

Project Controls

Master Specification

PC-EDM2 Safety Management in Design

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PC-EDM2 Safety Management in Design

1 General

- 1.1 This Part specifies the requirements for the incorporation of safety management into the design, construction, operation and maintenance of the Works.

2 References

- 2.1 The Contractor must ensure that the design of the Works enables compliance with the following:
- a) Work Health and Safety Act 2012 (SA); and
 - b) Work Health and Safety Regulations 2012 (SA).
- 2.2 Reference information on Safety in Design & Safe Design are available from:
- a) Australian Safety and Compensation Council (ASCC): Guidance on the Principles of Safe Design for Work; available from <https://www.safeworkaustralia.gov.au/>;
 - b) Safe Work Australia: model Code of Practice on the Safe Design of Structures available from <https://www.safeworkaustralia.gov.au/>;
 - c) Consult Australia: Safety in Design Pocket Guide; available from <http://www.consultaustralia.com.au/>; and
- 2.3 Reference information on Safe Systems approach is available from:
- a) AustRoads - Safe System Assessment Framework- AP-R509-16.
- 2.4 Reference information on Crime Prevention Through Environmental Design (CPTED) principles and procedures are available from:
- a) QLD Government, Crime Prevention Through Environmental Design, Part A: Essential Features of Safety Places, 2007 <https://www.police.qld.gov.au/programs/cscp/safetyPublic/>;
 - b) QLD Government, Crime Prevention Through Environmental Design, Part b: Implementation Guidelines 2007 <https://www.police.qld.gov.au/programs/cscp/safetyPublic/Documents/CPTEDPartB.pdf>.
- 2.5 "SFAIRP" has the meaning the Work Safe Australia Guide "How to Determine What is So Far As Is Reasonably Practicable to Meet a Health and Safety Duty".

3 Prevention through Design - Principles

- 3.1 Prevention through design refers to the integration of hazard identification and risk assessment early in the project lifecycle and design development process to prevent or eliminate risk and minimise the risks of injury throughout the life of infrastructure.
- 3.2 The most effective safety in design process begins at the earliest opportunity during the conceptual and planning phases. At this early stage there is the greatest chance of finding ways to design-out hazards, incorporate effective risk control measures and design-in efficiencies.
- 3.3 Effective design can transform the safety of infrastructure for users and maintainers in ways that benefit the business, workers, operators, users and the general public.

4 Safe Systems Approach

- 4.1 The Department places high importance on improving roads safety and the adoption of a safe systems approach to incorporate a holistic view of the road transport system and the interactions among roads and roadsides, travel speeds, vehicles and road users.
- 4.2 There are several guiding principles to this approach:

- a) People make mistakes. Humans will continue to make mistakes, and the transport system must accommodate these. The transport system should not result in death or serious injury as a consequence of errors on the roads.
- b) Human physical frailty. There are known physical limits to the amount of force our bodies can take before we are injured.
- c) A 'forgiving' road transport system. A Safe System ensures that the forces in collisions do not exceed the limits of human tolerance. Speeds must be managed so that humans are not exposed to impact forces beyond their physical tolerance. System designers and operators need to take into account the limits of the human body in designing and maintaining roads, vehicles and speeds.

5 Safety in Design

- 5.1 The Department places high importance on safety during the construction, operation and maintenance of the Works.
- 5.2 The Contractor must ensure that Safety in Design principles and processes are incorporated into the Design process and procedures.
- 5.3 The Contractor must liaise and consult with the Principal with regard to risks to health and safety arising from the design during the construction of the infrastructure, pursuant to Section 294 "Person who commissions work must consult with designer" of the Work Health and Safety Regulations 2012 (SA).
- 5.4 The Contractor must consult and liaise with representatives of stakeholders who will be:
 - a) constructing the Works;
 - b) accessing, operating or utilising the completed Works; and
 - c) maintaining the Works.

Safety in Design Procedure

- 5.5 The Contractor must have a documented Safety in Design procedure outlining the process of managing design implications in construction, operational and demolition phases of the project.
- 5.6 In undertaking the Safety in Design process, the Contractor must:
 - a) establish the context for the design;
 - b) identify the foreseeable uses of the design;
 - c) identify hazards relevant to the phase of the project;
 - d) record the hazards and their treatment status in a Hazard Log;
 - e) undertake an assessment of risk;
 - f) identify potential control measures and determine residual risk based on the SFAIRP principle;
 - g) monitor and review the design process at each Design Stage Review; and
 - h) communicate and consult with the Principal regarding Safety in Design.
- 5.7 The Safety in Design procedure must be integrated within the Design Management process and procedures.
- 5.8 The submission of the Safety in Design procedure shall constitute a **Hold Point**.
- 5.9 Subject to the acceptance of the Principal's Representative the Safety in Design procedure may be incorporated within the Design Management plan.

Hazard Analysis and Risk Assessment

- 5.10 The Contractor shall coordinate a Preliminary Hazard Analysis (Operational Risk Assessment) with DPTI Maintenance, Operational personnel and emergency services to:

- a) assess the Contractor's Tender Design (nominally 15%) of the Works;
 - b) identify and assess hazards and risks to be managed through the project lifecycle to mitigate the risk "so far as is reasonably practicable" (SFAIRP);
 - c) assess the tender design utilising a safe systems approach; and
 - d) assess the impact on current and proposed operational and maintenance procedures.
- 5.11 The submission of the Preliminary Hazard Analysis shall constitute a **Hold Point**.
- 5.12 The Contractor shall utilise the outcome of the Preliminary Hazard Analysis (Operational Risk Assessment) in the development of their Safety in Design assessments, to demonstrate the Design has mitigated the project risk "so far as is reasonably practicable".
- 5.13 A Safety in Design Risk Register must be developed to document the identified project hazards and proposed safety controls and residual risks.
- 5.14 The Safety in Design Risk Register must be forwarded to the Principal's Representative at each Design Stage Review (Preliminary 30%, Detailed 70% and Final).
- 5.15 Submission of the Safety in Design Risk Register shall constitute a **Hold Point**.

Safety in Design Report

- 5.16 The Contractor must prepare a written Safety in Design Report including, but not limited to:
- a) summary of the process to identify hazards and addressing safety risks within the design;
 - b) assessments and outcomes from addressing safety risks and hazards in the design including:
 - i) records of the consultation with stakeholders on safety in design;
 - ii) hazard analysis and Design Risk registers.
 - c) consideration of how construction / maintenance / operational risks that can be ameliorated by the design process will be addressed, including:
 - i) positioning of site access and egress points;
 - ii) location of site facilities and accommodation;
 - iii) location of traffic / pedestrian routes and proximity to traffic (where applicable);
 - iv) safe work at height requirements;
 - v) working in confined spaces / excavations; and
 - vi) issues relating to working adjacent to or with live Utility Services, including high voltages or pressures, overhead clearances, dangerous excavations and asbestos materials.
 - d) how safety in the use / operation of the Works will be addressed (if not addressed in other reports); and
 - e) evidence that satisfies the requirements of Section 295 "Designer must give safety report to person who commissions design" of the Work Health and Safety Regulations.
- 5.17 The Safety in Design report is to be used to inform the Contractor's Work Health Management Plans and Safe Work Method Statements.
- 5.18 At the Design Gate Reviews (refer PC-EDM1 "Design Management"), the Contractor must provide and discuss the Safety in Design Report (in draft format where appropriate).
- 5.19 At the completion of the Design, the Contractor shall issue a Safety in Design "Issued for Construction / Use" Report detailing all the Safety in Design process and outcomes for all design disciplines in a single, holistic and complete report.
- 5.20 Submission of the Safety in Design "Issued for Construction / Use" Report shall constitute a **Hold Point**.

6 Crime Prevention Through Environmental Design (CPTED)

- 6.1 The Department places high importance on safety of the public, passengers and maintenance personnel using the facilities following completion of the works and during the ongoing operation and maintenance of the facility.
- 6.2 The important principles and guiding ideas to prevent crime through the design process include:
 - a) Surveillance: passive or “natural” surveillance;
 - b) Legibility: allow people to easily understand where they are and how to get to where they are going;
 - c) Territoriality: aware of public and private territory and not trespassing by accident;
 - d) Ownership of the Outcome: feeling of individual and community ownership of the public realm;
 - e) Management: places that are maintained identifies to would-be offenders that the community cares; and
 - f) Vulnerability: reduce or limit risk from assault.
- 6.3 The Contractor must ensure that Crime Prevention Through Environmental Design (CPTED) principles are integrated within the Design Management process and procedures.

Design Requirements

- 6.4 Physical environments can be designed in order to lessen the opportunity for crime by creating environmental and social conditions that:
 - a) maximise risk to offenders (increasing the likelihood of detection, challenge and apprehension);
 - b) maximise the effort required to commit crime (increasing the time, energy and resources required to commit crime);
 - c) minimise the actual and perceived benefits of crime (removing, minimising or concealing crime attractors and rewards); and
 - d) minimise excuse-making opportunities (removing conditions that encourage / facilitate rationalisation of inappropriate behaviour).

CPTED Procedure

- 6.5 The Contractor must develop a CPTED procedure detailing the processes to review and demonstrate how the design will be analysed and the completed works will be reviewed to demonstrate the CPTED principles have been incorporated.
- 6.6 The Contractor may engage SAPOL's crime prevention unit to also complete an independent review of how well the design assist in prevention of crime.
- 6.7 Further information on implementing CPTED principles and procedures is detailed in the QLD CPTED Part B Implementation Guidelines.
- 6.8 The Contractor must ensure that CPTED principles and procedures are integrated within the Design Management process and procedures.
- 6.9 The submission of the CPTED procedure shall constitute a **Hold Point**.
- 6.10 Subject to the acceptance of the Principal's Representative the CPTED procedures may be incorporated within the Design Management plan.

CPTED analysis report

- 6.11 At the completion of the design, the Contractor shall issue a CPTED Analysis “Issued for Construction / Use” Report detailing all the CPTED Analysis and outcomes for all design disciplines in a single holistic complete report.

- 6.12 Submission of the CPTED Analysis “Issued for Construction / Use” Report shall constitute a **Hold Point**.

7 Road Safety Audit

- 7.1 Road Safety Audits are to be completed in accordance with PC-EDM3 “Road Safety Audits”.

8 Hold Points

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

Document Ref.	Hold Point	Response Time
5.8	Submission of the Safety in Design procedure	10 Working Days
5.9	Preliminary Hazard Analysis	10 Working Days
5.12	Safety in Design Risk Register	10 Working Days
5.20	Safety in Design “Issued for Construction / Use” Report	10 Working Days
6.9	submission of the CPTED procedure	10 Working Days
6.12	CPTED Analysis “Issued for Construction / Use” Report	10 Working Days