

Project Controls

Master Specification

PC-EDM1 Design Management

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Version	Change Description	Date
1	Initial issue (formerly D10)	15/02/19
2	Formatting for publishing	24/9/19
3	Change in terminology from Design Gate Review to Design Review. Removal of reference to tender design. Update to clarify that IDC occurs prior to Principal review. Inclusion of Witness Points rather than Hold Points. General formatting.	August 2020
4	Requirements relating to application of the Observational Method, inclusion of embodied carbon and recycled content in Design Reports and provision of a Traffic Impact Statement at detailed design.	August 2021

Document Management

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PC-EDM1 Design Management

1 General

- 1.1 This part specifies the requirements for the design of Road and Structural Infrastructure.
- 1.2 Contractor must comply with:
- a) WHS: Work Health and Safety (South Australia) Act 2012 and Regulations;
 - b) AS15288: Systems and Software Engineering – System Life Cycle Processes;
 - c) ISO/IEC 29148: Systems and software engineering – life cycle processes – requirements engineering;
 - d) ISO/IEC/IEEE 24748-4:2016: Systems engineering – application and management of the systems engineering process.

Definitions

- 1.3 The following definitions apply to terms in this Part

Table PC-EDM1 1-1 Definitions

Item	Definition
Observational Method	Integrated and continuous design process whereby a set of previously defined design solutions are implemented during construction as appropriate.

2 Contractor's Design Obligations

- 2.1 The Contractor acknowledges that the development of the design to meet the project requirements of this Contract is the sole responsibility of the Contractor.
- 2.2 The Principal has no obligations in respect of the development of the design, except where specified otherwise.
- 2.3 Receipt of the Contractor's documents by (or on behalf of) the Principal is solely for the purpose of monitoring the performance and progress of the Contractor.
- 2.4 The Principal owes no duty to the Contractor to review or examine any of the Contractor's Documents submitted by the Contractor for compliance with the project requirements or any applicable legislation.
- 2.5 Notwithstanding any review, comment, release of Hold Point, request for change, endorsement, approval, acceptance or deemed acceptance regarding any Contractors' Documents by (or on behalf of) the Principal:
- a) the Contractor is not relieved of its responsibilities and obligations under the Contract; and
 - b) the Principal has no liability whatsoever to the Contractor by reason of any errors, deficiencies or defects or omissions in any Contractor's Document.

3 Standard of Design

- 3.1 Work under the Contract must meet the requirements of:
- a) The Contract Documents, including all standards, guidelines and codes referenced therein or otherwise applicable; and
 - b) any clarifications or interpretations of standards, codes and guidelines contained within the Contract Documents.

- 3.2 Subject to any changes made during the development of the design to ensure compliance with the Contract Documents, the design of the Works and any temporary works shall be developed in a manner such that each stage of the design is consistent with, and a logical development of, the preceding version(s) of the design including when that design was developed during a tender stage.
- 3.3 The design must not be of a lesser standard than any preceding version of the design.
- 3.4 Where the Contractor identifies a specified requirement cannot be achieved, it must immediately notify the Principal.
- 3.5 The Contractor shall provide advice and details of why the requirement cannot be achieved and the proposed alternative design solution(s) for consideration by the Principal, within 10 Working Days of notifying the Principal.

4 Design Provided by the Principal

- 4.1 If a design has been prepared by the Principal (reference design / concept design / sketch / schematic design), the Contractor acknowledges that the design prepared by the Principal:
 - a) is provided for information only;
 - b) has been prepared solely for project planning purposes;
 - c) may not comply with the project requirements;
 - d) has not been reviewed, checked or optimised; and
 - e) does not form part of the Contract.
- 4.2 The Contractor may not place any reliance on a design prepared by the Principal or any aspect of the design prepared by the Principal.
- 4.3 The use of any aspect of any design prepared by the Principal is entirely at the Contractor's risk.

5 Design Management

- 5.1 The Contractor shall manage the development of the design to ensure the design achieves the project requirements.

Design Management Plan

- 5.2 The Contractor must develop, implement and comply with a Design Management Plan for the management of the engineering and design activities prior to commencing design activities.
- 5.3 The Project Design Management Plan must provide details including, but not limited to:
 - a) information on design team, including roles and competencies of personnel;
 - b) design deliverables;
 - c) design milestone dates;
 - d) information on any alternate approach to design management (i.e., departures from those specified in this Part);
 - e) management of the Designer's internal Verification;
 - f) if the observational method is to be utilised, a clear description of how the observational method will be applied, upheld and Certified including the individuals / parties responsible for ensuring all aspects will be implemented during design and construction phases of the project;
 - g) safety in design process;
 - h) additional requirements for D&C or Alliance projects;
 - i) interface management of both technical design disciplines and construction activities;
 - ii) design program (gantt chart) integration of the construction program;
 - iii) design packages and work breakdown structure;

- iv) management of the Independent Design Certifier;
- v) management of the Construction Variation.

5.4 The Design Management Plan may be integrated with other project management plans for smaller less complex projects.

5.5 Submission of the Design Management plan shall constitute a **Hold Point**.

Table PC-EDM1 5-1 Design Management Hold Points

Hold Point	Design Management Approach
Item Held	Management of the design
Submission Details	Design Management plan including specific details, of any alternate approach, design team, deliverables, and milestones.
Release of Hold Point	Contract Manager will review acceptability of the plan.
Response time	5 Working Days

Contractor's Proposed Alternative Approach

- 5.6 The Contractor may propose an alternative design management approach outside the requirements specified in this Part, (e.g. for smaller less complex projects, or low risk elements).
- 5.7 The Principal is under no obligation to accept any proposed alternate systems engineering based design management approach.
- 5.8 Any proposed alternative approach shall be documented in the design management plan and demonstrate:
- a) the alternate approach aligns with intent of the design management process, and
 - b) the benefit to the Principal.

Design Program

- 5.9 A design program shall be developed for each project. The Design program shall include as a minimum:
- a) the milestone dates for the development and submission of the Preliminary, Detailed and Final Design Documents;
 - b) the time allowed for review by the Independent Design Certifier and the Principal;
 - c) the time allowed for the release of Hold Points.
- 5.10 The design program shall be further developed for D&C or Alliance projects (to reflect the increased complexity) including as a minimum the following additional requirements:
- a) design program (gantt chart) integrated into the construction program
 - b) design activities, which are correlated with the Contractor work breakdown structure ('WBS') for each discrete element of the Works and the Temporary Work;
 - c) the time allowed for Construction and Designer's Verification and Road Safety Audits (if applicable);
 - d) the time allowed for traffic control drawings and traffic signal controllers;
 - e) design reviews including workshops;
 - f) float and the critical path of all design packages.
- 5.11 The design program shall be submitted to the Principal within 10 working days of the Contract Award.
- 5.12 If the Design Program is revised for any reason, the Contractor must provide a copy to the Principal.

Work Breakdown Structure

- 5.13 For D&C or Alliance projects, the Contractor must prepare a work breakdown structure which identifies the design packages for the individual elements of the Works and the design disciplines associated with each individual element.
- 5.14 The work breakdown structure must be commensurate with the complexity of the Works and be integrated with the Design Program.
- 5.15 Provision of a work breakdown structure (including revisions) shall constitute a **Witness Point**.
- 5.16 If the work breakdown structure is revised, the revised work breakdown structure must be provided to the Principal's Representative with a revised Design Program.

Safety in Design

- 5.17 The development and management of the design must be integrated with the Safety in Design requirements detailed in PC-EDM2 "Safety Management in Design".

Sustainability in Design

- 5.18 The development and management of the design must be integrated with the Sustainability in Design requirements detailed in PC-ST1 "Sustainability in Design".

Maintenance in Design

- 5.19 The Contractor must have a documented maintenance in design process that documents how it will manage design implications to minimise future maintenance activities and provide efficient and safe maintenance access.
- 5.20 A maintenance in design assessment must be undertaken in conjunction with the Department's nominated maintenance personnel.
- 5.21 The maintenance in design assessment is to be documented and integrated with the maintenance access strategy and training requirements detailed in PC-CN2 "Asset Handover".

6 Design Documents

Design Basis

- 6.1 The Contractor must prepare a summary "Design Basis Report" to define the requirements for each technical discipline of Work including, but not limited to:
 - a) all technical standards and references used to define the requirements;
 - b) material properties, including performance requirements, durability and design life;
 - c) requirements relating to greenhouse gas emission reduction and recycled content;
 - d) the site specific selected design coefficients, performance standard, etc. adopted (where the standard or guideline includes a minimum or maximum range of acceptable values);
 - e) design loadings;
 - f) any interpretations, clarifications or assumptions made in relation to the project scope and project requirements;
 - g) if the observational method is to be utilised, how it will be applied to the project;
 - h) design software; and
 - i) summary table of the above elements.
- 6.2 For design only contracts the design basis shall be submitted as soon as practical within the design development process and as a minimum at the Preferred Concept Stage (10%)

- 6.3 The design basis shall be submitted in D&C or Alliance projects at the Tender or Reference Design Stage (notionally 20% onwards).
- 6.4 The provision of the Design Basis Report shall constitute a **Hold Point**.

Table PC-EDM1 6-1 Design Basis Report Hold Points

Hold Point	Design Basis Report
Item Held	Development of the Preliminary Design (30%)
Submission Details	Basis of design proposed for the project
Release of Hold Point	Contract Manager (with the relevant technical lead) shall endorse (or otherwise) the suitability of the design basis.
Response time	10 Working Days

Site Assessment

- 6.5 The Contractor must undertake a field inspection of the site to verify the site features that would reasonably be apparent during a site inspection.
- 6.6 The outcome of the site inspection is to be documented in the design report detailing the inspection and any issues identified.

Design Report

- 6.7 The Contractor must prepare Design Reports for each technical discipline and each package (where applicable).
- 6.8 A Design Report is a summary of design work undertaken and must document the following as a minimum:
- the completed design basis report;
 - a description of the design development process;
 - key design decisions and benefits of the design decision (i.e., why it was selected), including environmental, economic and social benefits, having regard to the triple-bottom line assessment process described in the Department's Sustainability Manual part 9;
 - a proposed strategy for minimising embodied carbon increasing recycled content compared with Business as Usual materials and technologies (described in the Department's Sustainability Manual Appendix 6);
 - all relevant analysis and calculations for the Works and Temporary Work;
 - the information which has been specified in each applicable Part to be included in the reports (refer to the Clause "Records" in each Part);
 - a summary of any changes to the design since the previous issues of the design report;
 - a summary of Hold Points released and evidence of any required approvals; and
 - an outline of the documentation that will be prepared for the operation / maintenance of the Works and processes / procedures for commissioning of the Works.
- 6.9 The level of detail included in the draft Design Reports must be commensurate with the design package and percentage completion of the design.

Design Drawings

- 6.10 The Design Drawings are to be in accordance with the Department's "Road Design Technical Standards and Guidelines", in particular DP001 "General Requirements".
- 6.11 Department standards and guidelines are available from <https://www.dpti.sa.gov.au/standards>.
- 6.12 The Design Drawings must comply with the following:
- the drawing number and title must be in accordance with Department standards and project specific requirements;
 - drawings must only be developed on A1 sheet sizes;

- c) CAD files detailed plan view or general arrangement must be based on the Survey coordinates location and scale (i.e. local GDA and metres); and
- d) design models must be in a plane coordinate system based on the survey control marks and survey dataset supplied by the Principal;
- e) drawings shall nominate the person who has completed the Design and the person who has completed the Independent Design Certification.

Traffic Control & Traffic Signal Design Documents

- 6.13 This sub-clause only applies where Traffic Control Devices and Traffic Signals will be installed.
- 6.14 The Traffic Control and traffic signal design documents shall comply with the following Department requirements:
- a) Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices;
 - b) Pavement Marking Manual; and
 - c) Road Sign Guidelines: Guide to visitor and service road signs in South Australia.
- 6.15 The Contractor shall develop and submit a traffic impact statement with the Traffic Control Drawings.

Digital Engineering Model (BIM)

- 6.16 The Contractor is encouraged to develop a digital engineering model that uses intelligent design models to satisfy technical handover requirements or Asset Information Requirements that will make up the Asset Information Model.
- 6.17 The development and management of the digital engineering model will be integrated with the Design process and meet the requirements of PC-EDM5 "Digital Engineering".
- 6.18 The submission of the Contractor's digital engineering approach shall constitute a **Witness Point**.

Review Comments and Issues Register

- 6.19 The Contractor shall plan and implement procedures to capture, process and close out comments received from design review for each individual design package. These must be logged in an issues and comments register, and the Contractor shall respond to each individual issue or comment.
- 6.20 The issues and comments register will be updated and submitted at each design submission for each individual design package.
- 6.21 The design management plan will detail the process for the capture, processing and closed out of stakeholder comments throughout the review process.

7 Submission and Review of Design Documents

Submission Obligations

- 7.1 The Contractor shall:
- a) forward the design documents for review progressively and in a manner that does not result in an unreasonable number of design documents being submitted in any given week;
 - b) provide a design document to the Principal within 5 working days of a request from the Principal to view the current draft of that document; and
 - c) provide the Principal with a design document when that document reaches each design stage.
- 7.2 In addition to the electronic copies, the Contractor must be requested to provide bound paper copies of the Design Documents (minimum 2 sets drawings at A3).

Design Reviews

- 7.3 The Contractor must present the design at the specified design stages to the Principal and the IDC (if required by the Project Scope) in sufficient detail to determine the design will meet requirements and achieve the design intent.
- 7.4 Where IDC is required by the Project Scope, the Contractor shall provide design documents for review by the IDC prior to the Principal. The Principal shall not undertake review until the IDC has completed its review.
- 7.5 At each review, the Principal may:
 - a) permit work to proceed;
 - b) permit work to proceed, provided that specified changes are implemented by the Contractor; or
 - c) prohibit work from proceeding until the documentation is revised and re-submitted.

Tender Design Documents

- 7.6 Where required, the Contractor shall submit a tender design with its tender in accordance with the Tender Requirements.
- 7.7 The level of detail required of the tender design shall be dependent on the risk, scope and complexity of the project and will be defined within the Tender Requirements but will typically be not more than 30% complete.

Preliminary Design Disciplines (Notionally 30% Complete)

- 7.8 The Contractor shall develop its preliminary design documents (notionally 30% complete) to a level of sufficient detail to demonstrate the major design features and functionality prior to advancing to the detailed design stage.
- 7.9 The preliminary design documents and reviews shall be completed on individual technical design packages in accordance with the work breakdown structure.
- 7.10 Provision of the preliminary design documents shall constitute a **Witness Point**.

Preliminary Design Multidisciplinary Review

- 7.11 The preliminary multidisciplinary design review is a formalised assessment to present the holistic design solution of all technical disciplines and demonstrate the major design feature and functionality of the design achieve the requirements of the Contract.
- 7.12 The intent of the preliminary multidisciplinary design review is to identify potential deficiencies in the holistic design proposal at the preliminary stage of development and **prior to** the design progressing to Detailed and Final design.
- 7.13 The Contractor must convene and host a preliminary design multidisciplinary review workshop including project key stakeholders including:
 - a) the Designer and Contractor (where applicable);
 - b) the Independent Design Certifier;
 - c) the asset operator's personnel (e.g. road or rail);
 - d) the asset owner's maintenance personnel; and
 - e) the asset owner's key technical personnel.
- 7.14 The Contractor shall demonstrate how the preliminary design achieves the specified operational outcome (e.g. traffic or rail operational performance) and key project technical requirements.
- 7.15 The acceptance of "permit work to proceed" at the preliminary design multidisciplinary review for each individual discipline constitutes a **Hold Point**.

Table PC-EDM1 7-1 Preliminary Design Multidisciplinary Documents Hold Points

Hold Point	Preliminary Design Multidisciplinary Documents
Item Held	Progressing to Detailed Design
Submission Details	Demonstrate the preliminary design achieves the specified operational outcome and key project technical requirements
Release of Hold Point	Asset owner "permits work to proceed"
Response time	5 Working Days

Detailed Design (Notionally 70% Complete)

- 7.16 Detailed design documents (notionally 70% complete) must be sufficiently detailed to demonstrate that the design will meet all the project requirements.
- 7.17 The detailed design documents and reviews shall be completed on individual technical design packages in accordance with the work breakdown structure.
- 7.18 In accordance with RD-LM-D1 "Traffic Control Device Design", and where the design includes traffic control devices, the Contractor must complete a Traffic Impact Statement in accordance with the Department's Guidelines for Preparing Traffic Impact Statements and submit it to the Principal for review with the detailed design documents.
- 7.19 Provision of the detailed design documents (including the Traffic Impact Statement, if required) shall constitute a **Witness Point**.

Final Design Documents

- 7.20 The Final Design Documents must be sufficiently detailed to enable construction to take place without further explanation or clarification.
- 7.21 The Contractor must provide to the Principal copies of the Final Design Documents (and any applicable verification certificates required under the contract) relevant to an element of work at least 10 working days prior to construction commencing on that element of work.
- 7.22 Provision of the Final Design Documents shall constitute a **Hold Point**.

Table PC-EDM1 7-2 Final Design Documents Hold Points

Hold Point	Final Design Documents
Item Held	Issued for Construction
Submission Details	Final design with Design Certificates for review by IDC
Release of Hold Point	IDC issues a Certificate (endorsed by the Department Technical specialist)
Response time	10 Working Days

Final Design Documents - Traffic Control and Traffic Signal Design Documents

- 7.23 This sub-clause only applies where the Final Design documents incorporate Traffic Control and Traffic Signals design documents.
- 7.24 In accordance with RD-LM-D1 "Traffic Control Device Design", the Contractor must provide the applicable Traffic Control Drawings and Traffic Impact Statement at least 15 working days, prior to the installation of any permanent or semi-permanent Traffic Control Devices (to enable the Principal to obtain approval for the devices from a Recognised Traffic Practitioner).
- 7.25 Provision and acceptance of the Final Traffic Control and Traffic Signal Design Documents by a Recognised Traffic Practitioner shall constitute a **Hold Point**.

Table PC-EDM1 7-3 Traffic Control – Final Design Documents Hold Points

Hold Point	Traffic Control - Final Design Documents
Item Held	Traffic Control Drawings
Submission Details	Traffic Control Drawings and Traffic Impact Statement
Release of Hold Point	Recognised Traffic Practitioner accepts the drawings
Response time	15 Working Days

Traffic Signals

- 7.26 Approval requirements for the installation of traffic signals are provided in RD-EL-C2 “Installation of Traffic Signals”.
- 7.27 Following Acceptance of the Final Traffic Control and Traffic Signal Design Documents the Contractor shall request for the creation of traffic signal “personalities”.
- 7.28 Traffic signal programming of traffic signal “personalities” is undertaken by the Department Traffic Management Centre. The Department Traffic Management Centre requires 8 weeks to complete the traffic signal personalities.

Issued for Acceptance (“IFA”) Documents

- 7.29 Following the Final Design review, the Contractor shall submit an issued for acceptance submission to the Principal including:
- a) the final design documents with any changes as required from the Final Design review process to enable issuing of design certificates;
 - b) the design certificates;
 - c) independent design certificates;
 - d) acceptance of the Traffic Control documents and drawings; and
 - e) any relevant written approvals from third party asset owners.
- 7.30 The Contractor must provide to the Principal the “Issued for Acceptance” design submission relevant to an element of work at least 10 working days prior to construction commencing on that element of work.
- 7.31 At the “Issued for Acceptance” Design, the Principal may:
- a) accept the design documents - and permit them to be updated and identified as “Issued for Construction”;
 - b) accept the design documents - provided that specified changes are implemented prior to the documents being updated and identified as “Issued for Construction”; or
 - c) reject the design documents and provide details on why the Issue for Acceptance design documents have not been accepted.
- 7.32 Acceptance of the “Issued for Acceptance” Design documents by the Principal shall constitute a **Hold Point**.

Table PC-EDM1 7-4 Issued for Acceptance Design Documents Hold Points

Hold Point	Issued for Acceptance
Item Held	Construction
Submission Details	Final Design (with any amendments from the IDC review), Design certificates and IDC Certificates
Release of Hold Point	Accept the design documents by the Principal.
Response time	5 Working Days

- 7.33 In the event the “Issued for Accepted” Design Documents are rejected by the Principal, the Contractor shall revise, modify and / or amend their documents and re-submit the documents in a revised “Issued for Acceptance” submission.
- 7.34 Construction of Works prior to the Principal accepting the “Issued for Acceptance” design documents shall be deemed “Wilful Default” in accordance with the Clause **Error! Reference source not found.** and the Contract Conditions.
- 7.35 Following release of the “Issued for Acceptance” **Hold Point**, the Contractor shall update the drawings and issue an “Issue for Construction (IFC)” Design document submission.

Issued for Construction (“IFC”) Documents

- 7.36 Following release of the Issued for Acceptance **Hold Point**, the Contractor shall update the design documents from the Issued for Acceptance submission to identify the design documents as an IFC documents, revision 0, with the acceptance information provided by the Principal.
- 7.37 Issuing of the IFC documents is a **Witness Point**.

Completion Design Documents

- 7.38 The Contractor shall submit completion design documents (As-Built) in accordance with PC-CN2 “Asset Handover”.
- 7.39 The Contractor must prepare technical maintenance plans instructions / procedures describing the inspection and maintenance (operations where appropriate) that the Principal will be required to undertake to ensure that the performance, functionality and durability of the Works do not deteriorate.
- 7.40 Submission of the completion design documents shall constitute a **Hold Point**.

Table PC-EDM1 7-5 Completion Design Documents Hold Points

Hold Point	As- Built Documents
Item Held	Project completion
Submission Details	Completion design documents (As-Built)
Release of Hold Point	The completed infrastructure is accurately documented
Response time	10 Working Days

Changes to IFC Documents Design

- 7.41 The Designer shall assess the nature of any change proposed to and IFC design to determine if potentially have an impact on the integrity, nature or functionality of the design the design or is of minor nature to correct an error or omission.
- 7.42 The Designer’s assessment of the nature of change shall be a **Witness Point**.
- 7.43 Revisions to the IFC Design Documents including certificates **not** considered minor of nature shall constitute an “Issued for Acceptance” **Hold Point**.
- 7.44 Where the Principal or IDC does not agree the change is minor in nature the proposed change shall be become an “Issued for Acceptance” **Hold Point**.
- 7.45 Where the change to the IFC Design is **not** considered minor of nature the Designer shall:
- undertake all design assessment, analysis, integration to ensure the revised design complies with the Requirements; and
 - complete a Designer’s Verification on the change including an updated certificate ; and
 - where the IFC design element was subject to Independent Design Certification the Contractor shall engage the IDC to review and update their certificate in accordance with PC-EDM3 “Independent Design Certification”.
- 7.46 In a Construction only contract, any proposal by the Contractor to change the Works from that shown on an IFC Design Document or modify an IFC Document is deemed to be a request for a Variation for the Contractor convenience and is subject to the prior approval of the Designer and the Principal.

8 Design Verification and Certification

Designer’s Verification

- 8.1 The Designer shall undertake verification of its own the design in accordance with the designers Quality Assurance procedures.
- 8.2 The Designer’s Verification shall include an inter-disciple review of the design to ensure integration between different work packages.

Contractor's Review

- 8.3 The Contractor shall undertake a review of the design to consider constructability and integration of the design with construction staging or any temporary Works.

Independent Design Certifier

- 8.4 Where specified in the Project Scope the design shall be reviewed by an Independent Design Certifier to check the design for compliance to the requirements.
- 8.5 The Independent Design Certification shall be undertaken in accordance with PC-EDM3 "Independent Design Certification".

Principal Review

- 8.6 The Principal shall review the design to check the design for compliance to the requirements.
- 8.7 Where IDC is required by the Project Scope, the Contractor shall provide design documents for review by the IDC prior to the Principal. The Principal shall not undertake its review until the IDC has completed its review.

Third Party Asset Owners

- 8.8 Where the design includes any modification or change to a third party asset (e.g. Council asset or authority Service) the design shall be reviewed by the third party asset owner to confirm compliance with the asset owner's requirements.

9 Design Certificates

- 9.1 The Contractor must ensure that Certificates to confirm the Design compliance to the requirements are prepared and submitted to the Principal's Representative which:
- a) certify that the design documents comply with the requirements of this Contract and project requirements;
 - b) are forwarded within "issued for acceptance" submission;
 - c) are signed by authorised representatives of the Constructor and the Designer;
 - d) are in accordance with the form included in Appendix 1: Designer's – Certificate of Compliance.
- 9.2 unless agreed otherwise in writing with the Principal's Representative, design certificates are not qualified in any way which would lessen the effect of the certificate.

10 Construction Phase Services

- 10.1 During the construction phase, representatives of the designer's organisation shall be available to support the construction team and construction verifier in the following areas:
- a) Requests for Information - Provision of responses to requests for information to address design errors, clarify ambiguities and deal with site based challenges during the construction of the design;
 - b) If the observational method has been adopted in any part of the design, and subject to the agreed roles and responsibilities documented in the Design Management Plan, the designer shall Certify that the appropriate design solution is selected based on actual site conditions observed during construction;
 - c) Design Validation - Inspecting all or parts of the works on site to ensure that it aligns with the design intent if required under the Project's Contract or requested for other purposes;
 - d) Shop Drawings and Vendor Documents - reviewing and approving shop drawings or vendor data to ensure that it aligns with the intent of the design; and

- e) Non-conformances – review the impact on the design of any Non-conformances as a part of the construction process.
- 10.2 Records of all construction phase services provided shall be provided to the Principal at project completion;

11 Hold Points and Witness Points

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

Table PC-EDM1 11-1 Hold Points

Document Ref.	Hold Point	Response Time
5.5	Design Management Plan	5 Working Days
6.4	Design Basis Report	10 Working Days
7.15	Preliminary Design Multidisciplinary Design Review	5 Working Days
7.22	Final Design Document	10 Working Days
7.25	Traffic Control - Final Design Document	15 Working Days
7.32	"Issued for Acceptance" Design documents	5 Working Days
7.40	Completion design documents	10 Working Days
7.43	Revisions to IFC Design Documents not considered minor shall become an "Issued for Acceptance" Hold Point	5 Working Days
7.44	Principal or IDC does not agree changes to IFC Design Documents are minor shall become an "Issued for Acceptance Hold Point	5 Working Days

11.2 The following is a summary of Witness Points referenced in this Part:

Table PC-EDM1 11-2 Witness Points

Document Ref.	Hold Point	Response Time
5.15	Design packages and work breakdown structure	10 Working days
6.18	Digital engineering approach	10 Working days
7.10	Preliminary Design individual discipline review	10 Working days
7.19	Detailed Design Review	10 Working days
7.37	Issuing of the IFC documents	10 Working days
7.42	Accepting changes to the IFC Design Documents are minor in nature	5 Working days

12 Appendix 1: Designer's – Certificate of Compliance

Project:

Designer:

Certificate Number:

Design Package:

In accordance with the Contract the Designer certifies that the Design Documents:

- a) comply with the Contract and project requirements;
- b) comply with Legislative and Authority Requirements; and
- c) Design Verification and Quality Assurance review has been completed.

Design Documents:

[illegible]

Conditions of Certification:*

* Note: Written approval from the Principal's Representative of any conditions to certification must be submitted with the Certificate

Authorised Representative (NER, CPEng, etc)

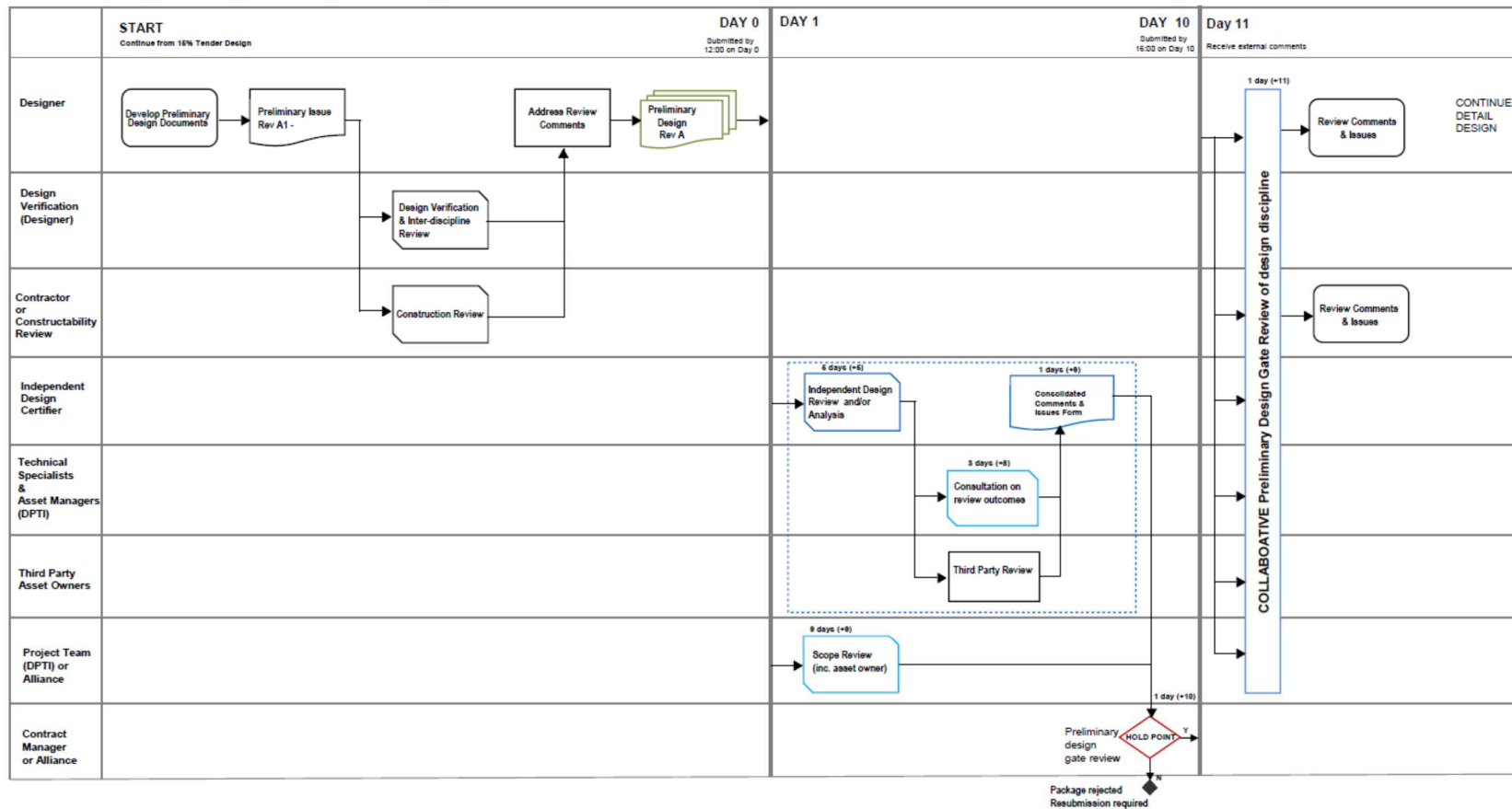
Name:		Qualifications
Position:		Signed:
Date:		

13 Appendix 2: Design Process Flow Charts



Preliminary Design 30%, Package Flow Chart.

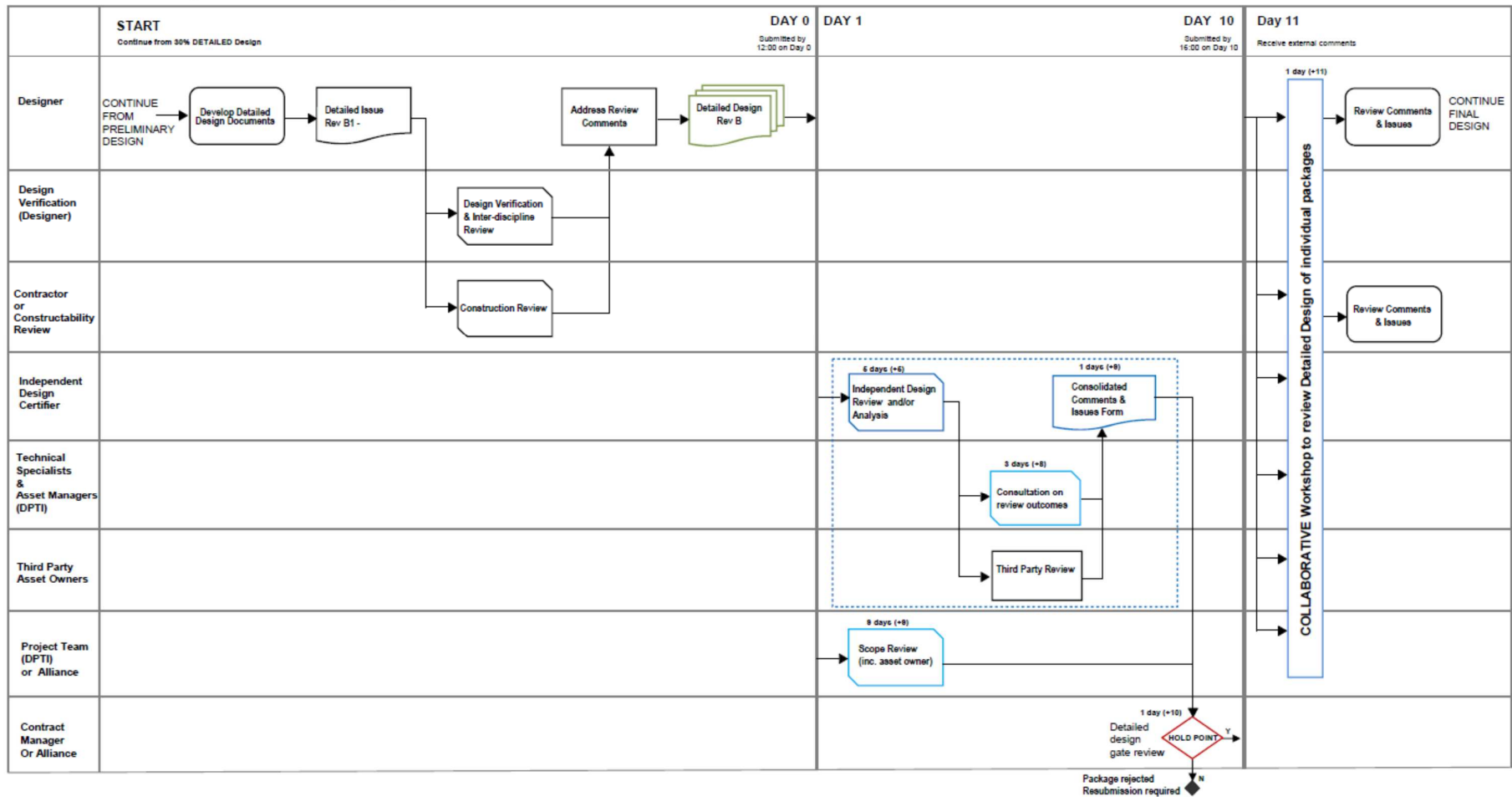
Engineering and Design Management Framework,
Design Gate 4A





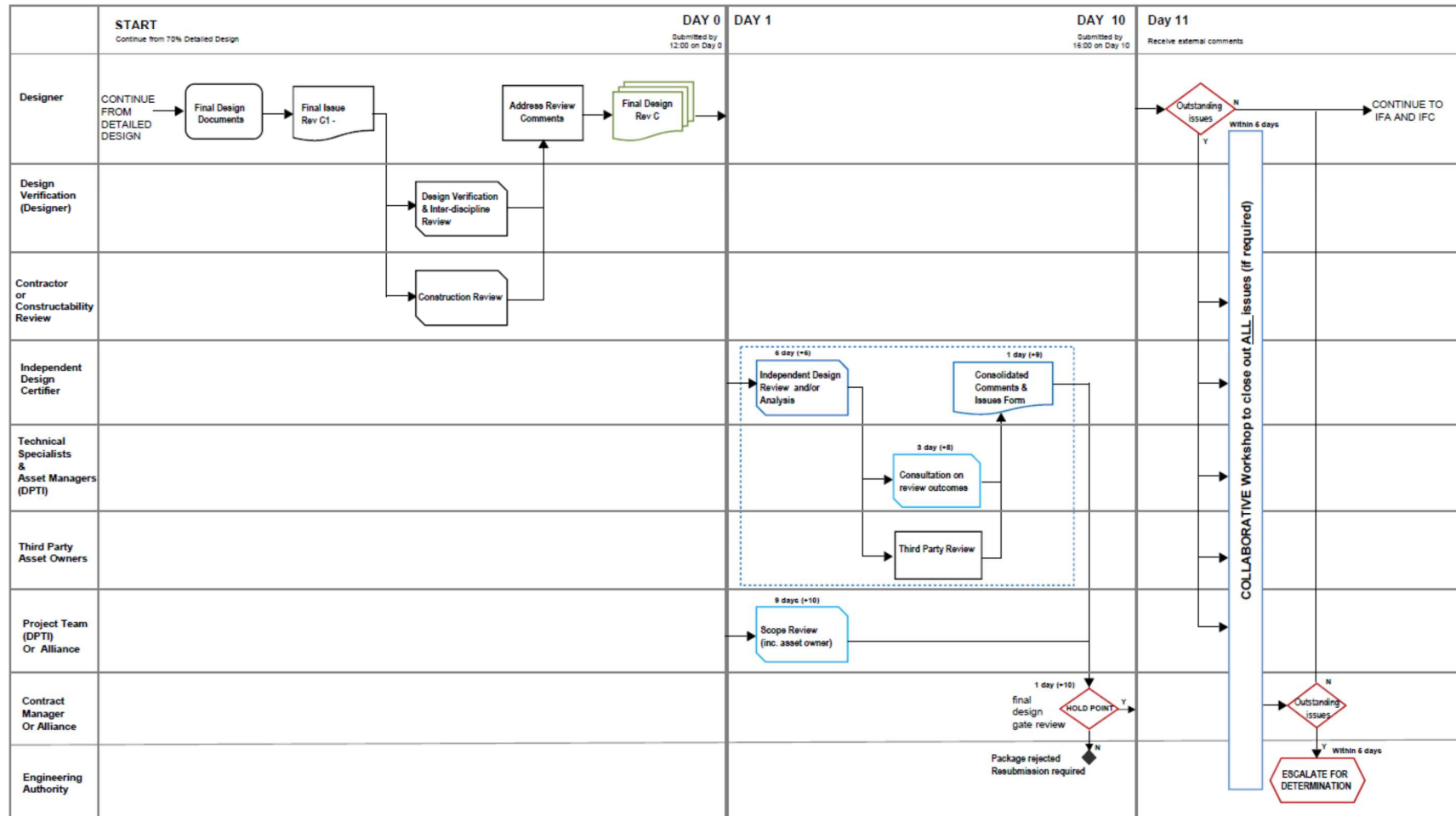
Detailed Design 70%, Package Flow Chart.

Engineering and Design Management Framework,
Design Gate 4B



Final Design 100% - Package Flow Chart.

Engineering and Design Management Framework,
Design Gate 4C



IFA - IFC Package Flow Chart.

Engineering and Design Management Framework,
Design Gate 4C

