

Project Controls

Master Specification

PC-SI4 Geographic Information Systems (GIS)

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PC-SI4 Geographic Information Systems (GIS)

1 General

- 1.1 This Standard Specification sets out the requirements for Geographical Information Services including requirements for aerial and remote capture data.
- 1.2 This includes but is not limited to:
 - a) Map Production;
 - b) Digital Mapping & web based GIS Service production;
 - c) Spatial Analysis & Modelling;
 - d) Spatial Dataset Manipulation;
 - e) Aerial Imagery;
 - f) Terrestrial, Mobile or Airborne Laser Scanning;
 - g) Lidar; and
 - h) Stereo Imagery or D3 DSM.
- 1.3 The Contractor shall comply with the requirements of:
 - a) Location SA Metadata Standard: <https://cms.dpti.sa.gov.au/locationsa/data/metadata>
 - b) ANZLIC Metadata Standard: <https://www.anzlic.gov.au/resources/asnz-iso-1911512015-metadata>
 - c) Geospatial Project Report: <https://www.dpti.sa.gov.au/standards/survey>
 - d) GIS Metadata Template: <https://www.dpti.sa.gov.au/standards/survey>
 - e) Engineering Survey Standard Specification SUR-CT003: <https://www.dpti.sa.gov.au/standards/survey>
 - f) Survey String Identifiers: <https://www.dpti.sa.gov.au/standards/survey>
 - g) Civil Aviation Safety Authority Regulations: <https://www.casa.gov.au/rules-and-regulations>

2 Coordinate Projections and Datum

- 2.1 Placement of control marks shall meet the accuracy requirements outlined in the Engineering Survey Standard SUR-CT003.

Horizontal Datum

- 2.2 Unless specified otherwise in the Project Brief, the horizontal datum shall be GDA94 using either projection - Map Grid of Australia (MGA) or SA Lambert Conic Conformal (LCC) should the coverage exceed one MGA zone.
- 2.3 All data files shall have a referenced coordinate system.

Vertical Datum

- 2.4 Unless specified otherwise in the Project Brief, datasets containing height values shall adopt the Australian Height Datum (AHD) as the vertical datum.

3 Data Accuracy

Documenting Data Accuracy

- 3.1 All data deliverables shall be accompanied by a recommended data accuracy. Accuracies shall be defined in metres and satisfy a 95% confidence level. Accuracy statements shall be documented in the appropriate metadata template for each dataset, and the project transmittal report.
- 3.2 Accuracy claims shall be supported with evidence appropriate to the method of capture which shall include separate checks on the model surface covering both horizontal and vertical positioning residuals.

4 Deliverables

Aerial Imagery

- 4.1 All standards below shall apply unless specified otherwise in the project brief.
- 4.2 Contractors are responsible for all flight planning, manifests and approvals.
- 4.3 Contractors must comply with all relevant Civil Aviation Authority Safety Authority (CASA) requirements and must be appropriately licensed to carry out such work including for drone operation.

Digital File Format

- 4.4 Aerial imagery shall be supplied in .ECW format as a preference, if specified in the project brief .jpg2000 or geoTiff may also be accepted.

Spectral Resolution

- 4.5 Photogrammetric digital camera providing 3 Bands - Red, Green, Blue and Panchromatic if applicable.

Spatial Resolution

- 4.6 Digital Imagery resolution will be defined as a Ground Sampling Distance (GSD) in the project brief.

Radiometric Resolution

- 4.7 Radiometric Resolution 8 Bit.

Ortho-Rectification

- 4.8 Aerial imagery shall be rectified and calibrated to the specified datum. Aspect of all structures obscuring adjacent ground level features is to be minimised. There is to be no cloud, cloud shadow or smoke haze obscuring the image.

Image Compression

- 4.9 Imagery compression shall not exceed 15 times and should minimise image quality loss.

Intellectual Property Agreement

- 4.10 All data supplied by the contractor under the Panel Agreement shall become the property of the Department and shall not be copied or reproduced by the contractor without prior written approval by the principal.

Laser Scanned and Remote Data Capture

- 4.11 All standards below shall apply unless specified otherwise in the project brief.

Digital File Format

- 4.12 String based data shall comply with the Department's Engineering Survey Standard Specification coding requirements.
- 4.13 Point cloud data shall be provided in a .las or .fbx file format as specified in the project brief.

File Size And Cloud Viewing

- 4.14 Determinations shall be made on an appropriate file size ensuring suitable usability and rendering performance in the intended application.

Shadowing Or Low Resolution Areas

- 4.15 Efforts should be made to minimise the effect of shadowing and subsequent accuracy loss. Low accuracy areas and shadowing are to be detailed in the project report where present. Areas may be requested to be depicted in the model by a closed loop string.

Digital File Formats

- 4.16 Unless specified otherwise in the Project Brief, all data shall be provided in the ESRI based formats.
- 4.17 Accepted formats include:
 - a) ESRI Geodatabase feature class types (file or personal Geodatabase accepted); and
 - b) Shapefile (.shp, .shx, .sbn, .sbx, .prj, .dbf).
- 4.18 Data files shall be accompanied with their relevant symbology layer (.lyr) files.
- 4.19 File naming of data shall include as a minimum (e.g. GalwerRail_ENV_VegSurvey_Rev1):
 - a) Project Site;
 - b) Discipline;
 - c) Work Task;
 - d) Revision.
- 4.20 When requested MXD Map documents shall be delivered as a package with all dataset links intact. Refer online help site for ESRI based formats, <http://desktop.arcgis.com/en/arcmap/>.

Map Production

- 4.21 All maps shall as a minimum contain the following information:
 - a) Project Title;
 - b) Scale Bar;
 - c) North Arrow;
 - d) Legend.
- 4.22 Unless specified otherwise in the Project Brief, Maps shall be supplied as an Adobe pdf format.
- 4.23 File naming of maps shall include as a minimum:
 - a) Title;
 - b) Publish Date;
 - c) Revision;
 - d) Page Size & Orientation, i.e. A3L, A1P.
- 4.24 If requested by the principal ESRI based map documents (MXD) shall be delivered as a package accompanied by the relevant dataset links intact.

Items to Be Supplied By Contractor

4.25 The Contractor shall supply the following items:

- a) Digital data in the form of either as specified in the project brief;
- b) ESRI based file formats;
- c) Adobe pdf format.

OR (from ARD-CT001)

- d) Digital data as specified above unless detailed otherwise in the project brief;
- e) Project Report (presented in the following order):
 - i) Date;
 - ii) Job Title, Number & Description;
 - iii) Project Lead & Manager;
 - iv) Contact Details;
 - v) Data Files, Revision & Format;
 - vi) Horizontal Coordinate System;
 - vii) Vertical Datum;
 - viii) Nominated Data Accuracy;
 - ix) Metadata Standard;
 - x) Capture Scale;
 - xi) Data Origin;
 - xii) Production Methodology;
 - xiii) Exception Report: details of any abnormalities relating to the project.

5 Metadata Standards

Minimum DIT Metadata Standard

5.1 The minimum metadata standard for the purposes of this panel agreement is outlined below.

Table PC-SI4 5-1 Project

Metadata	Description of Metadata
Dataset Title	Name of the dataset record.
Custodian	Details of the dataset provider e.g. name, organisation, email and contact phone no.
Project Number	Assigned project number (PATCHES) e.g. 201800123

Table PC-SI4 5-2 Description

Metadata	Description of Metadata
Description	Describes the content of the dataset, its spatial type, textual properties, geographic extent, attribute information, classification themes and associated information.
Dataset Use	Describes the usage of the dataset for a non- expert user, in plain language.
Projection / Coordinate System	Identifies the projection in which the dataset is referenced and stored.

Table PC-SI4 5-3 Data Quality

Metadata	Description of Metadata
Data Origin	Describes the source and ownership of the dataset, including method of capture and editing.
Completeness	Percentage of dataset completeness for the spatial geometry, thematic classes and attribute information, and compliance to standards.
Positional Accuracy	Assessment of the dataset's closeness in relation to their true position on the Earth. Accuracy defined in metres and satisfy a 95% confidence level.
Capture Scale	Describes the scale range used to create or edit the dataset.

Table PC-SI4 5-4 Data Status

Metadata	Description of Metadata
Last Updated	Date when the dataset was last updated.
Revision	As required for each new dataset updated.

- 5.2 This standard shall form the minimum metadata accompaniment for each GIS dataset supplied by the Contractor. The minimum metadata standard shall utilise the ESRI electronic metadata sheet.

Location SA Metadata Standard

- 5.3 If requested in the contract brief data shall be required to comply to the Location SA Metadata standard. Details on how to apply this standard can be found at the following website: <https://cms.dpti.sa.gov.au/locationsa/data/metadata>.
- 5.4 Datasets requiring the LMS specification are intended for use as a state wide, primary maintained open data source.

ANZLIC Metadata Standard

- 5.5 If requested in the contract brief data shall be required to comply with the ANZLIC metadata standard. Details on how to apply this standard can be found at the following website: <https://www.anzlic.gov.au/resources/asnz-iso-1911512015-metadata>.

6 Data Production Methodology

General

- 6.1 In order to achieve the required standards, the methodology used shall be documented to support accuracy statements and provide context for the use / application of GIS information. Details of this shall be included as a brief summary in the Geospatial Project Report.

Data Origin

- 6.2 Methodology statements shall include the origin of datasets. The contractor shall nominate whether information has been captured via GPS, data entry, digitised / drafted or via automated feature extraction techniques etc. Details shall be noted in the Project Report.

Capture Scale

- 6.3 Methodology statements shall include the captured scale range of datasets, in accordance with Location SA metadata standard for Data Quality. Details shall be noted in the Project Report. (e.g. Digitalising 1:1000, Data Entry 1:1000, Survey Data 1:50).