A-SPEC | As Constructed Data Submissions

Consultants Guide 2024

Document Information

Document Name	A-SPEC As Constructed Data Submissions – Consultants Guide 2024
Business Unit	Asset Management
Document Status	Approved and Issued
Version	Version 1.0
Version Date	March 2024

Document History

Version	Date	Description	Author	Team
0.1	November 2023	Provided Template	GH	GISSA International (External)
0.2	December 2023	Prepared Draft	SN	Asset Management
0.3	February 2024	Reviewed Draft	VN	Infrastructure
0.4	March 2024	Approved Final	BW	Infrastructure & Environment
1.0	March 2024	Issued - Version 1.0	SN	Asset Management

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Introduction

The City of Ballarat captures and records information about infrastructure assets created and gifted to the City of Ballarat from Developers and City of Ballarat appointed Contractors completing Capital Works Projects.

Managing data from new asset builds submitted to the organisation is a fundamental first step to ensure that valuable engineering data is not lost or diminished in value as it transforms into the organisation's Geospatial and Asset Management Information Systems (GIS and AMIS). This supports the City of Ballarat's commitment to making data-driven Asset Management decisions.

A-SPEC is a program involved in developing specifications for the delivery of newly constructed assets and modified assets as Digital Data in a GIS ready format to Asset Owners and Managers in Local Government, Utilities and Water Authorities around the world. The A-SPEC Specifications describe a clearly defined set of requirements of what data to capture for the various assets, including their related attributes and geometries.

The key objective of this initiative using **A-SPEC** Standard Data Specifications as part of the Asset and Asset Data Handover Process, is to streamline internal and external stake holders' processes for receiving, handling and storing data related to newly constructed or modified infrastructure assets from both subdivision developments and internal programs (e.g. capital works) in their GIS and AMIS.

This process will increase the efficiency of information management and result in greater customer satisfaction when dealing with enquiries from engineering contractors, consultants, surveyors, developers and prospective residents. In addition to this, it will aim to:

- Eliminate duplication of effort.
- Improve process efficiency.
- Improve customer service to both internal and external customers of asset information.
- Improve quality of asset data and data handover processes.
- Comply with statutory obligations (e.g. Auditor-General) and compliance requirements.
- Provide structure for the consistent recording of all the City of Ballarat's assets.
- Ultimately manage assets better to reduce the volume of ongoing maintenance and capital works costs.

The A-SPEC structure supports data intelligence by providing the relevant attribute information associated with geometric objects.

Please note, it is the responsibility of the Consultant to ensure that the As Constructed Data provided;

1. Accurately reflects what has been built with respect to its accuracy and completeness, and
2. Complies with the A-SPEC requirements as set out in the A-SPEC Standard Data Specifications.

This is a critical aspect as submitted data will be used to populate the organisation's database and inform data-driven decisions.

As Constructed Data Submission – Process

The As Constructed Data Submission Process is part of the overall Asset and Asset Data Handover Process at the City of Ballarat.

The key objective of the Asset and Asset Data Handover Process is to identify the key internal stakeholders involved in the request, validation and incorporation of As Constructed data.

There are two key elements to the provision of As Constructed data. These comprise of:

a. satisfying the A-SPEC requirements and
b. utilising the GDV Hub online system.

Each Submission will Require the Following

1. Provision of a completed A-SPEC Certification Form. Please refer to Sub Appendix 1.
2. Asset data is placed on the correct projection GDA zone and levels adhere to the AHD.
3. Provision of a list of variations from the Approved Design, Issued for Construction signed off by the authorised person. This includes:
    a. A tolerance report highlighting the differences between the Design and As Constructed details.
    b. All differences, for example, in invert levels, cover levels, grades, lengths and offsets. Also, any change of material or diameter.
    c. Please refer to Sub Appendix 2 for report template

Acceptance of the As Constructed Data

1. Asset locations recorded prior to backfill or as otherwise agreed upon methodology.
2. Compliance with the A-SPEC requirements.
3. Compliance with the City of Ballarat's requirements.

The City of Ballarat reserves the right to reject the asset data if the information provided is deemed to be of an unacceptable or unsatisfactory standard.

Should this occur, the owner will be notified in writing or as agreed to.

Link to Consent for Statement of Compliance

Satisfying all requirements as outlined in the relevant A-SPEC Data Specifications for each submission, and acceptance of the As Constructed Data supplied, will form key requirements for the City of Ballarat to consent to the issue of a Statement of Compliance.

Please refer to the Appendices for further mandatory details and advice:

1. *Sub Appendix 1 – Asset Data Submissions*
    1.1. A-SPEC Certification Form.
    1.2. Common EPSG Codes (Coordinate Reference Systems – Australia).
    1.3. A-SPEC Asset Deliverables Checklist.
2. *Sub Appendix 2*
    2.1. A-SPEC Certification Form.

The GDV Hub

The GDV Hub verifies and validates the

1. Asset attributes, and
2. Geometries and spatial data, based on the A-SPEC requirements.

The combination of these two elements improves the quality and latency of asset information to the organisation.

Ultimately it will increase the efficiency of information access and result in greater customer satisfaction when dealing with enquiries from engineering consultants, surveyors, developers, and current and prospective residents.

As Constructed Data Submission – Overview

Target Audience

- Geographical Information System Administrators
- Asset Management Information System Administrators
- Developers and their Consultants
- Consulting Engineers
- Surveyors
- Constructors
- Engineers and Project Managers
- Finance Departments
- Authority Field Staff
- Authority Customers

Definitions

As Constructed Data

Accurate data collected for the City of Ballarat's assets that are constructed during subdivision developments and/or capital works.

Authority

An organisation, such as a council or utility, which creates projects and assigns them to consultants (e.g. City of Ballarat).

Business Rules

The name for the set of standards, specifications and business rules used to validate the asset data.

Capital Works

Internal programs created and managed by the City of Ballarat to deliver new assets or refurbish / renew assets.

Consultant

An organisation, such as a Developer or their agent (e.g. Consultant Engineer or Surveyor that submits validated A-SPEC As Constructed Data).

Developer

An organisation, such as a Developer or their agent (e.g. Consultant Engineer or Surveyor that submits validated A-SPEC As Constructed Data).

GISSA International

The custodian and manager of A-SPEC.

Project Manager

The City of Ballarat or Consultant's representative in charge of the overall planning and execution of a project.

Validation Rules

Business Intelligence rules that have been identified to be utilised to ensure compliance with the City of Ballarat's business requirements.

A-SPEC

The overarching program managing each specification.

A-SPEC Check List

A document that forms part of the process to identify what asset data will be delivered at handover.

A-SPEC Registration

Registration to access the relevant materials outlining the asset data requirements to be delivered to the City of Ballarat.

A-SPEC Overview

A companion document to be read in conjunction with all the specifications.

B-Spec

A common specification outlining the details of building asset data that is to be supplied in a machine-readable format.

D-Spec

A common specification outlining the details of stormwater drainage and Water Sensitive Urban Design (WSUD) asset data that is to be supplied in a machine-readable format.

O-Spec

A common specification outlining the details of assets within open space and recreation reserves that is to be supplied in a machine-readable format.

R-Spec

A common specification outlining the details of assets within a road reserve that is to be supplied in a machine-readable format.

S-Spec

A common specification outlining the details of wastewater assets that is to be supplied in a machine-readable format.

W-Spec

A common specification outlining the details of potable and recycled water assets that is to be supplied in a machine-readable format.

The GDV Hub

An online service used to validate that the As Constructed Data submitted complies with the technical requirements of A-SPEC.

Preparation for As Constructed Data Submission

Preparation required for your As Constructed Data Submission

1. **During the assessment Phase of your Project**
   a. Confirm the requirements for As Constructed Data to be submitted in the A-SPEC structure.

2. **Access to A-SPEC material**
   There are three (3) A-SPEC specifications currently relevant to the City of Ballarat:
   a. R-Spec
   b. D-Spec
   c. O-Spec

   These documents can be accessed by going to the A-SPEC website and completing the Contact Form to request access.

   Please note if this is your first exposure to A-SPEC, you will be required to complete a non-disclosure agreement with the custodian of the specifications.

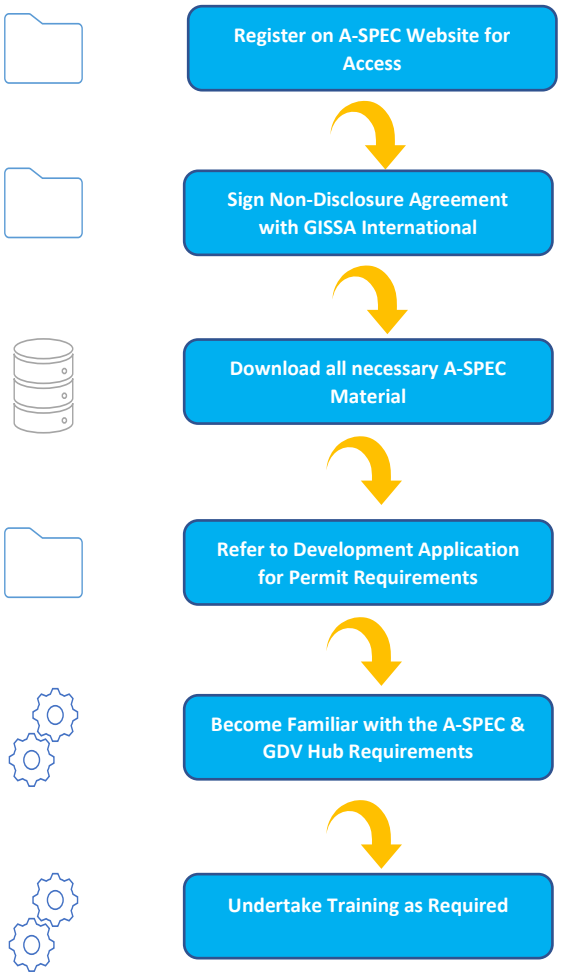
   Once access has been granted, become familiar with the requirements.

   Please refer to Sub Appendix 1 for a high-level summary.

3. **Training**
   Determine if you require training for:
   a. A-SPEC Capture.
   b. A-SPEC Data Creation and Validation.
   c. Data validation via the GDV Hub online portal.

   If training is required, please arrange with the relevant party. This may include being in communication with the **City of Ballarat** or GISSA International.

This Diagram shows the Steps for Preparation

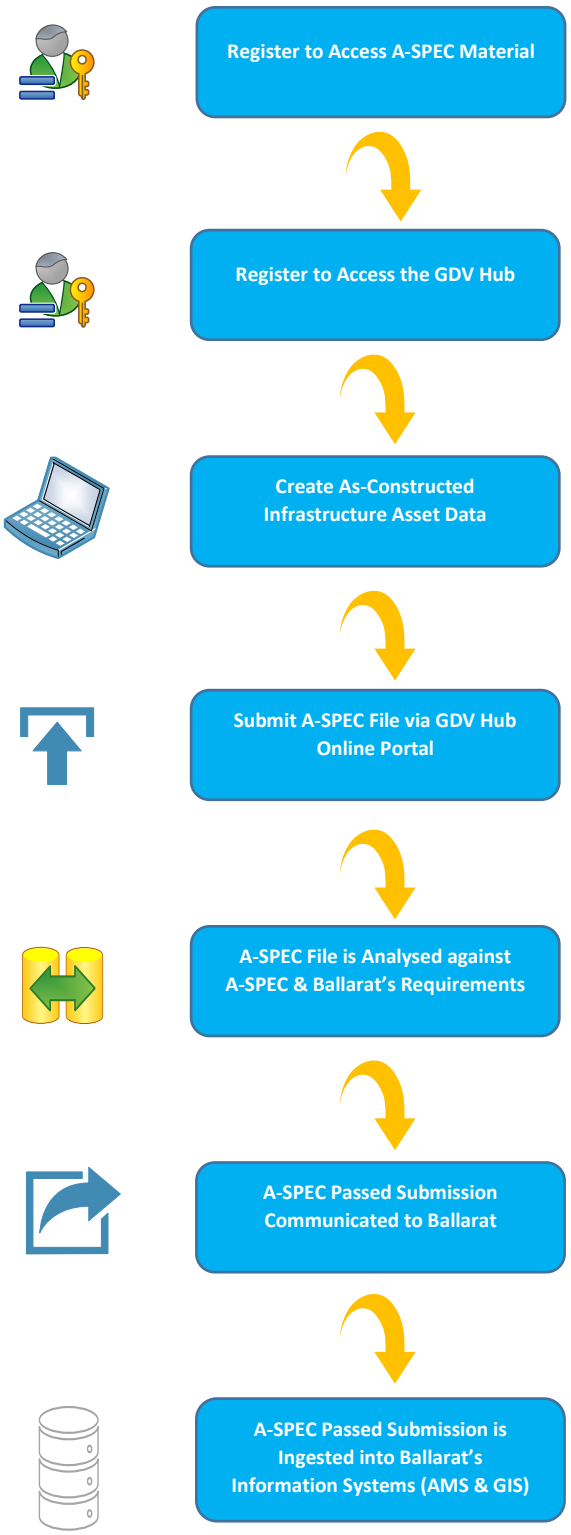


How the GDV Hub Works

Explanation of the GDV Hub

1. **Business Intelligence and Validation Rules are embedded in two (2) places:**
   a. GDV Hub Online Validation Portal
   b. Ballarat's Corporate Information Systems
      i. Asset Management System (AMS)
      ii. Geographic Information System (GIS)
2. **How to Access the GDV Hub:**
   You will receive an invitation from the City of Ballarat to use its GDV Hub subscription service.
   When invited to use Ballarat's GDV Hub subscription, your organisation will be set-up and trained through the City of Ballarat.
3. **How to utilise the GDV Hub:**
   There are two functions available for use with data submissions.
   a. Validation only
   b. Validation and Correction
4. **If using the Validation Only function:**
   If the file fails the validation analysis, an error report will be generated by the system and the submitter / consultant will be required to review and fix any errors in the submission.
   Once the errors have been resolved, the file will need to be re-submitted for validation.
5. **If using the Validation & Correction Function:**
   This enables the user to keep generic names and data types as the base information submitted. By selecting this function, the user will be able to map the data submitted to the correct nomenclature, enabling the GDV Hub to transform the data and assign the appropriate data types to each attribute field.
   Typically errors that have a submission fail are due to critical errors, such as:
   a. Missing attributes
   b. Missing related tables
   c. Null values
   d. Incorrect codes
   e. Inaccurate geometries
6. **What Data Formats does the GDV Hub accept?**
   The GDV Hub is able to process As-Constructed Data in three (3) formats:
   a. ESRI Shape
   b. MIF/MID
   c. Geopackage

This Diagram shows the high-level steps for Data Submissions



Sub Appendix 1 | A-SPEC

1.1 A-SPEC Certification Form

The Certification Form is a file that contains information about the project the digital data is being provided for and MUST accompany **EVERY** digital data submission. This is in addition to the Area of Works details. This document is to be provided as an Excel Spreadsheet so as to enable ease of ingestion. An Excel template is available upon request.

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

Errors and omissions will result in the data being returned to the consultant for correction and may result in a non-conformance being placed on the data submission. The following information will be used as part of validating the data submission.

Label	Description	*Example*
Company	Name of the company taking responsibility for the data	*GISSA International*
Contact	Contact name for this project	*George Havakis*
Telephone	Telephone number	*(03) 9877 6972*
Facsimile	Facsimile number	*NA*
Email	Email address (as applicable)	*george@gissa.com.au*
Mailing Address	Mailing address	*Suite 10, 476 Canterbury Rd, Forest Hill VIC 3131*
Physical Address	Physical business address	*'As Above'*
A-SPEC Member	Participating authority	*City of Gosnells*
Date Submitted	Date the digital data is submitted to A-SPEC Member	*31/1/2022*
Document Version	Version of the document used	*R-Spec Digital Data Specifications – V3.0.5*
Project or Subdivision	Project or Subdivision name	*Wyndham Estate*
Stage	Subdivision stage	*Stage 3B*
Area of Work Extent Identifier	A unique identification number for this project that is referenced in all data tables supplied	*RAPIDSSTG38_20190529*
Design Company	Design Company name for this project	*Fred Charles & Associates*
Plan Number	As Constructed Plan number	*6080R212*
Construction Company	Construction Company name for this project	*Jamieson Construction*
Construction Date	Date the asset was constructed/ built/ installed	*12/03/2021*
Coordinates/Datum	The coordinate system the data is provided in	*GDA94 Zone 50*
Spatial Reference (SRID)	The specific EPSG code. (Please refer to EPSG Codes – **Table 1** for relevant codes)	*28350*
Datum	Vertical Height Datum for this project	*AHD71*
Start Date of Observation	Start Date of measurements	*10/1/2022*
End Date of Observation	End Date of measurements	*20/1/2022*
Transformation	The coordinate system the data was transformed from	*Perth Coastal Grid to GDA94 Zone50*
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 data capture used	*Field Asset Capture*
Notes / Comments	Important notes or information to be included	*Information provided in this submission is a combination of data picked up in the field along with confirmation by the contractor responsible ICANDOIT Pty Ltd*

1.2 Common EPSG Codes – Coordinate Reference Systems (Australia)

The following table represents the relevant Codes applicable to Australia, including Lord Howe Island, Macquarie Island, Ashmore and Cartier Islands, Christmas Island, Cocos (Keeling) Islands, Norfolk Island. All onshore and offshore.

Please note: These codes are to be used to populate the "Spatial Reference" field in the Certification Form to be supplied with each submission.

Table 1 – EPSG Codes of Australia

EPSG Code	CRS Name
28349	MGA zone 49 (GDA94)
28350	MGA zone 50 (GDA94)
28351	MGA zone 51 (GDA94)
28352	MGA zone 52 (GDA94)
28353	MGA zone 53 (GDA94)
28354	MGA zone 54 (GDA94)
28355	MGA zone 55 (GDA94)
28356	MGA zone 56 (GDA94)
28357	MGA zone 57 (GDA94)
7849	MGA2020 Zone 49
7850	MGA2020 Zone 50
7851	MGA2020 Zone 51
7852	MGA2020 Zone 52
7853	MGA2020 Zone 53
7854	MGA2020 Zone 54
7855	MGA2020 Zone 55
7856	MGA2020 Zone 56
7857	MGA2020 Zone 57

1.3 A-SPEC Asset Deliverables Checklist

The following table represents a list of all the assets that are included in A-SPEC. Using this as a "checklist" during the planning and finalisation phases will ensure that all parties are aware of what asset data is expected to be delivered at Practical Completion prior to Handover.

Project Type:

(Please circle the applicable type)

- Capital Works
- Subdivision Development (gifted)
- Community Handover
- Other _____

Asset Type	Specification to Refer to	Asset Owner Check	Developer / Consultant Check
Abutments	R	□	□
Access Points / Manholes / Pits	D, S, W	□	□
Amenities	O	□	□
Area of Work Extent	B, D, O, R, S, W	□	□
Bar Tables & Stools (see Amenities)	O	□	□
Basins (see OSDS Area)	D	□	□
BBQ (see Amenities)	O	□	□
Bins	O	□	□
Bio retention Swale / Swale (linear) (see OSDS Linear)	D	□	□
Boardwalks	O	□	□
Boat Ramps	O	□	□
Bollards (see Traffic Management Device – point)	R	□	□
Breakwaters	O	□	□
Bridge / Major Culvert	R	□	□
Bridge / Major Culvert Component	R	□	□
Buffer Strips (see OSDS Linear)	D	□	□
Building Floor Plan	B	□	□
Building Footprint	B	□	□
Building Space	B	□	□
Bund (see Tank)	W	□	□
Channel Drain (see Pipes)	D	□	□
Parking	R	□	□
Cathodic Protection	W	□	□
Cathodic Protection Sites - **PROPOSED FUTURE UPDATES**	W		
Collection pipes for swales - Stormwater	D	□	□
Communication and Data Equipment	B	□	□
Communication and Data Cabling	B	□	□
Conduits	B, S, W	□	□

Asset Type	Specification to Refer to	Asset Owner Check	Developer / Consultant Check
Conveyance Systems	B	□	□
Conveyance Paths	B	□	□
Detention Chambers	D	□	□
Doors & Windows	B	□	□
Electrical Cabling	S, W	□	□
Electrical Equipment	B, S, W	□	□
Electrical Lines	B	□	□
Emergency Markers Linear	O	□	□
Emergency Markers Point	O	□	□
Escalators (part of Conveyance System)	B	□	□
Fences/Walls	O	□	□
Fire Protection Equipment	B	□	□
Fire Protection Lines	B	□	□
Fittings & Fixtures – Areas	B	□	□
Fittings & Fixtures – Lines	B	□	□
Floor Plan Lines	B	□	□
Gates	O	□	□
Grandstands (see Building Envelope)	B	□	□
Gravity Pipes	S	□	□
Gravity Pipe Miscellaneous Text	S	□	□
Gross Pollutant Traps (see Pits)	D	□	□
Ground Water Bores	O	□	□
Hard Stands	R	□	□
Head/End Walls	D	□	□
HVAC Mechanical Systems	B	□	□
HVAC Equipment	B	□	□
HVAC Lines	B	□	□
Infiltration Chambers (see Water Harvesting Device)	D	□	□
Instrumentation	S, W	□	□
ITS (Intelligent Transport Systems) – Lines	R	□	□
ITS (Intelligent Transport Systems) – Points	R	□	□
ITS (Intelligent Transport Systems) – Polygon	R	□	□
Irrigation (Linear)	O	□	□
Irrigation (Point)	O	□	□
Jetties, Piers and Marinas	O	□	□
Kerbs / Kerbs & Channel and Shoulders	R	□	□
Lakes (see OSDS Area)	D	□	□

Asset Type	Specification to Refer to	Asset Owner Check	Developer / Consultant Check
Lakes - Manmade (see Landscaping)	O	□	□
Landscaping	O	□	□
Lifts (part of Conveyance System)	B	□	□
Lighting	R	□	□
Marine Safety & Assist Facility	O	□	□
Mechanical Equipment	S, W	□	□
Minor Structures	O	□	□
Moving Walkways (part of Conveyance System)	B	□	□
OSDS Linear Centrelines	D	□	□
Open Spaces	O	□	□
Other Network Structures	S	□	□
Pathway Centrelines	R	□	□
Pathways	R	□	□
Pavements - Road	R	□	□
Piles	O	□	□
Pipes - Stormwater	D	□	□
Pipes – Stormwater Miscellaneous Text	D	□	□
Pits - Stormwater for Swales	D	□	□
Platforms	W	□	□
Playground and Exercise Equipment	O	□	□
Playgrounds	O	□	□
Playing Fields	O	□	□
Plumbing Equipment	B	□	□
Plumbing Lines	B	□	□
Poles	O	□	□
Ponds (like Basins see OSDS Area)	D	□	□
Pram Ramps (see Pathways)	R	□	□
Pressure Pipes- **PROPOSED FUTURE UPDATES**	D		
Pressure Pipes	S, W	□	□
Problems with matching to existing data	B, D, O, R, S, W	□	□
Property Connections	D, S	□	□
Public Art / Memorials	O	□	□
Public Toilets	B	□	□
Pump Station Sites- **PROPOSED FUTURE UPDATES**	D		
Pump Station Sites	S, W	□	□
Pumping Stations- **PROPOSED FUTURE UPDATES**	D		
Pumping Stations	S, W	□	□

Asset Type	Specification to Refer to	Asset Owner Check	Developer / Consultant Check
Pumps- **PROPOSED FUTURE UPDATES**	D		
Pumps	S, W	□	□
Rain Gardens (see OSDS Linear)	D	□	□
Recreation Reserves (see Open Space)	O	□	□
Reservoirs	W	□	□
Retaining Walls	O	□	□
Road Reserves	R	□	□
Road Safety Barriers	R	□	□
Seals / Surfaces – Road Surface (Sea)l	R	□	□
Security Equipment	B	□	□
Services (Linear)	O	□	□
Services (Point)	O	□	□
Sewer Fittings	S	□	□
Sewer Pumps	S	□	□
Sewer Pumping Stations	S	□	□
Sewer Rising Mains / Pressure Mains	S	□	□
Sewer Valves	S	□	□
Shelters	R	□	□
Signs	B, R	□	□
Stairs	B	□	□
Stairwells (part of Conveyance System)	B	□	□
Steps (see Pathway)	R	□	□
Stormwater Fittings - **PROPOSED FUTURE UPDATES**	D		
Stormwater Pumps - **PROPOSED FUTURE UPDATES**	D		
Stormwater Pumping Stations - **PROPOSED FUTURE UPDATES**	D		
Sumps (see OSDS Area)	D	□	□
Support Structures	S, W	□	□
Surface (Seal) Centrelines	R	□	□
Swales (as an area see OSDS Area)	D	□	□
Swales (as a conveyance system see OSDS Linear)	D	□	□
Table Drains	R	□	□
Tactile Ground Surface Indicators	R	□	□
Tanks (see Water Harvesting Device)	D	□	□
Tanks	W	□	□
Toilets in Buildings (see Building Space)	B	□	□
Traffic Management Devices – Areas	R	□	□
Traffic Management Devices – Lines	R	□	□

Asset Type	Specification to Refer to	Asset Owner Check	Developer / Consultant Check
Traffic Management Devices – Points	R	□	□
Traffic Signals	R	□	□
Treatment Plant Site - **PROPOSED FUTURE UPDATES**	S, W		
Trees	R	□	□
Tunnels - **PROPOSED FUTURE UPDATES**	R		
Underground Conduit Pits–Telecommunications	D	□	□
Underground Conduits –Telecommunications	D	□	□
Utility Tunnels - **PROPOSED FUTURE UPDATES**	TBC		
Vehicle Crossings (Driveways)	R	□	□
Walls (see Fence/Walls)	R	□	□
Water Fittings	W	□	□
Water Harvesting Devices	D	□	□
Water Hydrants	W	□	□
Water Meters	W	□	□
Water Pressure Mains	W	□	□
Water Service Mains	W	□	□
Water Valves	W	□	□
Wetlands (see OSDS Area)	D	□	□
Other to be specified		□	□
Other to be specified		□	□
Other to be specified		□	□

Consultant's Representative - Signature

Authority's Representative Signature

Consultant's Representative Name

Authority's Representative Signature

Date

Date

Sub Appendix 2 | A-SPEC

2.1 Tolerance Report

A tolerance / quality report is to be provided, documenting changes where construction of the asset deviates from the initial design and falls outside of the acceptable tolerances as specified by the relevant construction standard accuracy requirements.

Please use the following template as a guide to record the variations from Design to As Constructed Data for the assets constructed / installed for the City of Ballarat.

Example Tolerance Report required:

Project or Subdivision	Boggy Creek Main Road Extension
Stage	N/A
A-SPEC Consortium Member	ABC Council
Date Submitted	20 November 2021
Submitted by	GISSA International

Using examples from each specification as a guide. The following table lists some examples of how to complete this form:

Spec	Asset	ID	Attribute	Ascon	Design	Tolerance	Difference	Comments
B	Public Toilet	ABC123	No of WC's	4	3	NA *	+1	Change Agreed to by ABC Council
D	Pit	JP123-A	NA	NA	NA	NA	NA	New pit added. Change Agreed to by ABC Council
O	Exercise Equipment	GHO37	Type	Clatter Bridge	Climbing Frame	NA	NA	Changed Type Agreed to by ABC Council
R	Traffic Mgt Device	ABC123	Type	NA	Bollard	NA	NA	Not installed notified and agreed to by ABC Council
S	Gravity Wastewater	BG-C20 to BG-C21	US_IL	70.65	70.6	0.015-0.020	0.05	Outside tolerance. Change Agreed to by ABC Water Authority
W	Fitting	SEP43	NA	NA	NA	NA	NA	Fitting removed. Change Agreed to by ABC Authority

Please note:

1. If further comments are needed, please include in the "Comments" field.
2. * NA refers to Not Applicable.