

# Master Specification Part PC-ST1

## Sustainability in Design

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**Government of South Australia**  
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## Document Management

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## PC-ST1 Sustainability in Design

### 1 General

- a) This Master Specification Part specifies the requirements for understanding impacts and investigating and implementing initiatives to improve sustainability through design, including:
  - i) the sustainability objectives, as set out in section 2;
  - ii) the documentation requirements, as set out in section 3;
  - iii) the mandatory sustainability initiatives, as set out in section 4;
  - iv) the identification of sustainability initiatives, as set out in section 5;
  - v) the implementation of sustainability initiatives, as set out in section 6;
  - vi) the whole-of-life emissions reduction requirements, as set out in section 7;
  - vii) the circular economy requirements, as set out in section 8;
  - viii) the potable water use requirements, as set out in section 9;
  - ix) the Green Infrastructure requirements, as set out in section 10;
  - x) the Climate Change Risk Assessment and adaptation requirements, as set out in section 11; and
  - xi) the IS rating requirements, as set out in section 12.
- b) Depending on the project's value, risk, and opportunity to influence sustainability outcomes, Projects will either undergo:
  - i) an IS rating;
  - ii) a level 1 sustainability assessment; or
  - iii) a level 2 sustainability assessment.
- c) Where the Contract Documents specify that the Project is to obtain a rating under the Infrastructure Sustainability Council (ISC) rating scheme, the requirements of section 2 and 12 apply, and sections 3 to 11 do not apply.
- d) Where the Contract Documents do not specify that the Project is to obtain a rating under the Infrastructure Sustainability Council (ISC) rating scheme, the Contractor must determine whether the Project is to undergo a level 1 or level 2 sustainability assessment, in accordance with the Department's Sustainability Manual and:
  - i) where the Project will undergo a level 1 sustainability assessment, the requirements of sections 2 to 11 apply, and section 12 does not apply; or
  - ii) where the Project will undergo a level 2 sustainability assessment, the requirements of section 2 to 4, 6, and 8 to 11 apply, and sections 5, 7 and 12 do not apply.
- e) Sustainability through design must comply with the Reference Documents, including:
  - i) the Department Sustainability Manual (available from: <https://dit.sa.gov.au/standards/manuals>); and
  - ii) the Department Climate Change Adaptation Guidelines (available from: [https://dit.sa.gov.au/standards/standards\\_and\\_guidelines](https://dit.sa.gov.au/standards/standards_and_guidelines)).

### 2 Sustainability objectives

- a) The Contractor's design methodology must be undertaken to maximise the achievement of the following sustainability objectives:

- i) minimise the generation of greenhouse gases across the full asset lifecycle;
  - ii) contribute to circular economy outcomes by optimising use of recycled materials and minimising waste generated across the full asset lifecycle;
  - iii) minimise use of mains water across the full asset lifecycle through demand reduction strategies and through use of captured rainwater and recycled water;
  - iv) minimise materials' lifecycle impacts across the full asset lifecycle;
  - v) mitigate sustainability risks and drive improved sustainability performance in the Project's supply chains;
  - vi) deliver increased Green Infrastructure to improve liveability (including climate change resilience), amenity, biodiversity, water quality and reduce peak stormwater flows;
  - vii) minimise future maintenance, repair, re-engineering or replacement costs, having regard to future climate change impacts;
  - viii) design assets to facilitate and encourage greater use of public transport and active transport modes, including cycling and walking as well as facilitating use of sustainable low occupancy low / zero emission vehicles;
  - ix) design assets to facilitate private sector investment and contribute to local prosperity; and
  - x) recognise and promote the role of smart technology and infrastructure in achieving sustainability outcomes.
- b) The Contractor must ensure that all significant design decisions (as defined in the Design Management Plan) take into account whole-of-life environmental, economic, social and technical criteria relevant to the decision for each option. As a minimum, these must include relative carbon impact and alignment with the sustainability objectives required in section 2a).

### 3 Documentation

#### 3.1 General

This section 3 only applies to Projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).

#### 3.2 Design Basis

In addition to the requirements of PC-EDM1 "Design Management", the Design Basis must include design parameters required to achieve the applicable Green Infrastructure targets, such as minimum verge/median widths to accommodate street trees.

#### 3.3 Preliminary Sustainability Plan (Design)

- a) The Contractor must prepare a Preliminary Sustainability Plan (Design), including a Sustainability Initiatives Register, which complies with the requirements in section 6 of the Department Sustainability Manual.
- b) The Preliminary Sustainability Plan (Design) must be prepared, submitted, and updated (where required) in accordance with the requirements of PC-PM1 "Project Management and Reporting" and at a minimum the timing set out in section 6 of the Department Sustainability Manual.

#### 3.4 Design Reports

In addition to the requirements of PC-EDM1 "Design Management", the Design Reports for each discipline must include in relation to sustainability:

- a) the Sustainability Initiatives Register (produced in accordance with section 3.3a);

- b) any relevant climate change risks and adaptation measures identified, as well as evidence of implementation; and
- c) evidence that the Contractor's design methodology has maximised the achievement of the sustainability objectives set out in section 2a).

### 3.5 Sustainability Progress Reports

- a) The Contractor must, on a 6-monthly basis following acceptance of the Preliminary Sustainability Plan (Design) and until acceptance of the Final Sustainability Plan (Design), submit Sustainability Progress Reports, including an up-to-date Sustainability Initiatives Register, to the Principal, in accordance with section 6 of the Department Sustainability Manual.
- b) The Sustainability Progress Reports may be submitted as part of the relevant monthly project report required by PC-PM1 "Project Management and Reporting".

### 3.6 Final Sustainability Plan (Design)

- a) The Contractor must prepare a Final Sustainability Plan (Design), including the final Sustainability Initiatives Register, which:
  - i) complies with the requirements of section 6 of the Department Sustainability Manual; and
  - ii) includes the outcomes of the investigations, including selection and justification for the preferred approach for use of non-potable water for the project in accordance with section 9.
- b) The Final Sustainability Plan (Design) must be prepared and submitted in accordance with the requirements of PC-PM1 "Project Management and Reporting" and at a minimum the timing set out in section 6 of the Department Sustainability Manual.

## 4 Mandatory sustainability initiatives

- a) This section 4 only applies to Projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).
- b) Design of all concrete elements must achieve a reduction in whole of life embodied carbon and increase in recycled content compared with 'business as usual' materials and technologies (described in Appendix 6 of the Department Sustainability Manual).
- c) The Contractor must investigate opportunities to reduce Portland cement to the maximum extent practical as a means of reducing embodied carbon, with assessment completed in accordance with section 9 of the Department Sustainability Manual and justification provided for final mix design.
- d) As a minimum, the Contractor must ensure that the minimum Portland cement replacement levels specified in ST-SD-D1 "Design of Structures" are achieved or exceeded, and specified in the Design Documentation.
- e) Design of pavements must achieve a reduction in whole of life embodied carbon and increase in recycled content compared with 'business as usual' materials and technologies (described in Appendix 6 of the Department Sustainability Manual).
- f) As a minimum, the Contractor must investigate the following initiatives as a means of reducing embodied carbon and increasing recycled content, with assessment completed in accordance with section 9 of the Department Sustainability Manual and justification provided for selection of the final approach:
  - i) warm mix asphalt;
  - ii) increased levels of recycled asphalt plantings:

- A. up to 100% for footpaths / cycle paths and temporary pavements (e.g., site compounds); and
- B. >20%-50% for deep lift asphalt;
- iii) up to 100% recycled crushed concrete (with supplementary materials) as a substitute for virgin quarried granular materials;
- iv) crumb rubber as a substitute for polymer modified binders in spray seals;
- v) recycled glass aggregate as a substitute for sand:
  - A. in asphalt (2.5% in wearing and 10% in other layers); and
  - B. in pavement materials (up to 5% in Class 1, 10% in Class 2 and 15% in Class 3); and
- vi) in-situ and ex-situ stabilisation of pavement or subgrade materials.
- g) Design of noise barriers must achieve a reduction in embodied carbon and increased recycled content compared to 'business as usual' materials and technologies (described in Appendix 6 of the Department Sustainability Manual).
- h) The Contractor must investigate alternatives to concrete as a means of reducing embodied carbon and increasing recycled content in noise barriers, with assessment completed in accordance with section 9 of the Department Sustainability Manual and justification provided for selection of the final approach.
- i) The Contractor must investigate opportunities to reduce operational electricity use to the maximum extent practical as a means of reducing energy demand, with assessment completed in accordance with section 9 of the Department Sustainability Manual and justification provided for the final approach.

## 5 Identification of sustainability initiatives

- a) This section 5 only applies to Projects where a level 1 sustainability assessment is to be undertaken (see section 1d).
- b) In addition to the sustainability initiatives described in section 6b), the Contractor must use its best endeavours to identify initiatives which:
  - i) minimise whole of life greenhouse gas emissions;
  - ii) achieve circular economy outcomes (without markedly adversely impacting greenhouse gas emissions);
  - iii) minimise whole of life potable water use;
  - iv) ensure climate resilience; and
  - v) increase Green Infrastructure.
- c) The Contractor must undertake at least one workshop to identify and confirm sustainability initiatives to be further investigated or implemented for the Project, including any sustainability initiatives recommended in the planning phase sustainability plan. The workshop must:
  - i) be held at the earliest available opportunity and no later than 1 month following the Commencement Date, or as otherwise agreed by the Principal;
  - ii) involve all relevant Contractors' design and construction personnel, Principal's personnel, and other relevant stakeholders; and
  - iii) be facilitated by a suitably qualified professional with specific experience in undertaking sustainability assessments for major construction projects.
- d) The Contractor must undertake a triple-bottom-line assessment of the sustainability initiatives in accordance with section 9 of the Department Sustainability Manual.

- e) The Contractor must record the outcomes of the assessment required by section 5d), including the decision to implement, in the Sustainability Progress Reports or Final Sustainability Plan (Design).

## 6 Implementation of sustainability initiatives

- a) This section 6 only applies to Projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).
- b) As a minimum, the Contractor must implement:
  - i) all mandatory sustainability initiatives listed in section 4;
  - ii) any additional Principal-nominated sustainability initiatives specified in the Contract Documents; and
  - iii) any Contractor-nominated sustainability initiatives included in the Contractor's tender submission.
- c) Where the Contractor has identified and assessed additional sustainability initiatives in accordance with section 5, and has determined that an initiative should be implemented, the Contractor must either:
  - i) implement the initiative (where no Design Departure or Variation is required); or
  - ii) seek approval from the Principal to implement the initiative (if a Design Departure or Variation is required).

## 7 Whole-of-life emissions reduction

- a) This section 7 only applies to Projects where a level 1 sustainability assessment is to be undertaken (see section 1d).
- b) The Contractor must develop a 'base case' for the purpose of estimating whole of life greenhouse gas emissions. The base case must:
  - i) be based on the project's Concept Design (Principal's reference design), including any implemented sustainability initiatives, materials and technologies, unless agreed otherwise with the Principal;
  - ii) where the Principal's reference design did not implement sustainability initiatives, materials and technologies, adopt 'business as usual' assumptions outlined in Appendix 6 of the Department Sustainability Manual, propose any additional assumptions, and include any additional assumptions as agreed with the Principal;
  - iii) be developed to represent construction, operation and maintenance of the Project;
  - iv) document a methodology to account for data not available for the base case, how scope change will be managed and a list of exclusions; and
  - v) be included in the Preliminary Sustainability Plan (Design).
- c) The Contractor must model whole of life greenhouse gas emissions associated with energy use and materials lifecycle impacts for the base case and for the Final Design submission, in accordance with section 7 of the Department Sustainability Manual.
- d) Unless otherwise specified in the Contract Documents, the Contractor must implement emission reduction strategies to reduce the whole of life greenhouse gas emissions associated with energy use and materials lifecycle impacts, such that modelling for the Project's Final Design demonstrates:
  - i)  $\geq 10$  % reduction in whole of life greenhouse gas emissions from energy use (measured in units t CO<sub>2e</sub>), compared to the Project's base case;



- ii)  $\geq 10$  % reduction in whole of life greenhouse gas emissions from materials use and haulage ( measured in units t CO<sub>2</sub>e), compared to the Project's base case; and
- iii)  $\geq 10$  % reduction in upfront greenhouse gas emissions (measured in units t CO<sub>2</sub>e), compared to the Project's base case.
- e) Justification must be provided for all emission sources for which the Final Design is found to result in an increase or decrease in whole of life greenhouse gas emissions.
- f) The Contractor must identify in the Final Sustainability Plan (Design) any barriers faced in minimising greenhouse gas emissions during design, and describe how they were overcome. For any barriers which could not be overcome, where relevant, provide recommendations on how they could be addressed on future projects.

## 8 Circular economy

- a) This section 8 only applies to projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).
- b) The Contractor must optimise use of recycled materials and apply the principles of the waste hierarchy to the design of the asset, in accordance with section 9 of the Department Sustainability Manual.

## 9 Potable water use

- a) This section 9 only applies to projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).
- b) The Contractor must investigate and assess the feasibility of using non-potable water sources for the construction and operation of the asset (including, if necessary, extension of the current network to the Project Site).
- c) The Contractor must present the outcomes of the investigations required by section 9b), including selection and justification for the preferred approach for use of non-potable water for the project, in the Final Sustainability Plan (Design).

## 10 Green Infrastructure

- a) This section 10 only applies to projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).
- b) The Contractor must ensure the design incorporates sufficient and suitable Green Infrastructure to achieve the following, listed in order of precedence:
  - i) any applicable requirements of the Contract Documents regarding Green Infrastructure, except for those listed below in sections 10b)ii) and 10b)iii);
  - ii) the Green Infrastructure targets included in the Green Infrastructure Assessment, if one has been prepared in the planning phase of the Project; and
  - iii) the standard Green Infrastructure targets specified in Table PC-ST1 10-1.

**Table PC-ST1 10-1 Standard Green Infrastructure targets**

<b>Standard Green Infrastructure targets</b>
Provision of shade trees to achieve $\geq 20\%$ increase in existing canopy cover in the Site (measured at maturity).
Provision of shade trees to improve amenity for pedestrians, cyclists and public transport customers, targeting $\geq 50\%$ canopy cover (at maturity) over all footpaths and cycle paths in the Site, including those existing prior to the Commencement Date.
Where new or upgraded car parking areas are included in the Works, $\geq 50\%$ of vehicle spaces must have some degree of canopy cover (at maturity).
Incorporation of WSUD elements to achieve the WSUD policy performance targets for water quality, peak flow and flood risk as set out in Department of Environment, Water and Natural Resources: 'Water sensitive urban design'.
A minimum of $50\%$ of new landscape plantings to be local native species suited to local conditions, having regard to future impacts of climate change.

## 11 Climate Change Risk Assessment and adaptation

- a) This section 11 only applies to projects where a level 1 or 2 sustainability assessment is to be undertaken (see section 1d).
- b) Where a Climate Change Risk Assessment has been undertaken during the planning phase, the Contractor must review the risk assessment to ensure it is appropriate for the scope of work that is being delivered, and update (where necessary) the relevant risks and treatments.
- c) Where a Climate Change Risk Assessment has not been undertaken during the planning phase, the Contractor must carry out a risk assessment, in accordance with the Department Climate Change Adaptation Guidelines. Appropriate risk treatments must be identified for extreme and high level risks using an adaptive management approach.
- d) The Contractor must demonstrate that appropriate risk treatments have been incorporated into the design, and residual risks entered in the project risk register with clear management responsibility identified for each risk (refer to PC-PM4 "Risk Management"). The Contractor must demonstrate that climate risk opportunities have been incorporated into the design.

## 12 IS rating

- a) This section 12 only applies to projects where the Contract Documents specify that the Project is to obtain a rating under the Infrastructure Sustainability Council (ISC) rating scheme.
- b) Where the Contract Documents specify that the Contractor must obtain an IS rating, the Contractor must comply with the requirements outlined in section 4 of the Department Sustainability Manual, unless otherwise agreed in writing with the Principal.
- c) The Principal has nominated a minimum IS rating score for the Project and minimum levels to be achieved for specified credits in the Contract Documents.
- d) The Contractor must achieve the minimum IS rating score and minimum levels for specific credits as specified in the Contract Documents, unless appropriate justification is provided to and approved by the Principal as to why these are not able to be achieved.
- e) The Design Report must include evidence that the Contractor's design methodology has maximised the achievement of the sustainability objectives set out in section 2a).