

# Master Specification

## Part PC-CN2

### Asset Handover

September 2024



**Government of South Australia**  
Department for Infrastructure  
and Transport

**Build.**  
**Move.**  
**Connect.**

## Document Information

Document Information	
K Net Number:	13738110
Document Version:	2
Document Date:	30/09/2024

## Document Amendment Record

Version	Change Description	Date
0	Initial issue	31/08/2023
1	Update to amend terminology – change “Asset Data Collection Manual” to “Asset Data Collection Standard” and “Asset Data Spreadsheet” to “Asset Data Capture Template”	31/01/2024
2	Updated cover page	30/09/2024

## Document Management

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## PC-CN2 Asset Handover

### 1 General

- a) This Master Specification Part sets out the requirements for Handover including:
  - i) the documentation requirements, as set out in section 2;
  - ii) the pre-requisites to Handover, as set out in section 3;
  - iii) the requirements for Handover, as set out in section 4;
  - iv) the formatting requirements, as set out in section 5; and
  - v) the Hold Point requirements, as set out in section 6.
- b) Handover must comply with the Reference Documents, including:
  - i) AS ISO 55001 Asset management - Management system - Requirements; and
  - ii) Department Asset Data Collection Standard (AM-PRC-005).

### 2 Documentation

#### 2.1 Asset Completion and Handover Plan

##### 2.1.1 Submission requirements

- a) The Contractor must develop an Asset Completion and Handover Plan.
- b) The Asset Completion and Handover Plan must be prepared, submitted, and updated in accordance with the requirements of PC-PM1 “Project Management and Reporting” and as set out in section 2.1.1c).
- c) Unless otherwise specified in the Contract Documents, the Contractor must at a minimum submit:
  - i) a preliminary version of the Asset Completion and Handover Plan prior to the start of any design work. Design of the relevant Works must not commence until the relevant Hold Point as set out in PC-PM1 “Project Management and Reporting” has been released; and
  - ii) an updated Asset Completion and Handover Plan prior to construction commencing. Construction of the relevant Works must not commence until the relevant Hold Point as set out in PC-PM1 “Project Management and Reporting” has been released.

##### 2.1.2 Asset Completion and Handover Plan requirements

The Contractor must establish, implement, and maintain an Asset Completion and Handover Plan for the management of asset handover, including Third Party Assets and the Department assets, which must include:

- a) planned dates for progressive completion of the Works, including completion of Third Party Assets;
- b) procedures for the expeditious and progressive closure for asset handover, including in accordance with section 3;
- c) processes and systems that will be used to monitor all completion and testing and commissioning activities (carried out in accordance with PC-CN1 “Testing and Commissioning”), including completion of any remaining Works and closure of Non-Conformances and Defects;

- d) a detailed scope of completion and commissioning tests which must be carried out prior to Handover, Completion and, where applicable, the sequence of such tests and in accordance with PC-CN1 "Testing and Commissioning";
- e) a detailed scope of disaster recovery exercises that must be carried out prior to Handover;
- f) any Approvals or acceptances required from relevant Authorities, including Emergency Services;
- g) the form, content, and structure of the O&M Manuals (including the Maintenance Manual, Code of Maintenance Standards and Operation Manual), including a copy of the table of contents and sample O&M Manual in accordance with section 3.4;
- h) the requirements set out in the Department Asset Data Collection Standard (AM-PRC-005);
- i) where PC-EDM5 "Digital Engineering" forms part of the Contract Documents, the requirements set out in PC-EDM5 "Digital Engineering"; and
- j) details of training in accordance with the Training Manuals and section 3.5, including:
  - i) any relevant training related to the Third Party Assets;
  - ii) training provider details;
  - iii) location and type of training; and
  - iv) number of training sessions.

### 3 Pre-requisites to Handover

#### 3.1 General

The following activities must be completed as a condition precedent to Handover:

- a) acceptance of all As-Built Records in accordance with section 3.3;
- b) acceptance of the O&M Manuals in accordance with section 3.4;
- c) acceptance of the Training Manuals in accordance with section 3.5;
- d) acceptance of the Asset Handover Report in accordance with section 3.6;
- e) acceptance of the roadway in accordance with section 3.7;
- f) where PC-EDM5 "Digital Engineering" forms part of the Contract Documents, acceptance of the Asset Information Model in accordance with PC-EDM5 "Digital Engineering";
- g) completion of all testing and commissioning, including commissioning activities, reports and data in accordance with PC-CN1 "Testing and Commissioning";
- h) provision of training to operational and maintenance personnel as identified in the accepted O&M Manual and the accepted Training Manual;
- i) resolution of all Non-Conformances, including provision of evidence of compliance with any approval conditions for Non-Conformances;
- j) providing evidence of compliance with approval conditions for Accepted Design Departures;
- k) completion of a Defects liability plan detailing access, responsibility and delegations' arrangements during the Defects Liability Period;
- l) acceptance of the technical data in accordance with section 3.2;
- m) all required electrical certificates;
- n) structural calculations and Design Reports;
- o) Safety in Design and ongoing risks register;

- p) Road Safety Audits;
- q) where Third Party Agreements exist, completion of all obligations of the Third Party Agreements;
- r) provision of lessons learned in accordance with PC-PM1 “Project Management and Reporting”;
- s) provision of all items to the asset operator and maintainer that are required to operate and maintain the completed Works, including special tools, software, hardware, manuals, keys, access cards and firmware; and
- t) all other items within the Contract Documents (including the Master Specification) that are identified as a condition precedent to Handover.

## 3.2 Technical data

### 3.2.1 Submission requirements

The Contractor must develop, prepare, and submit, the finalised technical data requirements in accordance with section 3.2.2, which will constitute a **Hold Point**. The release of this Hold Point is a condition precedent to Handover.

### 3.2.2 Technical data requirements

The following technical data lists must be developed in accordance with the Department Asset Data Collection Standard (AM-PRC-005):

- a) population of the Asset Data Capture Template or providing asset data within the Asset Information Model;
- b) special tools and test equipment list populated in an Asset Data Capture Template or provided as asset data within the Asset Information Model;
- c) disposal process;
- d) drawing;
- e) list of Defects / Non-Conformances;
- f) list of Third Party Assets;
- g) list of waivers;
- h) software list;
- i) parts list and spare parts list or provided as asset data within the Asset Information Model; and
- j) technical documents.

## 3.3 As-Built Records

### 3.3.1 Pre-requisites to As-Built Records closure

Closure of As-Built Records must not occur until:

- a) all Work Lots represented by As-Built Records have been closed in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable);
- b) the Hold Point in accordance with section 3.3.2 has been released;
- c) the Hold Point for the finalised Design Documentation in accordance with PC-EDM1 “Design Management” has been released;
- d) the Construction Quality Representative has provided written endorsement that the As-Built Records are compliant with the requirements of the Contract Documents; and

- e) in the case of Third Parties, the requirements of the relevant Third Party have been met, including any requirements from a Third Party Agreement (as applicable).

### 3.3.2 Submission requirements

The Contractor must develop, prepare and submit, the finalised As-Built Records, which will constitute a **Hold Point**. The As-Built Records must not be closed until this Hold Point is released.

## 3.4 Operation and Maintenance Manual

### 3.4.1 Submission requirements

- a) The Contractor must develop, prepare and submit a table of contents for each O&M Manual together with a sample O&M Manual which will constitute a **Hold Point**. The development and preparation of the O&M Manual must not commence until this Hold Point is released.
- b) The Contractor must develop, prepare, and submit, each O&M Manual which will constitute a **Hold Point**. The release of this Hold Point is a condition precedent to Handover.
- c) Where the O&M Manuals are required to be updated to address any issues that arise during the training, testing or commissioning activities that impact the O&M Manuals, the O&M Manuals must be resubmitted, in which case the requirement to submit the O&M Manuals in accordance with section 3.4.1b) will reapply, including the Hold Point.

### 3.4.2 O&M Manual requirements

- a) O&M Manuals must be developed and delivered individually for each asset type and not delivered as a combined document.
- b) The O&M Manuals as a minimum must:
  - i) include a table of contents;
  - ii) be allocated a unique document number as required by the Principal;
  - iii) include page numbers and number of pages (e.g. 2 of 50) of the O&M Manual;
  - iv) include a Maintenance Manual;
  - v) include the Code of Maintenance Standards;
  - vi) include an Operation Manual;
  - vii) reference all As-Built Records, including the Quality Management Records;
  - viii) include a schedule of all Accepted Design Departures;
  - ix) include a schedule of all approved Non-Conformances and Defects;
  - x) address any issues that arise during the training, testing, and commissioning activities that impact the O&M Manual; and
  - xi) incorporate all of the Principal's comments and amendments,  
**(O&M Manual)**.

### 3.4.3 Maintenance Manual requirements

The Maintenance Manual as a minimum must:

- a) include a table of contents;
- b) be allocated a unique document number as required by the Principal;
- c) include page numbers and number of pages (e.g. 2 of 50) of the Maintenance Manual;
- d) include special tools and test equipment for all items that are required to operate and maintain the completed Works including hardware, manuals and special tools;

- e) include software for all software that is required to operate and maintain the completed Works;
- f) include detail on all spare parts in accordance with the Contract Documents (including as required by the Master Specification);
- g) include a schedule of applicable warranties and guarantees for the Works;
- h) include a copy of the Asset Data Capture Template fully populated with all assets installed;
- i) include a list of all decommissioned assets;
- j) address any issues that arise during the training, testing and commissioning activities that impact the Maintenance Manual;
- k) incorporate all of the Principal's comments and amendments; and
- l) provide comprehensive instruction and detail for all maintenance requirements of the assets, special tools, and test equipment to ensure that the performance, functionality, and durability of the Works does not deteriorate, including (where applicable):
  - i) the ongoing maintenance requirements for all assets;
  - ii) the estimated ongoing maintenance costs;
  - iii) detailed maintenance plans, instructions, procedures, tasks and activities;
  - iv) maintenance guidelines;
  - v) safety and hazardous materials warnings;
  - vi) failure mode effect analysis and fault finding of critical components;
  - vii) a description of any fault codes, troubleshooting faults, cause and remedies;
  - viii) maintenance schedules for inspection, planned and scheduled maintenance;
  - ix) procedures for shutdown, start up and emergency shutdown;
  - x) information regarding safety alarms or any trip settings;
  - xi) any occupational health and safety related information;
  - xii) maintenance checklists;
  - xiii) technical documents associated with the operation and maintenance of assets, including any provided by manufactures instructions and specifications;
  - xiv) an asset disposal process;
  - xv) all maintenance related design requirements within the Design Documentation;
  - xvi) any other information to ensure safe and efficient maintenance; and
  - xvii) the information which has been specified in each applicable Master Specification Part, including the Maintenance Plans,

**(Maintenance Manual).**

#### 3.4.4 Code of Maintenance Standards

- a) A Code of Maintenance Standards must be developed which consolidates and summarises the O&M Manual documentation.
- b) The Code of Maintenance Standards must establish the guiding principles by which the asset maintenance services will be delivered.
- c) The Code of Maintenance Standards must link each element of the O&M Manual to the relevant equipment or asset(s) by:
  - i) Department asset ID (original); and



- ii) Department asset hierarchy.
- d) The Code of Maintenance Standards must collate all O&M Manual data into a document, which includes the Designer's minimum safe operational requirements (such as what level of functional loss can be tolerated by any particular system installed, prior to operational safety suffering degradation).
- e) The Code of Maintenance Standards must as a minimum include the content detailed in Table PC-CN2 3-1.

**Table PC-CN2 3-1 Code of Maintenance Standards minimum content**

Information	Description
Reference no.	A unique code reference number
Asset class	The asset class to which the standard applies
Asset element	The asset element to which the standard applies
Primary outcome	The outcome to which the asset element makes its primary contribution
Maintenance rationale	The purpose for the maintenance of the asset element
Defects	A listing of the principal Defects likely to occur and the associated risk of its occurrence and the appropriate remedial action
Performance standards	The performance standard to be provided during various specified times throughout the life of the asset by the asset element including by asset items and asset sub-items within that asset element
Inspection	A reference to the procedures used to inspect the condition of the asset element and monitor the durability performance
Intervention	The intervention level and response time for maintenance work on the asset element
Inspection plan	The frequency of inspection of the asset element. The plan must cover both routine regular inspections and less frequent but more comprehensive inspections and tests
Maintenance	A listing of the principal maintenance activities used to maintain the asset element
Asset criticality	Asset criticality as defined by the project design
Redundancy	A design in which a component is duplicated so if it fails there will be a backup
Acceptable loss	The extent to which an asset can fail before intervention is required
Spares requirements	If relevant - spares required to be held to meet asset criticality requirements
Condition assessment	The intervention standards would correlate to the condition assessment score (between 1 and 5) and drive the work order generation and start the clock on response time.

### 3.4.5 Operation Manual requirements

The Operation Manual as a minimum must:

- a) include a table of contents;
- b) be allocated a unique document number as required by the Principal;
- c) include page numbers and number of pages (e.g. 2 of 50) of the Operation Manual;
- d) include a list of all decommissioned assets;
- e) address any issues that arise during the training, testing and commissioning activities that impact the Operation Manual;
- f) incorporate all of the Principal's comments and amendments; and
- g) provide comprehensive instruction and detail for the operation of the assets, special tools. and test equipment, including:
  - i) site specific operational instructions;

- ii) design and operational limits;
- iii) safe working, operational practices and procedures;
- iv) basic operational conditions;
- v) operating parameters such as temperature, humidity, wind speed and other limits;
- vi) include technical documents associated with the operation of assets;
- vii) details of safety precautions, hazardous materials, situations, fire risk and any occupational health related risks;
- viii) operation of all control systems, hardware and software;
- ix) a description of any operator maintenance, inspection, daily servicing, adjustment and tuning tasks;
- x) failure mode effect analysis and fault finding of critical components;
- xi) procedures for shutdown, start up and emergency shutdown; and
- xii) any other information to ensure the safe and efficient operation,

(Operation Manual).

## 3.5 Training Manual

### 3.5.1 Submission requirements

- a) The Contractor must develop, prepare, and submit, Training Manuals, each of which will constitute a **Hold Point**. The release of this Hold Point is a condition precedent to Handover.
- b) Where the Training Manuals are required to be updated to address the requirements of section 3.5.2b)ii), the Training Manuals must be resubmitted, in which case the requirement to submit the Training Manuals in accordance with section 3.5.1a) will reapply, including the Hold Point.

### 3.5.2 Training Manual requirements

- a) The Training Manuals must be utilised by the Contractor to provide training for the Principal and all relevant Third Party Asset owners.
- b) The Training Manuals as a minimum must:
  - i) include training materials and procedures to ensure all assets can be safely and effectively operated and maintained;
  - ii) address any issues that arise during the training, testing and commissioning activities that impact the Training Manual;
  - iii) incorporate all of the Principal's comments and amendments;
  - iv) include content that is intended to be used for both classroom training and field training on site; and
  - v) where PC-EDM5 "Digital Engineering" forms part of the Contract Documents, the training requirements set out in PC-EDM5 "Digital Engineering".

### 3.5.3 Training

The Contractor must conduct classroom and field (on site) training with the Principal, relevant Third Parties, and any other person nominated by the Principal in accordance with the finalised Training Manuals including for commissioning activities, safe operations of the completed Works, asset familiarisation and safe maintenance procedures for maintaining the completed Works:

- a) as a condition precedent to Handover; and
- b) prior to undertaking relevant commissioning activities.

## 3.6 Asset Handover provision

### 3.6.1 Submission requirements

The Contractor must develop, prepare, and submit, the Asset Handover Report which will constitute a **Hold Point**. The release of this Hold Point is a condition precedent to Handover.

### 3.6.2 Asset Handover Report requirements

The Asset Handover Report as a minimum must:

- a) include the Designer's certification confirming that the Design Documentation complies with the Contract Documents;
- b) include the Contractor's certification confirming that the Design Documentation complies with the Contract Documents and as described in PC-EDM1 "Design Management";
- c) include the Independent Design Certificate as described in PC-EDM1 "Design Management" and PC-EDM3 "Independent Design Certification" (where relevant);
- d) include a placeholder for the asset handover certificate for inclusion after the release of the Hold Point in accordance with section 4;
- e) reference the applicable testing and commissioning undertaken in accordance with the Contract Documents and the results obtained;
- f) reference the O&M Manuals and Training Manuals that have been produced and issued previously by the Contractor;
- g) include a schedule of the As-Built Records as provided in accordance with this Master Specification Part;
- h) include the final consolidated Safety in Design report in accordance with PC-EDM2 "Safety Management in Design";
- i) provide a list of all Third Party Assets and a copy of the Third Party Agreements;
- j) include a schedule of remaining Works to be completed; and
- k) include reference to the Quality Management Records and an index of the documentation contained with cross referenced storage location as provided to the Principal.

## 3.7 Works inspection

- a) As a condition precedent to Handover, the Contractor must inspect the Works with the Principal.
- b) At a minimum 10 Business Days prior to the Contractor's proposed inspection date of the Works, the Contractor must:
  - i) request an inspection with the Principal;
  - ii) ensure that all commissioning and testing requirements are complete;
  - iii) provide the finalised As-Built Records to the Principal and Third Party (where relevant) that relate to the traffic control drawings; and
  - iv) provide the pre-opening road safety audit to the Principal and Third Party (where relevant), including the Contractor's response to all issues raised in the pre-opening road safety audit.
- c) The acceptance by the Principal at the inspection set out in section 3.7a) will constitute a **Hold Point**. Release of this Hold Point is required prior to opening to users and as a condition precedent to Handover.
- d) The date and time of the Principal's acceptance must be recorded by the Contractor before the roadway is opened to users and public traffic.

## 3.8 Bridges inspection

- a) As a condition precedent to Handover and prior to opening any bridge to users, the Contractor must inspect each bridge with the Principal.
- b) At a minimum 10 Business Days prior to the Contractor's proposed inspection date the Contractor must, for all bridges:
  - i) request an inspection of the relevant bridge structure with the Principal;
  - ii) ensure that all testing and commissioning requirements are complete; and
  - iii) provide the finalised As-Built Records to the Principal and Third Party (where relevant) that relate to the relevant bridge.
- c) The acceptance of each bridge by the Principal at the bridge inspection set out in section 3.8a) will constitute a **Hold Point**. Release of this Hold Point is required prior to opening the relevant bridge to users and as a condition precedent to Handover.

## 4 Handover

### 4.1.1 Asset handover certificate

- a) The Contractor must submit an asset handover certificate to the Principal once all pre-requisites to Handover, excluding the requirements of section 4.1.1b), have been achieved in accordance with section 3.1, which will constitute a **Hold Point**.
- b) As a condition precedent to Handover and after the release of the Hold Point in accordance with section 4.1.1a), the asset handover certificate must be included in the Asset Handover Report.

### 4.1.2 Asset Handover process

- a) The Contractor must notify the Principal once all pre-requisites to Handover have been achieved and when the Contractor considers Handover has been achieved.
- b) Following receipt of the Contractor's notice in accordance with section 4.1.2a), the Principal must consider the Contractor's notification, and:
  - i) if the Principal determines that the relevant assets have achieved Handover, the Principal must confirm that Handover has been achieved for the relevant assets stating the date of Handover; or
  - ii) if the Principal determines that relevant assets have not achieved Handover, the Principal must notify the Contractor of those matters or things which need to be addressed before the relevant assets can achieve Handover.
- c) Where the Principal determines the relevant assets have not achieved Handover in accordance with section 4.1.2b)ii), the Contractor must address those matters or things and resubmit the notice in accordance with section 4.1.2a).

## 5 Formatting requirements

- a) All reports and manuals must be in the Department's template Microsoft Word format, and PDF format, and be bookmarked electronically for easy navigation and referencing. They must be formatted in accordance with the Department Style Guide and have a linked table of contents.
- b) The Contractor may add its company logo to the front page of the report or manual provided it is of high-resolution quality and of a size no larger than the Department's logo.
- c) Without limiting the requirements of PC-PM5 "Information Management", all O&M Manuals, Training Manuals, the Asset Handover Report and As-Built Records must be provided in the

formats detailed in PC-CN1 "Testing and Commissioning" to ensure that they are captured within the Principals digital engineering environment.

## 6 Hold Points

Table PC-CN2 6-1 details the review period or notification period, and type (documentation or construction quality) for each Hold Point referred to in this Master Specification Part.

**Table PC-CN2 6-1 Hold Points**

<b>Section reference</b>	<b>Hold Point</b>	<b>Documentation or construction quality</b>	<b>Review period or notification period</b>
3.2.1	Technical data	Documentation	15 Business Days review
3.3.2	As-Built Records	Documentation	20 Business Days review
3.4.1a)	O&M Manual sample and table of contents	Documentation	10 Business Days review
3.4.1b)	O&M Manual	Documentation	15 Business Days review
3.5.1a)	Training Manual	Documentation	15 Business Days review
3.6.1	Asset Handover Report	Documentation	10 Business Days review
3.7c)	Works inspection	Construction quality	10 Business Days notification
3.8c)	Bridge inspection	Construction quality	10 Business Days notification
4.1.1a)	Asset handover certificate	Documentation	10 Business Days review