Master Specification
Part PC-RW50

Inspection, Testing and Commissioning

July 2025

Government of South Australia
Department for Infrastructure and Transport

Build.
Move.
Connect.

Document Information

Document Information	
K Net Number:	11716734
Document Version:	0
Document Date:	09/07/2025

Document Amendment Record

Version	Change Description	Date
0	Initial issue	09/07/2025

Document Management

 This is a controlled document and it will be updated and reissued as approved changes are made.

Contents

PC-RW50 Inspection Testing and Commissioning

1 General

a) This Master Specification Part sets out the requirements for inspection, testing and commissioning of Rail Infrastructure including:

i) the documentation requirements, as set out in section 2;

ii) the Contractor's responsibilities, as set out in section 3;

iii) the testing and commissioning requirements and signal and control system engineering, as set out in section 4;

iv) the testing and commissioning requirements for electrical engineering and communications, as set out in section 5;

v) the whole of system testing and commissioning requirements, as set out in section 6;

vi) the decommissioning and disposal requirements, as set out in section 7; and

vii) the Hold Point and Witness Point requirements, as set out in section 8.

b) The inspection, testing and commissioning of Rail Infrastructure must comply with the Reference Documents, including:

i) PTS-AR-10-PM-GUD-00000098 – Guidelines for Inspection Testing and Commissioning of assets for rail projects;

ii) SG1-DOC-000452 Testing and Commissioning of Signalling Systems for AMPRN;

iii) SG4-DOC-002026 Engineering Instruction – Rail Safety Worker Competency Assessment For Signalling Contractors Staff; and

iv) AMPRN Rules and Procedures.

c) The Contractor must ensure that the inspection, testing and commissioning of Rail Infrastructure is undertaken safely and in accordance with the requirements of the Contract Documents, including PC-CN1 "Testing and Commissioning" (as applicable to Rail Infrastructure) and this Master Specification Part.

d) The gate details in this Master Specification Part are in accordance with PC-RW10 "Railway Management Planning".

2 Documentation

2.1 Testing and Commissioning Management Plan

a) In addition to the requirements of PC-CN1 "Testing and Commissioning", the Testing and Commissioning Management Plan must include:

i) details of the safety management system (per PC-RW70 "Railway Safety Management") including how testing will be managed in a live rail environment and when the 25kV OHWS is live;

ii) a register of ITPs in accordance with PC-QA1 "Quality Management Requirements" or PC-QA2 "Quality Management Requirements for Major Projects" (as applicable);

iii) the testing regime as required by sections 4, 5, and 6;

iv) details of how the dynamic integration tests ensure system integration as required by section 6.3d); and

v) any decommissioning and disposal of an item or system as required by section 7a).

b) The Testing and Commissioning Management Plan must address “whole of system” inspection, testing and commissioning requirements to ensure all of the interfaces have been managed to prevent any “whole of system” failure and ensure that track, signalling, communications, rolling stock, OHWS and traction power systems function correctly together.

c) The Contractor must develop, implement, maintain and comply with ITPs so as to provide objective evidence of compliance with the requirements of the Contract Documents. ITPs must be developed as standard proforma in accordance with PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable).

d) The Testing and Commissioning Management Plan must be prepared, submitted and updated in accordance with the requirements of PC-PM1 “Project Management and Reporting” and:

i) an updated Testing and Commissioning Management Plan must be submitted 10 Business Days prior to the review at gate 4B in accordance with PC-RW10 “Railway Management Planning”; and

ii) an updated Testing and Commissioning Management Plan must be submitted 20 Business Days prior to the review at gate 4C in accordance with PC-RW10 “Railway Management Planning”.

3 Contractor’s responsibilities

a) In addition to the requirements of PC-CN1 “Testing and Commissioning” and PC-PM3 “Contractor’s Personnel and Training”, the Contractor must appoint a railway experienced and practicing professional engineer as the Chief Commissioning Engineer for the duration of the Project.

b) The Contractor must ensure that the Chief Commissioning Engineer complies with the competency requirements set out in SG4-DOC-002026 Engineering Instruction – Rail Safety Worker Competency Assessment For Signalling Contractors Staff.

c) The Chief Commissioning Engineer is responsible for ensuring that inspection, testing and commissioning activities comply with the requirements of this Master Specification Part.

d) The Chief Commissioning Engineer must be supported by a team of experienced commissioning engineers and technicians.

4 Testing and commissioning requirements and signal and control system engineering

a) In addition to the requirements of PC-CN1 “Testing and Commissioning”, the specific requirements for the inspection, testing and commissioning of the systems associated with railway signal and control system engineering must be in accordance with SG1-DOC-000452 Testing and commissioning of signalling systems for AMPRN.

b) The Contractor must prepare an ITP which satisfies the requirements of section 4a) and submit that ITP at least 20 Business Days prior to Gate 4C in accordance with PC-RW10 “Railway Management Planning”. The submission of the ITP constitutes a **Hold Point** and the Contractor must not proceed to Gate 4C until the Hold Point is released.

5 Testing and commissioning requirements for electrical engineering and communications

a) Electrical testing for Rail Infrastructure must be carried out by appropriately trained and qualified personnel. Provision of the qualifications and experience of the personnel performing the electrical testing will constitute a **Hold Point** which must be submitted 10 Business Days prior Gate 4D in accordance with PC-RW10 “Railway Management Planning”. Electrical testing must not commence until the Hold Point is released.

b) The Contractor must provide at least 48 hours' notice of the time and date that each stage of the electrical testing will be undertaken. Provision of the notification constitutes a **Witness Point**.

c) The Principal may choose to witness a representative sample of tests as they are conducted.

d) Within 5 Business Days of the successful electrical testing being complete, the Contractor must document the results in an electrical testing report and submit it to the Principal for approval which will constitute a **Hold Point**. The Contractor must not proceed to Gate 4E, in accordance with PC-RW10 "Railway Management Planning" until this Hold Point has been released.

e) Following completion of each Work Lot testing of electrical conduits and cablings, the installation must be certified as compliant with all relevant communications standards using a TCA1 form (one for each separate Work Lot and system). The Contractor must submit the TCA1 form to the Principal 10 Business Days prior to Gate 4E in accordance with PC-RW10 "Railway Management Planning" which will constitute a **Hold Point**. Further commissioning cannot commence until the Hold Point is released.

6 Whole of system testing and commissioning requirements

6.1 Static tests / Site Acceptance Testing (SAT)

a) In addition to the requirements of PC-CN1 "Testing and Commissioning, the Contractor must:

i) complete the Rail Infrastructure static test / SAT following the installation of an individual item;

ii) comply with the AMPRN Rules and Procedures;

iii) in addition to testing individual systems, test by simulation in accordance with the Contract Documents and the Design Documentation, the interfaces between the Contractor's systems and those of others, including other Contractors;

iv) obtain requirements for the level of simulation required from the Principal; and

v) supply the necessary level of simulation of its own systems to others on a timely basis.

b) The static tests must be undertaken in the following three sub-phases:

i) intermediate static tests which must be undertaken as follows:

A. during the intermediate static tests, neither the systems nor their components are energised. The objective of the tests is to verify that the plant and material, systems and the Works have been constructed and installed in accordance with this Contract Documents and that the next sub-phase of testing can start without damaging any part of the system;

B. the intermediate static tests must verify that the plant and material, systems and the Works have been constructed and installed properly so that they do not adversely affect or impede the proper functioning of other systems;

C. the Contractor must issue an installation release note to the Principal on successful completion of the intermediate static tests; and

D. provision of the installation release note constitutes a **Hold Point** and pre-commissioning static tests must not take place until this Hold Point is released by the Principal.

ii) pre-commissioning static tests which must be undertaken as follows:

A. the Contractor must undertake pre-commissioning static tests when the elementary components or sub-systems are energised. The objectives of these tests are similar to those described above in "intermediate static tests" in section 6.1b)i) but also serve to verify that the plant and material, systems and the Works function in accordance with the Contract Documents;

B. the Contractor must issue a pre-commissioning static test plan for each test or set of tests for the Principal's approval. This constitutes a **Hold Point** and pre-commissioning static testing must not take place until this Hold Point has been released by the Principal; and

C. provision of the test records and a Pre-Commissioning Certificate (PCC) constitutes a **Hold Point** and system static testing must not take place until this Hold Point is released; and

iii) system static tests which must be undertaken as follows:

A. the Contractor must complete system static tests when all sub-systems that comprise an elementary system are connected in order to verify that the sub-systems work on an integrated basis;

B. in carrying out the system static tests, the Contractor must take into account the interface of the relevant systems with the systems of others including other contractors, the external railway operators and external facility networks; and

C. the Contractor must issue a system static test plan for each of these tests, which must be approved by the Principal prior to execution and this constitutes a **Hold Point** which must be submitted 10 Business Days prior to SIAT, Gate 4D in accordance with PC-RW10 "Railway Management Planning. The plan must be completed with data from the testing activities and submitted with an Elementary System Acceptance Certificate for the approval of the Principal.

6.2 System Integration Acceptance Testing (SIAT)

a) In addition to the requirements of PC-CN1 "Testing and Commissioning, the Contractor must:

i) undertake SIAT when the interfaces between all systems, including the interfaces with the systems of others including other contractors, the external railway operators and external facility networks are fully connected;

ii) undertake the SIAT to the same objectives and description of the tests specified for system static tests detailed in section 6.1b);

iii) obtain details of all necessary interface activities from the Principal, including other contractors;

iv) test and operate the Contractor's equipment as required to support the testing of interfaces and integration with other systems where such interface and integration testing is carried out by the Principal or other contractors; and

v) take into account, the operational constraints and include such constraints in the ITPs.

b) Provision of the test records and PCC will constitute a **Hold Point**. Dynamic integration testing in accordance with section 6.3 must not commence until the Hold Point is released.

6.3 Dynamic integration tests

a) Dynamic integration testing must be undertaken as part of the User Acceptance Testing in accordance with PC-CN1 "Testing and Commissioning".

b) The Contractor is not required to undertake Operational Scenario Testing prior to User Acceptance Testing as required by PC-CN1 "Testing and Commissioning".

c) Throughout dynamic integration tests, the Principal will run passenger type train or tram sets which will be used as test trains or trams.

d) The Contractor must clearly document in the Testing and Commissioning Management Plan how the dynamic integration tests ensure system integration with the remainder of the AMPRN as well as external rail transport operator networks, and Utility Services.

e) The dynamic integration tests must verify that the design and installation of the plant and material, systems and the Works comply with the Contract Documents and that all system interfaces function and are integrated so that the system operates properly and safely.

f) Train operations will be progressively increased throughout this test to the level anticipated by the Principal for trial or test running.

g) The Contractor must test and commission its systems taking account of the Principal's operation requirements during dynamic integration tests.

h) The Contractor must include in the ITP, details of the additional safety measures, such as those regarding track occupations and test tracks required for the dynamic integration testing.

i) Further to the requirements of PN-CN1 "Testing and Commissioning", throughout dynamic integration tests, the Contractor must train the Principal's staff to operate its systems to enable the Principal's staff to operate the overall system for trial runs in accordance with the Principal's requirements.

j) Training Manuals and Operation Manuals, including the training documents, must be used during dynamic integration tests as though the AMPRN were in full commercial operation.

k) Provision of the dynamic integration test records and provisional asset handover certificate constitutes a **Hold Point** which must be submitted 10 Business Days prior Gate 4E in accordance with PC-RW10 "Railway Management Planning". Testing must not be completed until this Hold Point is released.

6.4 Trial or test running

a) The Principal operates the overall system and conducts the necessary tests in accordance with the AMPRN Rules and Procedures.

b) The Contractor must provide the Principal with all requested assistance, information, services, facilities and labour in order for the Principal to conduct trial and test runs pursuant to the AMPRN Rules and Procedures.

c) Trial runs must include a sufficient number of runs to burn in the overall system and allow for correction of any emergent faults and provide maintenance, driver and operator / controller training.

d) Trial runs must be carried out both during and outside of revenue service and will be coordinated by the Principal with the operating divisions of the railway. The Contractor must make staff available to support the activities.

e) A certificate of train / tram running (as applicable) from infrastructure and overhead wiring and certificate of signalling must be provided to the Principal and constitutes a **Hold Point** which must be submitted 10 Business Days prior Gate 4E in accordance with PC-RW10 "Railway Management Planning".

f) Test or revenue trains must not operate on the AMPRN until this Hold Point is released by the Principal.

7 Decommissioning and disposal

In addition to the requirements of PC-CN1 "Testing and Commissioning", the Contractor must:

a) take into account any decommissioning and disposal of an item or system in the Testing and Commissioning Management Plan;

b) identify and list the item or system which needs to be decommissioned and disposed;

c) develop, implement, maintain and comply with the plan for safe shut down or dismantling of the system; and

d) dispose of all redundant material, items, equipment and systems generated during the commissioning process in accordance with the sustainability and waste management

requirements and to avoid any infringement, confusion or distraction to train drivers, operators or maintainers.

8 Hold Points and Witness Points

a) Table PC-RW50 8-1 details the review period or notification period, and type (documentation or construction quality) for each Hold Point referred to in this Master Specification Part.

b) Table PC-RW50 8-2 details the review period or notification period, and type (documentation or construction quality) for each Witness Point referred to in this Master Specification Part.

Table PC-RW50 8-1 Hold Points

Section reference	Hold Point	Documentation or construction quality	Review period or notification period
4b)	Testing and commissioning requirements in the form of an ITP – signal control system engineering	Documentation	20 Business Days
5a)	Qualifications and experience of the personnel performing electrical testing	Documentation	10 Business Days
5d)	Electrical testing report	Documentation	5 Business Days
5e)	TCA1 form for electrical conduits and cablings	Documentation	10 Business Days
6.1b)i)D	Provision of the installation release note	Documentation	10 Business Days
6.1b)ii)B	Pre-commissioning static test plan for each of system static test	Documentation	10 Business Days
6.1b)ii)C	Provision of the test records and PCC	Documentation	10 Business Days
6.1b)iii)C	System static test plan for each of system static test	Documentation	10 Business Days
6.2b)	Provision of test records and PCC	Documentation	10 Business Days
6.3k)	Dynamic Integration Test Records and Provisional Asset Handover Certificate	Documentation	10 Business Days
6.4e)	Certificate of train / tram running (as applicable) from infrastructure and overhead wiring and certificate of signalling	Documentation	10 Business Days

Table PC-RW50 8-2 Witness Points

Section reference	Witness Point	Documentation or construction quality	Review period or notification period
5b)	Notice of the time and date that each stage of the electrical testing will be undertaken	Construction Quality	48 hours