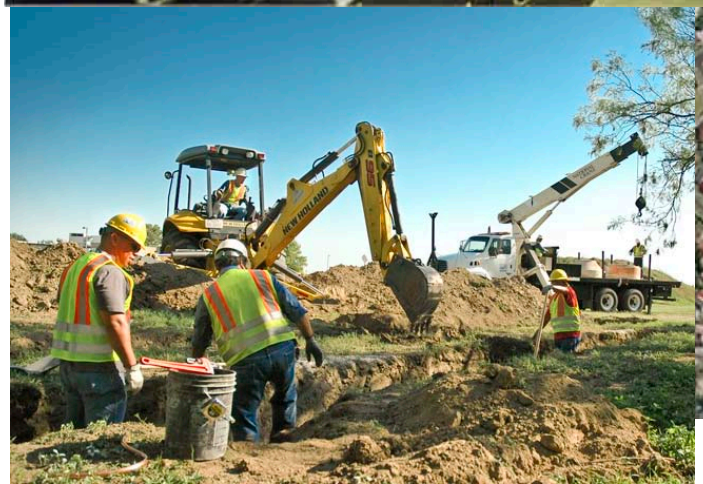
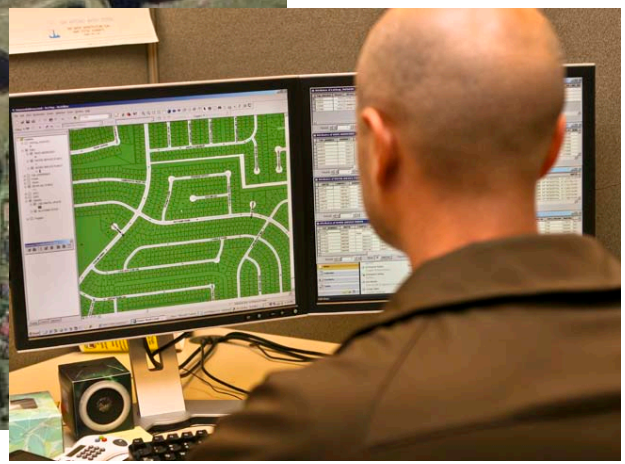
A collaborative approach for Asset Managers & Owners

Aspec

digital data specifications





This afternoon

Key areas of discussion

1. A Quick Recap
2. The Specs
3. Engagement with Industry
4. Other Engagement
5. Improvements and Modifications
   - The Specifications in Australia & New Zealand

GISSA

(formerly Workforce Solutions)

George Havakis

Managing Director

- 23 years in private sector
- 12 ½ years in public sector
  - in the Water Industry – recording and design
- GIS Consultant, Business Analysis, Information Management
- Chairman of SIBA Victoria *(Spatial Industries Business Association)* and holds a position on the national board
- Founding member of SSSI *(Surveying and Spatial Sciences Institute)*.
- Member of LandXML.org industry consortium
- Founder of the A-SPEC consortium

Role of GISSA

1. Coordinator
   - ✓ Consistent message
2. Facilitator
   - ✓ Channel interest and actions
   - ✓ Inclusion of stakeholders
   - ✓ Engagement with industry
3. Liaison
4. Support
5. Continuous improvement
   - ✓ Feedback

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A QUICK RECAP

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A-SPEC is a program involved in the development of data specifications for recording information of new or existing assets.

- *It provides a core structure, identified and (distilled) by SME's.*

To simplify information management for Asset Managers and Owners

GISSA

The focus

The focus is twofold:-

1. Receive *consistent* information about Council's Assets
   a) Contributed Assets – Developer works
   b) Capital Works – Internal programs

2. Using GIS technology to validate data

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digital data specifications

Format v Specification

Format describes the **data exchange format** e.g. MIF/MID, Arc Shape, Intergraph native, LandXml etc and is **flexible**.

The **specification** outlines the **detailed information** required about each asset type and is **prescriptive**.

GISSA

TO SUMMARISE

- Councils **working with consultants** to comply with A-SPEC
- Councils continue to review **internal processes**
- Included as part of Capital Works processes
- **2007 VCAT decision**
- *Industry support from vendors and consultants alike*

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THE SPECS

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The Specs. 11 years on

d-spec outlines the specifications for digital files containing *stormwater drainage data*: pipe, pit, property connections and Water Sensitive Design Elements *(WSUD)*.

r-spec outlines the specifications for digital data of authorities' assets within the *Road Reserve*.

o-spec outlines the specifications for digital data of **Public Open Space and Recreation Assets**.

s-spec outlines the specifications for digital data containing *Sewerage/waste water asset data.*

This specification is being created in collaboration with WCC, MWC & Southern Water.

w-spec outlines the specifications for digital data containing *Water supply assets*. This specification is being created in collaboration with WCC, MWC & Southern Water.

b-spec outlines the specifications for the delivery of digital data relating to *Building Assets*.

This specification is currently in the being developed and will be available for comment

t-spec outlines the specifications for the collection of digital data relating to *optical fibre/telecommunications assets*. It is planned to further develop from its current format within d-spec.

New Zealand Stakeholders

A-SPEC founding member in New Zealand

Absolutely POSITIVELY Wellington
Me Heke ki Pōneke
Wellington City Council

Initial Focus - 3 WATERS

d-spec outlines the specifications for digital files containing *stormwater drainage data*: pipe, pit, property connections and Water Sensitive Design Elements *(WSUD)*.

s-spec outlines the specifications for digital data containing *Sewerage asset data.*
This specification is being created in collaboration with WCC, Southern Water, Cradle Mountain Water, Ben Lomond Water and MWC.

w-spec outlines the specifications for digital data containing *Water supply assets*.
This specification is being created in collaboration with WCC, Southern Water, Cradle Mountain Water, Ben Lomond Water and MWC.

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Tasmanian Stakeholders

A-SPEC founding members in Tasmania

Now merged as TasWater

southern water

BEN LOMOND WATER

cradle mountain WATER

Aspec digital data specifications

Consortium and Stakeholder Group

15 of 25 Growth Area Councils across Australia

IDM infrastructure design manual

GISSA

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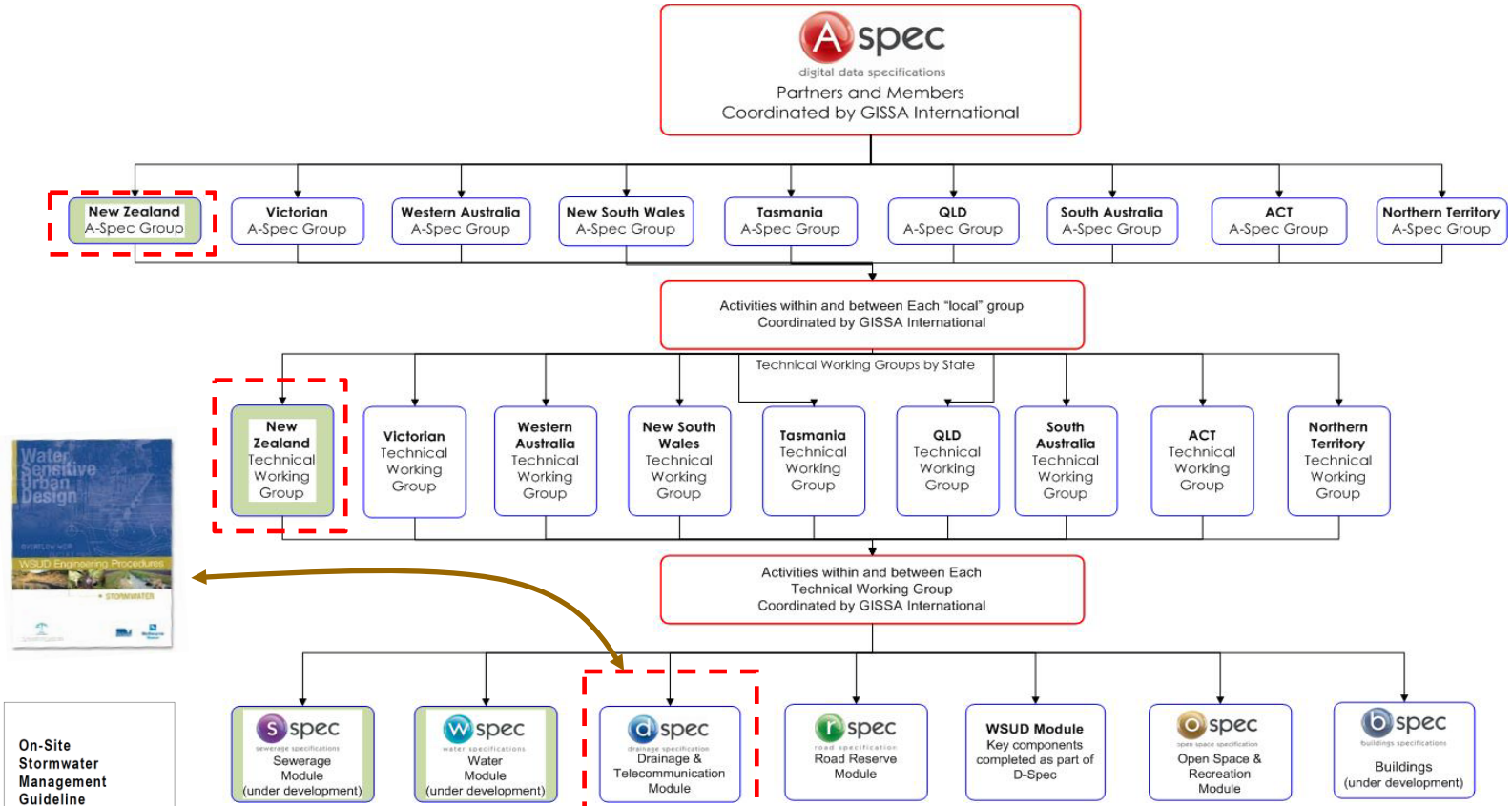
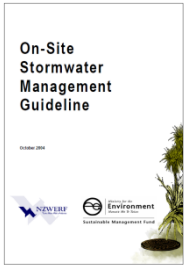
digital data specifications

GOVERNANCE UPDATE

GISSA

Engagement Governance Model





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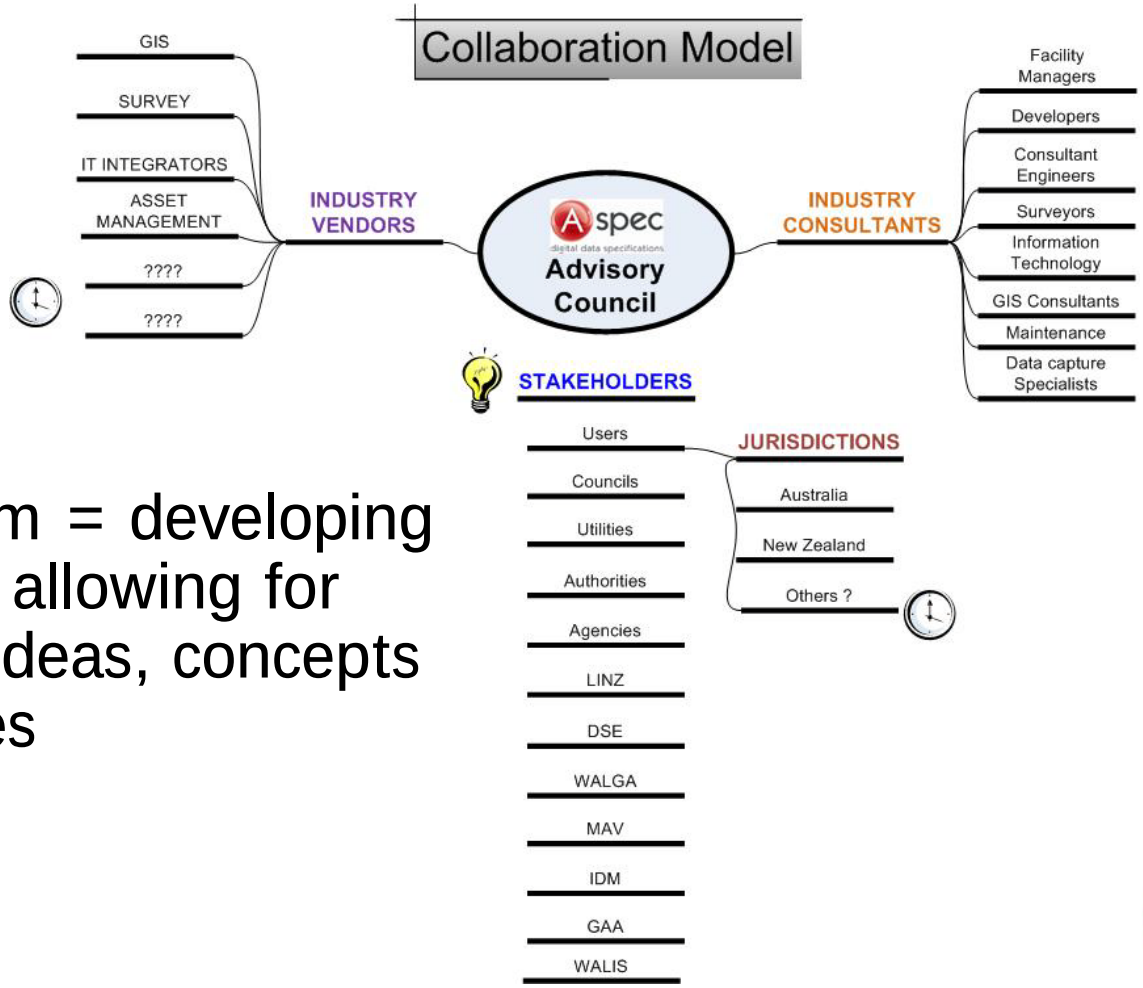
INDUSTRY ENGAGEMENT

- Stakeholders
  - Members (requesters – end users)
  - Partners (service providers - consultants)
  - Other
    - Spear
    - IDM
    - GAA

GISSA

Created the Possibility for Collaboration



New paradigm = developing *new practice* allowing for evolution of ideas, concepts and processes

home
consortium members
news
consultant register
contact us
dspec stormwater drainage specification
rspec road specification
ospec open space specification
bspec buildings specifications
tspec telecommunications specifications
sspec sewerage specifications
wspec water specifications
Case Studies

Registered Consultants

Consortium Members

> 35 Degrees South
> Adapt Solutions Pty Ltd
> Adrian Gordon Consulting
> Alan McLean Engineering Pty Ltd
> Alexander Symonds (Vic) Pty Ltd
> Anstra Technologies
> APH Contractors
> Arcon Consulting Engineers Pty Ltd
> Baigents Pty Ltd
> BCE Surveying Pty Ltd
> Benchmark Surveying Pty Ltd
> Beveridge Williams & Co
> BMT WBM
> Bortoli Wellington Pty Ltd
> Bosco Jonson Pty Ltd
> BPA Engineering Pty Ltd
> Breese Pit and Dixon Pty Ltd
> Brook & Marsh Pty Ltd
> Brown Consulting (Vic) Pty Ltd
> BSO Development Consultants
> C.R. Kennedy & Company Pty Ltd
> CAF Consulting
> Cardno BSD
> Cardno Grogan Richards
> Cardno Spectrum Survey
> Chris Smith & Associates
> Colin Campbell Design & Survey
> Conneil Wagner (Aurecon Group)
> Cossill & Webley
> David Curtain Consulting Pty Ltd
> DCE Dalton Consulting Engineers Pty Ltd
> De Nada Engineering Surveys Pty Ltd
> Dennis Price and Miller
> Development Engineering Consultants

digital data specifications

Industry Participation

Asset Management Vendor examples

- Assetic – Shire of Kalamunda (WA)
- Adapt Solutions – Bass Coast Shire (Vic)
- CIVICA - City of Rockingham (WA)
- Hansen - City of Casey (Vic)
- Bizeasset – Colac Otway (Vic)
- Technology One – City of Fremantle (WA)
- Conquest – Cardinia Shire (Vic)
- Asset Master – City of Wyndham (Vic)
- InfoNET – City of Wellington (NZ)

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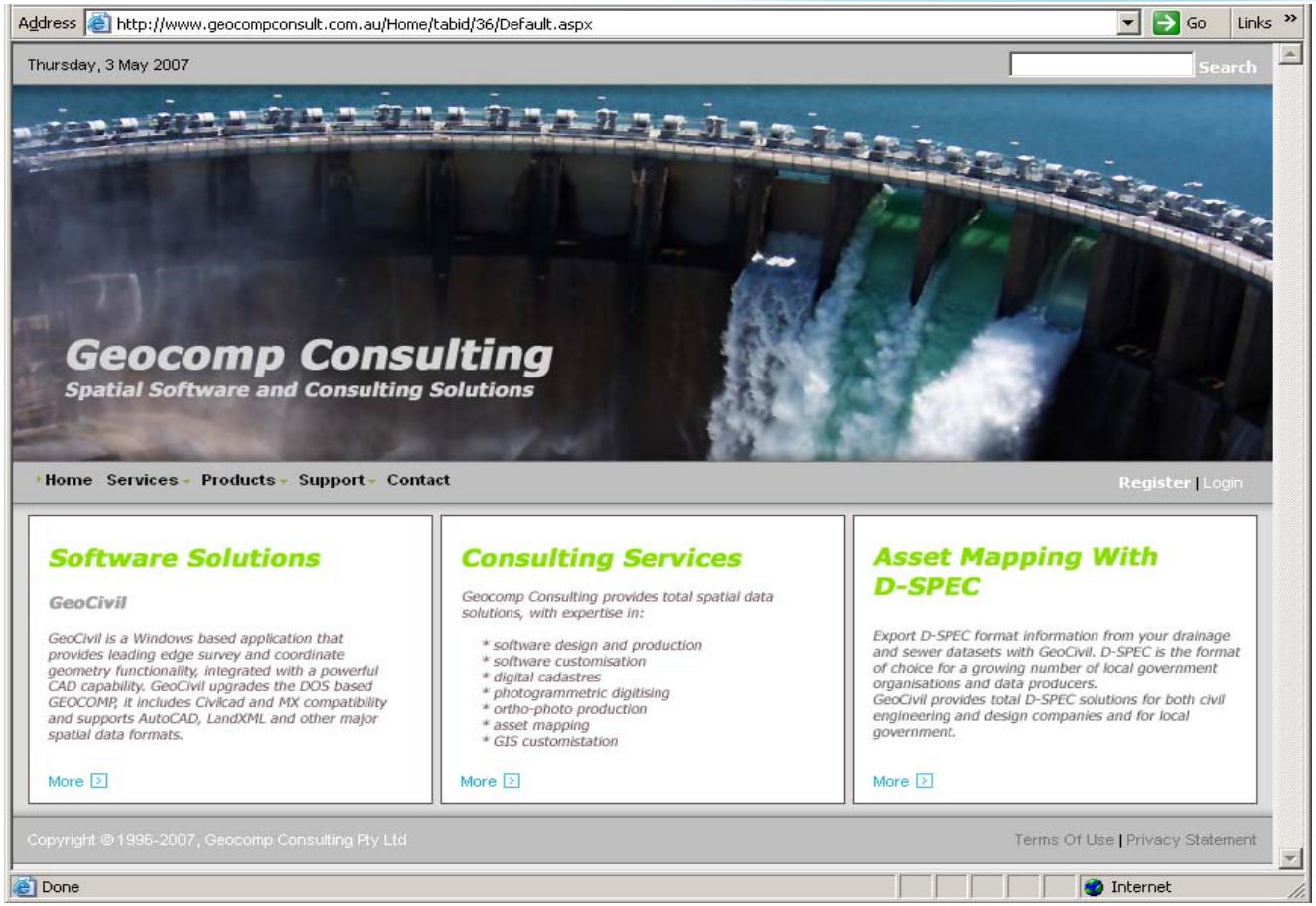
Industry Participation



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"Through the work of the A-Spec consortium, we now have a consistent approach when dealing with all Councils signed up to A-Spec."

"We are now looking to roll out that system across all our regional offices."

Beveridge Williams

A-Spec & Asset Recording

www.beveridgewilliams.com.au

Beveridge Williams is a multi-discipline, customer focused team of professionals offering services in surveying, urban design, town planning, water resources, civil engineering, project management, landscape architecture, environmental consulting and contamination assessment. The firm was established in 1961 and employs over 200 people with offices in Melbourne, Bairnsdale, Ballarat, Geelong, Leongatha, Sale, Traralgon and Wonthaggi.

Beveridge Williams provides a complete range of surveying services, utilising the latest technology including GPS and Total Station. We are committed to providing all clients with the highest level of services, on time and on budget. We have well established relationships with key individuals and industry organisations that are important to the success of land development and infrastructure projects.

A-Spec

Beveridge Williams also provides it's clients with A-Spec services for new estates. These include D (Drainage) - Spec, R (Roads) - Spec and O (Open Space) Spec. All are used to assist Authorities and Councils with locating, converting to GIS (Geographical Information Systems) and managing their infrastructure assets.

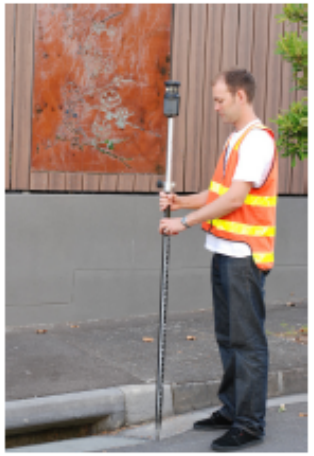
Authorities and Councils that Beveridge Williams provide A-Spec or asset recording services include:-

- Cardinia Shire Council;
- La Trobe Shire Council;
- Bass Coast Shire Council;
- Casey City Council

Asset Recording

Beveridge Williams uses advanced survey equipment that exceeds accuracies obtained from GPS technology to deliver the capture of infrastructure assets including sewerage, water and NBN.

Authorities and councils can also use the same technology to capture and/or audit existing asset information.



Authorities and councils are currently utilising GPS technology to capture their existing assets. GPS technology may provide unreliable data sets due to the accuracy limitations of the technology. Beveridge Williams can provide a quality audit of these processes and an error analysis to ensure the required accuracy of the data is being achieved.

As qualified measurement scientists Beveridge Williams can perform these procedure checks and educate staff in 'Best Practice Survey Techniques' to ensure the resultant data is of the required standard.

With field surveyors in all our offices we can also perform field audits of existing data sets to confirm their accuracy.

A well placed Victorian network

Always sensitive to the expanding needs of our clients, Beveridge Williams delivers a continually evolving range of services from its well-placed network of offices throughout Victoria. We are proud of our long history of successful infrastructure and subdivision projects. Our clients can look to us with confidence for cost effective and superior project outcomes.

Company Member
Association of Consulting Surveyors Victoria

UDIA Awards for Excellence 2007
'Consultants of the Year'
'Water Sensitive Urban Design'

Melbourne ph: 03 9524 8888
Bairnsdale ph: 03 5152 4708
Ballarat ph: 03 5327 2000
Geelong ph: 03 5222 6563
Leongatha ph: 03 5662 2630
Sale ph: 03 5144 3877
Traralgon ph: 03 5176 0374
Wonthaggi ph: 03 5672 1505

development & environment consultants

Aspec

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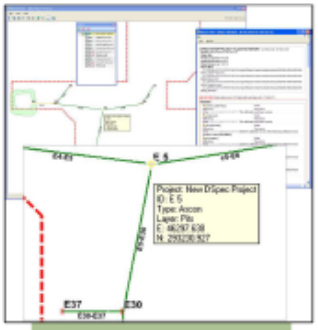
DSpecViewer

Import, display and validate DSpec Standard files.

Key Features

- A tool for importing, displaying and validating DSpec Standard files.
- Improve turn-around times in processing lodgements.
- Improve efficiency in the process of accepting lodgements and quality assurance.
- Easily incorporated into the existing workflow.
- Simple to use application.
- Quickly edit files and make changes using links from the report file.
- Better manage asset data.
- Supports MapInfo and ESRI native and exchange formats.



DSpecViewer Windows

The DSpecViewer is a validation tool has been designed to support both Local Government Organisation's and Consultant's efforts in complying with DSpec Specifications.

Using the DSpecViewer, datasets can be easily imported and assessed against the validation criteria. This includes checking attributes and geometry, plus making it easy to correct errors or input missing data. After the data is validated, Councils can be confident importing the dataset into their systems.

What is DSpec?

The ASpec program has been developed to provide a standard for Council's to manage their data with the aim to achieve efficiency and costs savings in maintaining their Geographic Information Systems (GIS) and Asset Management Systems (AMS). DSpec relates specifically to drainage and telecommunications data.

For more information on the DSpec Standard visit www.dspec.com.au.

Increase Efficiency

Improve your process for the examination of data on receipt and prevent erroneous or unacceptable data being uploaded to your GIS or AMS. Councils can quickly make decisions as to the acceptance of lodgments by your consultants and improve the quality of your data.

What can DSpecViewer do?

The DSpecViewer has a rich functionality and some of the key components are:

- ✓ MapInfo and ESRI native and exchange formats are supported for import and export.
- ✓ Full reports are produced showing errors.
- ✓ Effortlessly find errors by clicking on the links from the report view.
- ✓ Make single or global changes to attributes.
- ✓ Easily edit attribute fields in the attributes window.

- ✓ Add a georeferenced image for additional information.
- ✓ Layer control allows you to switch layers on and off for increased visibility.
- ✓ Save project files for future use and have multiple projects open at once.
- ✓ Reproject your dataset from a local grid projection or geographic coordinates.
- ✓ Easily create plots.
- ✓ Export the edited data ready for integration in your system.

Need more information?

To find out more about our products and services or to arrange a demonstration please visit our website at www.mapsolutions.com.au email info@mapsolutions.com.au or call 1300 669 973.

Aspec

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A2K Technologies

blackbox22 software

- Customisable
- Allows attribution of existing data
- In built reporting
- GIS ready output
- Can handle transformations

GISSA

Aspec digital data specifications

Open Spatial

ACDC

GISSA

LISCAD

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Product Information
FREE Evaluation
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LISCAD Dealers
Quote Request

Register
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LAND SURVEYING & CIVIL ENGINEERING SOFTWARE
WHAT'S NEW IN LISCAD VERSION 10.1

LISCAD Version 10.1 Surveying and Engineering Software introduces a multitude of new features and enhancements requested by customers around the world, making it even more powerful and comprehensive, while maintaining its intuitive ease of use. Some of the new features include:

- **Editing of Text enhanced**
  The View Edit Text command has been enhanced to allow the editing of both the actual text and the text attributes.
- **Support for AutoCAD 2013**
  Data Conversions has been enhanced to import DWG and DXF files in AutoCAD 2013 format. CAD Output has also been enhanced to create DWG and DXF files in AutoCAD 2013 format.
- **Support for MapInfo MIF/MID**
  The Export/MapInfo MIF/MID command has been added to support this format.
- **Support for D-SPEC**
  The Export/D-SPEC command has been added to support this in both MapInfo MIF/MID and ESRI shape file formats.
- **Import and Export of Topcon Civilcad LandXML**
  Data Conversions has been enhanced to both import and export files in the Topcon Civilcad LandXML format.

digital data specifications

Happy to Promote Industry Solutions

- Provide a two page brochure for A-SPEC website
  - Key criteria
    - Must be reviewed by GISSA for relevance
- GISSA happy to review outputs against A-SPEC requirements

GISSA

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OTHER ENGAGEMENT

GISSA

Inclusion in Other Relevant processes

growth areas AUTHORITY

partners in creating new communities

State Government Victoria

home | news & events | publications | links | contact us | search

- about us
  - our role
  - executive
  - board
  - job opportunities
  - vision and values
  - freedom of information
- growth areas
- urban growth zone
- precinct structure plans
- planning scheme amendments
- biodiversity
- growth areas infrastructure contribution (gaic)
- urban growth boundary (ugb) - growth areas logical inclusions review 2011
- urban growth boundary (ugb)

Home > About Us

About Us

The Growth Areas Authority is an independent statutory body with a broad, facilitative role to help create greater certainty, faster decisions and better coordination for all parties involved in planning and development of Melbourne's growth areas. We report directly to the Minister for Planning.

The goals of the Growth Areas Authority are to:

- Develop communities in growth areas that are socially, environmentally and economically sustainable.
- Work with industry and local Councils to ensure economic, employment and housing priorities are achieved in Melbourne's five growth areas.
- Improve the operation of regulatory and administrative processes over time to reduce costs and increase efficiencies for developers and local Councils.

The Growth Areas Authority was established in 2006 as part of the Victorian Government's plan for outer urban development, A Plan for Melbourne's Growth Areas. This plan sets out a vision for Melbourne's growth areas over the next 25 years.

The Growth Areas Authority works in partnership with local Councils, developers and the Victorian Government to help create sustainable, well serviced communities.

- Part of National Growth Areas Alliance
- 15 of 25

Inclusion in Other Relevant processes

MODEL CONDITIONS

D Spec and R Spec

SM_05 Prior to the issue of a Statement of Compliance, or any other time which the responsible authority agrees, the following must be provided to the responsible authority:

a) Copies of the "as constructed" engineering roads and drainage drawings in the format of one A1 tracing per drawing. The responsible authority may determine to accept digital data as an alternative.

b) As constructed measurements as digital data in a GIS ready format of the information component of the subdivision relating to drainage assets and assets with the road reserve in accordance with the current version of D-SPEC and R-SPEC.

c) Location of any permanent survey marks.

The various road works must be maintained by the owner until this condition has been complied with.

GAA Summary Comment: Updated the D-Spec and R-Spec condition to align with the VCAT decision in *Sunland Corporation Ltd* v *Wyndham CC* [2007] VCAT 2221 (16 November 2007). Also provides some flexibility in the format of data for Councils.

NOTE

Please refer to the A-SPEC website for further information: www.dspec.com.au.

partners in creating new communities

Related links

IDM Google Group
(members section)

Rainfall Intensity Frequency Duration Data

Growth Areas Authorities Engineering Standards Manual

Department of Planning and Community Development

Australian Standards On Line

D-SPEC

Water Sensitive Urban Design

Locate Survey Marks

Get involved

If you want to join the IDM group or make comments to improve the IDM, email the Development Coordinator, City of Greater Shepparton.

Engineering queries relating to

Download the Infrastructure Design Manual

The Infrastructure Design Manual is a living document and may be revised and amended from time to time. To ensure that everyone has access to the latest version of this manual it will only be available electronically on this web site.

Files

View the Infrastructure Design Manual (Version 3, September 2010) online document.
All attachments and appendices are linked to online resources. (PDF Format – 2.1 MB)

Download the Infrastructure Design Manual (Version 3, September 2010) complete package.
This download is comprised of the Infrastructure Design Manual (Version 3, September 2010), all attachments and appendices below compressed as a single file in ZIP format. (21.8 MB)
Includes Standard Drawings and Public Consultation Report (below)

Change log

Changes to the IDM – Version 3, September 2010
PDF format (68 KB)

Changes to the IDM – November 2009
PDF format (82 KB)

Attachments

Infrastructure Design Manual – Standard Drawings Index Sheet
PDF format (59 KB)

Infrastructure Design Manual – Standard Drawings
ZIP archive of PDF files (7.0 MB)

Infrastructure Design Manual – Standard Road Profiles
PDF format (543 KB)

ESTA

EMERGENCY MARKER

Call 000 and quote

ESL005

ESTA 000

Saving Time Saving Lives

Emergency Services Telecommunications Authority

Emergency Markers placed at key track intersections

Emergency Markers placed at locations where risk is increased, where multi activity use occurs

Emergency Markers placed at regular intervals

Park entrances and Information boards should indicate that EM's exist on the trail.

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IMPROVEMENTS and MODIFICATIONS

GISSA

digital data specifications

Common in all documents

GISSA

Identification of common fields

[AS 5488 Component]

Property Connection Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Description**
Type	Alpha	15 chars	No commas included	Property connection type. **EG: Extraction or Connection**
Status	Alpha	30 chars	No commas included	The current operational state of the asset. **EG: Disused. Default = In Use** *(Section 4 – D-SPEC Code Lists)*
St_Name	Alpha	40 chars	No commas included	Street name; Including street type (Rd, St, Crt, Dr etc). **EG: Jones Dr.** If not in a street, **Default=N/A**
DS_Pipe_No	Alpha/Numeric	35 chars	No commas included	Downstream pipe section the property connection is connected to. **EG: 37-38A**
Lot_No	Alpha/Numeric	20 chars	No commas included	Property lot number. **EG: 217**
Prop_Out_E	Floating Point	n/a	3 decimal places	Easting of connection to pipe
Prop_Out_N	Floating Point	n/a	3 decimal places	Northing of connection to pipe
Prop_In_E	Floating Point	n/a	3 decimal places	Easting of property end of pipe
Prop_In_N	Floating Point	n/a	3 decimal places	Northing of property end of pipe
Material	Alpha	10 chars	No commas included	Property connection material. **EG: PVC** *(Section 4. D-SPEC Code lists)*
Length	Floating Point	n/a	2 decimal places	Length of property connection in meters. **EG: 12.75**
Dia_Width	Integer	n/a	Whole mm	Diameter of property connection pipe. **EG: 450.** [AS 5488 Component]
IL	Floating Point	n/a	2 decimal places	Invert level at property end of pipe in meters. **EG: 1.75** [AS 5488 Component]
Silt_trap	Alpha	1 char	Yes/ No field	If silt trap exists then yes. **EG: "Y"** if not then **"N"** for no.
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision or Project Stage Number. **EG: 7 or 3B. Default=N/A**
Design_Co	Alpha	100 chars	No commas included	Design company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Plan number. **EG: 6080R212**
Const_Co	Alpha	100 chars	No commas included	Construction company name. **EG: Jamieson Drainage**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 12/03/2000**
Origin	Alpha/Numeric	100 chars	No commas included	Original coordinate system prior to transformation. **EG: Perth Coastal Grid. Default=N/A**
Transfrm	Alpha/Numeric	20 chars	No commas included	The coordinate system transformed to. **EG: MGA 94 Zn 49. Default=N/A**

Aspec
digital data specifications

2.8 Problems Attribute File Format Instructions

Problems Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Problem_No	Alpha/Numeric	10 chars	No commas included	Problem Number
Comment1	Alpha/Numeric	254 chars	No commas included	Comments about the problem
Comment2	Alpha/Numeric	254 chars	No commas included	Additional comment about the problem
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision or Project Stage Number. **EG: 7 or 3B or N/A**

Previously a form to be filled in

NOW

A digital file

GISSA

Aspec
digital data specifications

New Features in upcoming version of D-Spec

dspec
stormwater drainage specification

GISSA

Addition of a Glossary

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"**

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

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

PROPERTY CONNECTION

Mapping to AS5488

Table B1:

Attribute Information	Example of Format	Explanation	A-SPEC Coverage
Utility Type	Utility code and colour code	Type of 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	Telstra, Optus	Utility owner	Included as an attribute in appropriate tables in every specification
Feature Code	Alpha/numeric codes	Coding for utility features	Coding for all required features are specified in code lists in every specification
Size	110mm O.D. (outside diameter)	Outside or inside measurement	Included as an attribute in relevant attribute tables in every specification
Status	In service, redundant, decommissioned, abandoned	At the date and time of recording	Included as an attribute in relevant attribute tables in every specification
Material	PVC, asbestos, concrete encased	Type of material	Included as an attribute in relevant attribute tables in every specification
Configuration	Trench cross-section drawing	Layout of conduits or service if more than one	Layouts of required features are included under **'Section 1.3 – Graphical Data Construction Principles'** in every specification if required to be provided as digital data
			Layouts of required features are included under

Mapping to AS5488

The following table indicates how the A-SPEC standard data specifications D-Spec, S-Spec and W-Spec have been mapped to Table B3 in the AS 5488 Draft

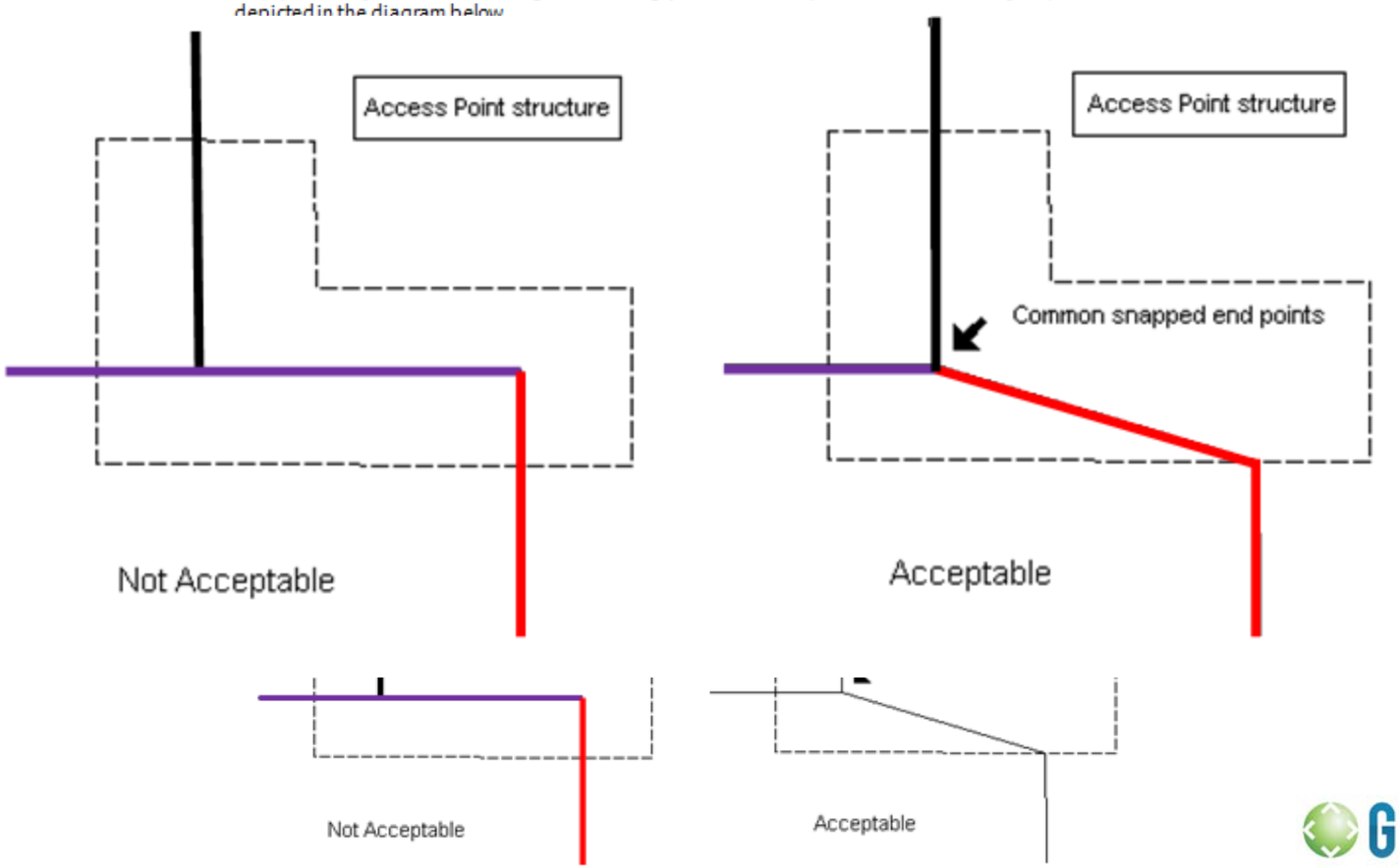
AS 5488			A-SPEC		
Entity	**AS 5488 Term**	**Code**	**Code/Field Name**	**Spec Covered**	**Description**
Water	Drainage box	DX	JP	D	Covered in **'Pit Types'** code list as **'Junction Pit'**
	Drainage Junction Manhole	DJM	JP	D	Covered in **'Pit Types'** code list as **'Junction Pit'**
	Drainage Pit	DP	-	D	Drainage pit types are defined in **'Pit Type'** code list. Default = Junction Pit
	Drain – Table Drain	DT	T_Drain	R	Table Drains (currently covered in R-SPEC)
	End of Wingwall	EWW		D	Wingwall dimensions are included in **'Pits'** attribute table
	Flood Height	FHT	-	-	Not required
	Gully Pit	GP	GP	D	Gully Pit/Grated Pit
	Gully pit point	GUL	-	-	Not required
	Headwall Bottom	HB	Height	D	Height of the headwall is included in **'Pits'** attribute table as **'Height'**.
	Headwall Bottom Point	HWB			
	Headwall Top	HW			
	Headwall Top Point	HWT			
	Inlet to sump	ILT	IL	D	Included in **'Pipes'** attribute table as **'Invert level'**
	Invert of Pipe	INV	IL	D	Included in **'Pipes'** attribute table as **'Invert level'**

dspec
stormwater drainage specification

Specific Detail for Capture

Joining Pipe Linework

All pipes must join and the Easting and Northing (XY coordinates) must be taken at the join point as depicted in the diagram below



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New Recording Example

Head Wall/End Wall

Figure:

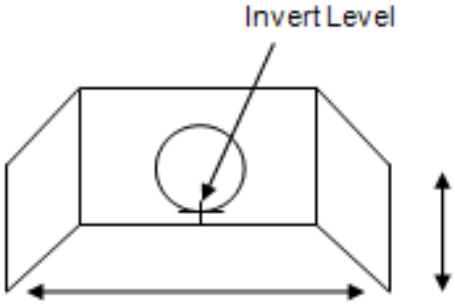

Figure: Front View

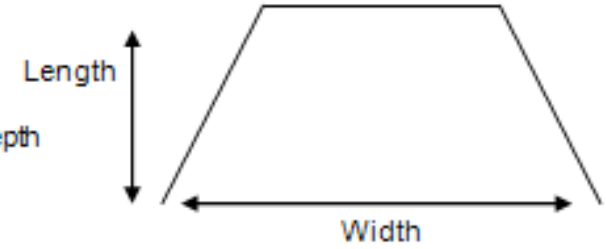

Figure: Plan View

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New Features in upcoming version

4.5 Pipe Types

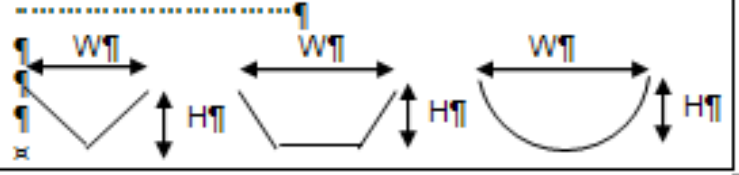
Code	Description	Comment
ABANDONED	Abandoned or Disused	An asset that is no longer in use
CULVERT	Culvert	A drain or channel crossing under a road
OPEN	Open	A flow channel not enclosed by a roof, arch or other structural lid
OUTFALL	Outfall	A point of discharge from drain to a water body
OVERFLOW	Overflow	A pipe or channel that carries excess water to or from a pit
PIPE	Pipe	A hollow cylinder or tube, solid or flexible, used to convey liquids
SUBSOIL	Subsoil	Sub-surface soil material comprising the B-horizons of soils with distinct profiles
TABLEDRAIN	Table drain	Side drain of a road adjacent to the shoulder. Can be V shaped, trapezoidal or parabolic 

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Table Drain

Table Drain (Polygon)

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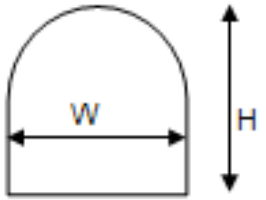
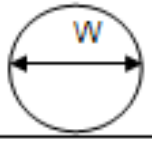
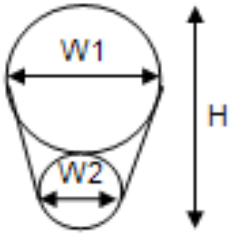
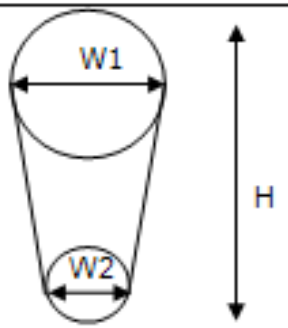
Code Lists
Pipe Shapes

Pipe Shapes

H = "**Height**" field
W/W1 = "**Dia_Width**" field
W2 = Second diameter for non-circular pipes "**Width2**" field

Pipes		
Code	**Description**	**Comment**
ARCH	Arch shaped pipe	
CIRC	Circular pipe	
EGG	Egg shaped pipe (Touching Circle)	
EGG2	Egg shaped pipe (non touching)	

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New PIT Code List

GF	Grated Footpath Pit	
GP	Grated Pit/Gully Pit	
GPT	Gross pollutant trap (Other types of GPTs: boulder trap, silt trap, trash rack, litter sock etc)	Grass Pollutant trap  Trash Rack  Boulder Trap  Silt Trap 
GS	Grated side entry pit/Side Entry Gully Pit (Added 10 Aug 2009)	

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Asset data

2.1 Pipe Attribute File Format Instructions

Pipe Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Type	Alpha	30 chars	No commas included	Pipe type. **EG: Pipe, open, culvert, subsoil**
Status	Alpha	30 chars	No commas included	The current operational state of the asset. **EG: In Use, Abandoned, Removed, Other Use. Default = In Use**
Pipe_No	Alpha/Numeric	25 chars	No commas included	Unique number in this Stage derived from pit numbers. **EG: 37-38A**
Up_Pit_No	Alpha/Numeric	10 chars	No commas included	Upstream Pit Number
Dn_Pit_No	Alpha/Numeric	10 chars	No commas included	Downstream Pit Number
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
St_Name	Alpha	40 chars	No commas included	Including street type (Rd, St, Crt, Dr etc). **EG: Jones Dr**
DS_IL	Floating Point	n/a	2 decimal places	Downstream end-of-pipe Invert Level
DS_Pipe_E	Floating Point	n/a	3 decimal places	Downstream end-of-pipe X Coordinate
DS_Pipe_N	Floating Point	n/a	3 decimal places	Downstream end-of-pipe Y Coordinate
US_IL	Floating Point	n/a	2 decimal places	Upstream end-of-pipe Invert Level
US_Pipe_E	Floating Point	n/a	3 decimal places	Upstream end-of-pipe X Coordinate
US_Pipe_N	Floating Point	n/a	3 decimal places	Upstream end-of-pipe Y Coordinate
Pipe_Con	Alpha/Numeric	50 chars	No commas included	**Example 1**. - Configuration of conduits/ pipes in culverts 3x150 i.e. 3 conduits / pipes @ 150mm diameter each. **Example 2**. - Configuration of conduits/ pipes in culverts 3x150x300 i.e. 3 conduits / pipes @ 150mm diameter_/ width by 300 height each. (please note configurations may vary)
Length	Floating Point	n/a	2 decimal places	Pipe section length in metres. **EG: 100**
Dia_Width	Integer	n/a	Whole mm	Pipe Diameter or Width if a culvert or non-circular. **EG: 450**
Height	Integer	n/a	Whole mm	Pipe Height. Needs to be populated for non circular pipes. **EG: 450.** If circular, **Default=-9999**
Shape	Alpha	10 chars	No commas included	Shape of the pipe. Refer to Code list. **EG: CIRC** *(Section 4 – S-Spec Code Lists)*
Width2	Integer	n/a	Whole mm	2nd pipe diameter when non-circular. **EG: 200. Default = -9999 for circular**

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Pipe Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Material	Alpha	30 chars	No commas included	Pipe material. **EG: RC** *(Section 4. D-SPEC Code lists)*
Rl_Rn_Mtd	Alpha	100 chars	No commas included	Relining or renewal method. **EG: Cured in place. Default = N/A**
Rl_Rn_Mat	Alpha	30 chars	No commas included	Relined or renewed material. **EG: Fibreglass. Default = N/A**
ARI	Date	n/a	dd/mm/yyyy	Average Recurrence Interval of the pipe
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision or Project Stage Number. **EG: 7 or 3B or N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Plan Number. **EG: 6080R212**
Const_Co	Alpha	100 chars	No commas included	Company name only. **EG: Jamieson Drainage**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 17/05/2001**
Origin	Alpha/Numeric	50 chars	No commas included	Original coordinate system prior to transformation. **EG: Perth Coastal Grid**
Transfrm	Alpha/Numeric	20 chars	No commas included	The coordinate system transformed to. **EG: MGA Zn 49**
Transf_by	Alpha/Numeric	100 chars	No commas included	Who carried out the transformation. **EG: City of Gosnells**
Source	Alpha/Numeric	50 chars	No commas included	**EG: As Constructed field work, As Designed – drawings, Aerial Photography, Topographic Maps – 1:25,000, etc**
Comments	Alpha/Numeric	240 chars	No commas included	Any additional comments that relate to this pipe section

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End d-spec

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Requirements

- Looking for most elements from the design
- **Not all** features will need attributes
- To be certified **“As constructed measurements”**
  - But do not expect field pick up as per D-Spec
- Linked to **Statement of Compliance**

Features to be Captured

1.5 Theme/Layer Structure

Asset Type	File Name	Description	Attribute Table
Road Reserve	Road	Property Boundary to Property Boundary	No. Graphics Only.
Seal / Pavement Width	Pave_Width	Lip of Kerb to Lip of Kerb	No. Graphics Only.
Seal Centreline	S_CLine	Centreline of Road, from intersection to intersection or to the end of current works	Yes
Pathways	Pathways	Perimeter of Pathway	No. Graphics Only.
Pathway Centreline	P_CLine	Centreline of Pathway, from intersection to intersection or to the end of current works	Yes
Car Parking	Parking	Perimeter of Parking Area	Yes
Kerb/Kerb & Channel & Shoulder	Kerbs	Back of the Kerb. If NO Kerb & Channel, edge of the shoulder must be provided.	Yes
Traffic Mgt - Devices	Dev_Perim	Perimeter of Device	Yes
Traffic Mgt - Lines	Tr_Lines	Line Markings, Pedestrian crossings/ medians/ chevrons	No. Graphics Only.
Traffic Mgt - Devices	Dev_Loc	Location of Device	Yes
Bridge / Major Culvert & Abutments	Bridges	Perimeter of Bridge / Major Culvert & Abutment	Yes
Signs	Signs	Centre of Sign	Yes
Trees	Trees	Centre of Tree	Yes
Water Hydrants	Hydrant	Centre of Water Hydrant	Yes
Lighting	Lighting	Non-standard Public Lighting	Yes
Vehicle Crossing	Vhcl_Cross	Driveway access	No. Graphics Only.
Road Safety Barriers	Barriers	Centreline depicting extents of barrier	Yes

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Other Asset Types that may be found in the Road Reserve

The following asset types may also be found in the "Road Reserve" but are covered in another specifications developed by the A-SPEC Consortium.

Asset Type	Description	A-SPEC Specification
Minor Structures	Perimeter of Structure. Eg: Pergola, Toilets, Shade Sale, Rotunda....	Please refer to **O-Spec**
Fences	Line indicting the position of the fence.	Please refer to **O-Spec**
Amenities	Central location of Amenity. Eg: BBQ, Tanks, Park Furniture	Please refer to **O-Spec**
Bins	Central location of Bin. Eg: BBQ, Tanks, Park Furniture	Please refer to **O-Spec**
Services (Point)	Supply of Power, Water, and Gas – Metre and/or outlet Location	Please refer to **O-Spec**
Services (Line)	Supply of Power, Water, and Gas lines	Please refer to **O-Spec**
Public Art / Memorials	Centre of Artwork. Eg: Statue	Please refer to **O-Spec**
Landscaping	Landscaping Areas Eg: Garden Beds, lawns, Habitat Rehab Area	Please refer to **O-Spec**
Irrigation (Point)	Sprinkler location	Please refer to **O-Spec**
Irrigation (Line)	Irrigation line location	Please refer to **O-Spec**
Stormwater Pipes		Please refer to **D-Spec**
Stormwater Pits		Please refer to **D-Spec**
Water Storage (Dam)		Please refer to **D-Spec**

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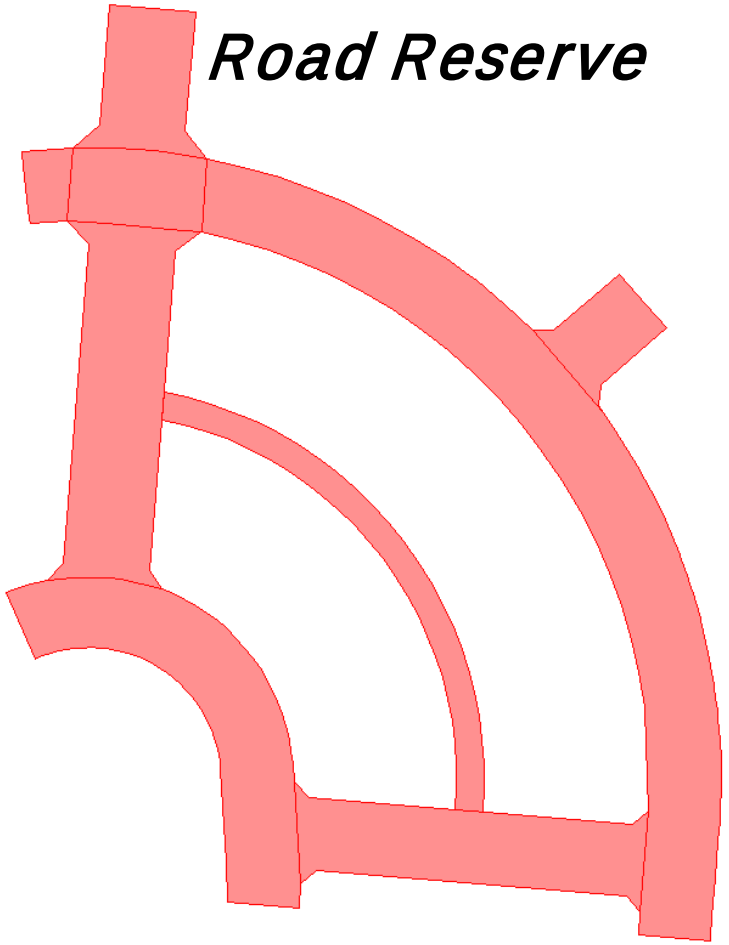
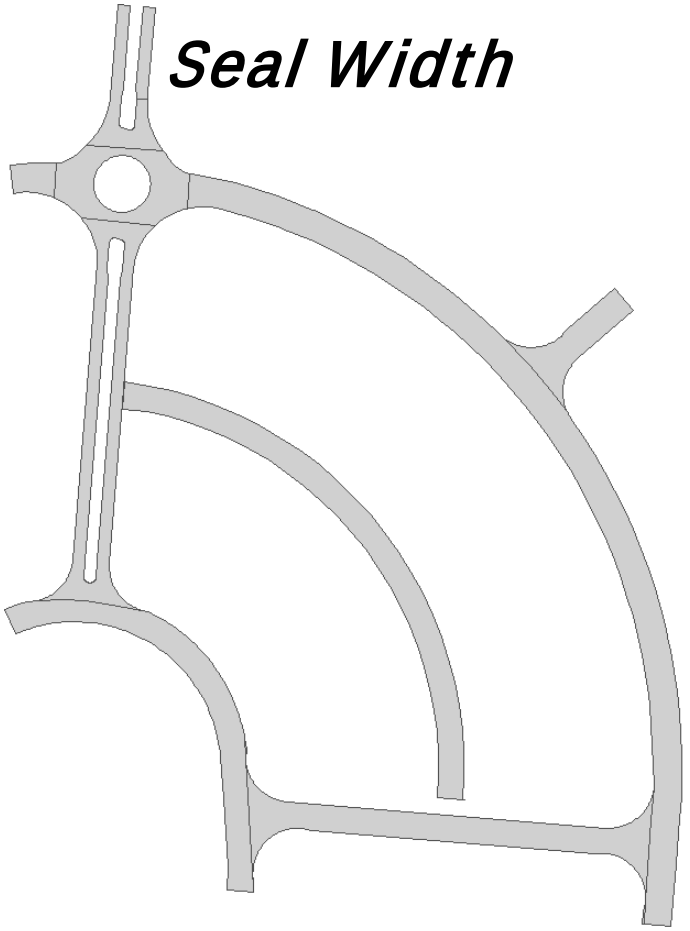
Example - without Attributes

Road Reserve



Seal Width



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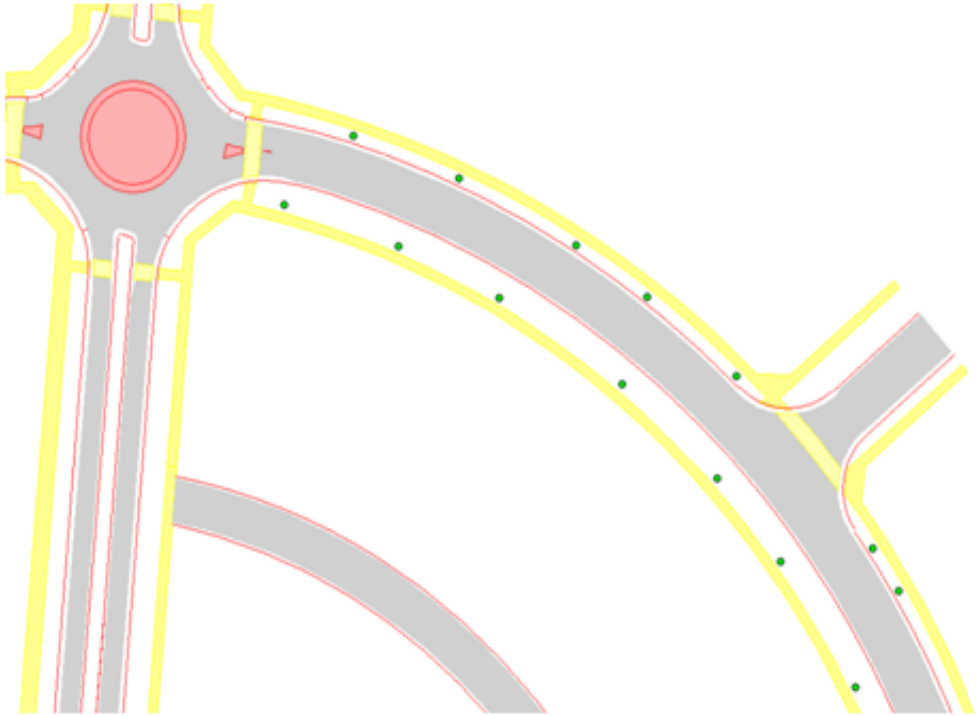
Example - with Attributes

1.4.13 Trees (Point)

Centre of the Tree is to be represented as a point. This will correspond with the attribute table. (Shown in green in the diagram below)



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Attributes

2.3 Seal Centreline File Format Instructions

Column Name	Data Type	Max Length	Comments	Contents
St_Name	Alpha	100 chars	No commas included	Street Name; Including street type (Rd, St, etc) for example: Jones Dr
Road_from	Floating Point	n/a	2 decimal places	Chainage at start of street segment
Road_to	Floating Point	n/a	2 decimal places	Chainage at end of street segment
No_lanes	Integer	n/a		Number of lanes
Seg_length	Floating Point	n/a	2 decimal places	Centreline segment length between chainages in metres
Seal_Type	Alpha	100 chars	No commas included	Seal material or wearing course, for example Bitumen
Seal_W	Floating Point	n/a	2 decimal places	Width of seal in "metres"
Seal_D	Integer	n/a	Whole mm	Depth of seal in millimetres
Pavement_W	Floating Point	n/a	2 decimal places	Width of base course underneath seal.
Base1Type	Alpha	100 chars	No commas included	The **type of base** course material. For Victorian members as per VicRoads Standard Specification http://www.vicroads.vic.gov.au/NR/rdonlyres/AED0401E-FB1B-464E-A5E8-28AA4EDA7491/0/sd5300.pdf *Where only one course of material is used, enter the type in "Base1Type" column. The column "Base2Type" and "Base3Type" is to be left blank.*

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Checks

3.3 Pavement Centreline Attribute Data Validation Checks

The following guidelines are designed to assist Developer/Consultants when putting together information in the Pavement Centreline attribute file.

Attribute	Technical Description	QA Validation
Street Name *(St_Name)*	An Alpha data type is to be used with a maximum of 100 characters. No commas are to be used in this field. **EG: Jones Dr**	Field cannot be empty
Road from *(Road_from)*	A Floating-Point data type is to be used to two decimal places.	Field cannot be empty. Will be used in the computation check of the pipe length This is to be the starting chainage of the centreline The chainage is to correspond with the pavement length, when the pavement type changes this will constitute a separate centreline.
Road to *(Road_to)*	A Floating-Point data type is to be used to two decimal places.	Field cannot be empty. Will be used in the computation check of the pipe length This is to be the finishing chainage of the centreline
Number of lanes *(No_lanes)*	An Integer data type is to be used in whole numbers.	Field cannot be empty

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Code List

Traffic Management Type

Code	Description	Comment
MS	Median strip	
SI	Splitter island	
RB	Roundabout	
RPAV	Raised pavement	
CHI	Chicane	
TI	Tee Intersection	
IP	Intersection Platform	
SB	Speed Bump	
PR	Pedestrian Refuge	
BST	Bus Stop	To be represented as a point
BSH	Bus Shelter	To be represented as a polygon
SC	School Crossings	

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New Features in upcoming version of R-Spec

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Bridges / Major Culverts

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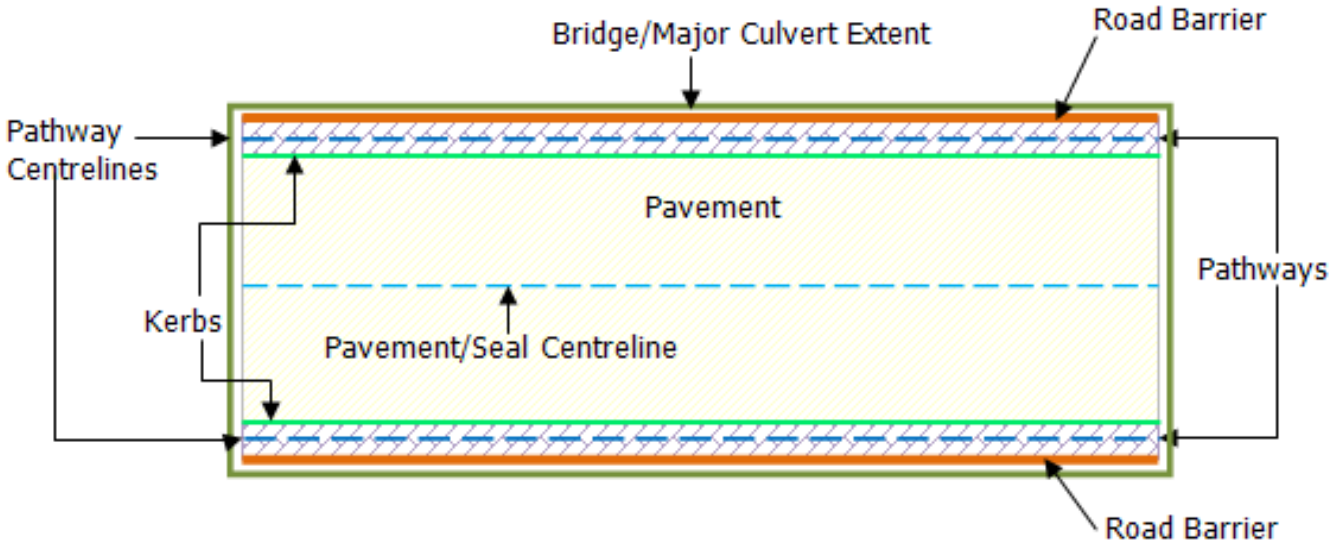
Combined Graphical Representation:

2. This is the combined graphical representation of the components of a bridge or major culvert that should be captured.
   Please comment on the clarity and level of detail provided in these diagrams



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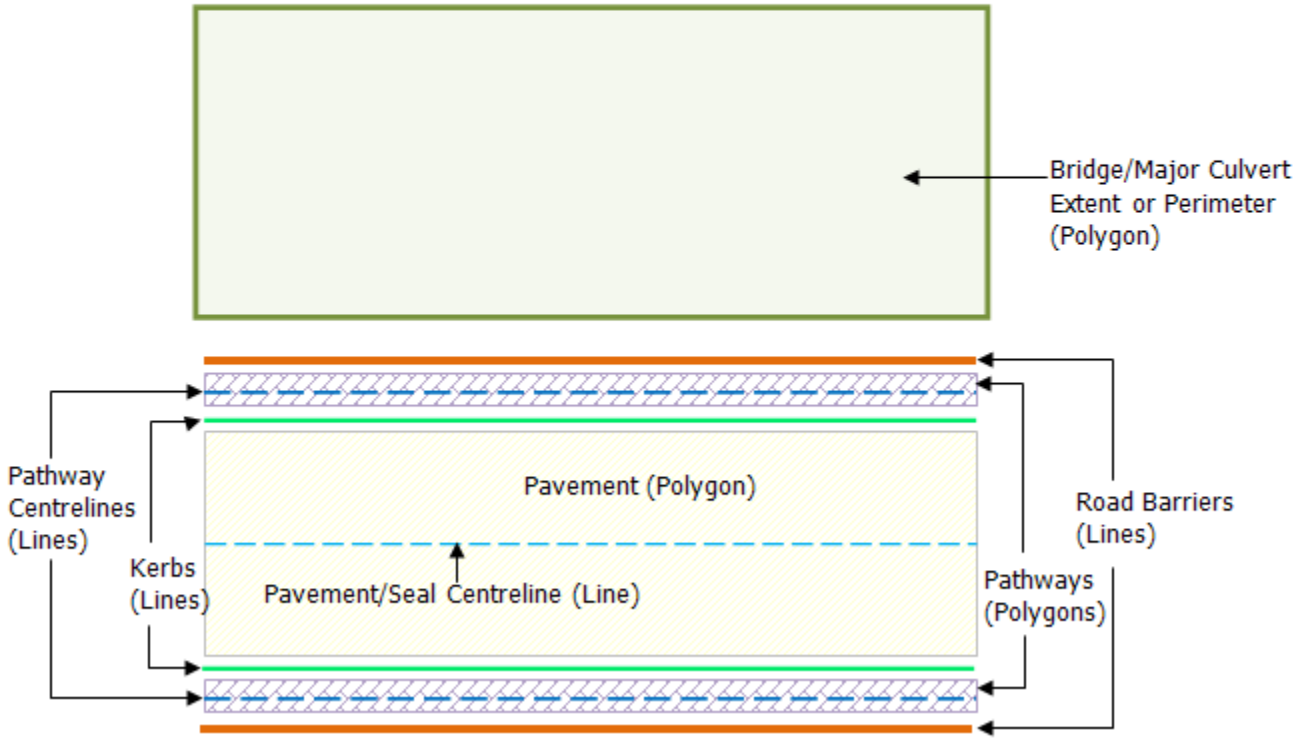
Individual Element Capture:

Following are a break up of all individual elements that needs to be captured (please note that they have been separarted for identification)



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Culvert and Cell Dimensions:

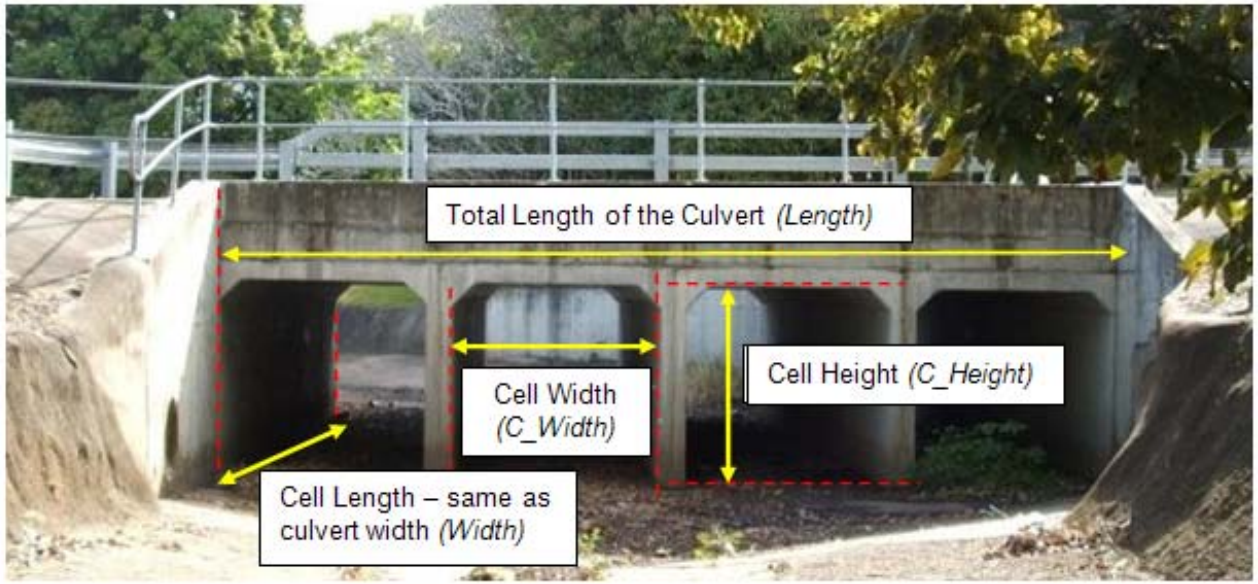

Image Source: LGAM Knowledge Base

Dimensions of a culvert that needs to be captured are shown in the above diagram. The respective attribute for each is given within brackets.

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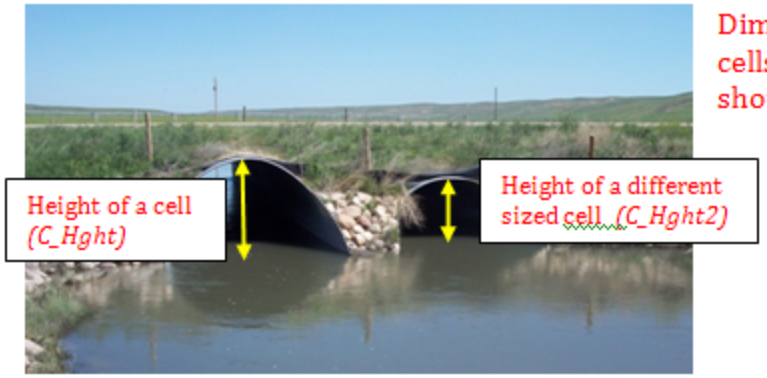
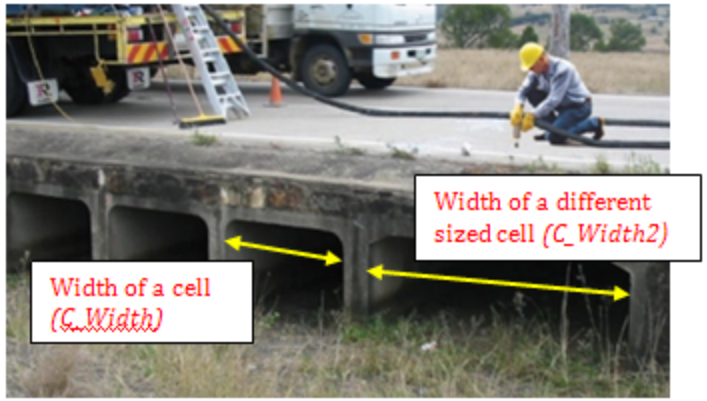
Following are examples for culverts with different sized cells:



Dimensions of a culvert with different sized cells and their respective attribute names are shown here.

Cells with different heights



Cells with different widths

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Major culverts are culverts with a total length greater than or equal to 6m.

Bridge/Major Culvert & Abutment Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
St_Name	Alpha	40 chars	No commas included	Street Name; Including street type (Rd, St, etc). **EG: Jones Dr**
Type	Alpha	30 chars	No commas included	Feature Type. **EG: Road** *(Section 4, R-SPEC Code lists)*
Config	Alpha/Numeric	100 chars	No commas included	Pipe Configuration. **EG: –** Configuration of conduits/pipes in culverts 3x150x300. i.e. 3 conduits/pipes @ 150mm diameter/width by 300mm height each. (Please note configurations may vary). NOTE: Populate only if the feature is a culvert. If not a culvert, **Default=N/A**
Span_Cell	Integer	n/a	Whole number	Number of spans of a bridge or number of cells in a culvert. **EG: 2.**
Material	Alpha	30 chars	No commas included	Material of the feature. **EG: Steel**
Pav_Mat	Alpha	30 chars	No Commas included	Pavement Material. Populate only if the Bridge Type is 'Road Bridge'. If not a 'Road Bridge', **Default=N/A**
Function	Alpha	30 chars	No commas included	Function of the feature. **EG: Over road** or **Under road / Over railway** or **under railway / Over watercourse** etc.
Clearance	Floating	n/a	2 decimal place	Distance between water feature and the bridge at the high water mark in metres. In the event of inland water at high water mark **or** tidal water at high tide. **EG: 1.5m** Populate only if the feature is over a watercourse. If not over a watercourse, **Default = -9999.99**
No_Beams	Integer	n/a	Whole number	Number of beams. Populate only if the feature is a bridge. If not a bridge, **Default = -9999**
Beam_Mat	Alpha	30 chars	No commas included	Beam material. **Default=N/A**

Bridge/Major Culvert & Abutment Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Deck_Mat	Alpha	30 chars	No commas included	Deck material. **Default=N/A**
Pier_Type	Alpha	20 chars	No commas included	Pier type. **Default=N/A**
Pier_Mat	Alpha	30 chars	No commas included	Pier material. **Default=N/A**
Waterway	Alpha	1 char	No commas included	Existence of a waterway. **EG: Y** or **N**
WW_Name	Alpha	30 chars	No commas included	Name of the crossing waterway. If no waterway, **Default=N/A**
Limit	Integer	n/a	Whole Tonnes	Vehicular load limit on the bridge in tonnes. **EG: 25**
Abut_Mat	Alpha	30 chars	No commas included	Abutment material. If no Abutment, **Default=N/A**
Width	Floating Point	n/a	2 decimal places	Width of the bridge or culvert in metres. **EG: 2.45**
Length	Floating Point	n/a	2 decimal places	Length of the bridge or total length of the culvert in metres. **EG: 20.50**
C_Width	Floating Point	n/a	2 decimal places	Width of a single cell in a culvert or diameter if circular in metres. **EG: 1.16.** If not a culvert, **Default = -9999.99**
				Width of a single cell in a culvert or diameter if circular in metres if there is a cell with a

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Table Drain Attribute File Format Instructions

Table Drain File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
St_Name	Alpha	40 chars	No commas included	Street Name; Including street type (Rd, St, etc) **EG: Jones Dr**
Shape	Alpha	20 chars	No commas included	Shape of the table drain. **EG: V shaped, trapezoidal, parabolic**
Length	Floating Point	n/a	2 decimal places	Length of the table drain in metres. **EG: 30.25**
Width	Floating Point	n/a	2 decimal places	Width of the table drain in metres.
Material	Alpha	30 chars	No commas included	Table drain material. **EG: Natural**
Owner	Alpha	30 chars	No commas included	Owner of the asset. Council / Other
RespAuth	Alpha	100 chars	No commas included	The name of the responsible Authority for maintenance purposes.
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision or Project Stage Number. **EG: 7 or 3B or N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Plan Number. **EG: 6080R212**
Const_Co	Alpha	100 chars	No commas included	Company name only. **EG: Jamieson Drainage**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 17/05/2001**
Origin	Alpha/Numeric	100 chars	No commas included	Original coordinate system prior to transformation. **EG: Perth Coastal Grid**
Transfrm	Alpha/Numeric	20 chars	No commas included	The coordinate system transformed to. **EG: MGA 94 Zn 49**
Transf_by	Alpha/Numeric	100 chars	No commas included	Who carried out the transformation. **EG: City of Gosnells**
Source	Alpha/Numeric	50 chars	No commas included	What was the source of the data and its accuracy. **EG: As Designed drawings**
Comments	Alpha/Numeric	240 chars	No commas included	Any additional comments that relate to this feature

Pathway Descriptors

'Boardwalk' is removed from this list and moved in to **O-SPEC**. It is suggested that Boardwalks are no longer considered to be part of **R-Spec**

4.1 Pathway Type

Code	Description
BA	Beach Access
BWK	Boardwalk
FP	Footpath
HT	Horse Trail
PA	Pedestrian Access
SP	Shared Path
WT	Walking Track

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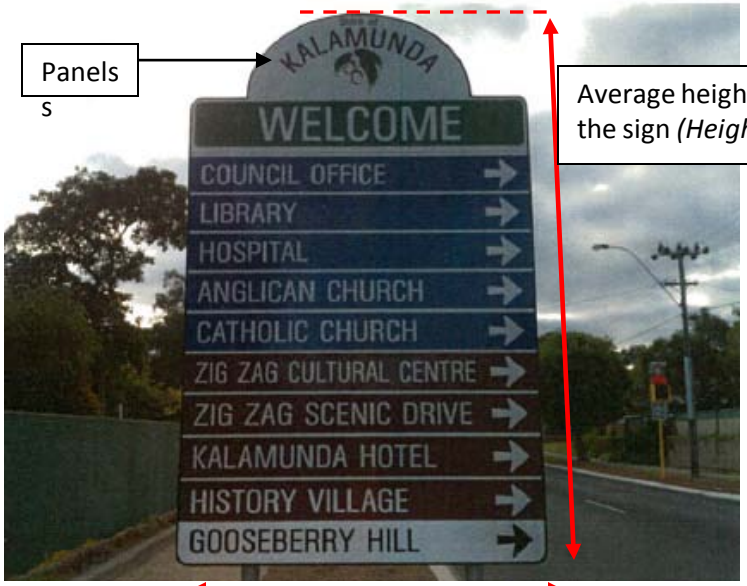
Trees

Trees Attribute File Format Instructions

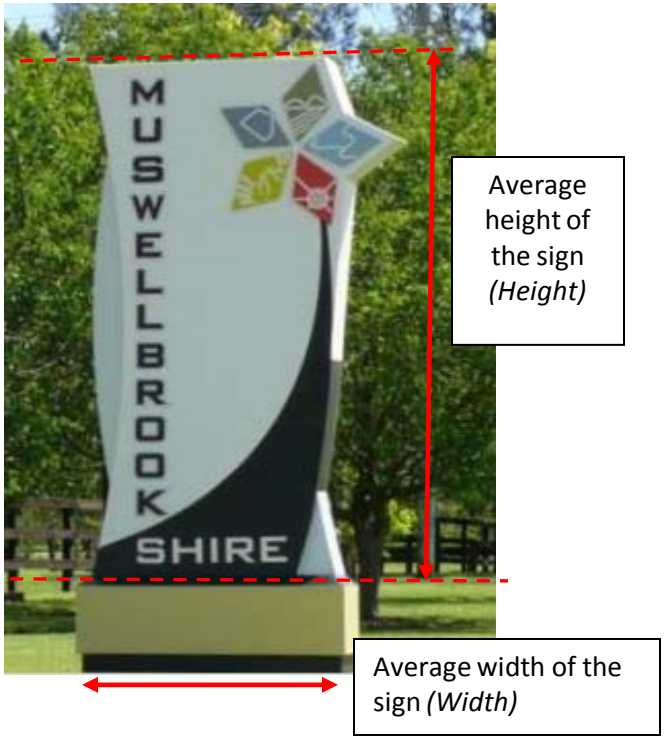
Trees Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
St_Name	Alpha	40 chars	No commas included	Street Name; Including street type (Rd, St, etc) **EG: Jones Dr**
SLK	Floating Point	n/a	2 decimal places	Chainage at asset location. Not required if asset is located in Open Space. This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Common	Alpha	100 chars	No commas included	Common Name. **EG: River Red Gums**
Species	Alpha	100 chars	No commas included	Tree Species. **EG: Eucalyptus Camaldulensis**
Guard	Alpha	1 char	Yes / No field	If the Tree/Plant has guards. **EG: N**
Plant_Mtd	Alpha	10 chars	No commas included	Plant method of the tree. **EG: Remnant** *(Section 4. R-SPEC Code Lists)*
Age	Alpha	2 chars	No commas included	Age of the tree. **EG: YN** *(Section 4. R-SPEC Code Lists)*
Height	Integer	n/a	Whole number	Tree height. **EG: 2** *(Section 4. R-SPEC Code Lists)*
Signific	Alpha	20 chars	No commas included	Significance of the tree. **EG: Historical** *(Section 4. R-SPEC Code Lists)*
Wires	Alpha	1 char	Yes/No field	Existence of overhead wires. **EG: Y** or **N.** Wire type can be mentioned in the Comments field.
Location	Alpha	30 chars	No commas included	Plant location. **EG: Traffic island, footpath, park, reserve**
Maintain	Alpha	240 chars	No commas included	Maintenance issues. **EG: Seasonal fruiting, Seasonal leafing**
Photo_Ref	Alpha/Numeric	50 chars	No commas included	Reference photograph of asset. **EG: 12345abcd67ef.jpeg** Provide photograph references for all new and existing assets. For existing assets, **Default=N/A**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision or Project Stage Number. **EG: 7 or 3B or N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Plan Number. **EG: 6080R212**
Const_Co	Alpha	100 chars	No commas included	Company name only. **EG: Jamieson Drainage**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date (in this case, Date the plant/tree is being planted). **EG: 17/05/2001**
Origin	Alpha/Numeric	100 chars	No commas included	Original coordinate system prior to transformation. **EG: Perth Coastal Grid**
Transfrm	Alpha/Numeric	20 chars	No commas included	The coordinate system transfomed to. **EG: MGA 94 Zn 49**
Transf_by	Alpha/Numeric	100 chars	No commas included	Who carried out the transfomation. **EG: City of Gosnells**
Source	Alpha/Numeric	50 chars	No commas included	What was the source of the data and its accuracy. **EG: As Designed drawings**
Comments	Alpha/Numeric	240 chars	No commas included	Any additional comments that relate to this feature

rspec road specification

Signs



There are 11 panels in this sign.



There is 1 panel only in this sign.

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rspec road specification

Signs

Signs Attribute File Format Instructions

Signs Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Loc_Name	Alpha	40 chars	No commas included	Sign location Name. **EG: Building Name, Street Name, Park Name etc.**
Type	Alpha	30 chars	No commas included	Sign type. Refer to Australian Standards
SLK	Floating Point	n/a	2 decimal places	Chainage at asset location. If the sign is in Open Space then SLK is not required This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sign_Ref	Alpha/Numeric	40 chars	No commas included	Standard **Local** Sign Reference Number
No_Panels	Integer	n/a	Whole Number	Number of panels in the sign. **EG: 2**
Sign_Mat	Alpha	30 chars	No commas included	Material of the sign panel
Width	Integer	n/a	Whole mm	Average Width of the sign.
Height	Integer	n/a	Whole mm	Average Height of the sign.
Supp_Type	Alpha	20 chars	No commas included	Support type of the sign. **EG: On a post, Attached to a wall, concrete base**
No_Supps	Integer	n/a	Whole Number	Number of supports. **EG: 2**
Supp_Mat	Alpha	30 chars	No commas included	Material of the support.
Photo_Ref	Alpha/Numeric	50 chars	No commas included	Reference photograph of asset. **EG: 12345abcd67ef.jpeg** Provide photograph references for all new and existing assets. For existing assets, **Default=N/A**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision or Project Stage Number. **EG: 7 or 3B or N/A**

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Lighting
Not street lighting

2.16 Lighting Attribute File Format Instructions

Lighting Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
St_Name	Alpha	40 chars	No commas included	Street Name; Including street type (Rd, St, etc) **EG: Jones Dr.** If not in a street, **Default=N/A**
Location	Alpha	40 chars	No commas included	Location of the light if not in a road reserve. **EG: Park (specify park name)**
SLK	Floating Point	n/a	2 decimal places	Chainage at asset location. If in Open Space this field is not required. This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Type	Alpha	20 chars	No commas included	Lighting Type. **EG: Directional** *(Section 4. R-SPEC Code Lists)*
Man_Imp	Alpha	100 chars	No commas included	Name of the Manufacturer or Importer. **EG: Australian Lighting Company**
Connection	Alpha	10 chars	No commas included	Connection Type, Above ground, below ground. **EG: Above** or **Below**
Pole_Type	Alpha	20 chars	No commas included	Pole type. **EG: Pedestal, cantilever, butterfly**
P_Height	Floating Point	n/a	2 decimal places	Pole height in meters. **EG: 2.25**
P_Finish	Alpha	20 chars	No commas included	Pole finish. **EG: Painted, Galvanised**
Lumi_Type	Alpha	20 chars	No commas included	Luminaire type
L_Manufact	Alpha	100 chars	No commas included	Luminaire manufacturer
No_Lumis	Integer	n/a	Whole number	Number of luminaires. **EG: 2**
Wattage1	Integer	n/a	Whole number	Wattage of the first Luminaire. **EG: 100**
Wattage2	Integer	n/a	Whole number	Wattage of the second Luminaire. **EG: 100** If there's only one Luminaire, then enter the wattage in Lumi_Watt1 field. For Lumi_Watt2, **Default=N/A** If there are more than two luminaires, add fields to the table accordingly.
Photo_Ref	Alpha/Numeric	50 chars	No commas included	Reference photograph of asset. **EG: 12345abcd67ef.jpeg** Provide photograph references for all new and existing assets. For existing assets, **Default=N/A**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project Name. **EG: Rockbank Rise or Henley St extension**

End r-spec

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open space specification

Features to Capture

Asset Type	Feature (Object Type)	Description	Attribute Table
Open Space	Polygon (Closed Polyline)	Perimeter of Open Space – Eg: Park, Nature Reserve, Bushland.	**Yes**
Playing Fields	Polygon (Closed Polyline)	Perimeter of Playing Field – Eg: Football, Tennis, Hockey, Baseball…	**Yes**
Playgrounds	Polygon (Closed Polyline)	Perimeter of Playground,	**Yes**
Minor Structures	Polygon (Closed Polyline)	Perimeter of Structure. Eg: Pergola, Toilets, Shade , Rotunda….	**Yes**
Fences	Line (Polyline)	Line indicting the position of the fence.	**Yes**
Amenities	Point	Central location of Amenity. Eg: BBQ, Tanks, Park Furniture	**Yes**
Bins	Point	Central location of Bin. Eg: BBQ, Tanks, Park Furniture	**Yes**
Public Toilets	Polygon (Closed Polyline)	Perimeter of Toilet Structure.	**Yes**
Services (Point)	Point	Supply of Power, Water, and Gas – Metre and/or outlet Location	**Yes**
Services (Line)	Line (Polyline)	Supply of Power, Water, and Gas lines	**Yes**
Public Art / Memorials	Point	Centre of Artwork. Eg: Statue	**Yes**
Landscaping	Polygon	Landscaping Areas Eg: Garden Beds, lawns, Habitat Rehab Area	**Yes**
Irrigation (Point)	Point	Sprinkler location	**No**
Irrigation (Line)	Line (Polyline)	Irrigation line location	**No**

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open space specification

Features to Capture

Pathways	Please refer to **R-Spec**
Car Parking	Please refer to **R-Spec**
Trafficable Width	Please refer to **R-Spec**
Pavement Centreline	Please refer to **R-Spec**
Kerb / Kerb & Channel & Shoulder	Please refer to **R-Spec**
Bridge / Major Culvert & Abutments	Please refer to **R-Spec**
Signs	Please refer to **R-Spec**
Trees	Please refer to **R-Spec**
Lighting	Please refer to **R-Spec**
Fire Hydrants	Please refer to **R-Spec**
Stormwater Drains	Please refer to **D-Spec**
Stormwater Pits	Please refer to **D-Spec**
Water Storage (Dam)	Please refer to **D-Spec**

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ospec

open space specification

- Looking for most elements from the design
- Not all features will need attributes

- To be certified “As constructed”
  - But do not expect field pick up as per D-Spec

- Linked to Statement of Compliance

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Examples of features

open space specification

1.3.20 Playground and Exercise Equipment (Point)

- The central location of a Playground Equipment (EG: Location of slide (O-Spec code - SD)) is to be represented as a point.

Figure 12: Playground Equipment
Photograph Reference from – Wattle Range Council

Figure 13: Exercise Station (in WA)
Photograph Courtesy: GISSA International

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NEW Features to Capture

open space specification

2.19 Boardwalk Attribute File Format Instructions

Asset to be provided as a Polygon (Closed Polyline) representing the perimeter of the Boardwalk.

Boardwalk Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Name	Alpha	50 chars	No commas included	Name of feature. **EG: The Mangrove Boardwalk**
Material	Alpha	30 chars	No commas included	Boardwalk surface material. **EG: Timber**
Length	Floating Point	n/a	2 decimal places	Length of the Boardwalk in metres
Width	Floating Point	n/a	2 decimal places	Width of the Boardwalk in metres
Rail_Type	Alpha	50 chars	No commas included	Boardwalk Rail Type. **EG: Top rail with wire rope**
Rail_Mat	Alpha	30 chars	No commas included	Boardwalk Rail material. **EG: Timber**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project. **EG: Wyndham Vale**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision Stage Number. **EG: 7 or 3B. Default=N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Design Plan Number. **EG: 6080R212**
Const_Co	Alpha	100 chars	No commas included	Company name only. **EG: Jamieson Construction**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 17/05/2001**
Origin	Alpha/Numeric	100 chars	No commas included	Original coordinate system prior to transformation. **EG: Perth Coastal Grid. Default=N/A**
Transfrm	Alpha/Numeric	20 chars	No commas included	The coordinate system transformed to. **EG: MGA Zn 49. Default=N/A**
Transf_by	Alpha/Numeric	100 chars	No commas included	Who carried out the transformation. **EG: City of Gosnells. Default=N/A**
Source	Alpha/Numeric	50 chars	No commas included	What was the source of the data and its accuracy. **EG: As Designed drawings**
Comments	Alpha/Numeric	240 chars	No commas included	Any additional comments that relate to this asset

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NEW Features to Capture

open space specification

1.3.7 Gates (Point)

- Centre of a gate is to be represented as a point.

Figure 8: Gate
Photograph Courtesy: GISSA International

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Gates

open space specification

2.7 Gates Attribute File Format Instructions

Amenities File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Type	Alpha	20 chars	No commas included	Gate type. **EG: Single** *(Section 4. O-SPEC Code Lists)*
Material	Alpha	30 chars	No commas included	Material the gate is made out of. **EG: Steel** *(Section 4. O-SPEC Code Lists)*
Height	Floating Type	n/a	2 decimal places	Height of the gate in meters. **EG: 1.25**
Length	Floating Point	n/a	2 decimal places	Gate length in meters. **EG: 2.45**
Key_Contct	Alpha/Numeric	50 chars	No commas included	Name and contact details of the person who holds the key to the gate. Further details and instructions can be included in the comments field.
Veh_Access	Alpha	1 char	Yes/No Filed	Ability for vehicle access. **EG: Y** or **N**
Photo_Ref	Alpha/Numeric	50 chars	No commas included	Reference photograph of asset. **EG: 12345abcd67ef.jpeg** Provide photograph references for all new and existing assets. For existing assets, **Default=N/A**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project. **EG: Wyndham Vale**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision Stage Number. **EG: 7 or 3B. Default=N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Design Plan Number. **EG: 6080R212**
Const_Co	Alpha/Numeric	100 chars	No commas included	Company name only. **EG: Jamieson Construction**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 17/05/2001**

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Mods. to data types

2.1 Open Space Attribute File Format Instructions

Asset to be provided as a Polygon (or Shape or Region) representing the perimeter of Open Space.

Open Space Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Type	Alpha	30 chars	No commas included	Type of space. **EG: Nature Reserve, Bushland.** *(Section 4. **O-SPEC** Code List)*
Name	Alpha/Numeric	30 chars	No commas included	Unique name of space. **EG: Presidents Park Softball Facilities**
St_Name	Alpha	40 chars	No commas included	Including street type (Rd, St, Crt, Dr etc). **EG: Jones Dr.** If not in a street, **Default=N/A**
Map_Ref	Alpha/Numeric	30 chars	No commas included	Street Directory Reference. **EG: Melway 64E3**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project. **EG: Wyndham Vale**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision Stage Number. **EG: 7 or 3B. Default=N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Design Plan Number. **EG: 6080R212**
Const_Co	Alpha	100 chars	No commas included	Company name only. **EG: Jamieson Construction**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 17/05/2001**
Origin	Alpha/Numeric	100 chars	No commas included	Original coordinate system prior to transformation. **EG: Perth Coastal Grid Default=N/A**
Transfrm	Alpha/Numeric	20 chars	No commas included	The coordinate system transformed to. **EG: MGA Zn 49. Default=N/A**
Transf_by	Alpha/Numeric	100 chars	No commas included	Who carried out the transformation. **EG: City of Gosnells. Default=N/A**
Source	Alpha/Numeric	50 chars	No commas included	What was the source of the data and its accuracy. **EG: As Designed drawings**
Comments	Alpha/Numeric	240 chars	No commas included	Any additional comments that relate to this asset

Additional Field

2.2 Playing Field Attribute File Format Instructions

Asset to be provided as a Polygon (or Shape or Region) representing the perimeter of the Playing Field.

Playing Field Attribute File Format Instructions				
Column Name	**Data Type**	**Max Length**	**Comments**	**Contents**
Type	Alpha	30 chars	No commas included	Type of field. **EG: Football** *(Section 4. O-SPEC Code lists)*
Name_Feat	Alpha	50 chars	No commas included	Name of feature. **EG: Skirman Football Reserve**
Use_1	Alpha	30 chars	No commas included	Type of use. **EG: Football**
Use_2	Alpha	30 chars	No commas included	Second Type of use. **EG: Cricket.** If there are more uses, mention in the comments field
Surface	Alpha/Numeric	30 chars	No commas included	Playing surface material. **EG: Grass, Concrete etc** *(Section 4. O-SPEC Code lists)*
Photo_Ref	Alpha/Numeric	50 chars	No commas included	Reference photograph of asset. **EG: 12345abcd67ef.jpeg** Provide photograph references for all new and existing assets. For existing assets, **Default=N/A**
WAPC_No	Alpha/Numeric	20 chars	No commas included	Western Australian Planning Commission reference number – This field is required ONLY in WA. **Default = N/A.** Not to be supplied in other jurisdictions
Sub_Name	Alpha/Numeric	100 chars	No commas included	Subdivision or Project. **EG: Wyndham Vale**
Stage_No	Alpha/Numeric	10 chars	No commas included	Subdivision Stage Number. **EG: 7 or 3B. Default=N/A**
Design_Co	Alpha	100 chars	No commas included	Company name only. **EG: Fred Charles and Associates**
Plan_No	Alpha/Numeric	20 chars	No commas included	Design Plan Number. **EG: 6080R212**
Const_Co	Alpha/Numeric	100 chars	No commas included	Company name only. **EG: Jamieson Construction**
Const_Date	Date	n/a	dd/mm/yyyy	Construction date. **EG: 17/05/2001**
				Original coordinate system prior to transformation. **EG: Perth Coastal Grid**

End o-spec

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The FUTURE Specs

buildings specifications

b-spec outlines the specifications for the delivery of digital data relating to *Building Assets.*

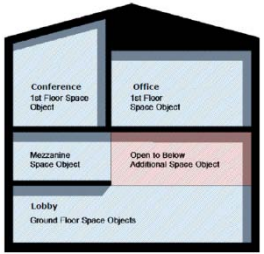
This specification is currently in the planning stage for development

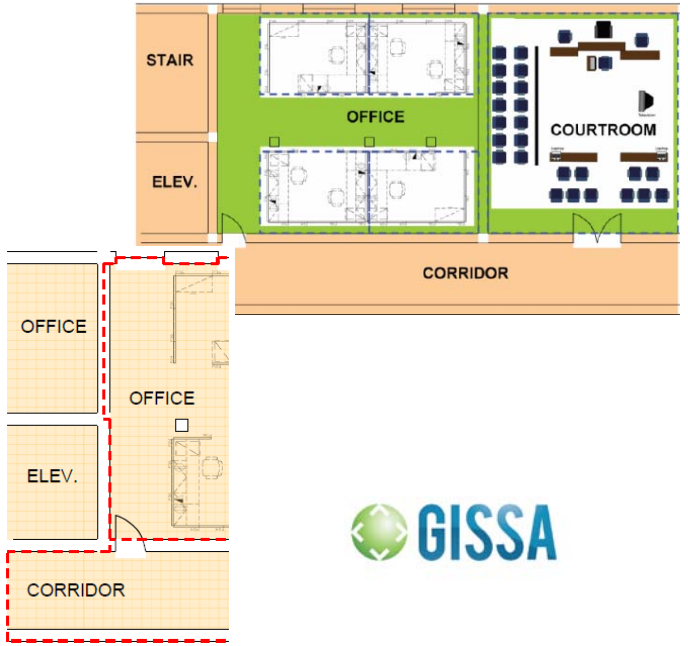
BIMF, AEC, sustainable development for community buildings

Framework will include a hierarchy based on asset management needs – using NAMS as a reference

Building – Superstructure, Sub-structure, services, roof, walls, spaces, zones ….the list goes on

A key objective is to be able to contribute to various data models





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buildings specifications

Themes

1.4 Theme/Layer Structure

Asset Type	File Name	Description	Attribute Table
Building Footprint	BFP	Represents the base footprint of the building.	Yes
Building Floor Plan	Build_FP	Represents the floors contained in a building.	Yes
Building Space	Bld_Space	Represents an interior space such as meeting rooms.	Yes
Conveyance Area	Conv_Area	Represents an area designated for transporting people or goods. **EG:** Stairwell, escalator etc.	Yes
Electrical Equipment	Elec_Equip	Represents a point location for electrical fixtures and equipment. **EG:** Data/Power Filter	Yes
Electrical Lines	Elec_Line	Represents a conductor wire through which electricity flows.	No. Graphics Only
Fire Protection Equipment	Fire_Equip	Represents a point location of equipment used for fire prevention, suppression or emergency safety. **EG:** Fire Hydrant, Hose Reel etc.	Yes
Fire Protection Lines	Fire_Line	Represents pipes through which fire suppression fluid flows. **EG:** sprinkler lines	No. Graphics Only
Fittings & Fixtures	Fitt_Fix	Represents a point location of furniture assets. **EG:** Cabinet, Cupboard etc	Yes
Floor Plan Lines	Floor_Line	Represents the lines that compose a floor plan, such as walls, doors and windows.	No. Graphics Only
HVAC Equipment	HVAC_Equip	Represents a point location of equipment used for internal environmental air control **EG:** Air Conditioners, Heaters etc	Yes
HVAC Lines	HVAC_Line	Represents Ducts and pipes serving HVAC equipment. **EG:** Duct Segment, Pipe Segment.	No. Graphics Only

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HVAC Area	HVAC_Area	Represents an area of large HVAC equipment or a designated HVAC zone.	No. Graphics Only
Plumbing Equipment	Plmb_Equip	Represents a point location of equipment for distributing water or collecting waste water. **EG:** Sink, Fountain, Urinal etc.	Yes
Plumbing Lines	Plmb_Line	Represents Plumbing Pipes for Water & Gas supply and Wastewater & Stormwater collection.	No. Graphics Only
Problems with matching to existing data	Problems	Circle of radius 10m containing letter "P". Associated table listing all problems with a unique number (i.e. 1,2,3 etc) with easting and northing coordinates and a description is also to be supplied	Yes
Security Equipment	Secu_Equip	Represents a point location of equipment for security.	Yes
Signs	Signs	Represents a point location of a sign	Yes

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Matched to other relevant requirements

1.5 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 must be delivered on a separate level/layer and the files must be clearly labelled in accordance with the "**File Name**" indicated below.

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

Asset Type	File Name	Description	IPWEA Importance Rating[4]	Essential Safety Measures	Attribute Table
Building Footprint	BFP	Represents the base footprint of the building.	1, 2, 3, 4, 5	-	Yes
Building Floor Plan	Floor_Plan	Represents the floors contained in a building.	1, 2, 3, 4, 5	-	Yes
Building Space	Build_Space	Represents an interior space such as meeting rooms.	2, 3, 4, 5	Yes	Yes
Floor Plan Lines	Floor_Lines	Represents the lines that compose a floor plan, such as walls, doors and windows.	2, 3, 4, 5	-	No Graphics Only
Communication and Data Equipment	COMD_Equip	Represents a point location of equipment which belong to communication and data system	3, 4, 5	-	Yes
Communication and Data Lines	COMD_Lines	Represents cables which belong to the communication and data system	3, 4, 5	-	No Graphics Only

digital data specifications

Example Proposed Attributes

2.3 Building Space Attribute File Format Instructions

Assets to be provided as polygons (closed polylines) representing the perimeter of individual building spaces consisting of internal walls.

Column Name	Data Type	Max Length	Comments	Contents
Build_ID	Alpha/Numeric	20 chars	No commas included	Unique ID of the building. **EG: 039474**
Floor_ID	Alpha/Numeric	25 chars	No commas included	Unique ID of the floor. **EG: 2**
Space_ID	Alpha/Numeric	25 chars	No commas included	Unique ID of the space. **EG: WCD-0957**
Space_Type	Alpha	100 chars	No commas included	Building Space Type. **EG: Office**
Space_Name	Alpha/Numeric	100 chars	No commas included	Space or Room Name. **EG: John Hansen**
Room_No	Alpha/Numeric	10 chars	No commas included	Space or Room Number. **EG: 2.15**
C_Ins_Mat	Alpha	1 char	Yes/No field	Ceiling insulation material. **Default=N/A**
Ceil_Hght	Decimal	n/a	2 decimal places	The height of the ceiling in metres.
Ceil_Mat	Alpha	30 chars	No commas included	Internal ceiling construction. **EG: Acoustic Tiles**
Ceil_Area	Decimal	n/a	2 Decimal Places	Floor Area in metres. **EG: 20.95m**
Floor_Mat	Alpha	30 chars	No commas included	Floor material
Floor_Area	Decimal	n/a	2 Decimal Places	Floor Area in metres. **EG: 10.65m**
W_Ins_Mat	Alpha	1 char	Yes/No field	Existence of wall insulation. **Default=N/A**
Wall_Type	Alpha	30 chars	No commas included	Wall type. **EG: Standard wall, Toilet/shower partition, Operable wall**
Wall_Mat	Alpha	30 chars	No commas included	Wall construction. **EG: Concrete Render**
Wall_Finish	Alpha	30 chars	No commas included	Wall Finish. **EG: Paint Finish**
Wall_Area	Decimal	n/a	2 Decimal Places	Wall Area in metres. **EG: 10.65m**
No_Doors	Integer	n/a	Whole number	Number of doors. **EG: 3**
D_Int_Ext	Alpha	10 chars	No commas included	Door is internal or external. **EG: Internal**

Example Proposed Diagrams

Aspec digital data specifications

1.3.3. Building Space (Polygon/Closed Polyline)

The perimeter of a **Building Space** on a floor is to be represented as a **polygon** using the internal walls as the guide to depict the actual floor space available for use.

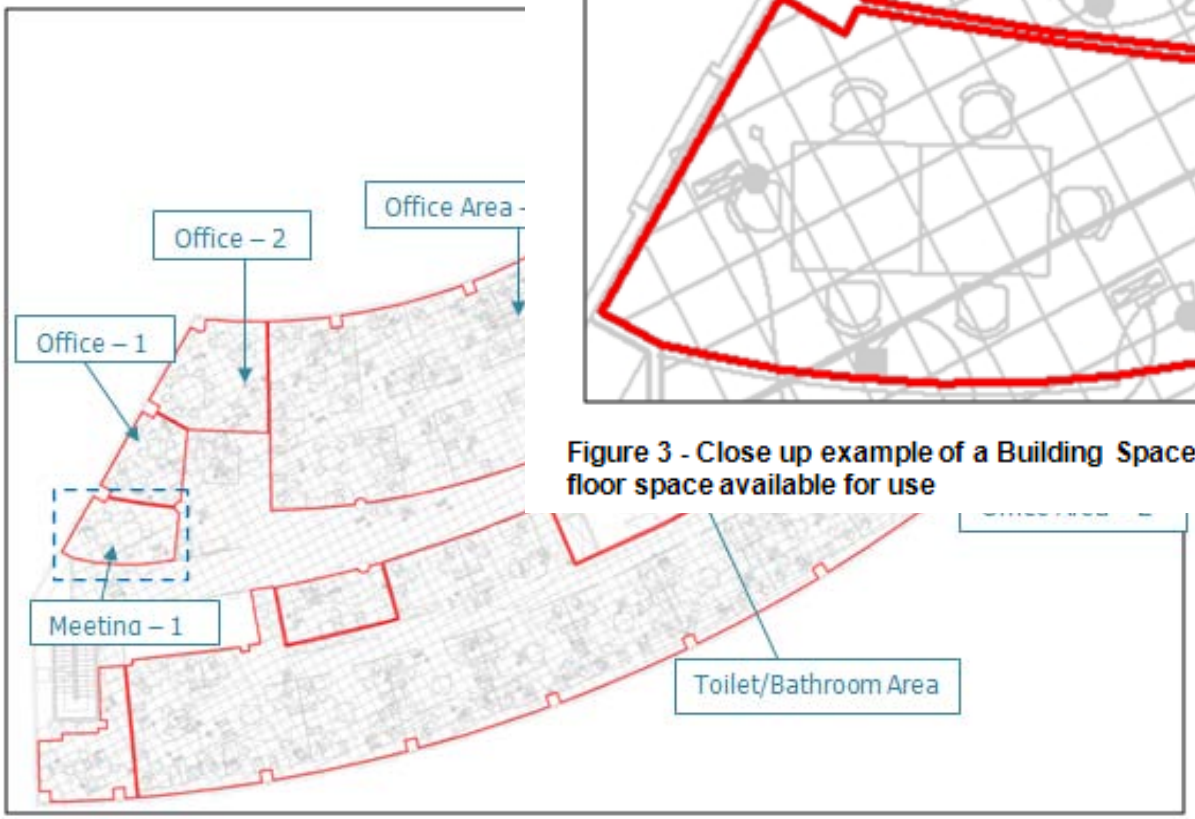

Figure 3 - Close up example of a Building Space using the internal walls to define the actual floor space available for use

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Example Proposed Diagrams

digital data specifications

1.3.4. Communication and Data (Point)

Communication and data locations are to be represented as points.

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