Who carried out the transformation from the original coordinate system to the relevant system	*City of Gosnells – Jack Dowling*
SOURCE OF DATA	The type of capture used	*Surveyed*
NOTES/COMMENTS	Important notes or information to be included here.	~~*Any other relevant information that the data custodian needs to be aware of.*~~ *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 type~~ 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	~~Graphics~~ Area_Extent	Polygon~~/Region/Shape~~	Polygon representing the extents of the subdivision development or capital works	Yes
Pressure Main	Pressure Main	Line/Polyline	Line indicting 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~~/Region/Shape~~	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~~/Region/Shape~~	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~~/Region/Shape~~	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 **R-Spec** for requirements
Kerbs and Channels	Please refer to **R-Spec** for requirements
Stormwater Pipes and other infrastructure	Please refer to **D-Spec** for requirements
Sewerage Pipes and other infrastructure	Please refer to **S-Spec** 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.

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 (Polyine 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

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

1.1.1 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.

1.1.2 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) – **"Reproduced with permission from SAI Global Ltd under Licence 1309-c020"**

Table B1 (modified):

Attribute Information from AS5488	A-SPEC Coverage
Type of Utility/Asset	**S-Spec** – wastewater/sewerage; **W-Spec** – Potable water, re-use (recycled); **D-Spec** – 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 ~~code lists~~ 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 **'Section 1.4 – Graphical Data Construction Principles'** 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 **'Section 1.4 – Graphical Data Construction Principles'** 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 **'Section 1.4 – Graphical Data Construction Principles'** in every specification if required to be provided as digital data
Horizontal Position relative to a structure	Layouts of required features are included under **'Section 1.4 – Graphical Data Construction Principles'** in every specification if required to be provided as digital data
Vertical Position relative to a structure	Layouts of required features are included under **'Section 1.4 – Graphical Data Construction Principles'** 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 **'Source'** and **'Comments'** fields
Information Source	This information can be provided in the **'Comments'** field
Date information obtained/recorded	This information can be provided in the **'Comments'** field
Locating Methods	This information can be provided in the **'Comments'** field
Survey Control Information	Not required in **A-SPEC** 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	'Fire Hydrant' is included as an attribute (**'Hydrant Type'**) in **Hydrant Type** attribute & validation table under section 2 and as a descriptor in **Hydrant Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~2.5~~ **2.6.2 – Hydrant Attribute & Validation File Format Instructions** for the complete set of attributes relating to hydrants required in **W-Spec**.
	Fire Service	Pipe_Type	FIRE	'Fire Service' is included as an attribute (**'Pipe Type'**) in **Pressure Main** and **Service Main** attribute & validation tables under section 2 and as a descriptor in **Pipe Type** ~~code list~~ CODELIST under section 3. Please refer to attribute tables ~~2.2~~ **2.3.2 – Pressure Main Attribute & Validation File Format Instructions** and ~~2.3~~ **2.4.2 – Service Main Attribute File Format Instructions** for the complete set of attributes relating to hydrants required in **W-Spec**.
Recycled Water	Hydrant – Recycled	Hydr_Type	RECYCLED	'Hydrant-Recycled' is included as an attribute (**'Hydrant Type'**) in **Hydrant Type** attribute & validation table under section 2 and as a descriptor in **Hydrant Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~2.5~~ **2.6.2 – Hydrant Attribute & Validation File Format Instructions** for the complete set of attributes relating to hydrants required in **W-Spec**.
	Main – Recycled	Pipe_Type	REC	This is included as an attribute (**'Pipe Type'**) in **Pressure Main** and **Service Main** attribute & validation tables under section 2 and as a descriptor (**'Recycled'**) in the **Water Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~2.2~~ **2.3.2 – Pressure Main Attribute & Validation File Format Instructions** and ~~2.3~~ **2.4.2 – Service Main Attribute & Validation File Format Instructions** for the complete set of attributes relating to mains required in **W-Spec**.
	Meter – Recycled	Meter_Type	REC	This is included as an attribute (**'Meter Type'**) in **Meter** attribute & validation tables under section 2 and as a descriptor (**'Recycled'**) in the **Water Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~2.6~~ **2.7.2 – Meter Attribute & Validation File Format Instructions** for the complete set of attributes relating to meters required in **W-Spec**.
	Stop valve – Recycled	Valve_Type	STOPRC	This is included as an attribute (**'Valve Type'**) in **Valve** attribute & validation tables under section 2 and as a descriptor (**'Stop-Recycled'**) in the **Valve Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~2.7~~ **2.8.2 – Valve Attribute & Validation File Format Instructions** for the complete set of attributes relating to valves required in **W-Spec**.

AS 5488			W-Spec	
Entity	**AS 5488 Term**	**Field Name**	**Code or Descriptor**	**Notes**
	Tap – Recycled	Fitt_Type	TAPRC	This is included as an attribute (**'Fitting Type'**) in **Fitting** attribute & validation tables under section 2 and as a descriptor (**'Tap-Recycled'**) in the **Fitting Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~**2.8**~~ **2.9.2 – Fitting Attribute & Validation File Format Instructions** for the complete set of attributes relating to fittings required in **W-Spec**.
Water	House Connection	Pipe_Type	HOUSE	A 'House Connection' is referred to as 'Service Main' in **W-Spec**. This is included as an attribute (**'Pipe Type'**) in **Service Main** attribute & validation table under section 2 and as a descriptor (**'House Connection'**) in **Pipe Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table **2.3 2.4.2 – Service Main Attribute & Validation File Format Instructions** for complete set of attributes relating to house connections required in **W-Spec**.
	Hydrant	Hydr_Type	HYDR HYOFF	This is included as an attribute (**'Hydrant Type'**) in **Hydrant Type** attribute & validation table under section 2 and as descriptors in **Hydrant Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~**2.5**~~ **2.6.2 – Hydrant Attribute & Validation File Format Instructions** for the complete set of attributes relating to hydrants required in **W-Spec**.
	Main	Pipe_Type	-	This is included as an attribute (**'Pipe Type'**) in **Pressure Main** and **Service Main** attribute & validation tables under section 2 and different pipe types are mentioned in the **Pipe Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~**2.2**~~ **2.3.2 – Pressure Main Attribute & Validation File Format Instructions** and **2.3 – Service Main Attribute & Validation File Format Instructions** for the complete set of attributes relating to mains required in **W-Spec**.
	Meter	Meter_Type	-	This is included as an attribute (**'Meter Type'**) in **Meter** attribute & validation tables under section 2 and different meter types are mentioned in the **Meter Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~**2.6**~~ **2.7.2 – Meter Attribute & Validation File Format Instructions** for the complete set of attributes relating to meters required in **W-Spec**.
	Stop Valve	Valve_Type	STOP	This is included as an attribute (**'Valve Type'**) in **Valve** attribute & validation tables under section 2 and as a descriptor (**'Stop Valve'**) in the in **Valve Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~**2.7**~~ **2.8.2 – Valve Attribute & Validation File Format Instructions** for the complete set of attributes relating to valves required in **W-Spec**.
	Tap	Fitt_Type	MTAP	This is included as an attribute (**'Fitting Type'**) in **Fitting** attribute & validation tables under section 2 and as a descriptor (**'Main Tap'**) in the **Fitting Type** ~~code list~~ CODELIST under section 3. Please refer to attribute table ~~**2.8**~~ **2.9.2 – Fitting Attribute & Validation File Format Instructions** for the complete set of attributes relating to fittings required in **W-Spec**.

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	~~No commas included~~ CODELIST entry	Pressure	Value derived from AS 5488-2013 requirement
Water_Type	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
Status	~~No commas included~~ CODELIST entry	INUSE	Value derived from AS 5488-2013 requirement
Owner	~~No commas included~~ Text	Western Water	Value derived from AS 5488-2013 requirement
Class_P	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
Pipe_DesT	Text		To be populated to comply with **W-Spec**
Location	~~No commas included~~ Text		To be populated to comply with **W-Spec**
St_Name	~~No commas included~~ Text		To be populated to comply with **W-Spec**
Pipe_No	~~No commas included~~ Text		To be populated to comply with **W-Spec**
~~Joint_Type~~ Joint_Mtd	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
From_Node	~~No commas included~~ Text		To be populated to comply with **W-Spec**
To_Node	~~No commas included~~ 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
~~Capacity~~ Flow_Rate	Whole number		To be populated to comply with **W-Spec**
Material	~~No commas included~~ Text	DICL	Value derived from AS 5488-2013 requirement
Manufact	~~No commas included~~ Text		To be populated to comply with **W-Spec**
Grnd_Water	Yes/No Field		To be populated to comply with **W-Spec**
Grnd_Type	~~No commas included~~ 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	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
Protection	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
Bedding	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
Backfill	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
Rl_Rn_Mtd	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**

Pressure Main Attribute & Validation File Format Instructions			
Column Name	**Details**	**Values**	**Notes**
Rl_Rn_Mat	~~No commas included~~ CODELIST entry		To be populated to comply with **W-Spec**
cctv_Ref	~~No commas included~~ Text		To be populated to comply with **W-Spec**
cctv_Date	dd/mm/yyyy		To be populated to comply with **W-Spec**
~~WAPC_No~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~RC_Type~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
Currency	~~No commas included~~ 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**
~~Value_Year~~	~~Whole number~~		~~To be populated to comply with W-Spec~~
~~Sub_Name~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Stage_No~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Design_Co~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Plan_No~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Const_Co~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Const_Date~~	~~dd/mm/yyyy~~	~~23/10/2001~~	~~Value derived from AS 5488-2013 requirement~~
~~Origin~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Transfrm~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
~~Transf_By~~	~~No commas included~~		~~To be populated to comply with W-Spec~~
Source	~~No commas included~~ CODELIST entry	~~As Constructed field work~~ COMB_1	Value derived from AS 5488-2013 requirement
Comments	~~No commas included~~ 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 **W-Spec**
Sub_Name	Text	Capital Works 2017/033	To be populated to comply with **W-Spec**
Stage_No	Text	N/A	To be populated to comply with **W-Spec**
Design_Co	Text	Icandoit Pty Ltd	To be populated to comply with **W-Spec**
Plan_No	Text	14A-Detail	To be populated to comply with **W-Spec**
Const_Co	Text	Dunit Pty Ltd	To be populated to comply with **W-Spec**
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 **W-Spec**
Transfrm	Text	N/A	To be populated to comply with **W-Spec**
Transf_By	Text	N/A	To be populated to comply with **W-Spec**
Source	CODELIST entry	AS5488-D	To be populated to comply with **W-Spec**

2 Attribute & Validation File Specifications

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 or as otherwise agreed to with the respective Consortium member.

Coordinate fields[1]

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.

~~In New Zealand – All Z coordinates are to be provided in NZTM projection (NZVD2016 datum).~~

Attribute Data fields

Maximum field widths are specified for Alpha/Numeric and Alpha data.

For ~~floating point~~ decimal data the number of characters after the decimal point is 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 files are to use the Column Names 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 ~~code lists~~ 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 ~~code lists~~.

Fields that are highlighted in grey are common to all tables.

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 as a guide to assist Developer/Consultants when putting together information for submission.

[1] Discussions held with Land Victoria (Victoria) and Landgate (Western Australia) have confirmed that the coordinated cadastral information provided by surveyors is generally adopted and data of lesser accuracy is "massaged / modified" to suit. i.e. where the surrounding data, for example is based on 1:10,000 accuracy, then that data will be manipulated to "fit" with the survey accurate data.

3 W-Spec CODELISTS ~~Code Lists~~

CODELISTS ~~Code lists~~ 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 ~~code list~~ entry number.

Consultants please note that should an entry not exist within ~~the~~ a CODELIST ~~code list~~ please ~~contact you're A-SPEC Consortium contact to make arrangements for its inclusion.~~ Use the '**SeeComment**' value.

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

Access Point Access Method – NEW

Access Point Material – NEW

Access Point Type

Asset Status

[AS 5488 – 2013 Component]

Backup Power Type – NEW

Bedding / Backfill Material

Cable Type – NEW

Cathodic Protection Type – NEW

Chamber Material – NEW

Conduit Material – NEW

Construction Type – NEW

Control Type – NEW

Electrical Equipment Type – NEW

Equipment Material – NEW

Equipment Purpose – NEW

External Coating – NEW

Feature Type – NEW

Filter Type – NEW

Fitting Type

Fuel Type – NEW

Ground Soil Type

Groundwater Classification – NEW

Health and Safety Issues – NEW

Hydrant Type

Impeller Material – NEW

Impeller Type – NEW

Inlet Protection Type – NEW

Instrument Type – NEW

Jointing Method ~~Type~~

Lift Type – NEW

Lining Material

~~Material~~

Mechanical Equipment Type – NEW

Meter Type
[AS 5488 – 2013 Component]

Network – NEW

Pipe Installation Method – NEW

Pipe Material - NEW

Pipe Renewal / Lining Material – NEW

Pipe Renewal Method – NEW

Pipe Pressure Class – NEW

Pipe Type

Position – NEW

Protection Type

Protective Material Type – NEW

Pump Purpose – NEW

Pump Station Type – NEW

Pump Type

Pump Use – NEW

~~Replacement Cost Type~~

Reservoir Type – NEW

Retention Structure – NEW

Source – NEW

Structure Material – NEW

Support Structure Material – NEW

Support Structure Type - NEW

Tank Type – NEW

Unit of Measure Reference – NEW

Valve Purpose

Valve Type

Voltage Type – NEW

Water Type
[AS 5488 – 2013 Component]