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

Version 8.1.0
1st February 2017

Victorian Members

City of Ballarat

Bass Coast Shire Council

Baw Baw Shire Council

Brimbank City Council

Cardinia Shire Council

City of Casey

Colac Otway Shire

City of Greater Dandenong

Department of Environment and Primary Industries

Emergency Services Telecommunications Authority

Frankston City Council

Glenelg Shire Council

Hume City Council

Latrobe City Council

Melbourne Water

City of Melton

Mitchell Shire Council

Moorabool Shire Council

Mornington Peninsula Shire Council

Greater Shepparton City Council

South Gippsland Shire Council

Southern Grampians Shire Council

Shire of Strathbogie

Surf Coast Shire Council

Rural City of Wangaratta

Wannon Water

Warrnambool City Council

Whittlesea City Council

Wyndham City Council

W.A. Members

City of Armadale

Shire of Augusta Margaret River

Shire of Broome

City of Busselton

City of Canning

City of Cockburn

City of Greater Geraldton

City of Gosnells

Shire of Kalamunda

City of Kwinana

City of Mandurah

City of Melville

Shire of Murray

Town of Port Hedland

Town of Port Hedland

City of Rockingham

Serpentine & Jarrahdale Shire

City of Swan

City of Wanneroo

Main Roads W.A .

New Zealand Members

Auckland Transport

Christchurch City Council

NZTA
(New Zealand Transport Agency)

Wellington City Council

Wellington Water

New South Wales Members

Orange City Council

Singleton Council

Wentworth Shire Council

Table of Contents

Index of Figures

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.

The **A-SPEC** management model enables Local Governments, Utilities and Water Authorities around Australia and New Zealand to participate in the development and use of the standards 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 related to newly constructed 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 drainage 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 by 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.

D-Spec Standard Specification

The **D-Spec** standard specification (Stormwater Drainage & Telecommunications – Optical Fibre standard) was created to enable Local Government, Utilities and Water Authorities around Australia and New Zealand to participate in the use of a single specification when dealing with the creation of new Councils, Utilities and Water Authorities' assets. This enables Councils, Utilities and Water Authorities to deal more efficiently with the Land Development and Industry Consultants in relation to subdivision development and capital works programs within their local jurisdiction.

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

A common specification for the supply of digital drainage 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 Councils, Utilities and Water Authorities.

The **D-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 **D-Spec**.

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

Use of the Specification

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 if there are similar elements in **D-Spec** that also appear in **S-Spec**, **R-Spec** and **O-Spec**, then the standard specification for those asset types are to be used to prepare the **As-Constructed/As Built** digital data to be delivered along with the stormwater drainage digital data requested.

This document includes a specification of common features (feature types, attribute types and attribute value domain). It also contains generalization rules for the graphical representation of the features i.e. assets within drainage networks, 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.

D-Spec will lay the foundation for stormwater drainage asset data infrastructure built on identified user requirements through a specification framework.

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 the works, as GIS Ready digital data of newly constructed road 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 Australia only. Therefore does not need to be an included field for other jurisdictions.

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

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

AS CONSTRUCTED INFORMATION
– may also be referred to as **"As Builts"** or **"Work as Executed"** or **"Work as Constructed"** or **"As Cons"** or **"As Laid"**

ASSET MANAGEMENT SYSTEM (AMS)
– may also be referred to as **"Asset management Information System (AMIS)"**

GROSS POLLUTANT TRAP
– may also be referred to as "**Litter Trap"** or "**Hydrodynamic Separator"** or "**Sediment Trap"** or "**Oil and Grit Trap"** or "**Rubbish Trap"** or "**Proprietary Unit"** or "**Catchpit Filter"** or "**Oil and Water Separator"**. Use to remove gross pollutants, particulate bound contaminants, rubbish, grit, coarse sediment, oil and litter. Oil and water separator is only used to remove hydrocarbons.

INLET
– may also be referred to as **"Bay"** or **"Creek"**

PERMEABLE PAVEMENT
– May also be referred to as **"Porous Pavement"** or **"Treatment Trench"** or **"Rock Filter"**

PIPE
– may also be referred to as a **"Main"**

PIT
– may also be referred to as a**" Manhole"** or an **"Access Point"**

POND
– may also be referred to as **"Retarding Basin"** or **"Detention Basin" or "Depression Storage"**

PROPERTY CONNECTION
– may also be referred to as a **"Lateral"** or a **"Service Connection"** or a **"Service Line"** or **"Property Discharge Lines"** or **"House Connection Branch (HCB)"**

RAIN GARDEN
– may also be referred to as **"Bio-Retention System"** or **"Storm Water Planter"**

ROOF GARDEN
– may also be referred to as **"Green Roof"** or **"Eco Roof"**

SWALE
– may also be referred to as **"Buffer Strip"** or **"Filter Strip"** or **"Treatment Wall"**

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 drainage and/or telecommunication conduit assets in a GIS ready format to the Consortium of members using the **D-Spec** standard specification.

This document outlines the specifications for digital files containing: - stormwater drainage pipes, pits, property connections, water sensitive urban design elements underground telecommunications conduits and pits (for optical fibre) as well as the boundary showing the extent of the work. 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 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 **D-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**.

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
- Cloud Mediums (FTP, Dropbox, Google Drive etc.)

The CD or DVD is to be labelled 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: _____

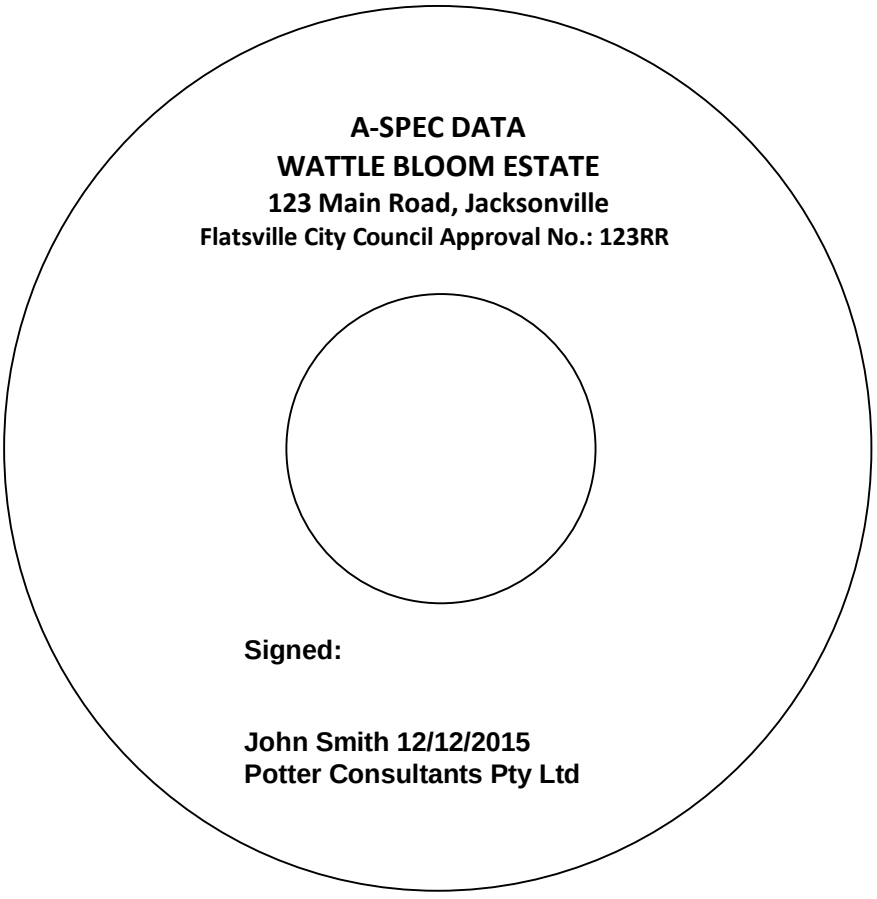

Figure 1 - Sample CD Label

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.

The following information may also 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	*N/A*
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	*D-Spec Digital Data Specifications – V7.2.1*
SOFTWARE FORMAT & VERSION	The software used to create the digital data	*MapInfo v7.5 / AutoCAD Map 2008*
PROJECT or SUBDIVISION	Project or Subdivision name	*Rockbank Rise*
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*
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.*

Theme/Layer Structure

The following information is provided as a guide to assist Consultants when putting together graphical information for members of the **A-SPEC** Consortium. The key principal is that each asset type must be delivered as a separate layer/theme and they must be clearly labelled.

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

It is important to note that these levels/layers 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	Polygon/Region /Shape	Polygon representing the extents of the subdivision development or capital works project	**Yes**
Pipe sections	Pipes	Line/Polyline/ Line String	Specifies drainage linework	**Yes**
Pipe Miscellaneous text	Pipes_Txt	Text	Change of grade, Tangent points and chainages, horizontal /vertical curves, Pipe Offset and brackets	**No**
Pits / Access points / Manholes	Pits	Australia – Polygon /Region /Shape NZ – Point with attributes attached (and a polygon/ shape/ region as graphics only)	Specifies pits/access points in network. Examples includes end of pipe symbols, pits	**Yes**
Head/End Walls	HEWalls	Polygon/Region /Shape	Specifies head walls and end walls	**Yes**
Property Connection	Prop	Line/Polyline/ Line String	Specifies property outlet to drainage network	**Yes**
Underground Conduits	Cond	Line/Polyline /Line String	Specifies underground optical fibre conduit linework in council owned infrastructure for telecommunications assets	**Yes**
Underground Conduit Pits	Cond_Pits	Polygon/Region /Shape	Specifies pits/access points in council owned infrastructure for telecommunications assets	**Yes**
Bioretention Swale / Swale(linear)/ Buffer Strips and Rain Gardens	OSDS-Swale	Polygon/Region / Shape	Specifies the area of the trench indicating the location of the swale	**Yes**
Basin, Sump, Pond, Swale (areas), Wetland, and Lake	OSDS-Area	Polygon/Region / Shape	Specifies the area of the feature	**Yes**
Collection pipes for swales	Pipes	Line/Polyline/ Line String	Collection pipes for swales	**Yes**
Pits for Swales	Pits	Polygon/Region /Shape	Specifies pits/access points in network. Examples of this includes inlet and outlet structures	**Yes**
Problems with matching to existing data	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**

Other Asset Types that may be found in the Precinct of a Drainage Network

There may be instances where other asset types are constructed as part of a drainage project such as a treatment plant.

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 the relevant standard specification to refer to.

Kerbs and Channels	Please refer to **R-Spec** for requirements
Lighting	Please refer to **R-Spec** for requirements
Trees	Please refer to **R-Spec** for requirements
Sewer Pipes and Pits	Please refer to **S-Spec** for requirements
Water Pipes and Pits	Please refer to **W-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

Graphical Data Construction Principles

Each of the following sections details the graphical data construction principles that must be followed for all linework, polygons and points provided. Where practicable, the alignment of all data, whether "As Constructed" or "As Built" measurements, must be related to the title/property boundaries abutting the road reserve.

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

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.

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

1.2.1 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) –
"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 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 the relevant section within each of the specifications if required to be provided as digital data.
Drawing showing the approximate location of the Utility/Asset	Layouts of required features are included under the relevant section within each of the specifications if required to be provided as digital data.
Drawing showing the possible location of the Utility/Asset	Layouts of required features are included under the relevant section within each of the specifications if required to be provided as digital data.
Horizontal Position relative to a structure	Layouts of required features are included under the relevant section within each of the specifications if required to be provided as digital data.
Vertical Position relative to a structure	Layouts of required features are included under the relevant section within each of the specifications 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 **D-Spec** has been mapped to **Table B3** in the AS 5488 – 2013 Standard

AS 5488		D-Spec		
Entity	**AS 5488 Term**	**Field name**	**Code or Descriptor**	**Notes**
Drainage	Drainage Junction Manhole	Type	JP	This is included as an attribute (**'Type'**) in **Pit** attribute table under section 2 and as a descriptor in the **Pit Types** code list under section 3. This pit type is referred to as a **'Junction Pit'**. Please refer to table **'2.2.2 – Pit Attribute & Validation File Format Instructions'** for the complete set of attributes required in **D-Spec**.
	Drainage Pit	Type	JP	There are specific pit types defined in **D-Spec**. Where there's a generic term has been used, a pre-defined default value/term would be applied. For Pit Types, **DEFAULT = 'Junction Pit'**. In this case, since 'Drainage Pit' is a generic descriptor, this pit type is referred to as a **'Junction Pit'**. This is included as an attribute (**'Type'**) in **Pit** attribute table under section 2 and as a descriptor in the **Pit Types** code list under section 3. Please refer to table **2.2.2 – Pit Attribute & Validation File Format Instructions** for the complete set of attributes required in **D-Spec**.
	Gully Pit	Type	GP	This pit type is referred to as **'Gully Pit/Grated Pit'.** This is included as an attribute (**'Type'**) in **Pit** attribute table under section 2 and as a descriptor in the **Pit Types** code list under section 3. Please refer to table **2.2.2 – Pit Attribute & Validation File Format Instructions** for the complete set of attributes required in **D-Spec**.
	Invert of Pipe	DS_IL US_IL IL	-	In **D-Spec**, Invert of pipe is included in two attribute tables; **Pipe** and **Property Connection**. In the Pipe table (table 2.1), this term is included as two attributes; **'Downstream Invert level (DS_IL)'** and **'Upstream Invert level (US_IL)'** In the Property Connection table (table 2.4.2), this term is included as **'Invert Level (IL)'.** Please refer to attribute tables **2.1.2 – Pipe Attribute & Validation File Format Instructions** and **2.4.2 – Property Connection Attribute & Validation File Format Instructions** for the complete set of attributes required in **D-Spec** relating to pipes.

ROAD MAP TO AND COMPLIANCE WITH D-Spec

The example below shows a table populated with the fields which comply with AS 5488 – 2013. To comply with **D-Spec** requirements there are additional fields that are to be populated prior to providing data.

Example:

Pipe Attribute & Validation File Format Instructions			
Column Name	**Details**	**Values**	**Notes**
Type	No commas included	PIPE	Value derived from AS 5488 – 2013 requirement
Pipe_No	No commas included		To be populated to comply with **D-Spec**
Owner	No commas included		To be populated to comply with **D-Spec**
Up_Pit_No	No commas included		To be populated to comply with **D-Spec**
Dn_Pit_No	No commas included		To be populated to comply with **D-Spec**
St_Name	No commas included		To be populated to comply with **D-Spec**
Location	No commas included		To be populated to comply with **D-Spec**
DS_IL	2 decimal places		To be populated to comply with **D-Spec**
DS_Pipe_E	3 decimal places		To be populated to comply with **D-Spec**
DS_Pipe_N	3 decimal places		To be populated to comply with **D-Spec**
US_IL	2 decimal places		To be populated to comply with **D-Spec**
US_Pipe_E	3 decimal places		To be populated to comply with **D-Spec**
US_Pipe_N	3 decimal places		To be populated to comply with **D-Spec**
Pipe_Con	No commas included		To be populated to comply with **D-Spec**
Length	2 decimal places		To be populated to comply with **D-Spec**
Dia_Width	Whole mm	300	Value derived from AS 5488 – 2013 requirement
Height	Whole mm		To be populated to comply with **D-Spec**
Material	No commas included	BRASS	Value derived from AS 5488 – 2013 requirement
Class	No commas included		To be populated to comply with **D-Spec**
Joint_Mtd	No commas included		To be populated to comply with **D-Spec**
Grnd_Water	Yes/ No field		To be populated to comply with **D-Spec**
Grnd_Type	No commas included		To be populated to comply with **D-Spec**
Rock_Excav	Yes/ No field		To be populated to comply with **D-Spec**
Instl_Mthd	No commas included		To be populated to comply with **D-Spec**
Protection	No commas included		To be populated to comply with **D-Spec**
Bedding	No commas included		To be populated to comply with **D-Spec**
Backfill	No commas included		To be populated to comply with **D-Spec**
cctv_Ref	No commas included		To be populated to comply with **D-Spec**
cctv_Date	dd/mm/yyyy		To be populated to comply with **D-Spec**
Mant	No commas included		To be populated to comply with **D-Spec**
Status	No commas included	INUSE	Value derived from AS 5488 – 2013 requirement
PShape	No commas included		To be populated to comply with **D-Spec**
Width2	Whole mm		To be populated to comply with **D-Spec**
Rl_Rn_Mtd	No commas included		To be populated to comply with **D-Spec**
Rl_Rn_Mat	No commas included		To be populated to comply with **D-Spec**
ARI	dd/mm/yyyy		To be populated to comply with **D-Spec**
Permit_No	No commas included		To be populated to comply with **D-Spec**
RC_Type	No commas included		To be populated to comply with **D-Spec**
Currency	No commas included		To be populated to comply with **D-Spec**
Unit_Cost	2 decimal points		To be populated to comply with **D-Spec**
Value_Year	Whole number		To be populated to comply with **D-Spec**
Sub_Name	No commas included		To be populated to comply with **D-Spec**
Stage_No	No commas included		To be populated to comply with **D-Spec**
Design_Co	No commas included		To be populated to comply with **D-Spec**
Plan_No	No commas included		To be populated to comply with **D-Spec**

Pipe Attribute & Validation File Format Instructions			
Column Name	**Details**	**Values**	**Notes**
Const_Co	No commas included		To be populated to comply with **D-Spec**
Const_Date	dd/mm/yyyy	12/07/2002	Value derived from AS 5488 – 2013 requirement
Origin	No commas included		To be populated to comply with **D-Spec**
Transfrm	No commas included		To be populated to comply with **D-Spec**
Transf_By	No commas included		To be populated to comply with **D-Spec**
Source	No commas included	As Designed Drawings	Value derived from AS 5488 – 2013 requirement
Comments	No commas included	Information from City of Gosnells Obtained on 14/08/2004. Located by Survey	Data fields populated as a combination of AS 5488 – 2013 requirements and **D-Spec** requirements

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 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 Vicmap property 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 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 Data files are to use the Column Names and structures in order as 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 code lists are provided to standardise the capture of information in the Attribute files. They can be found in *Section 3 – **D-Spec** Code Lists*. The **A-SPEC** website will also contain the most current code list.

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 is to be carried and is provided as a guide to assist Developer/Consultants when collating information for submissions.

[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 D-Spec Code Lists

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 tables require the input of a code list entry number.

Consultants please note that should an entry not exist within the code list please contact your **A-SPEC** consortium contact to make arrangements for its inclusion.

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

3.1 Pipe, Property Connection & Underground Conduit Material

3.2 Pit Type

3.3 Construction Type

3.4 Pit Lid Type

3.5 Asset Status

3.6 Replacement Cost Type

3.7 Pipe Types

3.8 Pipe Shapes

4 D-Spec Document Control

Project Name	Stormwater Drainage Module
Document Type	Specification
Document Number	DS-2012-0001
File Name	**D-Spec** Digital Data Specifications-Version 8.1.0.docx
Version Date	1 February 2017
Written by	Samudrika Wilamuna & Duncan Brooks
Reviewed by	George Havakis and Duncan Brooks
Authorised by	**D-Spec** Technical Working Group

5 Document Revision History

Revision Number	Date	Comments
1	13 Dec 2002	Draft document
1.1	17 Dec 2002	Addition of drawings in Graphical Section
2	20 Mar 2003	Incorporate Changes
3	15 May 2003	Incorporate changes resulting from Workshop 1 May, 2003
4	31 Aug 2004	Incorporate changes resulting from Pilot Program
4.2	19 Nov 2004	Incorporate changes resulting from final review
4.2.1	6 Dec 2004	Update prospective members page
4.2.2	12 May 2005	Incorporate changes from Consortium Meeting March, 2005
5	19 October 2005	Incorporate changes resulting from final review
5.1	2 June 2006	Attribute names have been limited to a length of 10 characters
6	21 April 2008	Addition of Western Australian requirements and modification to Victorian requirements
6.5	23 Sept 2009	Draft Additions for MRWA
7	1 Feb 2010	WA Department of Water and completion of WSUD elements.
7.1	10 May 2010	Modification in wording to reflect use for Capital Works
7.2.1	10 June 2010	Addition of new council members
7.5	1 November 2013	Draft addition of New Zealand – WCC requirements
8.0	1 November 2014	Modifications and amendments
8.0.1	1 November 2014	Typos fixed
8.0.2	1 November 2014	Typos fixed
8.1.0	11 November 2016	Reformatted to group graphical and attribute capture requirements per asset type
8.1.0	1 February 2017	Document date changed to coincide with release date NZVD2016 now height datum for NZ
8.1.0	11 April 2017	Updated Bass Coast logo

6 Summary of Specification Changes

The following is a summary of changes made to the **D-Spec** Specification from the last officially released Version – Version 8.0.2 in 2014.

Summary of Changes

Item #	Change
1	Removal of 'Workforce Solutions' logo and replaced with *'GISSA International logo'* in header
2	Updating of members logos and names to be consistent in each document.
3	Addition of *'Glossary of Terms and Definitions'*
4	Changed wording from 'Supplier Register' to *'Consultant Register'*
5	Alteration in the **A-SPEC** Member Contact Details
6	Clarification of the duration for data supply for all industry consultants from '3 weeks' to *'15 working days'*
7	Addition of Developer/Consultant Responsibilities for New Zealand and Tasmania
8	Addition of **A-SPEC** Consortium Member Responsibilities for New Zealand and Tasmania
9	Addition of new fields into the *'Certification Form – Readme/Metadata File'*
10	Expansion of the description on Datums of Australia
11	Inclusion of height datums for New South Wales, Tasmania and New Zealand
12	Merging of 'Section 1.3 – Graphical Data Construction Principles' and 'Section 1.7 – Sample Diagrams' into *'Section 1.4 – Graphical Data Construction Principles'*
13	Changed Theme/Layer Structure section number from 'Section 1.5' to '*Section 1.3'*
14	Removal of 'Section 1.6 – Data Structure' and inclusion as *'Data Types'* for each feature under section 1.3
15	Addition of Section *'1.3.1 – Other Asset Types that may be found in the Precinct of a Stormwater Drainage Network'*
16	Removal of the example showing the Subdivision Boundary
17	Addition of text *'Laterals'* into 'Property Connections' sub heading under section 1.4.1
18	Addition of text *'Optical Fibre/Telecommunications'* in to 'Underground Conduits' sub heading under section 1.4.1
19	Addition of diagrams for irregular and circular shaped pits in *'Joining Pipe Linework'*
20	Inclusion of diagrams of a *'Head/End Wall with/without apron'* to show what data to capture
21	Change 'Design Boundary Extent' to *'Area of Work'*
22	Addition of an example into the problem log in '1.6 – Matching to Existing Infrastructure'
23	Removal of Section '1.7 – Offsets' and incorporated into sample drawings 'Section 1.4'
24	Renaming of *'Section 1.7 – Match to AS 5488 – 2013'*
25	Incorporation of *'Data Validation Checks'* into Attribute tables in Section 2 and removal of *'Section 3 – Attribute Data Validation Checks'*
26	Inclusion of *'Code List Reference'* column into every attribute table
27	Inclusion of Financial Metadata fields into every attribute table
28	Addition of three new Tables • 2.1 Area of Work Extent • 2.4 Head/End Walls • 2.10 Problems
29	Modification of Data Types in all relevant tables • Character Length of 'Origin' changed from 50 chars to 100 chars • Character Length of 'Comments' is changed from 100 chars to 250 chars • Character Length of 'St_Name' is changed from 40 chars to 100 chars • Inclusion of Default Values into relevant fields • Character Length for Pipe Number changed from 25 chars to 31 chars

Item #	Change
	• Character Length for Pit Number changed from 10 chars to 15 chars
30	Addition of new attribute field *'Status'* into every attribute table
31	Modifications to 'Pipe' table Addition of fields • PShape • Width2 • Rl_Rn_Mtd • Rl_Rn_Mat • Location Removal of field • 'Rtn_period'
32	Modifications to 'Pit' table • No_of_Irons is changed to *'No_Irons'* to comply with 10 character limit for ESRI Shape files • Con_Type is changed to *'Const_Type'* Addition of fields • Fenced • Location • Photo_Ref
33	Modifications to 'Property Connections' table • Addition of Location field • Character Length for DS_Pipe_No changed from 10 chars to 31 chars
34	Modifications to 'Underground Conduit' table • Up_Con_No is changed to *St_Pit_No* • Dn_Con_No is changed to *En_Pit_No* • Up_Con_E is changed to *St_Con_E* • Up_Con_N is changed to *St_Con_N* • Dn_Con_E is changed to *En_Con_E* • Dn_Con_E is changed to *En_Con_N*
35	New additions to 'Material' code list • Acronytrile Butadiene Styrene • Asbestos Cement • Aluminium • Aluminium Bronze • Bluestone • Bitumen • Black Brute • Brass • Brick • Grey Cast iron • Cast Iron cement Lined • Clay • Cement Lined In-situ • Concrete • Concrete Lined Steel • Cement Lined Steel Coat • Copper • Coal Tar Enamel • Incoloy • Inorganic Zinc Silicate • Liner • Low Density Polyethylene • Malleable Iron • Modified PVC • Mild Steel Cement Lined • Mild Steel Enamel Lined • Mild Steel Spiral Riveted • Mild Steel Welded • Nylon • PE Loose Sleeving • Ductile Iron • Ductile Iron Cement Lined • Ductile Iron Enamel Lined • Ductile Iron Plastic Lined • Earth • Fusion Bonded Epoxy • Fusion Bonded Polyethylene • Fibreglass • Fibre Reinforced Cement • Fibre Reinforced Plastic • Gunmetal • Glass Reinforced Concrete • Glass Reinforced Plastic • Gunnite • Galvanised Wrought Iron • Galv. Wrought Iron Cement Lined • Phosphor Bronze • Polyurethane • Polyuria • Polyvinyl Chloride • Reinforced Concrete Plastic Lined • Stainless Steel – No Grade • Stainless Steel – Grade 316 • Steel • Stone Pitching • Spiral Welded • Tape Wrapped • Wrought Iron

Item #	Change
	• Oriented Polyvinyl Chloride • Wood
36	New additions to 'Pit Types' code list • Change of Grade • Catch Pit • Catch Pit combined with Side Entry Pit • Discharge Control Pit • Double Grated Side Entry pit • Infiltration Chamber • Junction Pit with Elevated Entry • Junction Pit combined with Side Entry Pit • Junction Pit combined with Grated Pit/Gully Pit • Kerb-Side Catch Pit • Maintenance Riser • Roading Sump • Side Entry Pit with Extended Throat • Soak Pit combined with Side Entry Pit • Triple Grated Side Entry pit • V Throated Pit
37	Modifications to 'Construction Type' code list Additions • Annealed • Gravity Cast • Seamless • Corrugated • Hard Drawn • Spun Cast • Extruded • Mandrill Cast • Lock Bar • Folded • Riveted • Brick and Concrete **removed** from this table and added to materials code list
38	'Unknown' is removed from every code list except *'Construction Type'*
39	Addition of four new code lists • 3.5 Asset Status • 3.6 Replacement Cost Type • 3.7 Pipe Types • 3.8 Pipe Shapes
40	Replacement of 'Attachment 2: Corrective Action Form' with table *'2.10 Problems'*
41	Changed the web address from 'www.dspec.com.au' to 'www.a-specstandards.com.au'
42	Addition of the following fields in to every attribute/validation table **Please note these fields are for use with Capital Works projects** • RC_Type • Currency • Unit_Cost • Value_Year
43	Reformatted to group graphical and attribute capture requirements per asset type

Attachment 1: Request for Digital Data for Stormwater Drainage from A-SPEC Member

- Please refer to the **A-SPEC** website for relevant contact details.
  www.a-specstandards.com.au

Date:	
A-SPEC Member Contact:	
Developer or their Representative's Name:	
Developer or their Representative's Contact Name:	
Address:	
Suburb:	**Postcode:**
Telephone:	
E-mail:	
Development project(s) reference(s):	

I, the representative named above, request from _____ an extract
(*Insert name of **A-SPEC** member*)
from their stormwater drainage digital map base covering the area as described in the following sections. As a condition

of using this data, I agree to acknowledge the ownership of _____
(*Insert name of **A-SPEC** member*)
over this data and agree to be bound by the restriction that the data is only to be used for the nominated

development projects.

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

Requested method of data delivery	Requested media format
❑ E-mail	❑ DVD
❑ Post	❑ CD-ROM
❑ To be collected	❑ FTP, Dropbox, Google Drive etc

Please complete one of the sections below.
Adequate information must be provided to easily identify the area of interest.

Description
E.g. the area bounded by Latrobe, Swanston, Bourke and Spencer Streets.

Bounding Coordinates
E.g. the area within (294081m E, 5802320m N), (294430m E, 5802315m N), (294449m E, 5801990m N), (294094m E, 5801991m N).

Area shaded in attached picture
E.g. the area shown shaded in an extract from a street directory.