

Master Specification

Part PC-ENV4

Noise Assessment, Treatment Design, and Implementation

September 2024



Government of South Australia
Department for Infrastructure
and Transport

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Document Information

Document Information	
K Net Number:	13623466
Document Version:	1
Document Date:	30/09/2024

Document Amendment Record

Version	Change Description	Date
0	Initial issue	31/08/2023
1	Updated cover page	30/09/2024

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PC-ENV4 Noise Assessment, Treatment Design, and Implementation

1 General

- a) This Master Specification Part sets out the minimum noise assessment requirements, including:
 - i) the documentation requirements, as set out in section 2;
 - ii) the Contractor's environmental obligations, as set out in section 3;
 - iii) the applicability assessment requirements, as set out in section 4;
 - iv) the preliminary noise assessment requirements, as set out in section 5;
 - v) the Noise Modelling and Mitigation Design Report requirements, as set out in section 6;
 - vi) the noise barrier requirements, as set out in section 7;
 - vii) the property treatment requirements, as set out in section 8;
 - viii) the noise treatment validation requirements, as set out in section 9; and
 - ix) the Hold Point requirements, as set out in section 10.
- b) The noise assessment must comply with:
 - i) the Reference Documents, including:
 - A. Department Environment and Heritage Technical Manual (EHTM), including all attachments and supporting documentation (available from: <https://dit.sa.gov.au/standards/manuals>);
 - B. AS/NZS ISO 717.1 Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation; and
 - C. Department Property Noise Mitigation: Façade Treatment Package Specification (available upon request); and
 - ii) all Laws including the *Environment Protection Act 1993* (SA), and all Environmental Protection Policies made under the Act.
- c) For the purposes of this Master Specification Part:
 - i) Department EHTM Attachment 7A - Road Traffic Noise Guidelines is referred to as the "RTNG";
 - ii) a reference to "EPA GANRI" refers to both (as applicable):
 - A. the SA EPA Guidelines for the Assessment of Noise from Rail Infrastructure; and
 - B. Department EHTM Attachment 7B - Operational Rail Noise [EPA: Guidelines for the Assessment of Noise from Railway Infrastructure];
 - iii) "Environmental Protection Policies" has the meaning defined in the Environment Protection Act 1993 (SA); and
 - iv) a reference to "property treatments" includes Façade Treatment Packages.

2 Documentation

2.1 Design Documentation

In addition to the requirements of PC-EDM1 “Design Management”, the Design Documentation must include:

- a) all assessments, reports, investigations, sketches and drawings required by this Master Specification Part (including the EHTM);
- b) the proposed noise treatment measures (if applicable), as required by section 3c);
- c) the Noise Modelling and Mitigation Design Report, as required by section 6; and
- d) the GIS spatial data (i.e. shapefiles), as required by section 6b).

2.2 Quality Management Records

In addition to the requirements of PC-QA1 “Quality Management Requirements” or PC-QA2 “Quality Management Requirements for Major Projects” (as applicable), the Quality Management Records must include:

- a) all monitoring data, reports and modelling data specified in this Master Specification Part; and
- b) spatial information of final noise treatments implemented, including barriers and house treatments (noise treatment package specific), which must be provided in accordance with PC-SI4 “GIS & Aerial and Remote Data Capture Standard”.

3 Contractor’s environmental obligations

- a) The Contractor must:
 - i) undertake noise and vibration assessments;
 - ii) where required, design noise mitigation treatments;
 - iii) where required by the Contract Documents, implement all necessary noise treatments for the operational phase of the Project; and
 - iv) demonstrate compliance at all sensitive receivers in accordance with:
 - A. for road traffic noise, the RTNG;
 - B. for rail noise, the EPA GANRI; and
 - C. for other noise sources, the *Environment Protection Act 1993* (SA) and Environment Protection Policy requirements.
- b) Where the noise assessment is undertaken in accordance with the EPA GANRI or Environment Protection Policies, the Contractor must consult with the EPA as necessary to determine the application of the guidelines.
- c) Where noise treatment is required, priority must be given to treating the noise at the source, to applicable standards, over treatment at the receiver. Noise treatment measures must be approved by the Principal as part of the Design Documentation or the relevant planning phase submission.
- d) Where noise criteria are unable to be achieved with the maximum barrier height specified in the RTNG or as specified in the Contract Documents, the Contractor must seek approval from the Principal to provide property façade treatments as a Design Departure.
- e) All modelling and design activities required by this Master Specification Part must be undertaken by a suitably qualified acoustic specialist.
- f) The Contractor must review all previous or preliminary assessments provided by the Principal to determine, and undertake, all necessary updates to the assessments (including any

changes in geometry, traffic volumes, etc.) or determine if they meet the requirements of the Contract Documents.

4 Applicability assessment

- a) If not completed previously, the Contractor must identify the applicability, or otherwise, of the RTNG, the EPA GANRI or other relevant Reference Documents based on the scope of the Project and the principles of application of the guideline. The applicability must be documented in the Environment and Heritage Impact Assessment Report (EHAR) required by PC-ENV3 “Environmental Design”, or noise assessment/design reports (as appropriate).
- b) Where a guideline is initially deemed not to apply and there is a change in the scope of the Project or design modifications, the applicability of the guideline must be reassessed.
- c) Where a guideline is deemed not to apply, and accepted by the Principal, no further work under this Master Specification Part is required.

5 Preliminary noise and vibration assessment

- a) This section 5 only applies to pre-delivery phase or planning phase projects.
- b) If not completed previously by the Principal, the Contractor must undertake a preliminary noise and vibration assessment and prepare a Preliminary Noise Assessment and Mitigation Report in accordance with:
 - i) for road traffic noise, the RTNG;
 - ii) for rail noise, the EPA GANRI; or
 - iii) for other noise sources, the *Environment Protection Act 1993 (SA)* and Environment Protection Policy requirements.
- c) Submission of the Preliminary Noise Assessment and Mitigation Report required in section 5b) will constitute a **Hold Point**. The Contractor must not submit the Noise Modelling and Mitigation Design Report in section 6, until the Hold Point has been released.

6 Noise Modelling and Mitigation Design Report

- a) If not completed previously by the Principal, the Contractor must undertake a noise and vibration assessment and prepare a Noise Modelling and Mitigation Design Report in accordance with:
 - i) for road traffic noise, the RTNG;
 - ii) for rail noise, EPA GANRI; or
 - iii) for other noise sources, the *Environment Protection Act 1993 (SA)* and Environment Protection Policy requirements.
- b) GIS spatial data (i.e. shapefiles) must be provided for all noise treatments including sound reducing pavements, barriers and property treatments per package as part of the Design Documentation.
- c) The Noise Modelling and Mitigation Design Report required in section 6a), must be submitted as a Design Report in accordance with PC-EDM1 “Design Management”.

7 Noise barriers

7.1 Noise barrier minimum design requirements

- a) Noise barriers must be designed in accordance with the RTNG or the RPA GANRI (as applicable).

- b) The following minimum requirements apply to noise barrier design:
 - i) noise barriers must be designed so as to produce a continuous solid construction, without gaps that would permit the passage of sound. Where gaps are required, the barrier must still achieve the equivalent noise reduction; and
 - ii) barrier panels must be constructed with a material to achieve a weighted sound reduction index (Rw), when determined in accordance with AS/NZS ISO 717.1 Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation, of not less than 26 for normal use and an Rw of not less than 31 where noise reductions of more than 10 dB(A) are required.
- c) The Noise Modelling and Mitigation Design Report required in section 6a), must provide documentary evidence that the materials proposed for wall panels and barriers comply with the requirements of section 7.1a) and 7.1b).
- d) Unless specified otherwise, the Contractor's design and documentation must comply with:
 - i) the requirements of this Master Specification Part;
 - ii) PR-LS-D1 "Landscape and Urban Design"; and
 - iii) the urban design aspects of the Contract Documents. Consideration must also be given to the TfNSW publication "Noise wall design guideline - Design guideline to improve the appearance of noise walls in NSW" (available from: <https://roads-waterways.transport.nsw.gov.au/>).

7.2 Noise barrier implementation

- a) Where noise barriers are proposed to be located on the property boundary (e.g. private, local government, etc.), the Contractor must undertake and implement the Works in accordance with Department EHTM Attachment 7C - Noise Treatment Implementation Guideline.
- b) The Contractor must not undertake property Works until the relevant Approvals have been obtained (Deed of Consent and Agreement).

8 Property treatment

8.1 General

- a) The Contractor must determine sensitive receivers eligible to receive property treatments in accordance with the RTNG and design and install treatments in accordance with the RTNG, EPA GANRI, or as specified in this Master Specification Part.
- b) All Works must comply with the National Construction Code (NCC).

8.2 Façade treatment design and scope of works

- a) Façade treatments must be designed in accordance with the RTNG or the EPA GANRI (as applicable).
- b) Where façade treatments are to be installed at private properties, the Contractor must undertake property inspections and consultation with the affected landowners to determine the exact nature of the treatments.
- c) Property inspections must include:
 - i) attendance by key personnel including an acoustic engineer and community engagement representative;
 - ii) where required for certain properties, an architect or builder experienced in acoustic design and installation for design of façade treatments; and
 - iii) for heritage listed properties, an architect with heritage experience.

- d) The Contractor must prepare a Façade Treatment Scope of Works (FTSW) document for each eligible property in accordance with the RTNG and EPA GANRI.
- e) All façade treatments installed must comply with the Department Property Noise Mitigation: Façade Treatment Package Specification (obtained by request from the Principal). The Department Property Noise Mitigation: Façade Treatment Package Specification must supplement the FTSW documents and provides further information regarding:
 - i) reference to acoustic performance and specification requirements and suitable proprietary products;
 - ii) typical construction drawing details; and
 - iii) construction notes regarding practical implications for installation.
- f) Submission of each FTSW document required in section 8.2d) will constitute a **Hold Point**. The proposed façade treatments must not be implemented until this Hold Point has been released.

8.3 Property treatment implementation

- a) The Contractor must undertake and implement the Works in accordance with Department EHTM Attachment 7C - Noise Treatment Implementation Guideline.
- b) The Contractor must not undertake property Works until the relevant Approvals (including Deed of Consent and Agreement) has been executed.
- c) The Contractor must provide a warranty period of 2 years (or as otherwise required in the Contract Documents) from the date of co-signing of the Completion of Works certificate (refer to Department EHTM Attachment 7C - Noise Treatment Implementation Guideline) by the property owner for all property façade treatments.

9 Noise treatment validation

- a) The Contractor must undertake a validation assessment to confirm that the implemented noise treatment strategy meets the requirements of the Contract Documents.
- b) The validation assessment must be undertaken in accordance with the relevant Reference Documents including the RTNG, EPA GANRI and Environment Protection Policy (as applicable).
- c) The Contractor must be responsible for rectifying the implemented noise treatments if the validation results do not comply with the RTNG, EPA GANRI or Environment Protection Policy (as applicable) at all sensitive receivers.
- d) The Contractor must provide outcomes of the validation process in a Noise Treatment Validation and Closure Report in accordance with the RTNG, EPA GANRI or Environment Protection Policy (as applicable).
- e) Submission of the Noise Treatment Validation and Closure Report required in section 9d), will constitute a **Hold Point**.

10 Hold Points

Table PC-ENV4 10-1 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-ENV4 10-1 Hold Points

Section reference	Hold Point	Documentation or construction quality	Review period or notification period
5c)	Submission of Preliminary Noise Assessment and Mitigation Report	Documentation	10 Business Days review
8.2f)	Submission of each Façade Treatment Scope of Works document	Documentation	10 Business Days review
9e)	Submission of Noise Treatment Validation and Closure Report	Documentation	10 Business Days review