SAFETY IN DESIGN

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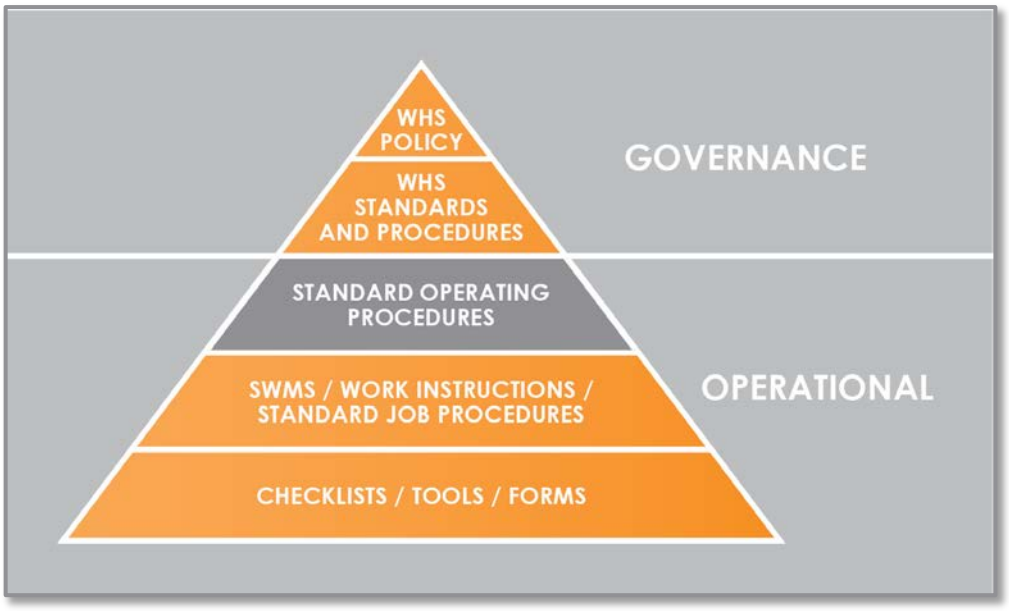
1. WHSMS DOCUMENT HIERARCHY



2. PURPOSE

This Standard Operating Procedure (SOP) documents QUU's procedure for the management of risks associated with the design, safe construction, operation, maintenance and demolition for our workplace assets. In particular, this SOP:

- Sets out the design requirements to ensure hazards are eliminated where reasonably practicable, or otherwise appropriately controlled, during the design stage.
- Details the responsibilities of QUU staff who are involved in the design of new, modifications or demolitions works of QUU infrastructure (including buildings, equipment (mechanical/electrical) and plant used for work).
- Outlines the 'Principles of Safety in Design' to be applied throughout QUU workplace for the protection of people and assets.
- Details the risk assessment process to be applied at design stage to eliminate or minimise potential risks during construction, installation, commissioning, operation and maintenance, modification of infrastructure and related processes.

3. SCOPE

This (SOP) applies to all QUU staff, including contractors, designers and consultant's engaged to provide services relating to the design, construction, installation, modification and removal of infrastructures and equipment, operated or intended to be operated at QUU workplaces.

4. DEFINITIONS AND ACRONYMS

CLIENT: The client has specific duties in relation to the safe design of infrastructure. In most cases, QUU are 'the client' in the context of Safety in Design and the WHS Act.

COMPETENT PERSON: means, for performing an inspection or other task for a control measure, a person who has acquired, through training, qualifications or experience, the knowledge and skills to do the task in a safe way including knowledge of:

- Relevant Australian Standards;

- Relevant codes of practice; and
- Other relevant legislation.

DESIGNER: A person who conducts a business or undertaking whose profession, trade or business involves:

- Them preparing sketches, plans, drawings, documents, directions, or advice (verbal or written) for infrastructure, facility or equipment including variations to existing infrastructures, facilities and equipment.
- Providing advice on the design requirements for infrastructure for compliance and risk management purposes;
- Making decisions that may affect the health and safety of persons who construct, use or carry out activities in relation to the infrastructure.

Designers can be Planners, Design Engineers or Construction Engineers dependent upon the various stages of the Project Lifecycle

DUE DILIGENCE: is the corporate governance responsibility of officers with respect to work health and safety. The due diligence obligation recognises that the behaviour and decisions of officers of a person conducting a business or undertaking (PCBU):

- determine whether the PCBU complies with its work health and safety duties, and
- strongly influence the health and safety culture of businesses and undertakings

HEALTH AND SAFETY REPRESENTATIVE (HSR): a worker who has been elected by their workgroup to represent them in all health and safety matters.

INFRASTRUCTURE: For the purposes of the SOP, this term includes mechanical, electrical and civil infrastructure that is constructed, whether fixed or moveable, temporary or permanent, and includes:

- buildings, masts, towers, framework, pipelines, roads, bridges, rail infrastructure and underground works (shafts or tunnels),
- any component of a structure,
- and part of a structure.

MANAGER: the person/s directly responsibility for the workplace activity being performed or the work site where the activity is occurring.

OFFICER: a term used to refer to directors, partners, or anyone else who makes decisions which affect the whole or a substantial part of a business or undertaking.

Under the WHS Act 2011, Officers are required to exercise due diligence when ensuring that their business or undertaking fulfils its health and safety obligations. This means that Officers are expected to:

- have up-to-date knowledge of all work health and safety matters,
- understand the operations of the business and the hazards and risks involved,
- ensure appropriate resources and processes are in place to enable hazards to be identified and risks to be eliminated or minimised,
- ensure information regarding incidents, hazards and risks is reviewed and responded to in a timely manner,
- ensure that the business has, and implements, processes for complying with any legal duty or obligation,
- ensure that these processes are verified, monitored and reviewed.

PERSON CONDUCTING A BUSINESS OR UNDERTAKING (PCBU): a term which is primarily used to refer to employers, but which is equally applicable to sole traders, contractors, the self-employed, or anyone else who is responsible for workers.

Under the WHS Act 2011, PCBUs are, as far as is possible, responsible for ensuring the health and safety of:

- workers they directly engage or whose activities they influence,
- anyone else who could be put at risk by the activities the PCBU is undertaking, for example visitors, customers, or members of the public.

PRODUCT LIFECYCLE: all phases in the life of a product. Specific phases depend on the type of product but may include design, development, manufacture, construction, assembly, import, supply, distribution, sale, hire, lease, storage, transport, installation, erection, commissioning, use or operation, consumption, maintenance, servicing, cleaning, adjustment, inspection, repair, modification, refurbishment, renovation, recycling, resale, decommissioning, dismantling, demolition, discontinuance, disposal.

PRINCIPAL CONTRACTOR (PC): A person responsible for the planning and conduct of construction work is responsible to ensure work is managed in a way that minimises the health and safety risks so far as is reasonably practicable. A PC is required for construction work valued at $250,000 or more and may be:

- The entity that commissions the work (QUU), or
- Is engaged by QUU as the PC (is appointed formally) and is authorised to exercise management control over a construction work place.

PICOW (PERSON IN CONTROL OF WORKSITE): QUU staff employed as a Supervisor/PICOW, or in a role that requires them to oversee, supervise, direct or control a workplace or work activity, including persons involved in the activity.

QUU WORKPLACE: Any structure or location where work is undertaken by QUU workers, including fixed, temporary and mobile locations such as vehicles, plant, and buildings.

RPEQ: Acronym used for Registration as a Professional Engineer of Queensland (refer to Professional Engineers Act 2002).

REASONABLY PRACTICABLE: Means that which is, or was at a particular time, reasonably able to be done to ensure health and safety, taking into account and weighing up all relevant matters including:

- The likelihood of the hazard or the risk concerned occurring;
- The degree of harm that might result from the hazard or the risk;
- What the person concerned knows, or ought reasonably to know, about the hazard or risk, and ways of eliminating or minimising the risk;
- The availability and suitability of ways to eliminate or adequately minimise risk to an acceptable level; and
- After assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, including whether the cost is grossly disproportionate to the risk.

SAFE DESIGN: The integration of hazard identification and risk assessment methods early in the design process to eliminate or minimise the risks of injury throughout the life of the product being designed. It encompasses all design including facilities, hardware, systems, equipment, products, tooling, materials, energy controls, layout and configuration.

SAFETY IN DESIGN: A concept aimed at preventing injuries and disease by considering hazards as early as possible in the planning and design process. A safety in design approach considers the safety of those who construct, operate, clean, maintain, modify and demolish an asset (e.g. building, infrastructure, plant or equipment) as well as those who work in or with it. Designers are in a unique position to reduce the risks that arise during the life cycle of the asset during the design phase.

SUPERVISOR: a term used to refer to any QUU employee who acts or is appointed as a Supervisor, Coordinator or Team Leader within QUU.

WHS: Work Health and Safety.

WHS MANAGEMENT SYSTEM (WHSMS): the comprehensive and integrated system of WHS Standards, Procedures, SOPs, Quick Guides and Work Instructions that allows QUU to effectively manage and control our workplace hazards and risks.

WORKER: a person who carries out work in any capacity for a person conducting a business or undertaking. This includes employees, contractors, sub-contractors, apprentices, trainees, volunteers and work experience students.

Under the WHS Act 2011, Workers are responsible for:

- their own health and safety,
- ensuring their actions do not adversely affect the safety of others,
- complying with all reasonable instructions given by the PCBU,
- co-operating with any policy or procedure which has been communicated to them.

5. ROLES AND RESPONSIBILITIES

Officers, Managers and Workers have clear responsibilities and accountabilities for WHS outlined in QUU's **WHS Resources, Responsibility and Accountability Standard (STD132)** and **Procedure (PRO359)**. These responsibilities and accountabilities are non-transferrable and critical to achieving QUU's WHSMS goals, objectives and targets.

Outlined below is the role specific responsibilities relating to the management of QUU's safety in design requirements:

5.1 DESIGNER

Designers have a duty under the Act and Regulations to consider that the infrastructure or asset to be designed or altered is to be safe when it is used as, or at, a workplace. The Designer must also undertake any testing and analysis required to fulfil this duty. The Designer must also consider the safety of people in the vicinity of the workplace.

The Designer must also consider that the infrastructure be designed to eliminate or minimise the need for any hazardous manual task to be carried out and give information to each person who is provided with the design about any features that eliminate the need for these tasks to be carried out (reg.61, WHS Regulation 2011).

Under Section 22(4) and 22(5) of the WHS Act, the Designer must provide information to anyone who is issued with the design, indicating the purpose for which the infrastructure is designed, the results of any testing and analysis undertaken and any conditions necessary to ensure that the Designer has designed the infrastructure to be without risk to health and safety when it is used as a workplace during its lifecycle. Current relevant information must also be provided to people who use, construct, operate, maintain or demolish the infrastructure on request.

Under the WHS Regulation s295 the Designer must give a Safety Design Report to the 'person conducting a business or undertaking' (PCBU) who commissions the design. This report must specify the hazards relating to that particular design. If you are working on a design that another designer has prepared (e.g. as a drafting job or for a renovation) you must obtain a copy of the report from the original designer.

The Designer is required to be familiar with Section 22 of the WHS Act 2011 and regulations 61 and 294-296 of the WHS Regulation 2011.

The Queensland Code of Practice for *Safe Design of Structures* provides practical guidance to achieving the standards of health, safety and welfare under the WHS Act and WHS Regulation. This code of practice applies for to anyone involved in making decisions that influence the design of structures.

The Designer should also be familiar with other Queensland Codes of Practice for work, health and safety related to the design such as Managing Risks of Plant in the Workplace, Confined Spaces, etc.

5.2 MANAGER

- Incorporating risk assessment in project/activity planning and delivery where the project/activity involves design or modification of infrastructure or processes.
- Facilitating consultation between stakeholders, designers and user groups at the earliest stage of design development.
- Facilitating consultation throughout the project life cycle that incorporates the identification and treatment of hazards.
- Employing, training, and engaging QUU workers, HSRs and designers with relevant technical and operational experience for involvement in the design process.
- Providing appropriate resources to facilitate the identification of risk in project/activity design and the implementation of control measures so far as is reasonably practicable.

5.3 PRINCIPAL CONTRACTOR (PC)

- A Principal Contractor is required for a construction project where the value of the construction work is $250,000 or more. The Principal Contractor has duties to ensure that the construction work is planned and managed in a way that eliminates or minimises health and safety risks so far as is reasonably practicable. The Client can be the Principal Contractor or the Client can engage a Principal Contractor (builder) to discharge their duties as a Principal Contractor. The Principal Contractor must prepare a WHS management plan where the value of the construction work is $250,000 or more.
- A Principal Contractor may also be a Designer if they undertake design work or if they alter or modify a design without consulting the original Designer. Principal Contractors must ensure that any changes they make to the design do not create additional risks to health and safety.
- Under certain circumstances, QUU (as the Client) can also operate as the Principal Contractor and as such, assumes the obligations of both Client and Principal Contractor roles.
- If the design has already been prepared by another designer, architect or draftsperson, the client has an obligation to provide you with the WHS information and safe design report for that design.

5.4 QUU EXECUTIVE (CEO, ELT AND OFFICERS)

- Overseeing and ensuring the implementation of the requirements of this SOP and related procedures within their respective functional areas.
- Allocating adequate and available resources that ensure the effective implementation of this SOP.
- For the purpose of this SOP, QUU Executive represents QUU as the client

The Code of Practice: Safe Design of Structures refers to a PCBU who commissions a design, construction work or a construction project as 'the client'. The client has specific duties in relation to the safe design of infrastructure. In most cases, QUU are 'the client' in the context of Safety in Design and the WHS Act.

Under Section 26 WHS Act, QUU (as the client) has duties to ensure that they commission work sites, equipment and infrastructures, that are, so far as is reasonably practicable without risk to health and safety for workers throughout their lifecycle as a workplace. QUU must also consider those in the vicinity of the workplace.

WHS Regulations 294 and 296 place further obligations on QUU (as the client):

- to consult with the Designer on how risks to health and safety can be eliminated or minimised; and also
- to provide the Principal Contractor with any information that they have in relation to the hazards or risks at, or in the vicinity of the workplace where the construction work is being

carried out. This would include providing the Principal Contractor with the Designer's safety report (which is required of the Designer under the WHS Regulation 295).

5.5 QUU PROJECT DELIVERY TEAM

- Include safety in design requirements in project 'scope of works 'documentation, including the requirements that designers:
    - Certify design is undertaken compliant with relevant regulations, standard and code of practice;
    - Consult with stakeholders, user groups etc. to ensure operational and maintenance requirements are considered in the design process;
    - Incorporate measures to eliminate, adequately minimise or control identified hazards in the designs;
    - Ensure that where a hazard must remain in a design, that information is communicated to stakeholders to facilitate development of appropriate safe work procedures.
- Ensure designers commissioned to design infrastructures possess appropriate capability and expertise to undertake the required design.
- Ensure that procurement processes include the requirement that designers consult with and include Functional Managers and operational stakeholders in the design process throughout the project life cycle.
- Develop a charter for all major works, where meetings are minuted, retained within the project documentation and kept within TRIM.

5.6 SUPERVISORS

- Consult with established stakeholders at the earliest stages of project planning;
- Facilitate the identification, assessment and control of risk by incorporating appropriate measures in project planning, design, conduct and delivery.
- Consult with designers to ensure compliance with relevant legislation, standards and codes of practice and ensure that the designer advises key stakeholders of health and safety risks throughout the project.
- Identified hazards are eliminated in the first instance, or where this is not practicable that appropriate control measures are established.
- Provide appropriate operational staff the opportunity to participate in design and to contribute to delivery of effective risk control measures.
- Document design risk assessments and obtain Safety Team endorsement of assessments and recommended risk control measures prior to implementation.

5.7 WHS TEAM

- Providing advice to assist business units to comply with this SOP:
- Assisting in the determination of QUU's position on safety matters that impact design (e.g. standards, and in the implementation of determined Safety in Design outcomes/programs across QUU).
- Provide ergonomic advice to ensure workers are not at risk (in accordance with the Manual tasks SOP) when operating or maintaining plant;
- Participating in design review and risk assessments for projects initiated by functional areas.
- Working with project/contract managers throughout the project life cycle to ensure contractors/designers meet QUU requirements.
- Provide final review of design related risk assessments to ensure compliance with WHS standards and QUU risk management protocols.

- Include assessment of the implementation of design safety in the WHS Inspection/Audit program through spot checking of projects involving design to validate compliance with the SOP.

5.8 WORKER

- Implement controls measures as outlined in a risk assessment, procedure or by supervisor/manager.
- Follow the requirements of this SOP;
- Participate in risk assessments and reviews relating to design safety as requested.

6. RELATED DOCUMENTS

- Contractor Management Procedure (PRO586)
- Procurement and Disposal WHS Standard (STD143)
- WHS Consultation and Communication WHS Procedure (PRO361)
- WHS Hazard and Risk Management WHS Procedure (PRO363)
- WHS Audit and Inspection WHS Procedure (PRO366)
- Manual Tasks Standard Operating Procedure (PRO416)
- Plant Standard Operating Procedure (PRO386)
- PICOW Handbook (MAN53)
- MP71 Electrical Safety Management Plan
- MP183 Hazardous Area Management Plan
- Risk Management Policy (POL11)
- Infrastructure Delivery Procedure Risk Management (PRO1)
- Safety Risk Assessment Guide (PRO125)
- Risk and Opportunity Assessment Guide - Risk Criteria (PRO84)

7. SAFETY IN DESIGN CONCEPTS

7.1 WHAT IS SAFETY IN DESIGN?

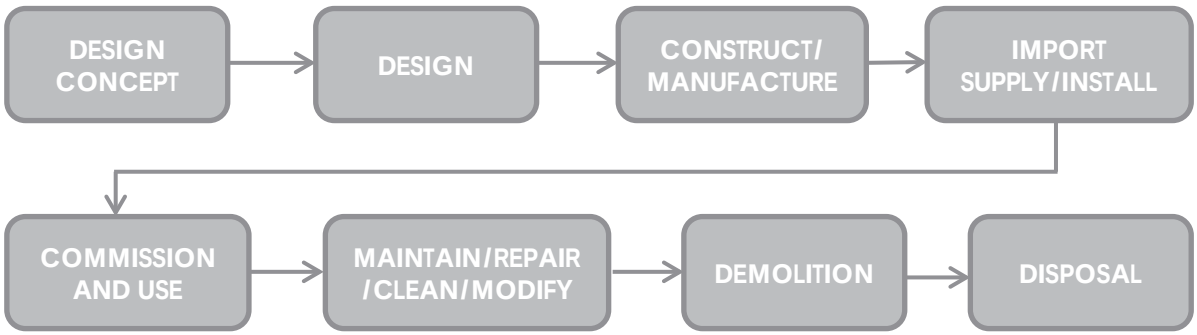
The aim of Safety in Design is to ensure the health and safety of persons who may have interactions with the infrastructure being designed by considering hazards as early as possible in the planning and design approach.

Safety in Design practices takes into consideration the safety of all persons who may interact with the infrastructure being designed. This includes those who construct, operate, clean, repair and demolish the infrastructure, in addition to those who work in or with it. By considering how each of these persons may interact with the infrastructure, potential impacts and adverse outcomes can be identified and addressed before the infrastructure is introduced into the workplace.

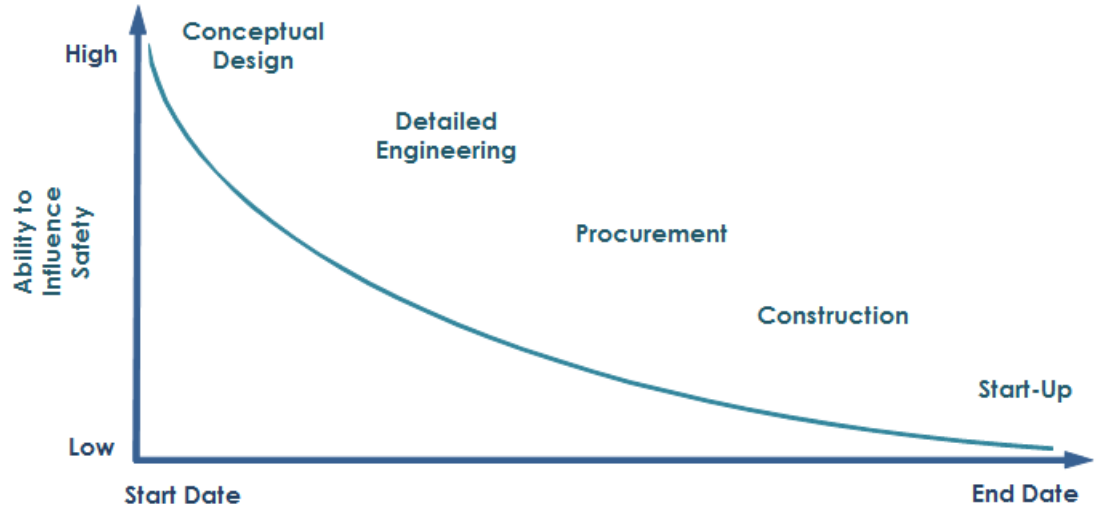
Safety in Design involves successfully balancing a wide set design objectives (e.g. practicability, aesthetics, cost, functionality), without compromising the health and safety of those persons potentially affected by the infrastructure over its lifecycle.

7.2 DESIGN LIFECYCLE

Safety in Design involves making choices about the design, materials and methods of manufacture/ construction that are required to enhance safety at all lifecycle stages of a design product, as depicted below.



The Safety in Design approach begins in the conceptual and planning phases of infrastructure design. The decisions made at this early stage fundamentally affect the health and safety of people who come into contact with the product over its entire lifecycle. It is at these early stages of a project that the greatest ability to influence the health and safety of a project exists, as depicted in the following graph.



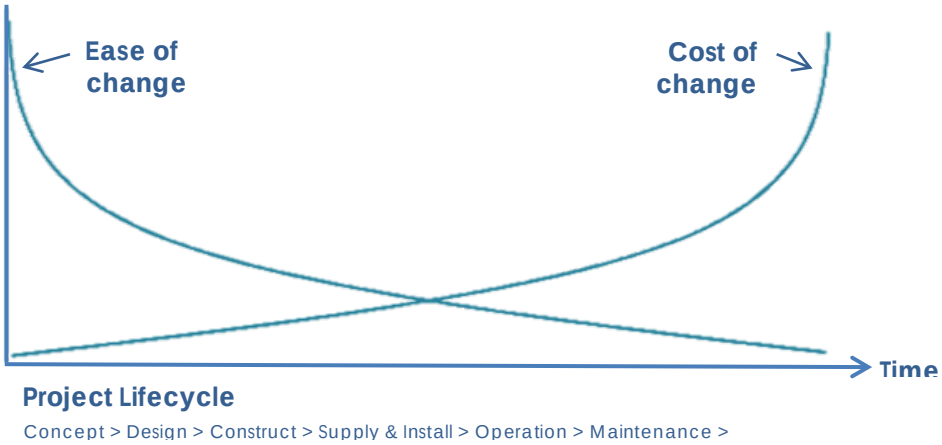
7.3 BENEFITS OF SAFETY IN DESIGN

There are a number of potential benefits of incorporating Safety in Design principles into the design process. These include:

- A better understanding of design requirements and limitations;
- Prevention of injury/illness;
- Compliance with legislation;
- Reduced costs;
- Improved productivity;
- Improved usability of infrastructures;
- Better prediction and management of production and operational costs over the infrastructure's lifecycle; and
- Innovation.

By eliminating hazards at the source, and incorporating risk mitigation in accordance with the hierarchy of controls early in the design stage, the cost impact to the project will be minimised, as demonstrated diagrammatically below.

The above diagram shows that deferring design changes to the later stages of a project increases the financial implications. In addition, it also reduces the ease with which such changes can be made, as represented in the diagram below.



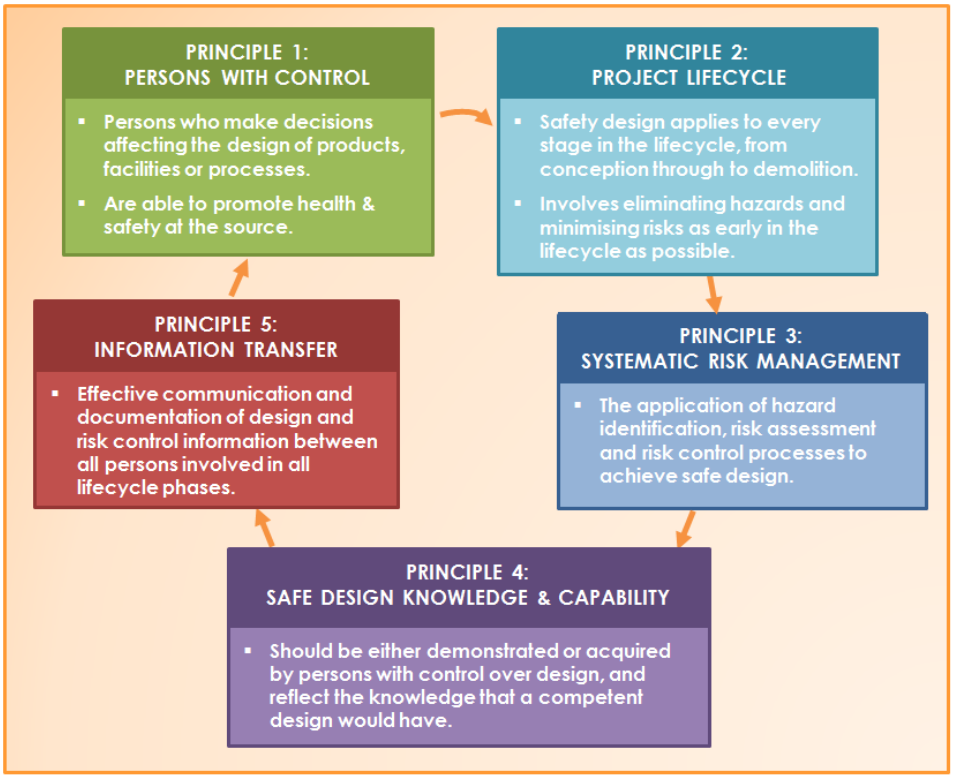
7.4 WHO INFLUENCES SAFETY IN DESIGN?

A range of parties influence the design of infrastructure throughout the design process, including:

- Design professionals (i.e. engineers, industrial designers, software developers and architects);
- The client, asset management and operations personnel; feasibility and planning engineers;
- Suppliers, constructors and installers of infrastructure;
- Trades/maintenance personnel;
- Workers who work with/operate or are affected by the infrastructure;
- Health and safety professionals; and
- Government regulators.

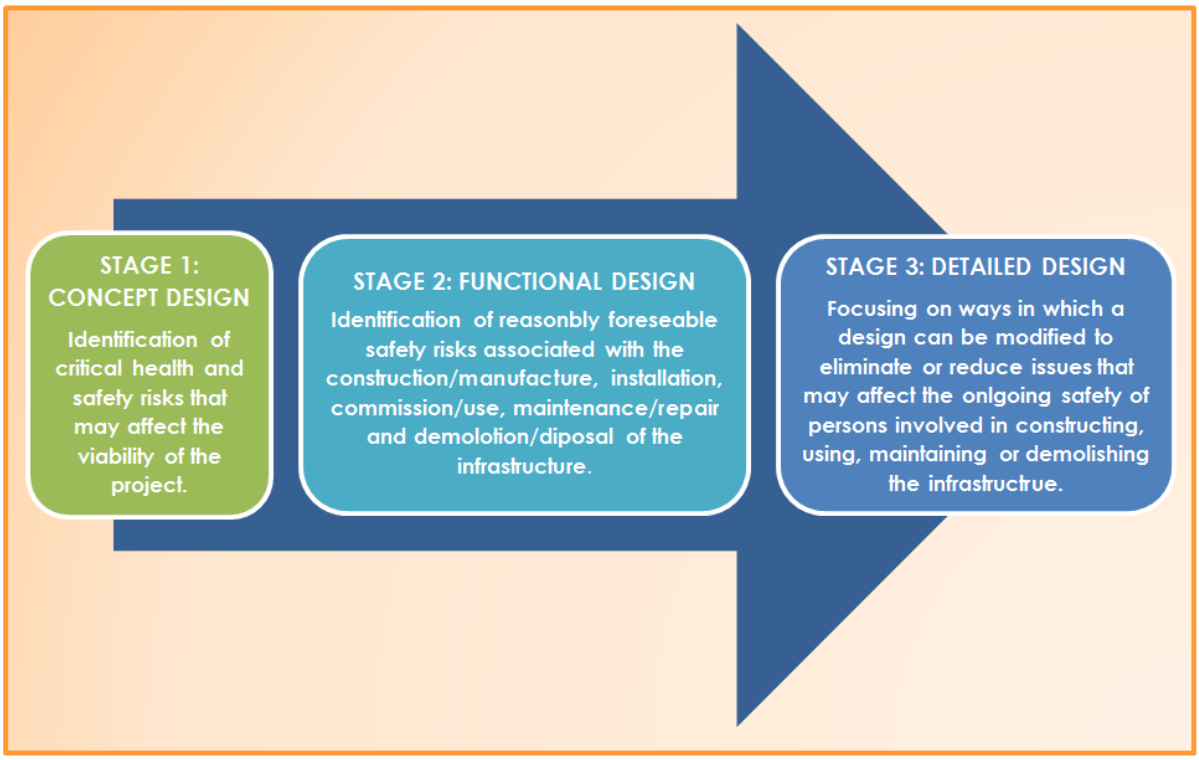
7.5 KEY PRINCIPLES OF SAFETY IN DESIGN

There are 5 key elements of Safety in Design, as depicted in the below diagram.



7.6 STAGES OF DESIGN

The 3 core stages in the design process in which Safety in Design principles are incorporated, as portrayed below. Risk identification must take place at each stage of the process to eliminate risk, or where this is not possible; reduce risk as low as reasonably practicable through the implementation of control measures.



7.7 SAFETY IN DESIGN PROCESS

The process of applying Safety in Design principles to design project is as follows:

STEP 1 ESTABLISH THE CONTEXT FOR THE DESIGN	▪ Establish stakeholders and confirm how stakeholders will work together.
STEP 2 IDENTIFY FORESEEABLE USES OF THE DESIGN	▪ Identify main objectives and outcomes of the design. ▪ Establish the intended and foreseeable uses for the design.
STEP 3 COMPLETE RISK ASSESSMENT	▪ Complete Safety in Design Risk Assessment. ▪ This should enable the risks arising from design-related hazards to be identified and either eliminated, or where this is not possible, reduced to as low as reasonably practicable
STEP 4 COMMUNICATE & CONSULT	▪ Stakeholders must be consulted at all stages of the design for effective management of risks and decisions on the implementation of control measures.

8. PROCEDURE

To ensure infrastructure is designed and commissioned in a way that minimises the risk to health and safety, QUU workers must adhere to the below requirements. These processes are intended to aid QUU in integrating Safety in Design considerations into the design of QUU's infrastructure, without compromising the design function of, or imposing undue technical or financial burdens on, projects.

8.1 GENERAL SAFETY IN DESIGN REQUIREMENTS

QUU workers must endeavour to incorporate safety features into projects and design as early as possible.

QUU workers who control workplaces and make decisions regarding QUU infrastructures, facilities and processes are able to influence health and safety at the source. QUU workers with lead roles in the design of infrastructures must apply, or require designers to apply, the principles of Safety in Design concepts, plans and recommendations on hazard control.

QUU workers overseeing or managing the design of infrastructure are to integrate safe design throughout all phases of the lifecycle, from initiation through to finalisation. This includes:

- Design (Concept/Function/Detail);
- Construction and installation;
- Trials and operation;
- Maintenance; and
- Decommissioning, removal and disposal.

Functional Managers, Contracts Administrators, Managers, Supervisors and PICOW overseeing projects that involve design are to:

- Verify that designers used on the project are appropriately qualified and suitable to undertake the design, including the capacity to identify, or consult appropriately to ensure the identification of hazards and risk arising from the design.

- Ensure design that is a professional engineering service is only performed by a Registered Professional Engineer of Queensland (RPEQ), or under the direct supervision of a RPEQ who is responsible. See section 8.2 below.
- Establish stakeholder groups and work area representation to provide input to the design phase to ensure relevant technical and operational hazards are identified and considered in the design. Typically stakeholder representation may include one or more of the following:
    - Functional Manager/ Manager/ contracting manger or PICOW;
    - Health and Safety Representative(s);
    - Relevant design specialists e.g. architects, surveyors, hydrologists, landscape engineers or other persons with relevant technical expertise;
    - Health and Safety Team member; and
    - User Group Representatives able to provide input on user/operational risks associated with installation and operation of the infrastructure under design.

8.2 SPECIAL REQUIREMENTS FOR ELECTRICAL AND HAZARDOUS AREA DESIGN

There are particular risks and safety requirements to be considered for design of electrical installations and electrical equipment in hazardous areas. Refer to MP71 Electrical Safety Management Plan and MP183 Hazardous Area Management Plan for further details.

8.3 REGISTERED PROFESSIONAL ENGINEER OF QUEENSLAND (RPEQ)

All workers and Contractors performing work related to QUU assets shall comply with the Queensland Professional Engineers Act 2002 (PE Act):

- professional engineering services for Queensland are required to be carried out by a registered professional engineer of Queensland (RPEQ); and
- a person can carry out professional engineering services for Queensland whilst unregistered if they are carrying out the services under the direct supervision of a RPEQ who is responsible for the services.
- A professional engineering service is defined as a service that requires, or is based on, the application of engineering principles and data to a design, or to a construction, production, operation or maintenance activity, relating to engineering.

Note the requirement for RPEQ is not limited to design.

Final design documents are to include a record of the RPEQ responsible for the work.

The Board of Professional Engineers of Queensland (BPEQ) regulates the profession of engineering in Queensland. The main function of BPEQ is the administration of the PE Act and managing the RPEQ system.

The Professional Engineers Act 2002 and the Professional Engineers Regulation 2003 can be downloaded from the BPEQ website http://www.bpeq.qld.gov.au.

8.4 DESIGN APPROVAL

All design deliverables produced at all stages of a project delivery cycle shall be verified and signed as approved by the RPEQ of the appropriate engineering discipline responsible for the design services.

8.5 RISK ASSESSMENT

The QUU WHS Hazard and Risk Management Process (PRO363) is to be utilised in the design safety process.

Functional Manager/Contract Managers/PICOWS are to ensure:

- All projects involving design are subject to a safety design risk assessment that addresses technical and operational hazards and risks relevant to the project (refer to Appendix A for guide on the identification of design hazards).

- Risk assessments are documented, with records maintained by the department initiating the design or operating the infrastructure.
- The Safety Team participates in and validates the risk assessment process prior to acceptance and implementation of the design.
- Appropriate safe work procedures are developed where hazards cannot be eliminated.

8.6 INTEGRATING RISK MANAGEMENT INTO THE DESIGN PROCESS

Functional Managers, Contracts Administrators, Managers, Supervisors/PICOW overseeing projects that involve design are to adhere to the below requirements to ensure that risk management is integrated into the entire design process.

1. INITIATION/PRE-DESIGN
• Establish the design context in terms of the scope and complexity of the project, as well as other aspects that may impact on the design (e.g. business, regulatory, competitive, financial etc.) • Identify current and future operational and maintenance activities and procedures related to the project. • Apply risk management approach to identify the range of hazards that need to be considered. • Identify the roles and responsibilities of various parties in relation to the project. • Decide the criteria against which risk will be evaluated. • Develop a safe design framework for the project by identifying the steps that need to be taken to ensure risks are addressed throughout the lifecycle of the infrastructure.
2. CONCEPT DEVELOPMENT
• Conduct a preliminary hazard analysis. Review historical risks and failures for similar projects. • Use a variety of hazard identification techniques and tools to gather sufficient information concerning potential risks. Consider what could happen, where it could happen and when. • Systematically generate and document a list of hazards and events that might affect the project and consider possible causes and scenarios – why and how it could happen.
3. DESIGN OPTIONS
• Identify hazards that can be adequately addressed by applying existing solutions in recognised standards (e.g. Australian Standards or Building Code of Australia). • Analyse the level of risk by combining the consequences and likelihood of something going wrong during the lifecycle. • Consider both technical and human factors, including humans' ability to change behaviour to compensate for design changes. Anticipate misuse throughout the lifecycle. • Develop a set of design options that meet the criteria for safety.

4. DESIGN SYNTHESIS
• Systematically assess the design options against the risk criteria established in the pre-design phase. • Apply the Hierarchy of Control to achieve the highest possible level of control. • Select the optimum solution. Balance the direct and indirect costs of implementing the design against the benefits derived.
5. TRIAL AND REVIEW
• Test, trial or evaluate the design solution with various users • Review design solutions to confirm the effectiveness of risk controls and, if necessary, redesign to reduce the risks as far as reasonably practicable
6. DESIGN COMPLETION
• Finalise the design and prepare risk control plans for the lifecycle of the product. • Review feedback from users and relevant new information to improve subsequent designs.
7. COMMUNICATE AND DOCUMENT
• Consult with the users of the infrastructure. • Document any findings or alterations to ensure that others can follow the design plans or modifications. • Ensure that key information concerning actions taken to address safety is adequately recorded and transferred to appropriate parties.

9. AUDIT & INSPECTION

Review of the implementation of this SOP will be undertaken through periodic inspections carried out in accordance with the **QUU WHS Audit and Inspection Procedure (PRO366)**.

The Safety Team will undertake period inspection of selected projects to validate, where design is required by the project, that the Principles 1-5 are applied and complied with.

10. RECORD KEEPING

The following records must be retained in TRIM:

- Design project documentation including that relating to the commissioning of designers, scope of works, sketches and plans
- Technical and general safety advice provided by designer(s)
- Risk assessments related to safe design of infrastructures

11. REFERENCES

- Queensland Work Health and Safety Act 2011
- Queensland Work Health and Safety Regulations 2011
- Queensland Electrical Safety Act 2002
- Queensland Electrical Safety Regulation 2013
- Professional Engineers Act 2002
- Safe Design of Structures, Queensland Code of Practice 2013
- Australian Safety and Compensation Council – Guidance on the Principles of Safe Design for Work 2006

12. REVIEW

This Standard Operating Procedure (SOP) is to be reviewed every 2 years or earlier if:

- There is an identified risk to the business;
- A significant WHS or unplanned event occurs;
- There is evidence safety is not effectively being considered in design at QUU workplace;
- Incident investigation or audit results demonstrate that the procedure is failing to deliver the required outcomes;
- There are changes in associated legislation; or
- There is evidence that the SOP is not having a positive impact on WHS-related KPIs.

13. FURTHER INFORMATION

For further information, contact your Health and Safety Representative (HSR) or a member of the QUU WHS Team.