

PART D19
DESIGN - ENVIRONMENTAL

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1. GENERAL

- .1 This Part specifies the requirements for incorporating environmental protection matters into the design of the Works.
- .2 The following documents are referenced in this Part:
 - (a) Part G50 "Environmental Management Requirements";
 - (b) Part CH50 "Environmental Protection Issues";
 - (c) Part D20 Design Roadworks;
 - (d) Part L03 Erosion Control Matting; and
 - (e) Part L27 Water Sensitive Urban Design.
- .3 The following definitions apply to this Part:
 - (a) "**Environmental authorisation**" includes an approval, licence, permit or exemption.

2. REFERENCES

- .1 Unless specified otherwise, all design must be undertaken in accordance with the following:
 1. DPTI: Contractor's Environmental Management Plan Guidelines for Construction – Road, Rail and Marine Facilities;
 2. DPTI: Rail and Roadside Significant Sites Environmental Instruction 21.5;
 3. DPTI: Cultural Heritage Guidelines;
 4. DPTI: Protecting Waterways Manual;
 5. DPTI: Water Quality Monitoring Manual for Construction;
 6. DPTI: Road Traffic Noise Guidelines;
 7. DPTI: Vegetation Removal Policy;
 8. DPTI: VE101 Vegetation Survey Guidelines;
 9. EPA: Stormwater Pollution Prevention Code of Practice for Local, State and Federal Government, http://www.epa.sa.gov.au/environmental_info/legislation/codes_of_practice
 10. EPA: Acid Sulfate Soil Material Guideline (Nov 2007) www.epa.sa.gov.au/xstd_files/Site%20contamination/Guideline/guide_sc_acid.pdf
 11. National Environment Protection (Assessment of Site Contamination) Measure 1999 <http://www.scew.gov.au/nepms>
- .2 DPTI publications are available from: <http://www.dpti.sa.gov.au/documents> or <http://www.dpti.sa.gov.au/standards/environment>.

- .3 Other publications are available on the nominated web site or directly from the agency concerned.

3. ENVIRONMENTAL SPECIALISTS

- .1 Environmental Specialists who undertake assessments, modelling, monitoring or design must be currently on the DPTI panel contracts.

4. ENVIRONMENTALLY SENSITIVE AREAS

- .1 The design of the Works and Temporary Works must minimise, to maximum extent practicable, the impact on any environmentally sensitive areas.
- .2 The Contractor must ensure that the following environmentally sensitive areas, at a minimum, are clearly shown on the relevant Design Documentation:
- (a) known Aboriginal and non-Aboriginal heritage sites including artefact scatters;
 - (b) contaminated soils and/or contaminated groundwater;
 - (c) actual or potential acid sulphate soils (to be included in foundation plans);
 - (d) operational or disused irrigation / production wells;
 - (e) Rail and Roadside Significant Sites
 - (f) regulated/significant trees (including structural root zones and tree protection zones) and areas of native vegetation;
 - (g) waterways; and
 - (h) noise sensitive areas.

5. FLORA AND FAUNA

- .1 Vegetation survey(s) of the Site and details of any approvals may be provided by the Principal. The Contractor must:
- (a) ensure that the design minimises the impact upon any areas of native and significant vegetation which have been identified in the vegetation survey(s) provided by the Principal;
 - (b) ensure that the design, to the greatest extent practicable, complies with recommendations contained within vegetation surveys;
 - (c) ensure that the landscape design incorporates offsets for impacted native, amenity, regulated and significant vegetation in accordance with the DPTI Vegetation Removal Policy, Native Vegetation Act 1991 and Development Act 1993, where relevant;
 - (d) prepare vegetation removal/impact drawings which 'overlay' the proposed horizontal design onto the vegetation survey drawings to identify all trees, shrubs and areas of vegetation that will require removal for the work under the works. For all trees, Tree Protection Zone and Structural Root Zone (as per AS 4970) shall be included on design / construction drawings (Refer to Part CH50 for more information). This information utilise this information for decision making on the design and construction methodology to avoid/minimise impacts to vegetation;
 - (e) submit the vegetation removal drawings to the Principal for use in the assessment of the Contractor's request to remove the vegetation;
 - (f) undertake or arrange for additional vegetation survey to be undertaken in accordance with DPTI Landscape Standards and Guidelines - VE101 Vegetation Survey Guidelines if the Works will affect vegetation that have not been included in the vegetation survey(s) provided by the Principal;
 - (g) present any additional vegetation survey on plans which enable the identification of particular trees, shrubs or areas of vegetation by use of the numbering system used in the Principal's vegetation surveys to avoid ambiguity or duplication in numbering of vegetation features;
 - (h) prepare documentation to obtain any necessary approvals in accordance with DPTI's Vegetation Removal Policy for the removal of vegetation where these have not already been obtained by the Principal. Template approval forms may be provided by the Principal upon request. The approvals may include those in accordance with:
 - .1 DPTI internal procedures;
 - .2 the *Development Act (SA) 1993* for Significant and Regulated Trees;
 - .3 the *Native Vegetation Act (SA) 1991*; and
 - .4 the *Environment Protection and Biodiversity Conservation Act (Cth) 1999*.

- .2 Provision of the above documentation shall constitute a **HOLD POINT** (refer Clause 11 "Hold Points").
- .3 The Contractor's design must comply with any recommendations regarding flora and fauna contained within any reports provided to the Contractor.

6. WATER QUALITY PROTECTION

- .1 Where applicable to the Works, the design must ensure the management of pollutants generated from the operation and maintenance of the infrastructure, including from road runoff and vehicle spills during the operation of a road.
- .2 Where the Works and / or Temporary Works will (or have the potential to) affect water quality, the design must incorporate water quality management features to meet the Principal's environmental objectives and the requirements of the following documents:
 - (a) any reports and / or the draft Water Quality Risk Assessment (WQRA) referenced in this Contract;
 - (b) Part D20 Design Roadworks
 - (c) Part L03 Erosion Control Matting
 - (d) Part L27 Water Sensitive Urban Design
 - (e) DPTI Protecting Waterways Manual;
 - (f) Natural Resource Management Act (SA) 2004;
 - (g) Environment Protection Act (SA) 1993;
 - (h) Environment Protection (Water Quality) Policy 2003; and
 - (i) Stormwater Pollution Prevention Code of Practice for Local, State and Federal Government.
- .3 The Contractor must undertake a Water Quality Risk Assessment at the completion of notionally 30% design or when specified by the Principal and update the WQRA during design development where appropriate.
- .4 The Provision of the Water Quality Risk Assessment documentation shall constitute a **HOLD POINT** (refer Clause 11 "Hold Points") and must be provided at least 10 working days prior to the commencement of work on any part of the site.
- .5 The Contractor must undertake a Water Affecting Activities Risk Assessment at the completion of notionally 30% design or when specified by the Principal in accordance with the DPTI Water Affecting Activities Permits Standard Operating Procedure. Should the risk assessment identify the need for a Water Affecting Activities (WAA) Permit, the Contractor must obtain a permit from the relevant Natural Resources Management Board. Prior to applying for the WAA Permit, the Contractor must confirm the findings of the risk assessment with the Principal.

7. EROSION AND SEDIMENT CONTROL

- .1 The design of the Works and Temporary works must:
 - (a) accommodate a range of sediment and erosion control measures where appropriate during construction;
 - (b) if necessary, include stabilisation using sterile rye grass or an approved equivalent method of stabilising until permanent stabilisation / revegetation has been established;
 - (c) ensure that erodible materials are not used as fill; and
 - (d) ensure that all batter slopes have grades that will not result in erosion or are provided with an appropriate surface treatment.

8. NOISE AND VIBRATION

General

- .1 The Contractor shall undertake a noise and vibration assessment. This shall include all necessary activities to undertake the assessment including noise/vibration monitoring and modelling.
- .2 The design of a road must comply with the DPTI *Road Traffic Noise Guidelines* (RTNG), which provide guidance on addressing road traffic noise in the planning and design of infrastructure projects.

- .3 The design of a rail must comply with the EPA: *Guideline for the assessment of noise from rail infrastructure (GANRI)*

Noise mitigation design

- .4 Where the noise assessment identifies the need to provide noise mitigation treatment, Part G53 Noise Mitigation Treatment applies.
- .5 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

Noise Modelling and Mitigation Design Report

- .6 The Noise Modelling and Mitigation Design Report shall, at a minimum, include:
 - (a) Noise Assessment Boundary;
 - (b) all identified assumptions (including calibration factors and existing and proposed pavement type, rail fixing type, rail/traffic volumes);
 - (c) monitoring and modelling inputs, results and outputs;
 - (d) details of the existing noise levels, predicted noise levels (on opening and 10 years post opening), the relevant noise targets/criteria and the noise achieved at each noise sensitive property ;
 - (e) details of the noise mitigation options to be implemented to achieve the noise criteria (e.g. barriers and/or façade treatments);
 - (f) noise contour plots and treatment plans (including noise barriers and façade treatments)
 - (g) an evaluation of the reasonable and practical noise mitigation measures in accordance with Section 4.5 of the RTNG.
- .7 The Participants must prepare detailed design drawings for all noise mitigation and attenuation treatments identified within the Noise Modelling and Mitigation Design Report including details of barrier locations, heights, materials, finishes, urban design, typical construction details, start and end chainage, total length.
- .8 The Noise Assessment and Mitigation Design Report shall be submitted with the preliminary, detailed and final design documentation.
- .9 The provision of the Noise Assessment and Mitigation Design Report and design drawings shall constitute a **HOLD POINT**.

Noise Assessment Verification

- .10 The Contractor shall verify that noise mitigation treatments comply with the targets in the RTNG and EPA GANRI by completing verification noise monitoring and verification modelling in accordance with this Part.
- .11 Following Completion and the operation of road and rail at ultimate speeds, the Contractor shall undertake operational noise measurements at or as near as possible to previously monitored locations, to validate the accuracy of the noise models and mitigation provided.
- .12 Operational monitoring shall be used to confirm that the implemented noise mitigation meets RTNG and EPA GANRI requirements by extrapolating the measured levels to traffic/rail volumes forecast in the design year and by validating the noise model. Adjustments shall be made for traffic/rail flow rates and likely road surface noise corrections at the time of monitoring.
- .13 Noise monitoring for verification shall as a minimum replicate the initial noise monitoring in terms of duration and location.
- .14 The Contractor shall be responsible for rectifying the implemented noise treatments if the monitoring and verification modelling results do not comply with the RTNG and EPA GANRI at all sensitive receivers.

Vibration assessment

- .15 The Participants must undertake an operational rail vibration impact assessment associated with the design to demonstrate compliance at all sensitive receivers with the evaluation criteria for intermittent vibration sources provided in Annex A of Australian Standard AS 2670.2–1990: Evaluation of human

exposure to whole-body vibration, Part 2—Continuous and shock-induced vibration in buildings (1 to 80Hz) and structural damage criteria in German Standard DIN 4150-3 Effects of Vibration on Structures . The implications of structure borne vibration shall be included in the assessment.

9. CONTAMINATION

- .1 If the work under the Contract will affect areas that have not been included in any contamination investigation provided by the Principal, the Contractor must arrange for a suitably qualified contamination consultant to undertake any further investigation necessary (prior to construction and during construction) to determine the scope and nature of contamination.
- .2 The design of the Works and Temporary works must address the management of contaminated material.

10. HERITAGE

- .1 If the work under the Contract will affect areas that have not been included in any Aboriginal heritage survey provided by the Principal (where provided), the Contractor shall undertake additional surveys to be undertaken, if required, in accordance with DPTI's Cultural Heritage Guidelines.
- .2 The design shall:
 - (a) Avoid, or if approved under the Aboriginal Heritage Act, minimise impacts to known Aboriginal heritage sites, objects or remains located within or adjacent to the project site;
 - (b) ensure that the design does not materially affect the amenity value of any state heritage listed or local heritage sites and complies with recommendations contained within heritage reports; and
 - (c) include drawings / images which 'overlay' the proposed design to highlight the visual / direct or indirect impacts of the design to aid the external approval processes (e.g. EPBC).

11. HOLD POINTS

.1 The following is a summary of Hold Points referenced in this Part:

CLAUSE REF.	HOLD POINT	RESPONSE TIME
7.4	Submission of any environmental approvals or licences	10 Working Days
8.2	Provision of documentation to seek vegetation removal approval	3 months
9.4	Provision of the Water Quality Risk Assessment documentation	10 Working Days
13.2	Provision of advice on need for additional Aboriginal heritage surveys	3 months

12. RECORDS

.1 The following records must be provided to the Principal:

Drawings

- (a) Vegetation Removal Plans.
- (b) Environmentally Sensitive Areas Plan.

Reports

.2 The surveys or reports which address:

- (a) Additions or revisions to the CSR;
- (b) Water Quality Risk Assessment, including additions or revisions;
- (c) Additional Vegetation Survey;
- (d) Additional Site Contamination Investigation;
- (e) Additional Non-Aboriginal Heritage Survey;
- (f) Revised air quality modelling;
- (g) Road traffic noise investigation, calculations and mitigation measures;
- (h) incorporation of sustainability measures;
- (i) management of noise and vibration;
- (j) Draft documentation to enable the Principal to obtain any necessary approvals in accordance with DPTI's Vegetation Removal Policy for the removal of vegetation; and
- (k) any other surveys, reports or studies issued to address environmental issues.

Implementation Records

.3 The following approvals or licences (at least 14 days prior to the commencement of work on any part of the site affected by the approval):

- (a) Approval for the removal of vegetation in accordance with the Development Act (SA) 1993 for Significant Trees, the Native Vegetation Act (SA) 1991 and/or the Environment Protection and Biodiversity Conservation Act (Cth) 1999.
- (b) Earthworks Drainage Licence from the Environment Protection Agency or any licence / approval or permit required under the Environment Protection Act (SA) 1993.
- (c) Any other licence/approval or permit required under any other legislation.