Workplace Health and Safety Queensland

# Guide to the workplace health and safety obligations of designers of structures

Version 1–June 2007

Queensland the Smart State

Queensland Government
Department of Employment and Industrial Relations

# Contents

## What is this guide about?

This guide is intended to assist designers of structures to understand their obligations under the *Workplace Health and Safety Act 1995* (the Act).

In 2005 the workplace health and safety obligations of designers were amended to give effect to aspects of the *National Standard for Construction Work* [NOHSC: 1016 (2005)]. The amended obligations for designers will take effect from 1 July 2007.

Caution should be exercised in the use of any guide. This guide should be read in conjunction with the *Workplace Health and Safety Act 1995, Workplace Health and Safety Regulation 1997* and other relevant codes of practice. References to legislation, Australian Standards and other documents in this guide are current at the time of printing. It is the responsibility of the reader to check whether these documents are current at the time of reading.

The information provided in this guide has been developed with the assistance of organisations that represent design professionals. In an attempt to reflect the wishes of these organisations this guide describes ways in which those involved in designing structures can meet their obligations under the Act.

The Act provides that, to properly manage exposure to risks, a person must:

- identify hazards;
- assess risks that may result because of the hazards;
- decide on appropriate control measures to prevent or minimise the level of the risks;
- implement control measures; and
- monitor and review the effectiveness of the measures.

Hazards and risks are not the same thing.

A **hazard** is something with the potential to cause harm. This can include substances, plant, work processes or other aspects of the work environment.

**Risk** is the likelihood that death, injury or illness might result because of the hazard.

As examples:
The *hazard* is electricity—the *risk* is the likelihood that a person might be electrocuted because of exposure to electrical wires that are inadequately insulated.
The *hazard* is a 40 kg bag—the *risk* is the likelihood that a person might suffer back strain from manually lifting 40 kg bags.
The *hazard* is carbon monoxide—the *risk* is the likelihood that a person might suffer carbon monoxide poisoning because they are using a petrol-operated pump in a well.

Readers should note that this guide cannot and does not claim to be definitive. A designer in choosing a means to discharge their obligation must be able to demonstrate that in the exercise of their chosen method, they have taken reasonable precautions and exercised proper diligence.

## Organisations consulted in the development of this guide

Association of Consulting Engineers Australia (Queensland Division)

Australian Council of Built Environment Design Professionals (Queensland Division)

Building Designers' Association of Queensland

Department of Public Works (Queensland Government)

Department of Main Roads (Queensland Government)

Engineers Australia (Queensland Division)

Royal Australian Institute of Architects (Queensland Chapter)

**Acknowledgement**

Acknowledgement is given to guidance material prepared by WorkSafe Victoria and the Australian Safety and Compensation Council.

## What is safe design?

Safe design is concerned with:

- eliminating workplace health and safety hazards at the design stage of structures; or
- controlling risks, as early as possible, in the planning and design of structures.

The safe design of a structure will always be part of a wider set of design objectives, including practicability, aesthetics, cost and functionality. These sometimes competing objectives need to be balanced in a manner that does not compromise the safety and health of those who work on or use a structure.

The Australian Safety and Compensation Council publication – *Guidance on the Principles of Safe Design for Work (2006)* defines safe design as*:*

> *"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."*

Safe design begins in the concept development phase of a structure when choices are made about the overall design and its details. The safety of a design can be enhanced prior to construction if a risk management approach is adopted.

A safe design approach begins in the conceptual and planning stages with an emphasis on making choices about design, materials used and methods of manufacture or construction to enhance the safety of the finished structure. A designer needs to consider how safety can best be achieved in each of the lifecycle stages. For example, when designing a building with a lift for occupants, ensuring the design also includes sufficient space and safe access to the lift-well, or machine room for maintenance work.

The design function is influenced by a range of parties at varying stages of the design process, as well as during the lifecycle of the structure. They include:

- design professionals, such as architects, engineers, industrial designers and software developers
- other groups who make design decisions, such as clients, developers, builders, owners, insurers, project managers, purchasers, health and safety professionals and ergonomics practitioners
- suppliers (including manufacturers, importers, plant hire), constructors, installers and trades/maintenance personnel
- government regulators and inspectorates.

A model of safe design is shown in Figure 1.

## What are the principles of safe design?

The Australian Safety and Compensation Council publication – *Guidance on the Principles of Safe Design for Work (2006)* describes the principles of safe design as:

**Principle 1: Persons with control** – persons who make decisions affecting the design of products, facilities or processes are able to promote health and safety at the source.

**Principle 2: Product lifecycle** – safe design applies to every stage in the lifecycle, from conception through to disposal[1]. It involves eliminating hazards or preventing or minimising risks as early in the lifecycle as possible.

**Principle 3: Systematic risk management** – the application of hazard identification, risk assessment and risk control processes to achieve safe design.

**Principle 4: Safe design knowledge and capability** – should be either demonstrated or acquired by persons with control over design.

**Principle 5: Information transfer** – effective communication and documentation of design and risk control information between all persons involved in the stages of the lifecycle, is essential for the safe design approach.

## What are the benefits of safe design?

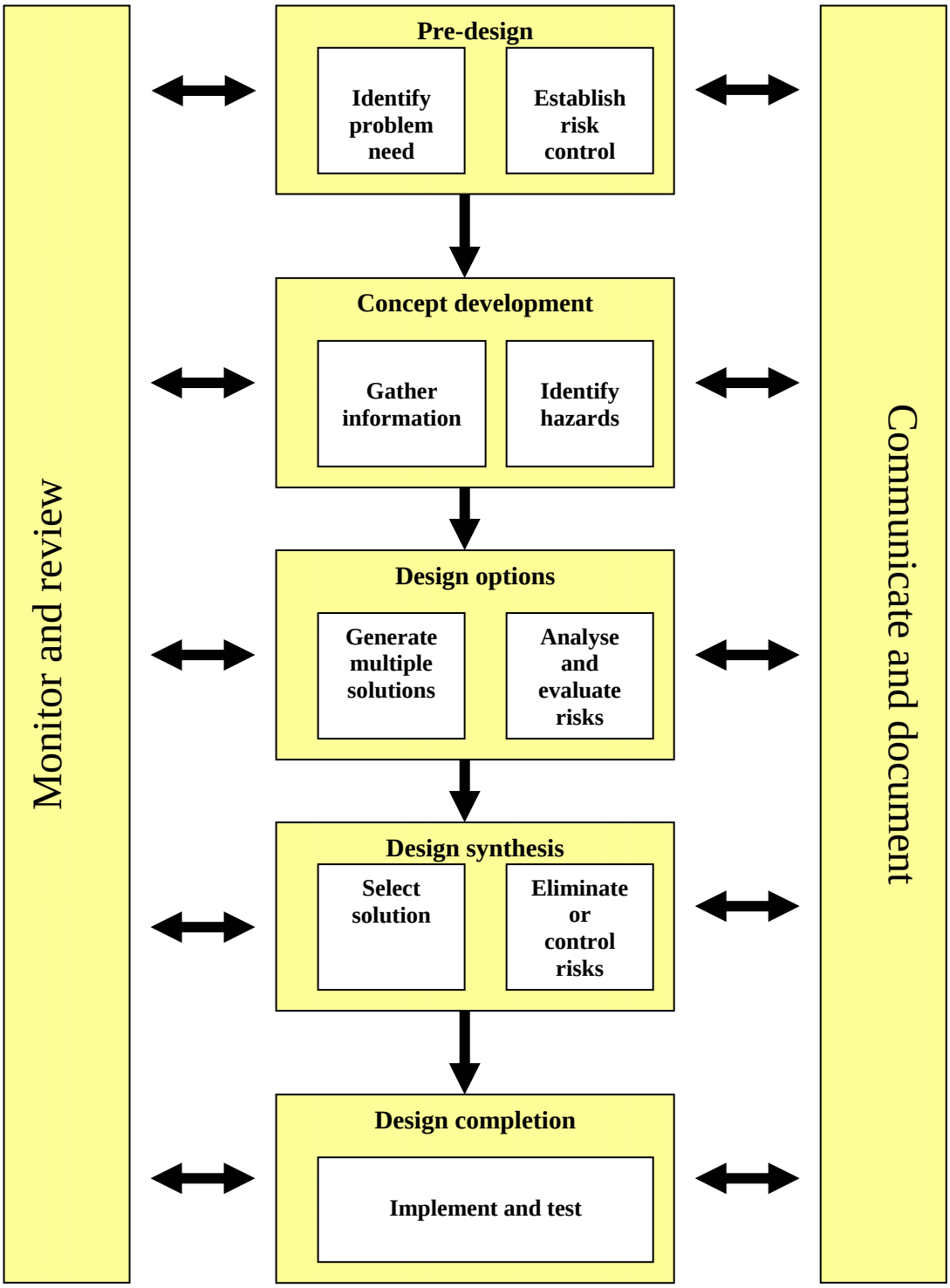
The opportunities to create safer structures are more cost effective when captured in the earliest stages of the lifecycle of the design. The most effective risk control measure – eliminating the hazard – is often cheaper and more practical to achieve at the design or planning stage, rather than making changes later in the lifecycle when the hazards become real risks to clients, users, workers and businesses. Figure 1 represents a suggested model of safe design.

The Australian Safety and Compensation Council publication – *Guidance on the Principles of Safe Design for Work (2006)* describes how safe design results in many benefits, including:

- prevention of injury and illness
- improved useability of structures
- improved productivity
- reduced costs
- better prediction and management of production and operational costs over the lifecycle of a structure
- compliance with legislation
- innovation, in that safe design can demand new thinking.

[1] The *Workplace Health and Safety Act 1995* only applies to the construction, use and maintenance stages of a structure.

**Figure 1: Model of safe design**




Australian Safety and Compensation Council (2006) – *Guidance on the Principles of Safe Design for Work.*

## Objectives of the *Workplace Health and Safety Act 1995*

Workplace health and safety improvement ultimately depends on the actions of all those with the capacity to affect workplace health and safety in Queensland. Under the *Workplace Health and Safety Act 1995* and the *Workplace Health and Safety Regulation 1997*, anyone whose actions could affect the health and safety of themselves or others has an obligation.

The objective of the *Workplace Health and Safety Act 1995* (the Act) is to prevent a person's death, injury or illness being caused by a workplace, by a relevant workplace area, by work activities, or by plant or substances for use at a workplace.

> *Example of an illness caused by a workplace*— asthma caused by inhaling spray paint mist from a neighbouring workplace.
>
> *Example of an illness caused by a work activity*— carbon monoxide poisoning caused by a liquefied petroleum gas operated forklift being used in a cold room.
>
> *Example of an illness caused by plant*— legionnaire's disease caused by inhaling legionella bacteria from the contaminated cooling tower of an air conditioning unit.

The objective is achieved by preventing or minimising a person's exposure to the risk of death, injury or illness caused by a workplace, by a relevant workplace area, by work activities, or by plant or substances for use at a workplace.

The Act establishes a framework for preventing or minimising exposure to risk by imposing workplace health and safety obligations on certain persons who may affect the health and safety of others by their acts or omissions.

The Act makes it clear that everyone involved in the workplace has a responsibility to prevent injury or ill health and the best way to meet this responsibility is by working together to progressively reduce the incidence, severity and cost to the community of work-related injury and illness.

The achievement of the Act's objective will help—

- reduce the human cost to individuals, families and the community caused by these deaths, injuries and illnesses; and
- reduce the financial burden on individuals, families and the community caused by these deaths, injuries and illnesses; and
- reduce the burden on the workers' compensation scheme caused by these deaths, injuries and illnesses, which in turn reduces costs imposed on industry; and
- maintain the community standard for workplace health and safety, which is eroded when persons gain an unfair competitive advantage by not implementing appropriate standards.

Workplace Health and Safety Queensland provides guidance to the *Workplace Health and Safety Act 1995* at www.deir.qld.gov.au.

## Who is a designer of a structure?

The Act does not provide definitions of "designer" or "design". In order to assist designers to meet their obligations, this guide relies on the definitions of designer and design from:

- *National Standard for Construction Work [NOHSC:1016 (2005)]*; and
- *Guidance on the Principles of Safe Design for Work* (Australian Safety and Compensation Council 2006)

A **designer** is a person, being a legal entity or natural person, whose profession, trade or business involves them in:

- preparing designs for structures, including variations to a plan or changes to a structure; or
- arranging for people under their control to prepare designs for structures.

**Design,** in relation to any structure, means any hard copy or electronic drawing, design detail, design instruction, scope of works document or specification relating to the structure.

**Designers** include but are not limited to:

- anyone who specifies or alters a design, or who specifies the use of a particular method of work or material (e.g. a quantity surveyor who insists on specific material, or a client who stipulates a particular layout, a town planner)
- anyone specifying or designing how demolition, dismantling work, structural alteration or the formation of openings is to be carried out
- architects, building designers, geotechnical engineers, civil and structural engineers, building surveyors, landscape architects and all other design practitioners contributing to, or having overall responsibility for, any part of the design (e.g. drainage engineers designing the drain for a new development)
- building service designers, engineering practices or others designing fixed plant (including ventilation and electrical systems and permanent fire extinguisher installations)
- contractors carrying out design work as part of their contribution to a project (e.g. an engineering contractor providing design, procurement and construction management services)
- temporary works engineers, including those designing formwork, falsework, scaffolding and sheet piling
- interior designers, including shopfitters who also help with the design.

The Act imposes an obligation on designers for the design of a structure. The Act provides that a **structure** is:

- a building (excluding class 1a and class 10a buildings), a steel or reinforced concrete construction, wall, mast, tower, pylon, structural cable or telecommunications structure; or
- an underground works (including shafts and tunnels), pipe, pipeline, sea defence works, river works, earthworks or earth retaining construction or other construction designed to preserve or alter a natural feature; or
- a road or highway, footpath or driveway, railway line or siding, tramway line, airfield, dock or harbour, water storage or supply system (including a constructed lagoon), sewerage or drainage system, electricity or gas generation facility, transmission or distribution facility, gasholder, park or recreation ground (including, for example, a golf course, playing field, racecourse or swimming pool); or
- production, storage or distribution facilities for heavy industries; or
- fixed plant; or

- a ship or submarine; or
- formwork, false work, scaffold or other construction designed or used to provide support, access or containment during construction work.

The Act relies on the Building Code of Australia (BCA) for the definition of a **class 1a building**. The BCA provides that a class 1a building is:

(a) a single dwelling being—

(i) a detached house; or

(ii) one or more attached dwellings, each being a building, separated by a *wall that is fire resistant*, including a row house, terrace house, town house or villa unit.

The Act relies on the Building Code of Australia (BCA) for the definition of a **class 10a building**. The BCA provides that a class 10a building is a non-habitable building being a private garage, carport, shed, or the like.

## What obligations do designers have?

Responsibility for achieving safe design rests with parties or individuals who control or manage design functions. This includes people who make decisions that influence the design outcome, such as clients, developers, manufacturers, directors and managers, in addition to those who are directly involved in the design activity, such as architects and engineers.

Responsibilities for the design process should be consistent with the degree of control that a person has. Often, the design process will occur over various stages and involve different people who make financial, commercial, specialist or technical decisions over a design. Such decisions may positively or negatively affect the safety of a structure. Such decision making leads to a shared responsibility between the parties for the control of a design.

Some design tasks, although related, may be controlled by different designers due to contractual arrangements. Designing a structure for end-use and maintenance, and designing the process by which it is constructed, is often undertaken by different people.

The Act provides that a designer has an obligation to prevent or minimise risks in the design of the structure so that the design does not adversely affect the workplace health and safety of persons—

- during construction of the structure; and
- when the structure has been constructed and is being used for the purpose for which it was designed.

*Examples of persons to whom obligations are owed include*:

- persons involved in the construction of the structure;
- persons who work in the structure after it has been constructed; and
- persons who maintain or repair the structure or any fixtures, fittings or plant in, or forming part of the structure.

## How can designers meet their obligations?

The Act provides that designers can meet their obligations by preventing or minimising risks to persons' health or safety arising out of the design.

*Examples of matters that might be considered in discharging a designer's obligation include—*

- availability of anchorage points for window cleaners
- adequacy of ventilation
- adequacy of lighting in plant rooms
- ease of access to the building for maintenance purposes
- provision for maintenance and servicing of air conditioning units
- adequacy of trafficable surfaces.

For deciding, after the structure has been designed, whether the designer has discharged the designer's workplace health and safety obligations, the Act provides that regard must be had to the standards of design prevailing when the designer designed the structure.

In addition, the Act provides that a designer's obligation applies only to the extent that the content of the design of the structure falls under the control of the designer.

What is or is not within a designer's "control" is a matter ultimately for a court to describe and decide. However, designers should consider that:

- Something being outside of a designer's understanding is different to being outside a designer's control.
- Any changes to design made by anyone without the designer's knowledge can remove the designer's control. The control of a design is limited to the elements of the design 'detailed' or specified by the designer and not by others.
- If a designer holds an accreditation to perform certain works, then that level of accreditation should be the level of control the designer has over the design.

Figure 2 illustrates design considerations for:

- safe construction
- safe use
- safe maintenance.

**Figure 2: Design considerations relating to risk identification and control measures**

| | |
|---|---|
| **Design for safe construction** | Risks relating to the construction of a structure can be controlled by:<br>• Providing adequate clearance between the structure and overhead powerlines by burying, disconnecting or re-routing cables before construction begins, to avoid 'contact' when operating cranes and other tall equipment.<br>• Designing components which facilitate pre-fabrication 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.<br>• Designing parapets to a height that complies with guardrail requirements, eliminating the need to construct guardrails during construction and future roof maintenance.<br>• 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.<br>• 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.<br>• Reducing the space between roof trusses and battens to reduce the risk of internal falls during roof construction.<br>• Choosing construction materials that are safe to handle. |
| **Design to facilitate safe use** | Consider the intended function of the structure, including the likely systems of use, and the type of machinery and equipment that may be used. 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.<br>In addition to the requirements of the Building Code of Australia (BCA), risks relating to the function of a structure can be controlled by:<br>• Designing traffic areas to separate vehicles and pedestrians.<br>• Using non-slip materials on floor surfaces.<br>• Providing sufficient space to safely install and operate plant and machinery.<br>• Designing spaces which accommodate or incorporate mechanical devices and therefore reducing manual task risks.<br>• Designing floor loadings to accommodate heavy machinery that may be used in the building. |
| **Design for safe maintenance** | Risks relating to cleaning, servicing and maintaining a structure can be controlled by:<br>• Designing the structure so that maintenance can be performed at ground level or safely from the structure, for example, window cleaning bays or gangways integrated into the structural frame.<br>• Designing features which use non-corrosive materials to avoid dirt traps and the use of abseiling methods or long ladders for cleaning windows.<br>• Designing and positioning permanent anchorage and hoisting points into structures where maintenance needs to be undertaken at height.<br>• Designing safe access and sufficient space to undertake structure maintenance activities. |

Source: WorkSafe Victoria (2005) – *Designing Safer Buildings and Structures (1st Edition)*

## Defences for designers

Workplace Health and Safety Queensland provides guidance for obligation holders on the prosecution, enforcement and investigation of alleged breaches of the Act. The guidance material is available on the Workplace Health and Safety Queensland website www.deir.qld.gov.au.

Any decision to prosecute is based on an assessment of a number of matters, including whether the obligation holder wilfully or recklessly caused injury.

The Act provides that it is a defence in a proceeding against a person for a contravention of an obligation imposed on the person for the person to prove—

- if a regulation or ministerial notice has been made about the way to prevent or minimise exposure to a risk—that the person followed the way prescribed in the regulation or notice to prevent the contravention
- if a code of practice has been made stating a way or ways to manage exposure to a risk—
  (i) that the person adopted and followed a stated way to prevent the contravention; or
  (ii) that the person adopted and followed another way that managed exposure to the risk and took reasonable precautions and exercised proper diligence to prevent the contravention; or
- if no regulation, ministerial notice, or code of practice has been made about exposure to a risk—that the person chose any appropriate way and took reasonable precautions and exercised proper diligence to prevent the contravention.

The Act also provides that it is a defence in a proceeding against a person for an offence against an obligation, for the person to prove that the commission of the offence was due to causes over which the person had no control.

## What are the client's obligations in relation to design?

The Act defines a **client** as the person who commissions the construction work and—

- engages a project manager to plan and manage construction work; or
- appoints a principal contractor to manage and perform construction work.

The Act provides that a client has an obligation to consult with—

- if a designer designed a structure that is, or is part of, construction work – the designer about how the construction work, in connection with the design, can be undertaken in a way that prevents or minimises all risks to health and safety; and
- if there is a project manager for the construction work – about how the construction work can be planned and managed in a way that prevents or minimises all risks to health and safety; and
- if there is a principal contractor for the construction work – about how the construction work can be undertaken in a way that prevents or minimises all risks to health and safety.

The Act provides that if the client is aware of any information about hazards and risks relating to the site, at which the construction work is to be undertaken, the client must give this information to the designer, project manager or principal contractor.

Examples of hazards and risks relating to a site include overhead powerlines, access and egress.

## Who else has obligations?

The Act defines a **project manager** for construction work as the person engaged by the client to carry out the planning and management of the construction work.

The Act provides that a project manager has an obligation to ensure construction work is planned and managed in a way that prevents or minimises risks to the health and safety of—

- all persons undertaking the construction work; and
- persons at or near the workplace during the construction work.

The Act defines a **principal contractor** for construction work as the person appointed under the Act by the client as the principal contractor for the construction work.

If the client does not appoint a principal contractor for the construction work, the client is taken to be the principal contractor for the construction work. If there is no client for the construction work, the person who commissions the construction work is taken to be the principal contractor for the construction work.

The Act provides that a principal contractor has an obligation to ensure the workplace health and safety of persons arising from—

- a hazard at the workplace for which no other person owes a workplace health and safety obligation; and
- anything that has been provided for the general use of persons at the workplace.

The Act provides that a principal contractor must—

- coordinate, supervise and oversee construction work in a way that prevents or minimises risks to the health and safety of persons at or near the workplace during the work; and
- consult with each of the following persons who are involved in the construction work in relation to identifying hazards associated with the construction work and assessing risks that may result because of the hazards—
  (i) the designer;
  (ii) the project manager;
  (iii) any other relevant person; and
- notify another person of any matter of which the principal contractor is aware, or should reasonably be aware, that may affect the capacity of that person to comply with the person's obligations under the Act.

Appendix A illustrates the relationship of the obligations of clients, projects managers and principal contractors.

# A recommended process to help designers

Obligation holders under the Act are required to adopt risk management principles. In order to assist designers, this guide relies on the process of systematic risk management as provided in *Designing Safer Buildings and Structures (1st Edition)* (WorkSafe Victoria 2005).

This process of systematic risk management was recommended by representatives from organisations of design professionals who assisted in the development of this guide.

## Systematic risk management

A systematic approach to identifying health and safety issues in the design of structures was recommended, as it sets up a process by which health and safety issues can be assessed and controlled by the designer (see Figure 3). It also encourages collaboration between a designer and client.

Systematic risk management aims to achieve an appropriate balance between realising opportunities for gains while minimising losses. The systematic process consists of five steps, when undertaken in sequence, to enable continuous improvement in decision making and health and safety performance.

Systematic risk management involves the development of designs through identification of hazards and consideration of:

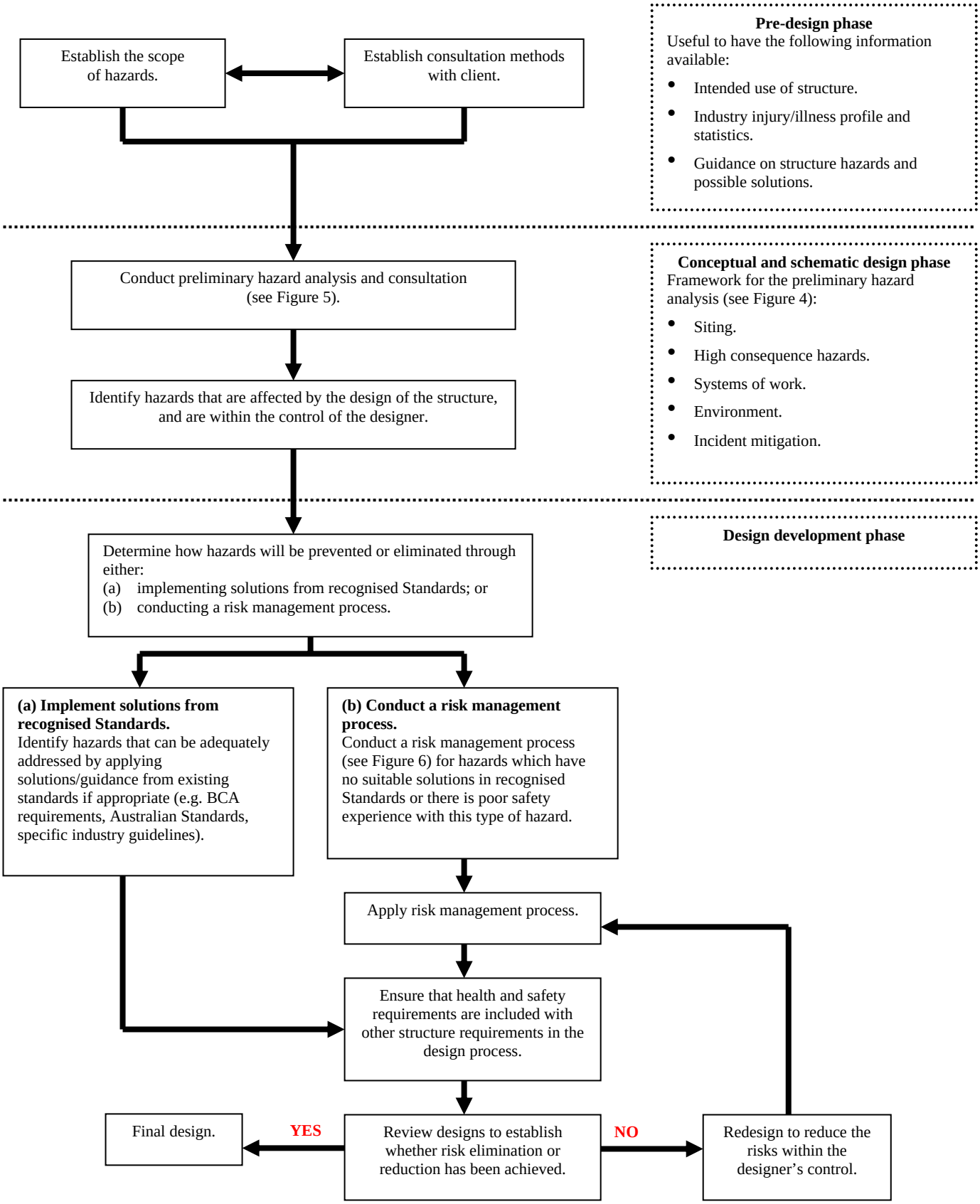
- assessing the risks in each of the lifecycle stages
- recommending or implementing control measures
- developing a trial and evaluation plan
- recommendations for safe construction
- commissioning, use and maintenance of the structure.

(See Figure 1 for a Model of safe design and Figure 2 for Design considerations relating to risk identification and control measures).

The recommended steps of systematic risk management are illustrated in Figure 3.

Some of the steps or measures recommended may not be feasible for a particular design project. Designers may choose to modify, or not to adopt them, in some circumstances. If the process recommended is clearly not suitable, the designer should ensure that safety considerations are actively taken into account during the design by some other method. This will be a matter for a particular designer to decide when considering what is required to comply with the law in a particular case.

**Figure 3: A systematic approach to designers' obligations for components of the design**




Source: WorkSafe Victoria (2005) – *Designing Safer Buildings and Structures (1st Edition)*

## Identifying hazards

Hazard identification should take place as early as possible in the concept development and design stages. It is important that the hazard identification activities are systematic and not limited to one or two people's experiences of situations. (Figure 4 outlines the Framework for the preliminary hazard analysis).

A preliminary hazard analysis ensures that broad groupings of hazards are identified before design scoping begins. A designer and others involved in the preliminary hazard analysis should then decide which hazards are 'in scope' of the steps of the risk management process, and should be considered in the design process. A hazard is 'in scope' if it can be affected, introduced or increased by the design of the structure. At this early stage, consideration can be given to possible ways that hazards could be prevented or eliminated.

**Figure 4: Framework for the preliminary hazard analysis**

| Category of hazards | Examples of hazards | Sources of control information to decide risk or control measures |
|---|---|---|
| Siting of structure | Events or incidents occurring between multiple structures, arising from poor siting, or lack of separation. | Specialist risk techniques may be required. Controls will involve siting of structures.<br><br>BCA requirements. |
| High consequence hazards | The storage and handling of dangerous goods, or work with high energy hazards (e.g. temperature, pressure) and health hazards such as biological materials. | Specialist techniques are likely to be necessary to assess risks and controls. Australian Standards and health and safety legislation, compliance codes and guidance will provide information and possible control measures.<br><br>Cumulative assessment of the overall risk may be necessary for these hazards.<br><br>BCA requirements. |
| Systems of work (involving the interaction of persons with the structure) | The systems of work (including cleaning and maintenance activities of the building or structure) that pose risks (e.g. inadequate pedestrian/vehicle separation, restricted access for building and plant maintenance, exposure to hazardous substances, manual tasks, exposure to occupational violence, working at height). | Professionals such as engineers, ergonomists, occupational hygienists, and materials chemists can provide information on controls and suitable assessment techniques. |
| Environment | Environmental conditions that are not part of the specific system of work, such as inadequate ventilation or lighting and welfare facilities that do not meet workplace needs. | The requirements of standards (e.g. BCA, Australian Standards, building and other legislation are generally sufficient if particular hazards or systems of work do not require a specific approach). |
| Incident mitigation | The possibility of the structure to increase the consequences after an incident due to inadequate egress, siting of assembly areas, inadequate emergency services access. | The requirements of BCA, building and other standards.<br><br>Liaison with Emergency Services. |

Source: WorkSafe Victoria (2005) – *Designing Safer Buildings and Structures (1st Edition)*

## Conducting the preliminary hazard analysis

The Act encourages designers and their clients to establish strong collaborative relationships to ensure effective information exchange during the preliminary hazard analysis.

Designers should initiate and facilitate a collaborative relationship with clients. This can be done by, among other actions, seeking details of the types of activities and tasks likely or intended to be carried out in the structure, including the tasks of those who maintain, repair, service or clean the structure as an integral part of its use.

Figure 5 provides suggestions to promote an efficient consultation process between a designer and client.

**Figure 5: Designer - client consultation**

| Step | Possible techniques |
|---|---|
| Initial discussions | Obtain information:<br>• Structure purpose, including plant and ancillary equipment and tasks.<br>• Industry injury profile and statistics and common hazards and safety issues.<br>• Guidance from health and safety authorities and relevant associations, and standards.<br><br>Establish the breadth of hazards and the consultation arrangements between the client and designer. |
| Pre-design preliminary hazard analysis | Useful techniques may include a combination of the following actions by the client:<br>• Conduct workshops and discussions with personnel from similar structures within the client company, including health and safety representatives.<br>• Conduct onsite assessment of an existing similar structure with feedback from the users of the existing structure.<br>• Research information or reports from similar structures on hazards and relevant sources and stakeholder groups and then complete analysis for own design needs.<br>• Conduct workshops with experienced personnel who will construct , use and maintain the new structure.<br>• Conduct workshops with specialist consultants and experts in the hazards. |
| Determine what hazards are 'in-scope' | Workshops/discussions to determine which hazards are 'in-scope'. To be considered in-scope, hazards must be affected, introduced or increased by the design of the structure. |

Source: WorkSafe Victoria (2005) – *Designing Safer Buildings and Structures (1st Edition).*

## Particular issues in preliminary hazard analysis

### *Safe systems of work*

Where there are systems of work which are foreseeable as part of the likely activities in the intended use of a structure or a structure as a workplace, they should be identified in the preliminary hazard analysis. The techniques in Figure 5 may assist a designer to identify details of these systems.

Some of these techniques may not be possible, for example, where clients do not have business activities which involve similar structures. Information in the form of likely or intended workflows, if known, will be useful as part of the design brief prepared by the client, including details at the task level.

The brief may also include any activities and systems with hazards specific to the nature of the structure (e.g. manual tasks in a health facility or occupational violence in a bank, dangerous goods storage in a warehouse) where the safety of these activities or systems is affected by the design of the structure. This may include foreseeable maintenance, cleaning, service and repair activities.

### *Systematic risk management*

When the preliminary hazard analysis has been completed, a systematic risk management process is recommended (see Figure 6 for examples of this process).

**Figure 6: Systematic risk management**

| Step | Possible techniques | By whom |
|---|---|---|
| Identify solutions from recognised standards | Workshop to determine which hazards can be addressed with recognised standards.<br><br>Plan the risk management process for other hazards. | Designer led.<br><br>Client approval of decisions. |
| Apply appropriate risk management techniques | Integrate detailed risk management into the design development process.<br><br>For the risk assessment, further detailed information may be required on hazards:<br>• hazard identification<br>• risk assessment checklists developed by health and safety authorities, such as manual tasks, noise, plant, hazardous substances.<br>• job/task analysis techniques.<br><br>A variety of quantified and/or qualitative risk assessment measures can be used to check the effectiveness of control measures.<br><br>Scale models and consultation with experienced industry personnel may be necessary to achieve innovative solutions to longstanding issues that have caused safety problems. | Designer led.<br><br>Client provides further information as agreed in the planned risk management process. |
| Discuss design options | Take into account how design decisions determine risks when discussing design risk control options. | Designer led.<br><br>Client contributing. |
| Design finalisation | Check that the evaluation of design risk control measures for risks is complete and accurate. | Client and designer agree with final result. |

| | | |
|---|---|---|
| | Prepare information about risks to health and safety for the structure that remain after the design process. | Designer led. |
| Potential changes in construction stage | Ensure that changes which affect design do not increase risks, for example, substitution of flooring materials which could increase slip/fall potential and may introduce risks in cleaning work. | Construction team in consultation with designer and client. |

Source: WorkSafe Victoria (2005) – *Designing Safer Buildings and Structures (1st Edition)*

## Further information

Useful information about the Act, the Regulation, obligations and codes of practice can be found at www.deir.qld.gov.au or by calling Workplace Health and Safety Queensland on 1300 369 915.

Practice notes prepared by industry associations and professional institutes can be found at:

- Built Environment Australia (BEDP) - www.bdp.asn.au
- Royal Australian Institute of Architects (RAIA) - www.architecture.com.au
- Building Designers' Association of Queensland (BDAQ) - www.bdaq.com.au
- Australian Standards - www.standards.com.au

Australian Building Code Board (2000): Building Code of Australia. Australian Building Code Board.

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# Appendix A – Relationships of obligation holders

This appendix outlines the relationships for construction work. Those relationships involving designers have been highlighted.

| Who | Action | With whom | When |
|---|---|---|---|
| **Designer** | **Consultation** – risks in the design of the structure. | Client | Before construction work starts. |
| **Client** | **Consultation** – how construction work in connection with the design can be undertaken in a way that prevents or minimises all risks to health and safety. | Designer | Before and during construction. |
| **Client** | **Consultation** – how construction can be planned and managed in a way that prevents or minimises all risks to health and safety. | Project manager | Before and during construction. |
| **Client** | **Consultation** – how construction work can be undertaken in a way that prevents or minimises all risks to health and safety. | Principal contractor | Before and during construction. |
| **Client** | **Provide information** – about hazards and risks. | Designer | Before and during construction. |
| **Client** | **Provide information** – about hazards and risks. | Project manager | Before and during construction. |
| **Client** | **Provide information** – about hazard and risks. | Principal contractor | Before and during construction. |
| **Project manager** | **Consultation** – health and safety aspects of the construction work. | Client | Before construction work starts. |
| **Principal contractor** | **Consultation** – to identify hazards associated with the construction work and assess the risks that may result because of the hazards. | Designer | Before and during construction. |
| **Principal contractor** | **Consultation** – to identify hazards associated with the construction work and assess the risks that may result because of the hazards. | Project manager | Before and during construction. |
| **Principal contractor** | **Consultation** – to identify hazards associated with the construction work and assess the risks that may result because of the hazards. | Client | Before and during construction. |