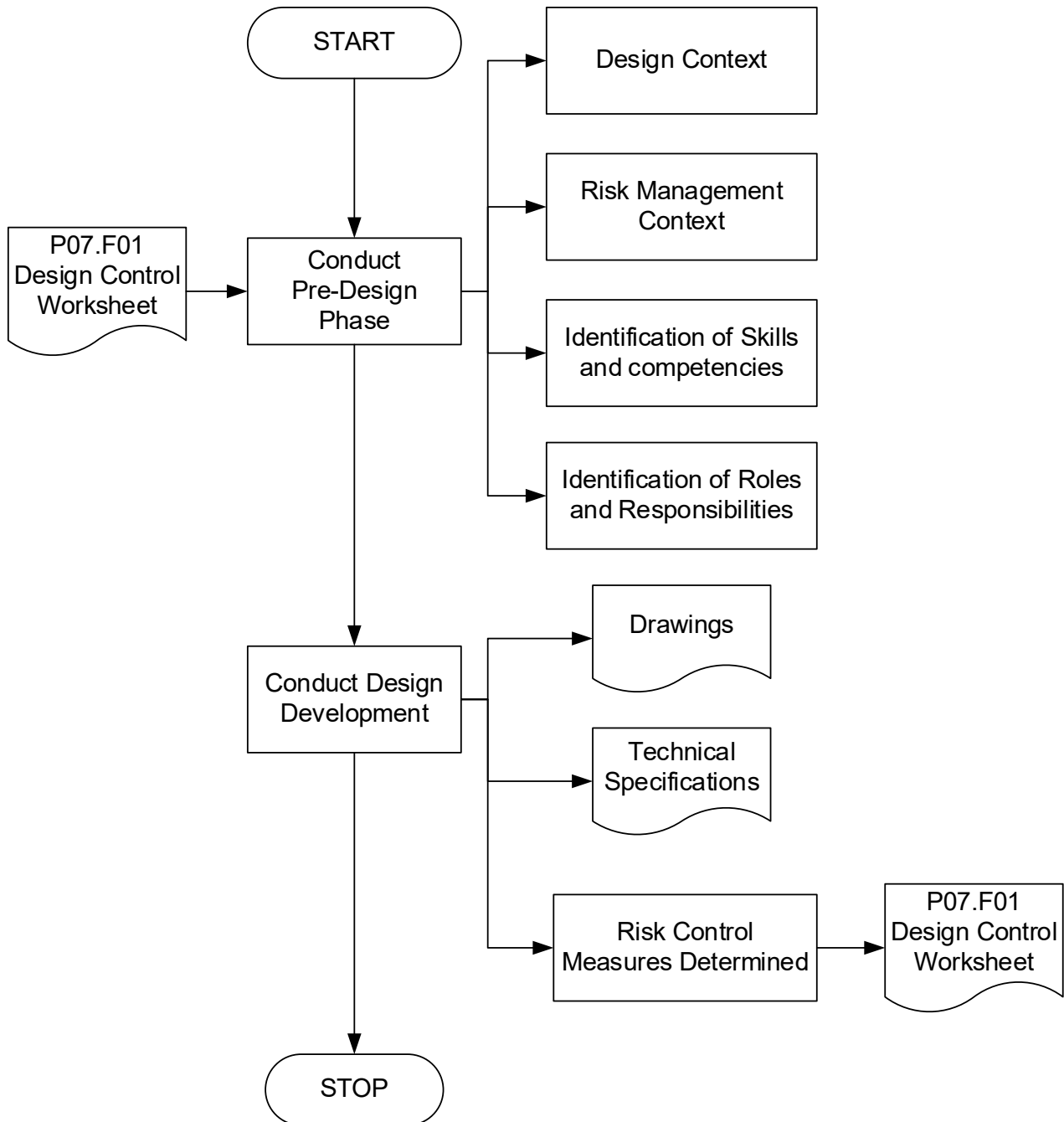


## DESIGN CONTROL

### 1.0 SUMMARY / FLOWCHART



## 2.0 RESPONSIBILITY

Organisational Level	Health and WHS Responsibilities
<b>Level 1</b> ( <i>General Manager, Group Directors</i> )	Provide adequate resources to ensure that the requirements of this procedure are implemented.
	Ensuring this procedure and systems are in place to identify and adequately control risk during the design phases of projects involving the design of structures, facilities, plant and equipment and processes.
	Ensuring this procedure and associated procedures are followed to ensure that design requirements are incorporated into specifications for services.
<b>Level 2</b> ( <i>Section Manager, Unit Manager / Unit Co-ordinator, Project Manager</i> )	All aspects of this design control procedure are communicated to internal and external design personnel, and the procedure is implemented in the area of their responsibility
	Ensuring persons involved in the development of design documentation have appropriate engineering and/or WHS qualifications, and would qualify or are a member of a professional association related to their profession.
	Appoint a Design / Project Manager for safe design of construction projects.
	Approve the design of a building, structure, facility, plant or process, within their level of delegated authority.
	Ensuring that this procedure is implemented in their area of report.
	Monitor system to ensure compliance and support continuous improvement.
	Ensure effective consultation and communication with all parties.
	Maintaining design related records and other pertinent information to ensure compliance with current WHS requirements.
	Undertake, record and communicate design review processes to improve future designs.
	Appoint a qualified designer with appropriate skills and knowledge in relation to the design work to be undertaken.
<b>Designers and Engineers</b>	Designing to eliminate or minimise, as far as reasonably practicable, the risk of injury or illness to the following persons:

	<ul style="list-style-type: none"> <li>• who use the structure, facilities, plant or process for the purpose for which it was designed.</li> <li>• who construct the structure at a workplace or carry out any foreseeable activity at a workplace in relation to manufacture, assembly or use of the structure.</li> <li>• who are at or in the vicinity of a workplace or whose wellbeing may be affected by use or activity, including constructing the structure.</li> </ul>
	Managing the design of a facility, item of plant or equipment and ensuring that WHS requirements are incorporated in design processes in compliance with WHS legislative requirements.
	Implementing and keeping design control review and approvals as verification of design processes meeting WHS requirements.
	Consult with all relevant persons or groups during the design process.
	Maintaining the currency of qualifications, certifications and insurances.
	Ensuring personnel reviewing design processes are suitably skilled, trained and experienced in the design process and the WHS requirements for safe design.
<b>Client or Nominated SCC representative</b>	Consult with the designer, so far as is reasonably practicable, about how to ensure that WHS risks arising from the design are eliminated or minimised.
	Provide the designer with any information that the client has in relation to the hazards and risks associated with the design.
<b>Level 3</b> ( <i>Coordinator within a Unit, Team Leader, Supervisor, Ganger or Leading Hand or Operator</i> )	Co-operate with and participate in consultation processes and other processes, including trialling and testing, required by design functions in designing structures, facilities, new plant and plant alterations.
	Encourage workers to contribute to the safe design of structures, facilities, processes, new plant and modifications to plant through consultation and involvement.
	Report any hazards identified associated with a structure, facility, process, new plant or plant modification during the design process.

<b>Level 4</b> ( <i>Team Member, Operator Attendant, Trainee, Apprentice</i> )	Co-operate with and participate in consultation processes and other processes, including trialling and testing, required by design functions in designing structures, facilities, new plant and plant alterations.
	Report any hazards identified associated with a structure, facility, process, new plant or plant modification during the design process.
<b>Level 5</b> ( <i>Volunteer, Contractor, Other</i> )	Co-operate with and participate in consultation processes and other processes, including trialling and testing, required by design functions in designing structures, facilities, new plant and plant alterations.
	Report any hazards identified associated with a structure, facility, process, new plant or plant modification during the design process.

### **3.0 PURPOSE & SCOPE**

#### **3.1 PURPOSE**

- 3.1.1 The overall objective of this procedure is the prevention of incidents, injuries or illnesses through the application of the principles of safe design to relevant activities undertaken by Shoalhaven City Council (SCC).

#### **3.2 SCOPE**

- 3.2.1 This procedure applies to all design activities undertaken by SCC, including the design of structures, facilities, plant, equipment and processes.

### **4.0 PROCEDURE**

#### **4.1 PRE-DESIGN PHASE**

##### **4.1.1 Pre-design Considerations**

- 4.1.1.1 The pre-design phase of the SCC's Design Control process involves the Design / Project Manager undertaking the following:
- the establishment of the design context in terms of the purpose of the structure, facilities, plant and equipment or process to be designed, and the scope and complexity of the project.
  - the establishment of the risk management context by broadly identifying the workplace hazards and the relevant legislation, codes of practice and standards that are to be considered.

- c) the identification of the required design disciplines, skills and competencies required.
  - d) the identification of the roles and responsibilities of the various parties in relation to the design project, and establishing collaborative relationships with clients and others who influence the design outcome.
  - e) the consultation and research to assist in identifying hazards, assessing and controlling risks.
- 4.1.1.2 The outcomes of the Pre-design Phase will be documented using P07.F01 Design Control Worksheet.

## **4.2 CONCEPTUAL AND SCHEMATIC DESIGN PHASE**

- 4.2.1 Hazard identification will be undertaken, in a systematic manner, as early as possible in the concept development and design stages.
- 4.2.2 A “designer” and others involved in the preliminary hazard analysis will decide which hazards are ‘in scope’, and will be considered in the design process.
  - 4.2.2.1 A hazard is ‘in scope’ if it can be affected, introduced or increased by the design of the structure, facility, plant, equipment or process.
  - 4.2.2.2 Hazards that are considered ‘in scope’ will be documented on P07.F01 Design Control Worksheet.
- 4.2.3 At this early stage, consideration will be given to possible ways that hazards could be eliminated or minimised.
- 4.2.4 Where there are systems of work which are foreseeable as part of the construction method and the intended use of a structure, facility as a workplace, or item of plant, equipment or process, they will be identified in the preliminary hazard analysis.
- 4.2.5 The brief will also include any activities and systems with hazards specific to the nature of the structure, facility, item of plant, equipment or the process where the WHS of these activities or systems is affected by the design.

## **4.3 DESIGN DEVELOPMENT PHASE**

- 4.3.1 In this phase the design concepts for the structure, facility, plant, equipment or process are converted into detailed drawings and/or technical specifications.
- 4.3.2 Control measures are determined and, if required, construction or manufacturing documentation prepared. Risk control measures will be documented on P07.F01 Design Control Worksheet.
- 4.3.3 Control measures will be determined from known solutions for common hazards, and by risk assessment for new or complex hazards.

- 4.3.4 The design development phase will involve the following:
  - 4.3.4.1 the development of design options in accordance with the hierarchy of controls documented within P10 Risk Management.
  - 4.3.4.2 the selection of the preferred option, balancing the direct and indirect costs of the implementation the design against the benefits derived.
  - 4.3.4.3 the testing, trialling and evaluation of the selected design option.
  - 4.3.4.4 Any redesign requirements to control any residual risks.
  - 4.3.4.5 the finalisation of the design, the preparation of WHS and other risk control information needed for the structure's life-cycle.
- 4.3.5 Implementation of solutions from recognised standards
  - 4.3.5.1 Other legislative provisions governing the design of buildings and structures in Australia include the building laws in each jurisdiction and the National Construction Code of Australia (NCCA) and The Building Code of Australia (BCA) (part of the NCCA).
  - 4.3.5.2 In addition, there are technical and engineering guidelines and standards produced by other government agencies, Standards Australia and relevant professional bodies.
- 4.3.6 The design is completed and handed to the “client”.
- 4.3.7 Assessment of Risk
  - 4.3.7.1 WHS risks will be assessed in accordance with the methodology documented in P10 Risk Management.
  - 4.3.7.2 Risk assessment methods for assessing design WHS Risk may include:
    - a) fact finding to determine existing controls, if any
    - b) testing design assumptions to ensure that aspects of it are not based on incorrect beliefs or anticipations on the part of the designer, as to how workers or others involved will act or react
    - c) testing of structures or components specified for use in the construction, end use and maintenance
    - d) consulting with key people who have the specialised knowledge and/or capacity to control or influence the design, (for example the architect, client, construction manager, engineers, project managers and WHS representatives), to identify and assess risks; consulting directly with other experts, (for example specialist engineers, manufacturers and product or systems designers) who have been involved with similar constructions

- e) when designing for the renovation or demolition of existing buildings, reviewing previous design documentation or information recorded about the design structure and any modifications undertaken to address WHS concerns; and consulting professional industry or employee associations who may assist with risk assessments for the type of work and workplace.

## **4.4 DESIGN CONSIDERATIONS**

### **4.4.1 Design for safe construction**

#### **4.4.1.1 Control measures for risks relating to the construction of a structure include the following:**

- a) providing adequate clearance between the structure and overhead electric lines by burying, disconnecting or re-routing cables before construction commences to avoid “contact” when operating cranes and other tall equipment.
- b) Designing components that can be pre-fabricated off-site or on the ground to avoid assembling or erecting at heights and to reduce worker exposure to falls from heights or being struck by falling objects.
- c) Designing parapets to a height that complies with guardrail requirements, eliminating the need to construct guardrails during construction and future roof maintenance.
- d) Using continual support beams for beam-to-column double connections, be it adding a beam seat, extra bolt hole, or other redundant connection points during the connection process. This will provide continual support for beams during erection – to eliminate falls due to unexpected vibrations, misalignment and unexpected construction loads.
- e) Designing and constructing permanent stairways to help prevent falls and other hazards associated with temporary stairs and scaffolding, and schedule these at the beginning of construction.
- f) Reducing the space between roof trusses and battens to reduce the risk of internal falls during roof construction.
- g) Choosing construction materials that are safe to handle.
- h) Limiting the size of pre-fabricated wall panels where site access is restricted.

- i) Selecting paints or other finishes that emit low volatile organic compound emissions.
- 4.4.2 Design to facilitate safe use
  - 4.4.2.1 Consider the intended function of the structure, including the likely systems of use, and the type of machinery and equipment that may be used.
  - 4.4.2.2 Consider whether the structure may be exposed to specific hazards, such as manual tasks in health facilities, occupational violence in banks or dangerous goods storage in warehouses.
  - 4.4.2.3 Risks relating to the function of a structure can be controlled by:
    - a) Designing traffic areas to separate vehicles and pedestrians.
    - b) Using non-slip materials on floor surfaces in areas exposed to the weather or dedicated wet areas.
    - c) Providing sufficient space to safely install, operate and maintain plant and machinery.
    - d) Providing adequate lighting for intended tasks in the structure.
    - e) Designing spaces which accommodate or incorporate mechanical devices to reduce manual task risks.
    - f) Designing adequate access, for example, allowing wide enough corridors.
    - g) Designing effective noise barriers and acoustical treatments to walls and ceilings.
    - h) Specifying plant with low noise emissions or designing the structure to isolate noisy plant.
    - i) Designing floor loadings to accommodate heavy machinery that may be used in the building and clearly indicating on documents design loads for the different parts of the structure.
- 4.4.3 Design for safe maintenance
  - 4.4.3.1 Risks relating to the cleaning, servicing and maintenance of a structure, facility or plant will be controlled by, but not limited to, the following:
    - a) designing the structure so that maintenance can be performed at ground level or safely from the structure, for example, positioning air-conditioning units and lift plant at ground level, designing inward opening windows, integrating window cleaning bays or gangways into the structural frame.
    - b) designing features to avoid dirt traps.

- c) designing and positioning permanent anchorage and hoisting points into structures where maintenance needs to be undertaken at height.
  - d) Designing safe access, such as fixed ladders, and sufficient space to undertake structure maintenance activities.
  - e) Eliminating or minimising the need for entry into confined spaces (refer to the Code of Practice: Confined Spaces for further guidance).
  - f) Using durable materials that do not need to be re-coated or treated.
- 4.4.4 Modification / Alteration
  - 4.4.4.1 Design is not always focussed on the generation of a design for a new structure, facility, plant or process. The design may require the alteration of an existing structure, facility, plant or process.
  - 4.4.4.2 The modification or alteration of a structure, facility, plant, equipment or process will be again subject to the processes undertaken in the design phases.
- 4.4.5 Verification of Designs
  - 4.4.5.1 Design / Project Managers will arrange for a competent person or persons, internal or external to SCC as required, to verify that designs and/or modifications meet WHS and legal requirements for the project.
  - 4.4.5.2 Verification records will be retained on design files, in accordance with P04 Document Control and WHS Records.
- 4.4.6 Execution of Designs
  - 4.4.6.1 WHS requirements, including risk control measures, will be incorporated into contract documents and will form part of the selection criteria used in the engagement of suitable contractors.
- 4.4.7 Design Reviews
  - 4.4.7.1 At predetermined points within the design process, or at other times when necessary, Project Managers / Designers will conduct Design Reviews to confirm the effectiveness of control measures, and, if required, redesign to minimise, as far as reasonably practicable, the health and WHS risks associated with the design.
  - 4.4.7.2 Design Reviews will, where possible, involve the people who will execute the design, e.g. construction of the structure, or manufacture the item of plant. If this is not possible, persons with knowledge and experience in the construction, maintenance or other related processes will be included in the design review process.

- 4.4.7.3 The purpose of Design Reviews is to identify any health and WHS issues overlooked in the design previously.
- 4.4.8 Qualifications of Designers and Engineers
  - 4.4.8.1 Designers and those involved in the design process and verification of designs will be competent to fulfil the requirements of these roles or functions
  - 4.4.8.2 The competency requirements of designers will be specified within the relevant SCC's documentation, such as position descriptions or specifications for services.
  - 4.4.8.3 Where external designers and engineers are used, SCC's Project Manager will obtain copies of applicable qualifications and verify that they are appropriate for the project or design work to be undertaken.
  - 4.4.8.4 Records of competency, such as copies of qualifications, will be maintained in accordance with P04 Document Control and WHS Records.

## **4.5 RECORDS**

- 4.5.1 All records generated as a result of the operation of this procedure will be managed in accordance with the requirements documented within P04 Document Control and WHS Records.

## **5.0 REFERENCES & ASSOCIATED DOCUMENTS**

- 5.1** Work Health and Safety Act 2011
- 5.2** Work Health and Safety Regulation 2011
- 5.3** How to Manage Work Health and Safety Risks: Code of practice 2011
- 5.4** Safe Design of Structures: Code of practice 2014
- 5.5** National Self-Insurer OHS Management System Audit Tool 2014
- 5.6** P04 Document Control and WHS Records
- 5.7** P10 Risk Management
- 5.8** P07.F01 Design Control Worksheet

**APPENDIX 1            DEFINITIONS**

<b>PCBU</b>	Person conducting a business or undertaking.
<b>Reasonably Practicable</b>	<p>The duty of a person conducting a business or undertaking to ensure health and WHS is qualified by what is reasonably practicable. Deciding what is ‘reasonably practicable’ requires taking into account and weighing up all relevant matters including:</p> <ul style="list-style-type: none"> <li>• the likelihood of the hazard or risk occurring</li> <li>• the degree of harm that might result from the hazard or the risk</li> <li>• knowledge about the hazard or risk, and ways of eliminating or minimising the risk</li> <li>• the availability and suitability of ways to eliminate or minimise the risk, and</li> <li>• after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.</li> </ul>
<b>Safe Design</b>	Safe design means the integration of control measures early in the design process to eliminate or, if this is not reasonably practicable, minimise risks to health and WHS throughout the life of the structure, facility, or plant being designed.
<b>Worker</b>	<p>A person is a Worker if the person carries out work in any capacity for a person conducting a business or undertaking, including work as:</p> <ul style="list-style-type: none"> <li>• an employee</li> <li>• a contractor or sub-contractor</li> <li>• an employee of a sub-contractor</li> <li>• an employee of a labour-hire company who has been assigned to work in the organisation</li> <li>• an outworker</li> <li>• an apprentice or trainee</li> <li>• a student gaining work experience</li> <li>• a volunteer</li> <li>• a person of a prescribed class.</li> </ul>