

PART P95
INDEPENDENT REVIEW OF DESIGN

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1. GENERAL

- .1 This Part specifies the requirements for undertaking the Independent Design Review of the design prepared by the D&C Contractor.
- .2 **"D&C Contract"** means the contract(s) awarded by the Principal for the design and construction of the Project.
- .3 **"D&C Contractor"** means the contractor(s) engaged by the Principal to undertake the design and construction of the Project.
- .4 **"Independent Design Review"** means the review of the preliminary and final designs provided by the D&C Contractor to assess compliance with the requirements of D&C Contract, including:
 - (a) detailed review of the design method and reference legislation, standards and codes used in the design;
 - (b) detailed review of all design actions and design assumptions;
 - (c) detailed review of design calculations, including an assessment of their accuracy and identification of any discrepancies;
 - (d) detailed review of the geometry and detailing;
 - (e) detailed review of drawings and design models, including an assessment of their compliance with the Specification, completeness, accuracy and identification of any discrepancies;
 - (f) detailed review of specifications for construction and materials;
 - (g) detailed review of proposed erection procedures for temporary and permanent structures;
 - (h) detailed review of Proof Engineering calculations and comments;
 - (i) assessment of safety in design review undertaken by the D&C Contractor;
 - (j) provision of advice to the Principal regarding the release of Hold Points specified in the D&C Contract;
 - (k) review of design certificates provided by the D&C Contractor, including Proof Engineering Certificates;
 - (l) assess and advise of the appropriateness and suitability of any qualifications to certificates provided by the D&C Contractor;
 - (m) detailed review and assessment of any design changes or revisions to the design documents by the D&C Contractor after the issue of Issue for Construction Drawings; and
 - (n) integration review of the different design elements.
- .5 **"Independent Reviewer"** means the Contractor (for the purposes of this Part only).
- .6 Unless expressly defined otherwise in this Contract, words and expressions which have a defined meaning in the other Parts of the DPTI Master Specification for Transport Infrastructure (available from: <http://www.dpti.sa.gov.au/documents/contractsandtenders/specifications>) have the same meaning as in this Part.
- .7 The following documents are referenced in this Part:

- (a) D13 Road Safety Audit
- (b) D20 Design - Roadworks
- (c) D27 Design Utility Services
- (d) D35 Structural
- (e) D37 Design Urban Landscaping and Design

2. ROLE OF THE INDEPENDENT REVIEWER

- .1 The D&C Contractor is responsible for the design of all work under the D&C Contract. The Independent Reviewer shall undertake an Independent Design Review of the D&C Contractor's Design Documents to verify that the Design Documents comply with the requirements of the Specification included in the D&C Contract. The Independent Design Review shall be risk based and have regard to:
 - (a) The criticality and risk of the element or process under review; and
 - (b) The D&C Contractor's previous compliance with, and control of, similar processes or elements of the design.
- .2 Where directed by the Principal, the Independent Reviewer shall undertake design calculations and / or investigations and of an element of the D&C Contract, independent of the D&C Contractor's design calculations and / or investigations.

3. QUALITY MANAGEMENT

- .1 The Independent Reviewer's Quality Management System shall be JAS-ANZ third party accredited. As part of the Quality Management System, the Independent Reviewer shall develop and implement an Independent Design Review Management Plan which describes the management and integration activities undertaken by the Independent Reviewer, which at a minimum includes the following:
 - (a) the approach to be taken regarding assessing and reviewing of the D&C Contractor's design;
 - (b) managing the review of the design including;
 - (c) management and organisation of the Independent Reviewer's personnel;
 - (d) details of the specific responsibilities and authorities of key personnel;
 - (e) coordination and integration of the review between different design disciplines within the Independent Reviewer's organisation;
 - (f) the Audit Plan of the D&C Contractor's design management system;
 - (g) procedures for managing the design review process and associated of outcomes;
 - (h) procedures for control of the D&C Contractor's Design Documents, which ensure that:
 - (i) all documentation includes the correct title information, revision, date of documentation and status;
 - (j) the Principal and the D&C Contractor have the all current design independent review documents, including history previous revisions of design documents;
 - (k) superseded documents are duly noted and removed from the project register;
 - (l) procedure and methodology to keep the Principal informed of the progress of the design, resolution of design issues or major design decisions;
 - (m) issuing Independent Review documentation; and
 - (n) procedure for managing for Hold Points during design of all work under the Contract.
- .2 The Independent Design Review Management Plan shall be a Controlled Document (refer to the DPTI Special Conditions of Contract).

4. INDEPENDENT REVIEW COORDINATION

Design Coordination Workshops

- .1 At the Preliminary and Final Design stages of the design development, the D&C Contractor will arrange a design coordination workshop to present the Design Documents to the Principal. Following the presentation of the Design Documents, the D&C Contractor will coordinate a workshop with the Principal and Independent Reviewer to review and discuss the technical elements of the design documents.

Design Coordination Meetings

- .2 The D&C Contractor will convene design coordination meetings to be held throughout the design phase at intervals not exceeding 2 weeks. The design coordination meetings shall review the status and progress of

the design and the meeting shall involve the D&C Contractor and the Principal. The Independent Reviewer may be required to attend these meetings.

Coordination with the Principal's Review

- .3 The Independent Reviewer shall coordinate the design review responses with any design review undertaken by the Principal.
- .4 Where any discrepancy exists between the Independent Reviewer and the Principal on the suitability or otherwise of the D&C Contractor's design, the Independent Reviewer shall arrange for a coordination meeting with the Principal's personnel to identify the nature of the discrepancy and the details of where the Independent Reviewer's assessment differs from the Principal's assessment.
- .5 Where a discrepancy cannot be resolved between the Independent Reviewer and the Principal, the Principal may instruct the Independent Reviewer to provide further information or undertake further investigation or design calculations.

Independent Review Program

- .6 The D&C Contractor will prepare, submit and regularly update their program with respect to design of each elements and work packages. The Independent Reviewer shall develop a design review program based on the D&C Contractor's programmed delivery of design documentation to ensure the prompt review of the design documents submitted by the D&C Contractor.

5. SITE ASSESSMENT

- .1 During the development of the design, the Independent Reviewer's Representative and key personnel shall undertake regular field inspection of the Site to verify that the design takes into account all existing physical features.

6. INDEPENDENT DESIGN REVIEW – ELEMENTS OF THE D&C CONTRACT

- .1 The Independent Reviewer shall undertake an Independent Design Review of the D&C Contractor's compliance with the requirements of the relevant design parts (Division D) of the DPTI Master specification for Transport Infrastructure, as incorporated in the D&C Contract. Listed below are the key elements to be reviewed. The corresponding part of the DPTI Master Specification for Transport Infrastructure is indicated in brackets.

Road Safety Audits (Part D13 Road Safety Audit)

- .2 review of Road Safety Audits undertaken by, or on behalf of, the D&C Contractor;

Environmental Protection (Part D20 Design - Roadworks)

- .3 compliance with environmental design principles;
- .4 compliance with the Environmental Management Plan;
- .5 noise modelling and proposed treatments;

Road Geometry (Part D20 Design - Roadworks)

- .6 geometric road design;
- .7 roadside design, safety and barriers;
- .8 design access and swept paths of the design vehicle;
- .9 sight distances;
- .10 design of intersections;
- .11 level of service;
- .12 intersection performance;
- .13 traffic weaving analysis;
- .14 incident management including emergency access;
- .15 pedestrian and cycling facilities;

- .16 design of temporary access roads proposed by the D&C Contractor to manage traffic during construction;

Roadworks Drainage (Part D20 Design - Roadworks)

- .17 design parameters and confirm the design assumptions;
- .18 hydraulic modelling of existing and any proposed modifications drainage network, including;
- .19 drainage pipelines, culverts, and channels;
- .20 detention basins, wetlands and retention basins,
- .21 sedimentation and water quality improvement devices;
- .22 flood discharge levels, stream velocities and afflux;
- .23 protection against scour and bank erosion;
- .24 detailing of stormwater structures including maintenance of the stormwater network;
- .25 water sensitive urban design elements of the drainage design;
- .26 water quality assessments;

Earthworks (Part D20 Design - Roadworks)

- .27 stability of embankments and cuttings;
- .28 dewatering;
- .29 settlement;
- .30 material properties;

Road Pavement (Part D20 Design - Roadworks)

- .31 design methodology and assumptions for each pavement type including:
 - (a) determination of asphalt moduli and fatigue constants;
 - (b) geotechnical issues that may affect pavement performance, including ride-ability and pavement tolerances;
 - (c) proposed construction techniques and processes;
 - (d) pavement design calculations; and
 - (e) suitability of the design of each pavement type.

Utility Services (Part D27 Design Utility Services)

- .32 Position and clearance of known and proposed Utility Services.

Road Signs, Barriers and Marking (Part D20 Design - Roadworks)

- .33 compliance with Road Design Standards and Guidelines;
- .34 position and clearance of known and proposed Signs, Barriers and other Road Furniture; and
- .35 pavement marking.

Lighting (Part D20 Design - Roadworks)

- .36 street lighting structures, including maintenance requirements and the design of poles and luminaires;
- .37 lighting design lux levels; and
- .38 any urban design lighting.

Conduits Systems (Part D20 Design - Roadworks)

- .39 location and clearances of conduits and pits.

Intelligent Transportation Systems (ITS) (Part D20 Design - Roadworks)

- .40 hardware design for systems and devices;
- .41 software systems including embedded software and device drivers;

- .42 communications network, including data transmission between the ITS and IMS equipment and DPTI's traffic management centre at Norwood;
- .43 ducting, cabling and provision for future equipment;
- .44 maintenance requirements of ITS and IMS equipment;
- .45 ITS proposed by the D&C Contractor to manage traffic during construction; and
- .46 durability of ITS and IMS equipment.

Traffic Signals (Part D20 Design - Roadworks)

- .47 Traffic Signal Operational Performance.

Structural (Part D35 - Structural)

- .48 Geotechnical and Substructure:
 - (a) all relevant Geotechnical Investigation Report(s) including the adopted Geotechnical Category in accordance with AS 5100 "Bridge Design";
 - (b) the foundation investigation, the recommended design values, material properties and possible failure mechanisms; and
 - (c) piling/ foundation and substructure design as a whole, to ensure that the strength, stability, serviceability and other Limit State requirements.
- .49 Superstructure
 - (a) The strength, stability, serviceability and other Limit State requirements of:
 - .1 structural elements;
 - .2 critical detailing and geometry;
 - .3 bearings and expansion joints;
 - .4 erection procedures and construction methodology; and
 - .5 any temporary works or demolition work.

Reinforced Soil Structures (Part D35 Design - Structural)

- .50 strength, stability, serviceability and other Limit State requirements of the structure; and
- .51 materials.

Landscape and Urban Design (Part D37 Design – Urban and Landscaping Design)

- .52 consistency with the urban design master plan and urban design principles or equivalent document;
- .53 selection, quantities and spacings of plant species;
- .54 treatment of batter slopes, wetlands, swales;
- .55 irrigation design; and
- .56 hardscape treatments.

7. DURABILITY REVIEW

- .1 The Independent Reviewer shall undertake a review of the D&C Contractor's design with respect to durability of the elements, including the following at a minimum:
 - (a) all bridge elements;
 - (b) stormwater structures and pipelines;
 - (c) pavements;
 - (d) landscape design including treatment and plantings;
 - (e) urban design elements including hardscape treatments, retaining walls, noise walls, lighting, and other urban design elements; and
 - (f) watering and maintenance requirements of planted landscapes.

8. RELEASE OF THE D&C CONTRACTOR'S DESIGN HOLD POINTS

- .1 The D&C Contract specifies Hold Points in the design process. The responsibility for release of these Hold Points resides with the Principal. The Principal will be relying upon the advice and expertise of the Independent Reviewer in making a determination whether to release a Hold Point.
- .2 Where the D&C Contractor notifies the Independent Reviewer and /or the Principal that a Hold Point has been reached, the Independent Reviewer shall examine all relevant information and documentation regarding the Hold Point and provide a written recommendation to the Principal as soon as practicable, and no case longer than 8 working days from receipt of the notification, regarding the release of the Hold Point.

9. CONTROL OF D&C CONTRACTOR'S NON-CONFORMANCE

- .1 The D&C Contractor is required to provide notification to the Independent Reviewer and Principal of any Non-conformance by the issue of a Non-Conformance Report (NCR).
- .2 In the event of a Non-conformance related to the Specification or the D&C Contractor's Quality Plan being observed by the Principal or Independent Reviewer and the D&C Contractor does not take appropriate action when informed of the Non-conformance, a Corrective Action Request (CAR) will be issued to the D&C Contractor by the Principal or Independent Reviewer.
- .3 The Independent Reviewer shall review the D&C Contractor's proposed disposition to rectify Non-conformances and advise the Principal of the suitability or otherwise of the D&C Contractor's proposed disposition.
- .4 The Principal will approve or otherwise the D&C Contractor's proposed disposition, including release of any subsequent Hold Points related to the Non-conformance.
- .5 Following completion of the disposition the D&C Contractor shall re-submit the Non-conformance Report, together with any necessary supporting evidence for review and approval by the Independent Reviewer, as delegated by the Principal.

10. REPORTING

- .1 All advice and comments provided by the Independent Reviewer to the Principal, Principal or D&C Contractor shall be in writing.
- .2 The Independent Reviewer shall prepare comprehensive written reports of the Independent Design Review throughout the design process. The reports shall be provided at least monthly and copies of the reports shall be provided to the Principal and the D&C Contractor.
- .3 At a minimum, the Independent Design Review Report shall include the following:
 - (a) identification of the elements / packages to which the report relates;
 - (b) document any changes since the previous Independent Review Report;
 - (c) detail the review and assessment that has been undertaken by the Independent Reviewer
 - (d) identify any discrepancies, error or omissions in the D&C Contractor's design, including assumptions, calculations, interpretation of reference standards and codes;
 - (e) discussion of any outstanding or unresolved issues;
 - (f) identify any discrepancies with the D&C Contractor's design documents including the assessment of their completeness and accuracy; and
 - (g) detail the assessment of the completeness of approvals provided by the D&C Contractor.
- .4 Within four weeks of the D&C Contractor issuing all Final Design Documents, the Independent Reviewer shall provide a final and complete Independent Review Report.

11. INDEPENDENT REVIEW DESIGN CERTIFICATE

- .1 For each "package" of completed design work submitted by the D&C Contractor, the Independent Reviewer shall provide a signed Independent Review Certificate, as detailed in Appendix P95A. The certificate shall be signed as "Independent Reviewer's Representative" and submitted to the Principal.

12. HOLD POINTS

- .1 There are no Hold Points referenced in this Part.

13. APPENDIX P95A INDEPENDENT REVIEW DESIGN CERTIFICATE

Contract:

Certificate Number:

Design Package:

The Independent Reviewer has completed a comprehensive review of the adequacy of the D&C Contractor's Design Documents listed below and certifies that these Design Documents comply with the requirements of the Specification included in the D&C Contract.

D&C Contractor's Design Documents:

Conditions of Certification:*

** note: written approval from the Principal of any conditions to certification shall be submitted with the Certificate*

Independent Reviewer's Representative

Signed Chartered Professional Engineer

Name:

Position:

Date: