

PART P60**PROJECT ISSUES AND IMPACTS****CONTENTS**

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1. GENERAL

- .1 This Part specifies the activities that shall be undertaken or issues and impacts that shall be investigated by the Contractor at a minimum. These activities and investigations shall be undertaken for each Concept being evaluated; however, the level of investigation and reporting shall be commensurate with:
 - (a) the likelihood of the concept under consideration becoming the Preferred Concept; and
 - (b) the significance of the issue/impact upon the concept under consideration.
- .2 The Contractor shall address each issue / impact by:
 - (a) investigating and describing the existing environment/community relevant to the issue;
 - (b) considering the effect of the construction and operational phase of the project on the existing environment/community relevant to the issue; and
 - (c) investigating, discussing and recommending amelioration and/or mitigation measures for any adverse impacts.
- .3 The Principal is responsible for the management of the following issues:
 - (a) Indigenous Heritage;
 - (b) Native Title; and
 - (c) Economic.
- .4 The estimated cost of amelioration and/or mitigation measures shall be determined in accordance with Part P20 Planning - General.
- .5 The Contractor shall provide the documents specified in Part P70 Outputs and Reports for each of the issues/impacts.
- .6 The following documents are referenced in this Part:
 - (a) National Parks and Wildlife Act (SA) 1972.
 - (b) Aboriginal Heritage Act 1988
 - (c) Native Vegetation Act 1991

Commented [D1]: Note to Specifiers:

This Part is provided as an example to provide guidance regarding the general layout of the Statement of Requirements used in Planning Consultancies.

It shall be used with AS 4122 and the DPTI Special Conditions of Contract for AS4122.

The detail in this example is appropriate for a very large study and should be simplified for smaller studies.

- (d) Disability Discrimination Act 1992
Development Act 1993
 - (e) Native Title Act 1994
 - (f) Environment Protection and Biodiversity Conservation Act (Cth) 1999.
 - (g) P20 Planning General
P70 Outputs and Reports
 - (h) DPTI: Environmental Approval Procedure – Environmental Instruction 21.1;
 - (i) DPTI: Roadside Significant Sites Environmental Instruction 21.5;
 - (j) DPTI: Road Traffic Noise Guidelines;
 - (k) DPTI: Management of Noise and Vibration: Construction and Maintenance Activities,
Environmental Instruction 21.7;
 - (l) DPTI: Cultural Heritage Guidelines;
 - (m) DPTI: Protecting Waterways Manual;
 - (n) DPTI: Vegetation Removal Policy;
 - (o) DPTI: Vegetation Offset Guidelines
 - (p) DPTI: Fauna Impact Assessment Guidelines
 - (q) DPTI: Sustainability Management Plan Guidelines;
 - (r) DPTI: Recycled Fill Materials for Transport Infrastructure – Environmental Instruction 21.6,
 - (s) DPTI: Vegetation Survey Guidelines;
 - (t) DPTI: Landscape Guidelines;
 - (u) DPTI Road Design Standards and Guidelines;
 - (v) Austroads Guidelines relating to Environmental Design;
 - (w) DPTI Guidelines for Disability Access in the Pedestrian Environment;
 - (x) SA Environment Protection Authority (EPA) Stormwater Pollution Prevention Code of Practice for
Local, State and Federal Government, available from <http://epa.sa.gov.au/pdfs/govcop1.pdf>;
 - (y) EPA: Acid Sulfate Soil Material Guideline (Nov 2007), available from
www.epa.sa.gov.au/xstd_files/Site%20contamination/Guideline/guide_sc_acid.pdf;
 - (z) National Environment Protection (Assessment of Site Contamination) Measure 1999
<http://www.scew.gov.au/nepms>.
- .7 DPTI publications are available from: <http://www.dpti.sa.gov.au/documents>. Other publications are
available on the nominated web site or directly from the agency concerned.

2. **ROADSIDE SIGNIFICANT SITES**

- .1 The Contractor shall interrogate the Roadside Significant Site database during the investigation to identify
any such sites potentially affected by the proposal.
- .2 The Contractor shall identify any potential sites of significance, including significant vegetation, aboriginal
and non-aboriginal heritage sites that may warrant inclusion on the Roadside Significant Sites Database to
provide for ongoing protection during the operation of the proposed infrastructure. Refer to DPTI: Roadside
Significant Sites Environmental Instruction 21.5.

3. **FLORA**

- .1 The Contractor shall undertake a literature review of previous biological studies undertaken within the
Study Area.
- .2 The Contractor shall search database records from local, South Australian and Australian Governments to
identify species that have been recorded in the area.
- .3 The Contractor shall undertake an assessment of the ecological and landscape value of the existing flora
using a consultant or sub-consultants eligible for inclusion on a Panel Contract with DPTI. The Contractor
shall:
 - (a) identify any vegetation communities that would have existed in the Study Area prior to European
settlement and vegetation communities that are currently present in the Study Area;
 - (b) describe any environmental areas of special significance (e.g. seasonal habitats) and
environmentally sensitive habitats including any aquatic environments;
 - (c) document key vegetation in the area affected by the proposal (including amenity and significant
trees);

- (d) identify and map areas within the Study Area in which the *Native Vegetation Act 1991* and/or significant tree regulations under the *Development Act 1993* apply;
 - (e) identify species and associations as listed under the *Environment Protection & Biodiversity Conservation Act (Cth) 1999*. Any species identified under the Act shall be confirmed with the State Herbarium;
 - (f) provide location information by the use of GPS; and
 - (g) identify any species listed in Schedules 7, 8 & 9 of the *National Parks and Wildlife Act (SA) 1972*.
- .4 The Contractor shall discuss potential impacts on vegetation in the Study Area ensuring:
- (a) describe any vegetation removal that will be required and the impact of partial/whole vegetation clearance;
 - (b) determine whether the project will have, or is likely to have, a significant impact on a matter of national environmental significance as outlined under the *Environment Protection and Biodiversity Conservation Act (Cth) 1999*;
 - (c) determine any impacts on species listed in Schedules 7, 8 and 9 of the *National Parks and Wildlife Act (SA) 1972*; and
 - (d) assess the implications of the removals and replacement landscaping on local resident's views and amenity and aesthetic value, especially for those species which are of significant value.
- .5 The Contractor shall describe the extent and significance of existing pest plants and diseases in study area and environs. Pest plants include proclaimed pest plants and environmental weeds
- (a) identify the potential for the introduction or dispersal of pest plants and diseases, and the associated implications for native species, habitat and agricultural land;
 - (b) identify the potential for increased distribution and abundance of existing pest plant and diseases, and the associated implications for native species, habitat and agricultural land; and
 - (c) outline mitigation measures and their effectiveness in reducing or avoiding the introduction or spread of pest plants and diseases (e.g. decontamination of plant, equipment and materials);
- .6 The Contractor shall provide advice on mitigation measures, including:
- (a) ameliorative measures to reduce the extent of impacts of the proposal on species and / or communities including the offset requirements in accordance with the DPTI Vegetation Removal Policy and DPTI Vegetation Offset Guidelines;
 - (b) expected time required for restoration of any habitat or ecological community;
 - (c) opportunity to improve habitat adjacent to existing roads in the study area;
 - (d) recommendations for any alternatives to the project proposal which would minimise impacts on significant species and / or communities;
 - (e) seed sources for revegetation / remediation works;
 - (f) details of any monitoring to assess the success of measures implemented.
- .7 The Contractor shall undertake a Vegetation Survey of the Preferred Concept in accordance with DPTI: Vegetation Survey Guidelines using sub-consultants prequalified with DPTI.
- .8 The Contractor shall undertake a Vegetation Assessment of the Preferred Concept. The Vegetation Assessment is to provide a general overview of existing vegetation and potential impacts to native and amenity vegetation in addition to significant trees. The content of the assessment shall be determined in consultation with the Principal. A sub-consultant prequalified with DPTI is required to undertake the assessment.
- .9 The Contractor shall identify any approvals required for vegetation removal in accordance with DPTI: Vegetation Removal Policy.
- .10 The Contractor shall prepare any documentation required to obtain the relevant vegetation removal approval in accordance with DPTI: Vegetation Removal Policy.

4. LANDSCAPE, VISUAL AMENITY AND URBAN DESIGN

- .1 The Contractor shall provide an overall Urban Design and Public Art Concept to include elements such as soft landscaping, feature lighting, the architecture of structures (e.g. bridges, buildings, noise barriers, retaining walls, road furniture and fences) and public art.
- .2 The Urban Designer(s) and Landscape Architect(s)/shall be eligible for membership of the DPTI Panel Contract for Urban Design and Landscape Design respectively.

- .3 The design shall be guided by requirements outlined in Clause 2 "References" and incorporate the principles of:
- (a) Ecologically Sustainable Development (ESD);
 - (b) Crime Prevention Through Environmental Design (CPTED);
 - (c) Equity of access, including disability access requirements;
 - (d) Water sensitive urban design (WSUD);
 - (e) Re-use or recycling of materials;
 - (f) Energy efficiency of materials and maintenance requirements;
 - (g) Minimising Whole-of-Life costs;
 - (h) and with regards to the principles contained within;
 - (i) The South Australian Government Urban Design Charter
<http://dataserver.planning.sa.gov.au/publications/1040p.pdf>;
 - (j) Planning SA: Transport Choice and Urban Design – Design Issues for Accessible Neighbourhoods
<http://www.sapo.org.au/pub/pub521.html>;
 - (k) Sustainable Landscapes
<http://www.environment.sa.gov.au/botanicgardens/pdfs/sustainable.pdf>;
 - (l) Planting Indigenous Species Policy
http://www.environment.sa.gov.au/biodiversity/pdfs/is_policy.pdf; and
 - (m) RTA NSW: Bridge Aesthetics Design Guidelines (available from <http://www.rta.nsw.gov.au/constructionmaintenance/urbandesign/index.html>).
- .4 The Contractor's Landscape Architect/Urban Designer shall work collaboratively as part of a multidisciplinary team. In developing the landscape and urban design, the Contractor shall:
- (a) undertake a review of previous landscape/ urban design studies or recent works that have been undertaken in the area;
 - (b) host workshops with staff nominated by the Principal and the urban design team to identify conceptual approaches to the overall treatment of the corridor throughout the project;
 - (c) undertake a landscape assessment in accordance with DPTI: Landscape Assessment Guidelines;
 - (d) describe, assess and document the existing landscape and built form in terms of character zones (i.e. land use, views, vegetation associations, dominant natural and man-made landscape elements);
 - (e) prepare landscape and urban design principles which establish a framework for the development and management of an integrated landscape/urban design strategy for the proposal;
 - (f) consider the materials to be used and the form(s) of structures to ensure they are appropriate to and in sympathy with the surrounding environment and any adjacent structures;
 - (g) ensure the infrastructure strengthens the local character of the area by responding to the social, cultural and environmental characteristics;
 - (h) ensure safe, efficient circulation routes for pedestrians, cyclists and people with disabilities;
 - (i) ensure a high standard of design to achieve quality infrastructure that is visually attractive and interesting, sophisticated and contemporary;
 - (j) liaise with the Principal during all stages of design development to ensure that budget limitations and operational maintenance requirements can be met; and
 - (k) incorporate sustainable design principles such as water management, energy efficiency and biodiversity.
- .5 For each of the character zones, the Contractor shall prepare a landscape and urban design concept which establishes an overall vision for the project and depicts key themes, features and indicative planting patterns/zones. The concept shall include consideration of the following:
- (a) maximising retention of native vegetation and use of indigenous plant species;
 - (b) integration of the Vegetation Management Plan for delivery of the offset and significant environmental benefit required under the Native Vegetation Act, where relevant;
 - (c) integration of amenity vegetation offsets required under the DPTI Vegetation Removal Policy, where relevant;
 - (d) integration of Regulated and Significant tree offsets required under the Development Act, where relevant;
 - (e) creation of fauna corridor/habitat;

- (f) integration of landscape and stormwater design (e.g. detention basins, wetlands, riverine environments, swales);
 - (g) integrating landscaping with adjoining areas in partnership with Councils and landowners to enhance the local area;
 - (h) soil remediation, stabilisation and erosion control techniques and methodologies;
 - (i) economically viable construction, maintenance / management strategies and sustainability issues;
 - (j) safety, clear zone and sight distance requirements;
 - (k) treatment of medians, verges and embankments and the use of buffer planting;
 - (l) aesthetic merit;
 - (m) design, detailing, intensity, height and scale of the built form (e.g. structures, overpasses, noise walls, embankments);
 - (n) opportunities for integrating amenity lighting and public art; and
 - (o) maintenance of vistas and screening of industrial/obtrusive views.
- .6 The Contractor shall prepare a Landscape Management Plan based on the Landscape Concept in accordance with DPTI: Landscape Management Guidelines. The management plan shall identify and include:
- (a) management strategies, including appropriate measures to ensure adequate vegetation growth within the growing conditions encountered on site;
 - (b) performance benchmarks, including the expected / acceptable survival rates for all revegetation through a 1-5 year period;
 - (c) an estimate of all costs and timeframes associated with achieving performance and sustainability requirements; and
 - (d) long-term maintenance issues.
- .7 Further to the requirements of Part P30 Planning Processes, the Contractor shall prepare a Landscape Cost Estimate which identifies costs associated with the mitigation work including: site preparation, vegetation removal, planting, direct seeding, hydroseeding, grassing, weed control, soil improvement and any hard landscape elements (e.g. paving, street furniture, public art as relevant).

5. **FAUNA**

- .1 The Contractor shall in accordance with the DPTI Fauna Impact Assessment Guidelines, assess the need for a Fauna Survey. If it is determined that a Survey is required, or may be required, undertake a Fauna Survey in accordance with the Guidelines, using a prequalified consultant. The survey shall be carried out by a Contractor or Sub-Contractor eligible for inclusion on a Panel Contract with DPTI.
- .2 The Contractor shall review any previous studies undertaken in the area.
- .3 The Contractor shall undertake a Fauna Assessment in accordance with the DPTI: Fauna Impact Assessment Guidelines, including:
- (a) describe the location, extent and significance of native fauna (terrestrial and aquatic), including individual species and communities (and associated habitats) in the project site and environs (include species and areas listed in State and Commonwealth legislation and in International Conventions and Agreements to which the Commonwealth of Australia is a party);
 - (b) identify any species as listed under the Environment Protection & Biodiversity Conservation Act (Cth) 1999;
 - (c) identify any species listed in Schedules 7, 8 and 9 of the National Parks and Wildlife Act(SA) 1972;
 - (d) describe the extent of fauna and/or habitat loss or disturbance (including any barriers to wildlife movement) associated with the proposal, and the ability of communities or individual species to recover during both construction and maintenance;
 - (e) describe any effect of the proposal on the conservation status of faunal communities or individual species during both construction and maintenance, and;
 - (f) outline mitigation measures and their effectiveness for mitigating the effects on native fauna, including individual species and habitats during both construction and maintenance. Include any management measures for pest animals which may be required.
- .4 The Contractor shall identify any approvals required under the Environment Protection and Biodiversity Conservation Act (Cth) 1999 and the National Parks and Wildlife Act (SA) 1972.

- .5 The Contractor shall prepare any documentation required for a referral or approval under the Environment Protection and Biodiversity Conservation Act (Cth) 1999 and the National Parks and Wildlife Act (SA) 1972.

6. **NOISE**

- .1 The Contractor shall undertake an investigation of existing and predicted noise levels and the impact of the project in accordance with:
- (a) for road traffic noise – the DPTI: Road Traffic Noise Guidelines;
 - (b) for rail noise – the criteria as defined by the EPA;
 - (c) for night works - Management of Noise and Vibration: DPTI Construction and Maintenance Activities, Operational Instruction 21.7; and
 - (d) for construction noise and any other noise sources—in accordance with the Environment Protection Act 1993 requirements.
- .2 The Contractor shall review any previous noise impact studies undertaken.
- .3 The Contractor shall obtain the Principal's approval of any computer models to be used by the Contractor;
- .4 The Contractor shall evaluate the impacts of any changes to the noise environment on noise sensitive land uses, in accordance with the DPTI: Road Traffic Noise Guidelines;
- .5 The Contractor shall evaluate the impact (positive and negative) of any changes to the existing noise environment resulting from the project and any additional impacts (positive and negative) likely on the adjacent transport networks.
- .6 The Contractor shall undertake noise measurements in accordance with Australian Standards at appropriate locations to:
- (a) adequately determine the existing noise levels within the study area; and
 - (b) provide sufficient data to verify the results of noise modelling and enable post construction monitoring.
- .7 The number and location of monitoring sites is to be determined by the Contractor and the Principal.
- .8 The following factors shall be included in the assessment of noise impacts:
- (a) the impacts of any changes to the noise environment;
 - (b) traffic flow characteristics and volumes;
 - (c) for road traffic noise modelling, where the heavy vehicle component of the traffic flow is 10% or greater during the day or the night, the model selected should be capable of segregating source height and noise components for the exhaust and engine and/or tyres of heavy vehicles or alternatively, adopt a "split-height" of energy for vehicles of different classifications;
 - (d) where the output from the model is not LAeq(15hr),day and LAeq(9hr),night, appropriate documentation of the conversion from the output of the model to the LAeq(15hr),day and LAeq(9hr),night parameters shall be provided;
 - (e) provision of tables and plans showing existing and predicted noise levels, and noise contours where appropriate, to enable an assessment of changes or impacts as a result of the project, both on opening and in the future;
 - (f) road traffic noise predictions shall include at a minimum LAeq(15hr),day and LAeq(9hr),night; and
 - (g) identification of the noise sensitive receptors where noise predictions will exceed the relevant criteria.
- .9 The Contractor shall identify any attenuation / mitigation measures that are required for each affected property and the options for implementing such measures. The options shall be developed in accordance with the DPTI: Road Traffic Noise Guidelines (2014). Where barriers are proposed consideration should be given to aesthetics, urban design and maintenance.

7. **VIBRATION**

- .1 The Contractor shall identify vibration sensitive structures/receivers adjacent the project area in accordance with DPTI Management of Noise and Vibration: Construction and Maintenance Activities, Environmental Instruction 21.7. This may include but not be limited to:
- (a) buildings including Heritage listed buildings and residential buildings;

- (b) infrastructure including vibration sensitive underground services; and
 - (c) hospitals, educational facilities and childcare centres.
- .2 The Contractor shall identify appropriate vibration criteria for any sensitive structures/receivers in line with relevant Australian and International Standards.
- .3 The Contractor shall investigate potential vibration impacts produced by the construction and operation of the project.
- .4 Where required, undertake vibration monitoring in accordance with appropriate Australian and/or International Standards at location (s) with similar characteristics to the project area for both structural and human exposure. The exact location/s and setbacks shall be determined by the Contractor and the Principal.
- .5 The Contractor shall identify appropriate mitigation measures to address the vibration impacts, where required.

8. AIR QUALITY

- .1 The Contractor shall determine existing air quality background levels and meteorological conditions for the study area from data obtained from the SA EPA or other data sources. Determine the most stable and conservative meteorological conditions (that will lead to the highest pollution levels), as well as the typical meteorological conditions.
- .2 Where supplied by the Principal, review any existing reports from the project area.
- .3 The Contractor shall identify air quality guideline limits for the project based on the SA EPA requirements and National Environment Protection Measures and outline the effects of air pollutants on human health.
- .4 Using a computer model approved by the Principal, the Contractor shall provide an assessment of the effects of the project by undertaking near road air quality modelling to determine peak concentrations of the air contaminants (using appropriate averaging times) for the opening of the project and 15 years after opening. The model shall be calibrated using local conditions.
- .5 Determination of traffic fleet emission rates and obtaining other data required for the modelling work will be the responsibility of the Contractor.
- .6 The Contractor shall provide tables comparing predicted peak concentrations levels with guideline limits and identify where levels will exceed guideline limits at sensitive receptors. Provide parameter concentration/distance curves showing any exceedances.
- .7 The Contractor shall assess the impact on local and broader metropolitan air quality, and compare predicted levels with current air quality objectives.
- .8 The Contractor shall validate calibration of the model using local conditions.
- .9 The Contractor shall evaluate the impact (positive and negative) of any changes to existing air quality resulting from the project and any additional impacts (positive and negative) likely on the adjacent transport networks affected by the proposal.
- .10 The Contractor shall identify measures to avoid or minimise the effects of construction and operation of the project on local air quality and the community.
- .11 The Contractor shall establish air quality mitigation and management requirements for operation and construction (e.g. management of dust generation) for inclusion in the Project Assessment Report.

9. WATER QUALITY

- .1 The Contractor shall review any studies of the water quality and hydrology of the project area and document the existing surface water, groundwater and marine features in the project area.
- .2 The Contractor shall assess the impacts of the project during the construction and operational phases including:
- (a) water quality including: turbidity, dissolved oxygen, salinity, pH, heavy metals and other pollutants, and temperature;
 - (b) aquatic ecology;
 - (c) riparian zones including bank erosion and stabilisation issues;

- (d) wetland ecosystems and marine environments;
 - (e) potential damage to the environment through accidental spillages from construction and operation of the project such as, oil, fuel or waste;
 - (f) flows, flooding and runoff;
 - (g) soil erosion and sedimentation;
 - (h) the impact of structures such as bridges, culverts, realignment of water courses etc.; and
 - (i) the water table and groundwater.
- .3 The Contractor shall identify the location and assess the impact of the project to water bores, wells and water quality monitoring/sampling wells.
- .4 The Contractor shall undertake an initial Water Quality Risk Assessment to address the impacts of the project in accordance with the DPTI: Protecting Waterways Manual (Chapter 5 and Appendix E) and identify measures to mitigate the potential impacts of the proposal and consideration of water quality targets. The Principal, Council, Natural Resources Management Board and other appropriate stakeholders shall be involved in the process. This should include key measures to manage construction impacts to be addressed in a Soil Erosion and Drainage Management Plan and measures to address operational impacts, such as detention basins, wetlands, litter traps, biofiltration etc.

10. HYDROLOGY AND HYDRAULICS

- .1 The Contractor shall review any existing drainage and flood studies of the area, in consultation with the DPTI Stormwater Unit.
- .2 The Contractor shall describe the existing drainage systems crossed by the project, including natural and artificial drainage patterns, surface waters, ground waters and flood characteristics and the existing and required flood protection standard on each system of any future Council proposals to upgrade these systems.
- .3 The Contractor shall conduct a hydrological investigation of the existing flooding characteristics and predicted flooding characteristics with construction of the project for both minor (5 year ARI) and major (100 year ARI) flood events.
- .4 For specified flood events, the Contractor shall:
- (a) provide current and predicted inundation periods;
 - (b) detail current and predicted floodwater velocities across the floodplain; within the stream channel, and at bridge or other flood relief structures. Include soil erosion potential;
 - (c) detail and illustrate, where possible, current and predicted flow distributions;
 - (d) detail current and predicted floodwater depths upstream and downstream of the proposal at buildings within the floodplain; and
 - (e) identify buildings and residences within the floodplain that are currently affected by floodwaters and/or would be affected by reason of the proposal.
- .5 The Contractor shall consider the hydraulics of structures, including:
- (a) mitigation of any adverse hydraulic effects;
 - (b) consideration of afflux;
 - (c) downstream impacts;
 - (d) increase in flood velocities;
 - (e) ponding and retention of water;
 - (f) indicative culvert sizes and locations; and
 - (g) erosion potential.
- .6 The Contractor shall assess the impact of the proposal on groundwater and surface runoff, and identify management options where depressed sections (e.g. underpasses) of road corridor are identified.
- .7 The Contractor shall determine preliminary waterway openings that protect the project from flooding and causes minimal disruption to existing drainage systems, to the required standards, for both the minor and major flood events, with associated preliminary sizes and costs. Identify any key issues and risks that require further investigation.
- .8 The Contractor shall determine a concept drainage strategy to drain stormwater off and away from the project itself, which meets specified standards and has minimal impact on downstream drainage systems, with associated preliminary sizes and costs. Identify any key issues and risks that require further investigation.

11. SITE CONTAMINATION

- .1 The Contractor shall review existing Phase I and Phase 2 contamination investigations for the project area.
- .2 The Contractor shall undertake a site contamination assessment for areas affected by the project in accordance with the National Environment Protection (Site Contamination) Measure (NEPM), www.ephc.gov.au. Schedule A of the NEPM shall be used as framework for determining the necessary steps required for the assessment.
- .3 A Phase I Site History Investigation shall be undertaken in accordance with the procedure as outlined in Schedule B(2) of the NEPM, regardless of the known or understood past site usage and known historical activities. This shall include the following sources of information:
 - (a) inspection of the site, noting indicators of potential contamination;
 - (b) interviews with people involved in historical site activities (if available) and sources of information which may relate to chemical storage, waste and wastewater disposal occurring onsite;
 - (c) review of local geology and hydrogeology (including groundwater depth, quality);
 - (d) history of ownership;
 - (e) historical aerial photos;
 - (f) EPA Section 7 Search; and
 - (g) consideration of surrounding land-uses which may have impacted on the site.
- .4 The Contractor shall assess the likely risks posed by each identified potentially contaminated site (indicated as high, medium or low contamination risk) that are likely to be effected by the project and the identification of those sites that may need additional studies to further understand potential contamination risks.
- .5 The Contractor shall based on the findings of the Phase I Site History Investigation, determine the need for a Phase II Environmental Assessment and obtain the Principal's approval to undertake an assessment if required.
- .6 If required, undertake a staged Phase II Environmental Assessment in accordance with procedures outlined in the NEPM and relevant Australian Standards. This shall involve consideration of the impact that past contaminating site activities have on soils, surface water or groundwater.
- .7 The Contractor shall assess the nature of the site contamination through comparison of sampling results with published Australian and International Guidelines. In particular consideration of the sampling results with the NEPM Guidelines (Health Investigation Levels, Ecological Investigation Levels and Groundwater Investigation Levels) and South Australian EPA relevant soil and water guidelines.
- .8 The Contractor shall report on the nature and risks of contamination within the area to be affected by the project and determine the need for further assessment and remediation, in the context of the overall project, if necessary.
- .9 The Contractor shall identify measures to manage contamination during design, construction and operation of the project.

12. INDIGENOUS HERITAGE

- .1 The Contractor shall review relevant studies applicable to the area, including Department of State Development, Aboriginal Affairs and Reconciliation (DSD-AAR) records.
- .2 The Contractor shall undertake a Cultural Heritage Survey in accordance with DPTI Cultural Heritage Guidelines and:
 - (a) Carry out a survey, in liaison with the relevant Aboriginal people and Native Title claimants as advised by DSD-AAR (and other relevant indigenous groups and individuals), and identify any sites of cultural significance as defined under the Aboriginal Heritage Act 1988;
 - (b) A heritage specialist eligible for membership of the Principal's Panel shall be engaged by the Contractor and is responsible for all aspects of the Cultural Heritage Survey, including liaising with the relevant Aboriginal people and Native Title claimants; and
 - (c) The implications of the project on Aboriginal Heritage shall be discussed and any potential mitigation measures identified, if necessary. The Contractor shall assess and advise on the effects of the proposal on any sites as defined under the Aboriginal Heritage Act. Should sites be affected, the Principal will consult with the relevant Aboriginal people and obtain any necessary approvals under the Aboriginal Heritage Act, 1988.

- .3 The Contractor shall identify the need for any determinations or approvals under section 12 or 23 of the *Aboriginal Heritage Act, 1988*. This shall constitute a **HOLD POINT** in accordance with Part P10 Preliminaries.
- .4 The Contractor shall prepare any documentation required to obtain any determinations or approvals under section 12 or 23 of the *Aboriginal Heritage Act, 1988*.

13. NATIVE TITLE

- .1 The Principal will obtain advice on the implications of the project on Native Title and advise if any land affected by the project is subject to the *Native Title Act 1994*. If Native Title is affected, the Principal will undertake any required notification process under the *Native Title Act 1994* and will provide the relevant information to the Contractor. The Contractor shall incorporate into the development and documentation of the proposal any of this information, where relevant.

14. NON-INDIGENOUS HERITAGE

- .1 The Contractor shall review relevant literature related to the study area;
- .2 The Contractor shall identify and document, in accordance with the DPTI: Cultural Heritage Guidelines the national, state and local heritage registers to determine if any sites or places are affected by the project. Assess the effects of the proposal on cultural heritage sites and advise on the level of significance of the impact. Where appropriate liaise with relevant heritage groups to determine the impact of the proposal;
- .3 The Contractor shall identify any mitigation measures for any heritage sites affected by the Project and the need for a conservation plan if required;
- .4 The Contractor shall prepare a conservation plan for the affected site. This shall be prepared by a heritage consultant eligible for membership to the Principal's Panel;
- .5 The Contractor shall identify any approvals required to affect a heritage place; and
- .6 The Contractor shall prepare the documentation to obtain the required approvals.

15. GREENHOUSE/ ENERGY / SUSTAINABILITY

- .1 The Contractor shall assess the proposal against the Infrastructure Sustainability Council of Australia (ISCA) Rating Tool to determine an indicative score based on the Concept Design(s);
- .2 The Contractor shall identify opportunities to increase the ISCA Rating Tool score;
- .3 The Contractor shall assess energy consumption and greenhouse emissions from the project with and without the proposal, including application of the DPTI Greenhouse Gas Assessment Tool;
- .4 The Contractor shall identify sustainability initiatives and assess sources of materials with opportunities for reuse and recycling of materials during construction, including potential sources of fill, pavement materials and water; and
- .5 The Contractor shall prepare the Sustainability Management Plan for the project in accordance with DPTI: Sustainability Management Plan Guidelines.

16. SOCIO-ECONOMIC IMPACTS

- .1 The Contractor shall undertake an initial desktop review of the project area including gathering of existing information and reviewing earlier relevant work;
- .2 The Contractor shall examine, profile and describe the local and regional community / social structure and patterns, including:
 - (a) demographic profile;
 - (b) age profile;
 - (c) education and income;
 - (d) place of birth and ethnicity;
 - (e) indigenous persons;
 - (f) housing types, affordability, ownership etc.;
 - (g) index of relative social economic disadvantage;
 - (h) unemployment;

- (i) income support recipients;
 - (j) rent assistance;
 - (k) private health insurance; and
 - (l) patterns and public transport usage.
- .3 The Contractor shall identify and assess the impacts of the proposal on the community (in particular, directly affected landowners and occupiers) such as:
- (a) local demographics;
 - (b) social adjustments, intrusion and community severance;
 - (c) employment opportunities;
 - (d) population groups most affected;
 - (e) settlement patterns and land use;
 - (f) effects on employment, business and industry;
 - (g) disruption to recreation and tourism;
 - (h) effects on travel and transport networks and local access patterns;
 - (i) direct and indirect impacts on retail business and community services and facilities;
 - (j) amenity and general community well-being; and
 - (k) changes to access patterns, severance, safety, amenity, character, open space and views.
- .4 The Contractor shall assess the impact of the proposal on local economic infrastructure;
- .5 The Contractor shall assess potential beneficial and adverse impacts of the proposals in terms of:
- (a) local access, including effects on local road access and access limitation to the new road;
 - (b) use of the road by cyclists; and
 - (c) provision of safe pedestrian crossings and paths where necessary.

17. BUSINESS AND INDUSTRY

- .1 The Contractor shall undertake an initial desktop review of the project area including gathering of existing information and reviewing earlier relevant work.
- .2 The Contractor shall examine and profile businesses impacted both directly and indirectly by the project including but not limited to:
- (a) land use code;
 - (b) scale;
 - (c) turnover;
 - (d) employee numbers;
 - (e) transport dependency;
 - (f) mobility; and
 - (g) co-location & dependency.
- .3 The Contractor shall identify and map:
- (a) the range of businesses and employee and freight movement patterns to and from these businesses services;
 - (b) access and movement patterns by employees by public transport, vehicle, walking and cycling; and
 - (c) origin and destination patterns of freight to and from the project area to and from the broader metropolitan area.
 - (d) Assess potential beneficial and adverse impacts of the proposals on businesses and the broader economy in terms of:
 - (e) impacts on particular business types;
 - (f) effects on travel and transport networks and local access patterns; and
 - (g) direct and indirect impacts on retail business and community services and facilities.

18. PLANNING, ZONING AND LAND USE

- .1 The Contractor shall assess the impact of the proposal on property owners/occupants who would be affected by the proposal and identify of major issues of concern such as property viability, impact on livelihood and effect on property values. Generally, detailed site studies or extensive interviews should not be undertaken prior to the approval of the Preferred Concept.
- .2 The Contractor shall discuss the feasibility of proposals for mitigating those impacts with reference to the *Land Acquisition Act 1969*.
- .3 The Contractor shall identify any environmental planning instruments which affect the project and should include a summary of how the project will contribute to local, regional and state planning strategies and objectives.
- .4 The Contractor shall identify and document any strategies being developed by local Councils and State Government which may affect the proposal, yet may not be reflected in formal planning documents.
- .5 The Contractor shall assess existing and proposed land use not considered as part of the socio-economic and business and industry assessments, such as:
 - (a) agriculture, commercial, mining, public utilities, government land, community services, transport networks and communications;
 - (b) residential;
 - (c) parks, reserves, tourism, recreational use, open spaces and wilderness;
 - (d) zoning;
 - (e) ownership, acquisition and property values;
 - (f) land severance and the treatment of excess land within the study area; and
 - (g) implications for urban sprawl.
- .6 The Contractor shall identify all approving authorities relating to land for the project.
- .7 The Contractor shall identify and report on any legal requirements and implications for relevant strategic planning initiatives including the 30 Year Plan for Greater Adelaide and summarise the statutory position of the proposal in relation to zoning provisions.
- .8 The Contractor shall consider opportunities for excess land or balance land as a result of land acquisition.
- .9 If directed by the Principal, undertake detailed consultation with property owners / occupiers affected by the Preferred Concept.

19. FINANCIAL AND ECONOMIC

- .1 The Contractor shall prepare estimates of Project and Construction cost (refer Part P20 Planning - General);
- .2 The Contractor shall document projected cash flows;
- .3 The Contractor shall determine Road User costs (e.g. Travel Times, Intersection Delays, Road Crashes, Environmental Amenity);
- .4 The Contractor shall determine Operational / Whole of Life costs;
- .5 The Contractor shall investigate Economic Development, including affect on property values, development opportunities and constraints, Tourism and opportunities for business,/ industry and trade; and
- .6 The Contractor shall determine the Benefit/Cost Ratio.

20. GEOTECHNICAL

- .1 The Contractor shall research all existing information regarding topography, geomorphology, geology and soils and carry out a geotechnical assessment based on this information.
- .2 Where necessary, in consultation with the Principal, The Contractor shall recommend a program of geotechnical investigation, including proposed boreholes, pits, testing and any other techniques such as seismic investigation; and
- .3 The Contractor shall assess the geotechnical impact on concepts, including slope stability, erodability, landforms, foundation type, retaining walls, constructability, settlement, earthquake loading, material

suitability, earthworks balance, sources of fill material, spoil locations, acid sulphate soils, material degradation and water table.

21. TRAFFIC AND TRANSPORTATION

- .1 The Contractor shall describe the Traffic/Transport requirements on a local, regional and state basis;
- .2 The Contractor shall review and give full consideration to existing traffic studies;
- .3 The Contractor shall consider and assess the effect of:
 - (a) interchange/intersection options, both location and form;
 - (b) impacts on public transport, including opportunities;
 - (c) impacts on emergency service operations (e.g. near medical centres);
 - (d) cyclists, (in consultation with local councils) pedestrians and equestrians;
 - (e) disability access;
 - (f) heavy vehicles, over-mass vehicles, emergency vehicles, over-dimensional vehicles, freight movements, carriage of hazardous materials;
 - (g) impacts on the local road network;
 - (h) safety and accidents;
 - (i) unplanned incidences on the corridor and network;
 - (j) traffic volumes (daily, peak, hourly, turning, composition, directional split), level of service, speeds, travel times, capacity, congestion and end point impacts; and
 - (k) opportunities and constraints regarding staging of the works and constructability.
- .4 The Contractor shall carry out supplementary studies as required to compare the route and interchange/intersection options;
- .5 The Contractor shall undertake traffic modelling, including SIDRA analysis where appropriate;
- .6 The Contractor shall examine any appropriate construction staging scenarios; and
- .7 The Contractor shall examine road safety, including undertaking a Road Safety Audit on the Preferred Concept.

22. CYCLING AND WALKING

- .1 The Contractor shall describe the existing cycling and walking facilities;
- .2 The Contractor shall describe the requirements on a local and regional basis;
- .3 The Contractor shall carry out a gap analysis on existing networks; and
- .4 The Contractor shall consider and assess the effect of the concepts relating to cycling and walking (in consultation with local councils and Office of Cycling and Walking).

23. ROAD AND RAIL INFRASTRUCTURE DESIGN AND GEOMETRY

- .1 The Contractor shall identify and map existing and proposed utility services infrastructure.
- .2 The Contractor shall consider and assess the effect of:
 - (a) connections to the adjoining road network and rail infrastructure (e.g. level crossings);
 - (b) existing and proposed utility services infrastructure;
 - (c) width of road reserve, parking lane/bay, cycle lane, climbing lane, shoulder, traffic lane, clear (safety zone), verge, services corridor, landscape allowance, median, bus bay, seal, carriageway, formation and service road);
 - (d) pedestrian, cycling and disability provisions, including the implications of the Disability Discrimination Act (Cth) 1992;
 - (e) crossfall of pavement, shoulder and footpath;
 - (f) horizontal design (speed environment, design speed, curve radii, side friction, superelevation, transitions, compound curves, broken-back curves, curve arc lengths, horizontal sight distance, curve widening, overtaking opportunities, roadway delineation, headlight glare, sunlight glare, weaving lengths, clearances to hazards);

- (g) intersection design (traffic lane layout, number and widths, lane lengths for storage, deceleration lane lengths, acceleration lane lengths, tapers, turns for design vehicles, turns for over-dimensional vehicles, islands size, signal pedestal locations, approach sight distance, entering sight distance, safe intersection sight distance, angle of intersection, stagger distances);
 - (h) vertical design (vertical curves, riding comfort, vertical sight distance, vertical curves appearance, clearances, grades, earthworks balance, earthworks extent, earthworks volume, presence of hidden dips, coordination of horizontal and vertical alignments, overtaking sight distance, effect of grade on stopping distance, drainage requirements, consistency with horizontal design);
 - (i) geometry of catch drains, table drains, sub-soil drains, cut and fill batter slopes, benching and noise mounds);
 - (j) functional layout of interchanges and intersections;
 - (k) functional layout of rail platforms;
 - (l) functional layout to achieve electrification and structural clearances on the rail corridor;
 - (m) Traffic Management Systems (e.g. ITS);
 - (n) lighting (street lighting, bridge lighting, feature lighting, height / spillage restrictions, maintenance and access);
 - (o) road furniture, such as guard fence and signs;
 - (p) property access and service roads;
 - (q) proximity to boundaries;
 - (r) Compliance with design standards; and
 - (s) temporary works (e.g. site compounds, access tracks, stockpile sites, demolition).
- .3 The Contractor shall consider and assess the impact of geometric design on:
- (a) traffic requirements identified in the investigation of traffic and transportation issues / impacts;
 - (b) hydrology and hydraulics;
 - (c) structures, including bridges, major drainage structures, safety barriers, retaining walls and noise walls;
 - (d) provision for flora and fauna, landscaping and visual impact;
 - (e) geotechnical;
 - (f) earthworks management (balance, disposal, hard materials etc.); and
 - (g) existing and proposed utility services infrastructure above and below ground.

24. **STRUCTURES**

- .1 The Contractor shall consider and assess the effect of:
- (a) superstructure and substructure type;
 - (b) construction sequence / constructability;
 - (c) transport logistics for components;
 - (d) piling / excavation, underground works;
 - (e) overload capacity;
 - (f) aesthetics;
 - (g) width, clearance and geometry;
 - (h) pedestrian, cycling and disability provisions; and
 - (i) runoff collection

25. **HOLD POINTS**

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

CLAUSE REF.	HOLD POINT	RESPONSE TIME
12.3	Heritage Act Approvals	