

Master Specification

Part PC-PL3

Concept Design Development

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PC-PL3 Concept Design Development

1 General

- a) This Master Specification Part sets out the requirements for developing Concept Designs including:
 - i) the inputs and requirements for Concept Designs, as set out in section 2;
 - ii) the requirements for the development of Concept Designs, as set out in section 3;
 - iii) the requirements for Concept Design drawings, as set out in section 4;
 - iv) the requirements for the Concept Design and Reference Design reports, as set out in section 5; and
 - v) the requirements for visual media, as set out in section 6.
- b) The development of Concept Designs must comply with the Reference Documents, including:
 - i) Austroads Guide to Road Design (AGRD); and
 - ii) Department Sustainability Manual.
- c) The Master Specification Part applies to Concept Design development during the proving phase in accordance with PC-PL1 "Framework for Planning Studies".
- d) Where specified in the Contract Documents, this Master Specification Part will apply to Reference Designs developed during the planning phase of a Project in accordance with PC-PL1 "Framework for Planning Studies", in which case all references to "Concept Design" in this Master Specification Part must be read as references to "Reference Design" (as applicable), excluding section 5.
- e) This Master Specification Part does not apply to the development and management of designs the subject of PC-EDM1 "Design Management".

2 Concept Design inputs and requirements

2.1 General

The Contractor must develop the Concept Designs in consideration of the outputs and requirements from PC-PL2 "Planning Investigations" for the Project.

2.2 Transport modelling

- a) Where required by the Contract Documents, the Contractor must undertake transport modelling in accordance with PC-PL2 "Planning Investigations".
- b) Transport modelling outputs must be included as part of each phase of the Concept Design development.

2.3 Safety in Design

- a) Safety in Design assessments must be undertaken throughout the Concept Design development in accordance with PC-EDM2 "Safety Management in Design".
- b) The outcomes of the Safety in Design assessment must be documented in a Safety in Design report or register within the Concept Design report required by section 5. A road safety "safe systems approach" assessment must be completed for road projects in accordance with PC-EDM2 "Safety Management in Design". The safe systems approach assessment may be integrated with the Safety in Design assessment and road safety audit.

- c) A preliminary hazard analysis integrated in the Safety in Design assessment must be undertaken for rail projects.

2.4 Urban design

- a) If required in the Contract Documents, the Concept Design development must consider the project urban design framework or principles, and all urban design documentation and requirements specified in the Contract Documents.
- b) The Concept Design development must consider the Green Infrastructure targets and objectives in the Green Infrastructure Commitment and Green Infrastructure Concept Plan (as applicable).

2.5 Land acquisition

- a) The Concept Design must identify any land acquisition requirements to complete the Project.
- b) The Concept Design must include a land acquisition plan showing the anticipated extent of land acquisition and a table including the following for each impacted land parcel:
 - i) land parcel identification;
 - ii) property address;
 - iii) certificate of title reference number;
 - iv) acquisition type which notes if the acquisition is full or partial; and
 - v) area of land to be acquired in square meters.
- c) The identification of land acquisition requirements must incorporate:
 - i) the outcome of the constructability assessment undertaken in accordance with PC-PL4 "Constructability Assessment", including any temporary land requirements for site offices, laydown, services re-location, stormwater management or temporary traffic management; and
 - ii) any land requirements necessary to ensure achievement of the applicable Green Infrastructure targets as required by PC-PL2 "Planning Investigations".

2.6 Stormwater and groundwater

- a) The Concept Design must consider the potential impact (or otherwise) on stormwater hydrology (flood flows) and groundwater hydrology (e.g. for an underpass).
- b) Where the Project could potentially impact stormwater or groundwater, the Concept Design development must include an assessment of the potential impact including investigations and modelling commensurate with the risk and level of concept development in the Concept Design Report.

3 Concept Design development

3.1 Concept Design management plan

- a) The Contractor must develop a Concept Design management plan to document the Contractor's management of the development of the Concept Design.
- b) The Concept Design management plan must be commensurate in size and extent with the proposed Project and include:
 - i) roles and task of individuals undertaking the Concept Design;
 - ii) the internal and external design review process; and
 - iii) management of sub-consultants and Contractor inputs.

- c) The Contractor must submit the Concept Design management plan to the Principal in accordance with the requirement of PC-PL1 “Framework for Planning Studies”. The Contractor must not commence the Concept Design development until the Concept Design management plan is approved by the Principal in accordance with PC-PL1 “Framework for Planning Studies”.

3.2 Stakeholder engagement

The Concept Design must consider the outcomes of engagement and consultation undertaken in accordance with PC-PL2 “Planning Investigations” in addition to the requirements in this section 3.

3.3 Concept options and version control

The Contractor must give each Concept Design option an individual alphanumeric designation and brief description to enable clear understanding of the option being reviewed (e.g. Option - 2A “Off-line, minimising land acquisition” and Option 2B “Offline, Level of Service D”).

3.4 Design departures and EDD

- a) Where the Concept Design proposes a design departure, potential design departure, or extended design domain (EDD) the Contractor must notify the Principal as soon as reasonably practicable.
- b) Where the Contractor is aware, the Contractor must:
 - i) identify all design departures within the relevant Concept Design report submission; and
 - ii) obtain the acceptance of the Principal to each design departure prior to the finalisation of the Reference Design documentation submission as set out in section 5.

3.5 Level of design

- a) In addition to the requirements of PC-PL1 “Framework for Planning Studies”, the Contractor must develop the Concept Design of the long list of options in accordance with this Master Specification Part to assist the initial assessment and shortlisting for the proving phase of the planning study.
- b) The long list of options Concept Design must be developed to sufficiently demonstrate the extent the option complies with the preliminary business case (where applicable) or such other design parameters provided by the Principal.
- c) Development of the agreed shortlisted options to Concept Designs must further refine the design to demonstrate the extent the option complies with the preliminary business case and consider outputs and requirements of investigations as per PC-PL2 “Planning Investigations” as inputs to the design development.
- d) Level of design for individual disciplines must be commensurate with the scale, risk and complexity of the proposed Project and be documented in the Concept Design management plan.

3.6 Development of the preferred concept to a Reference Design

- a) The preferred Concept Design must be selected in accordance with PC-PL1 “Framework for Planning Studies”.
- b) The preferred Concept Design must be further developed to a Reference Design.
- c) The Reference Design must be of a detail that meets the following requirements:
 - i) individual disciplines within the Reference Design must be developed in accordance with Table PC-PL3 3-1;
 - ii) to prepare an accurate project cost estimate in accordance with PC-PL5 “Cost Estimation”;

- iii) to support the procurement phase of a delivery contract, including sustainable procurement as defined in the Departments Sustainability Manual; and
- iv) a level of detail commensurate with the size, complexity and geometry of the Project.
- d) The Reference Design must document design departures accepted by the Principal pursuant to section 3.4b)ii).
- e) Where required by the Contract Documents, the Reference Design must be checked against transport modelling software to confirm the Reference Design is consistent with the defined transport modelling outcomes.

Table PC-PL3 3-1 Nominal development of Reference Design disciplines

Discipline	Nominal development (%)
Road or rail geometry	20
Transport modelling	70
Pavement design	20
Utility Services, re-locations or protections	20
Structural design (e.g. structural form)	10
Geotechnical design	20
Electrical design	10
Drainage design	10
Stormwater hydrology (flood modelling base case and concept)	70
Groundwater (e.g. for Tunnel or underpass)	30
Environmental aspects (e.g. vegetation, noise, air, erosion, etc.)	10
Land acquisition boundaries	20
Constructability elements, (e.g. temporary traffic provisions)	20
Pedestrian environment including disability, access and inclusion	10
Architectural, landscaping and amenity (urban design) elements	10
Green Infrastructure elements	10
Road safety audit	20

4 Concept Design drawings

4.1 General

- a) The Concept Design drawings are to be in accordance with the Department Standard Drawings.
- b) The Concept Design drawings must comply with the following:
 - i) the drawing number and title must be in accordance with Department Standard Drawings and the Contract Documents;
 - ii) drawings must only be developed on A1 sheet sizes;
 - iii) CAD files detailed plan view and general arrangement must be based on the survey coordinates' location and scale (i.e. local GDA and metres);
 - iv) design models must be in a plane coordinate system based on the survey control marks and survey dataset supplied by the Principal; and
 - v) drawings must nominate the person who has completed the design and the person who has completed independent design certification (where required by the Contract Documents).
- c) Concept Design drawings must be documented on Department sketch title blocks and incorporate state and or Federal Government logos and branding as advised in the Contract Documents.
- d) The development of Concept Design drawings must be commensurate with the planning study phase, level of Concept Design, project size, complexity and risk.

4.2 Project drawings

Concept Design project drawings must be developed to communicate the project extents and features to people without technical training including notes of features of the Concept Design. The project drawings must be suitable for use in public facing materials in accordance with PC-CS1 "Community Engagement and Media Management".

4.3 Technical drawings

- a) This section applies to 10% or greater Concept Design drawings.
- b) Concept Design technical drawings must be developed to support the development of Project scope and requirements and accurate Project estimates.
- c) The detail of Concept Design drawings must be commensurate with the stage of concept development.
- d) Concept Design technical drawings must include:
 - i) extent of works, including general layout and typical cross sections;
 - ii) land acquisition requirements;
 - iii) Utility Services, including protection and re-location requirements;
 - iv) notes, detailing the key features, risks and constraints:
 - A. for the Principal to consider in developing the options; and
 - B. for the project estimator to consider in the development of the project estimate; and
 - v) environmental or heritage constraints or values;
 - vi) vegetation removal;
 - vii) location and type of Green Infrastructure envisaged across the Project to maximise achievement of the Green Infrastructure targets and objectives that apply to the Project; and
 - viii) basic cut / fill volumes for construction estimating.
- e) Where the Concept Design includes grade changes from existing (e.g. overpass), is in terrain that will require cut or fill, or flat terrain that may result in low points, the shortlisted Concept Designs must incorporate a 3D concept assessment and a 3D digital model.
- f) Technical Drawings must be provided on Department sketch title blocks in PDF format and native electronic files (e.g. dwg, 12da, rvt).

5 Concept Design report and Reference Design report

- a) The Contractor must develop a Concept Design report to document the development and background on the development of the Concept Designs.
- b) The Concept Design report must be submitted to the Principal to align with each planning phase as detailed in PC-PL1 "Framework for Planning Studies".
- c) The Concept Design report must include the Concept Design basis including key parameters and interpretations of Reference Documents and relevant Master Specification Parts.
- d) The Concept Design report must be updated through the planning study. The development of the Concept Design report at each phase must be commensurate with the planning study phase, Project size, complexity and risk.
- e) Where the preferred Concept Design is developed to a Reference Design, a Reference Design report must be prepared that documents the concept development commensurate to the risk and complexity of the Project and must include:

- i) an executive summary;
- ii) a brief background and development of the Concept Designs to the Reference Design;
- iii) non-compliances or departures to the Master Specification and Reference Documents;
- iv) the transport modelling outcomes (e.g. level of service, travel time saving etc.);
- v) a decision register;
- vi) a risks register and opportunities;
- vii) a Utility Services register;
- viii) a register of land acquisition requirements including land acquisition plan, as required by section 2.5b);
- ix) the outcomes of the Safety in Design assessments (e.g. safe systems assessment etc.);
- x) summary of the constructability assessment incorporation into the Concept Design;
- xi) summary of the climate, carbon and sustainability assessments completed in PC-PL1 “Framework for Planning Studies”, PC-PL2 “Planning Investigations” and the Department Sustainability Manual; and
- xii) the Green Infrastructure Assessment.

6 Visual media

- a) Where specified in the Contract Documents, visual media representations of the Concept Design for community consultation or stakeholder engagement must be developed to communicate the Concept Design.
 - b) The Contractor must provide electronic information of the Concept Design to enable third parties to develop visual media of the Concept Design.
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