DEPARTMENT OF OCCUPATIONAL SAFETY AND HEALTH
MINISTRY OF HUMAN RESOURCES

GUIDELINES ON OCCUPATIONAL SAFETY AND HEALTH IN CONSTRUCTION INDUSTRY (MANAGEMENT) 2017

Messages from the Director General

I would like to take this opportunity to thank the Construction Safety Division and many people who have helped the preparation of these guidelines. Construction Safety Division leads and coordinates the Department of Occupational Safety and Health (DOSH) efforts to prevent work-related injuries and work-related fatalities in the construction industry. The number of construction-related fatalities was at all-time high since the turn of the century. Since 1999, the 17-year average of construction-related fatalities was 95. Since 2012, the construction industry fatality rate per 100,000 workers has been trending upwards and in 2015, the fatality rate per 100,000 workers was significantly higher than the overall fatality rate. Last year we have made significant progress, but there is no reward for idleness. We have to continue the process of improvement.

To trigger improvements in the safety and health performance, the pre requisite is for every stakeholder in the industry to work together towards a set of common objectives. To realise that, the *Guidelines of Occupational Safety and Health in Construction Industry (Management)* is developed to recommend the minimum roles of every stakeholder and how they can execute their responsibilities. The guidelines are developed based on the Prevention through Design (PtD) principle and the UK's *Construction (Design and Management) Regulations*, and also reverberated the spirit of the *Occupational Safety and Health Act* (OSHA), which clearly places responsibility on those who create risk to manage it. These guidelines provide practical guidance to the client, designer and contractor on the management of safety, health and welfare when carrying out construction projects.

Standing at the pinnacle of the construction industry supply chain, the chief responsibility falls to the client, the project proponent or the owner of the project. The role of the client is of paramount importance to the excellent safety performance of a project, especially in ensuring competent people are appointed at the right time. The designer and the contractor have important roles in managing the pre-construction and construction phases, respectively. Between these three key stakeholders, there should be good cooperative governance, effective communication and adequate information, instruction, training and supervision. Harnessing of workers' involvement to promote and develop effective measures completes the key elements of recommendations in the guidelines.

Our primary target after publishing these guidelines is to make the recommended responsibilities in these guidelines mandatory. Work is currently undergoing to develop regulations that replicate requirements in these guidelines and the *Factories and Machinery (Building Operations and Works of Engineering Construction) (Safety) Regulations* (*BOWECS Regulations*) 1986. Long ago, we have recognised that the government cannot accomplish the improvements alone, and now is the time for us all to work together to make this happen. It is high time that each stakeholder in the construction industry to grasp this golden opportunity to understand their role and become better at executing their responsibilities, as recommended by these guidelines. DOSH will continue to play our part, and I am sure that you will want to play yours too.

Director General
Department of Occupational Safety and Health

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1. Introduction

1.1 About these guidelines and who these guidelines are for

1 Managing occupational safety and health risks at the planning and design stage is often more effective, easier to sustain and cheaper to achieve than making changes later when the hazards become real risks in the workplace. **These guidelines provide practical guidance to the client, designer and contractor on the management of safety, health and welfare when carrying out construction *projects*[1] of a structure[2]**. This guidance is for people with legal duties under the *Occupational Safety and Health Act* and the *Factories and Machinery Act*. These include client, designer and contractor. **It explains what they must or should do to comply with the law and recommends duties to them in order to manage their projects**. Any actions taken should always be proportionate to the risks in the construction project.

2 Responsibility for occupational safety and health in construction are shared among all stakeholders in the industry's supply chain. Stakeholders such as client, designer and contractor should work together to *design* occupational safety and health hazards out of the construction industry's processes and products. By working together, they should identify and eliminate or reduce, as far as is *reasonably practicable*[3], all foreseeable design risks to safety or health of any *person*[4].

3 Under the *Occupational Safety and Health Act*, organisations or individuals can concurrently be one or more duty holder for a project or workplace. Duty holder can also have more than one duty. Each duty holder must comply with that duty to the standard required by the Act even if another duty holder has the same duty. Duty holder must perform his or her duties and cooperate with other duty holders to perform their duties, and promote safe execution of construction and maintenance works so that buildings and structures can be safe workplaces.

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[1]Project means a project which includes or is intended to include construction works and include all planning, design, management or other works involved in a project until the end of the construction phase.

[2]Structures are defined as any permanent or temporary structures, which also include any part of the structure and any product, or mechanical or electrical system intended for the structure.

[3] Reasonably practicable means that the degree of risk in a particular situation can be balanced against the time, trouble, cost and physical difficulty of taking measures to avoid the risk. An action is considered to be practicable when it is capable of being done. To decide if an action is reasonable, one has to consider: (a) the severity of any injury or harm to health that may occur; (b) the degree of risk (or likelihood) of that injury or harm occurring; (c) how much is known about the hazard and ways of eliminating, reducing or controlling it; and (d) the availability, suitability and cost of the safeguards.

[4] Person is defined as anyone: (a) carrying out or liable to be affected by construction work for the structure; or (b) working in a completed building or structure as a workplace including an individual who maintains or cleans the structure, or anything in or on the structure.

1.2 Key elements to securing construction safety and health

4 The guidelines are based on five key elements:

(a) managing the risks by applying the **risk management approach** and **general principles of prevention**;
(b) **appointing** the right people and organisations at the right time;
(c) making sure everyone has the **information, instruction, training and supervision** they need to carry out their jobs in a way that secures safety and health;
(d) duty holders **cooperating and communicating** with each other and **coordinating** their work; and
(e) **consulting workers and engaging** with them to promote and develop effective measures to secure safety, health and welfare.

Risk management approach and general principles of prevention

5 These set out the principles duty holders should use in their approach to identifying the measures they should take to control the risks to safety and health in a particular project. A risk management process is a systematic way of making a workplace as safe as possible and it should also be used as part of the design process. It involves the hazard identification, risk assessment, risk control and review control measures. The general principles of prevention are set out in full in Appendix 1, but in summary they are to:

(a) avoid risks where possible;
(b) evaluate those risks that cannot be avoided; and
(c) put in place proportionate measures that control them at source.

These guidelines recommend designers, principal designers, principal contractors and contractors to take account of the principles in carrying out their duties. Applying this principle at the planning and design stage will enable the client, designer and contractor to integrate control measures early in the design process to avoid or, if this is reasonably practicable, minimise risks to safety and health throughout the life of the structure being designed. Designing for safety of a structure should 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 the structure over its life. General guidance on the risk management process is available in the *Guidelines for Hazard Identification, Risk Assessment and Risk Control (HIRARC)*.

Appointing the right organisations and people at the right time

6 Appointing the right organisations and individuals to complete a particular project is fundamental to its success, including safety and health performance.

Appointing designers and contractors

7 Anyone responsible for appointing designers (including principal designers) or contractors (including principal contractors) to work on a project should ensure that those appointed have the skills, knowledge and experience to carry out the work in a way that secures safety and health. See Example 1. If those appointed are an organisation, they should also have the appropriate organisational capability. Those making the appointments should establish that those they appoint have these qualities **before** appointing them. Similarly, any designers or contractors seeking appointment as individuals should ensure they have the necessary skills, knowledge and experience.

8 Duty holders should be appointed at the right time. For example, clients should appoint principal designers and principal contractors as soon as practicable and **before** the start of the construction phase, so they have enough time to carry out their duties to plan and manage the *pre-construction*[5] and construction phases respectively. See paragraphs 26–31 and 38–44 for guidance on making these appointments and their timing.

Contractors appointing anyone for work on a construction site

9 When contractors appoint anyone to carry out work on a construction site, they should make sure that those they appoint have, or are in the process of gaining, the right skills, knowledge, training and experience (see paragraphs 133–139). Not everyone will have these qualities and, if they do not, appointments should be made on the basis that they are capable of gaining them.

Example 1. Appointing the right people.

In a proposed mix development, a client required five high-rise buildings to be designed and connected at the mid and top floors via curved sky bridges. The client initially appointed a building designer for the design, but subsequently realised that the building designer did not have the experience and knowledge to design the curved sky bridges. The client then appointed a bridge designer to design the curved sky bridges while the building designer designed the building.

[5]Pre-construction phase means any period of time during which design or preparatory work is carried out for a project and may continue during the construction phase.

Supervision, instructions and information

10 The level of supervision, instructions and information required will depend on the risks involved in the project and the level of skills, knowledge, training and experience of the workforce. Contractors (including principal contractors) should make sure supervision is effective and *suitable*[6] site inductions are provided along with other information – such as the procedures to be followed in the event of serious and imminent danger to safety and health (see paragraphs 140–144).

Cooperating, communicating and coordinating

11 Duty holders should cooperate with each other and coordinate their work to ensure safety and health. They should also communicate with each other to make sure everyone understands the risks and the measures to control those risks. For example, through regular dialogue between the client, the principal designer and principal contractor to ensure they have the time and resources to plan, manage, monitor and coordinate the pre-construction and construction phases (see paragraphs 46-47). Appendix 2 gives example of cooperation, communication and coordination between duty holders in various contractual arrangements.

Consulting and engaging with workers

12 Workplaces where workers are consulted and engaged in decisions about safety and health measures are safer and healthier. Consultation about safety and health is two-way. It involves giving information to workers, listening to them and taking account of what they say before decisions are made by the duty holder. For example, hold meetings before work starts to discuss the work planned for the day, identify risks and agree appropriate control measures. Involving workers helps those responsible for safety and health to manage it in a practical way by:

(a) helping spot workplace risks and knowing what to do about them;
(b) making sure safety and health controls are appropriate;
(c) increasing the level of commitment to working in a safe and healthy way.

13 Consultation is a legal requirement. Workers should be consulted at the right time. The *Occupational Safety and Health (Safety and Health Committee) Regulations* and the *Factories and Machinery (Building Operations and Works of Engineering Construction) (Safety) Regulations* require employers to consult their workforce and sub-contractors about safety and health, either direct with workers or through elected representatives. A safe workplace is more easily achieved when people involved at the design stage communicate with each other about potential risks and work together to find solutions. By drawing on the knowledge and experience of other people, including workers, more informed decisions can be made about how the building or structure can be designed to eliminate or minimise risks.

[6]The test of suitability will include an assessment of sufficiency of available time and other resources, past experience of similar projects, and the experience and qualifications of the employees.

1.3 Application

14 The guidelines are not intended for a project undertaken by a *domestic client*[7]. Reference to these guidelines is encouraged to the domestic client, designer and contractor appointed by the domestic client in their project (see paragraph 16). The restricted applicability of these should not be construed as prohibiting or discouraging the use of these guidelines to domestic construction projects.

[7] Domestic client means client for whom a construction project is carried out which is not done in connection with a business. Construction work on domestic homes, where the home is the principal residence of the client, will not be in the course of furtherance of a business, but if another house is built within the site of the principal residence, or the family house is converted into apartments, it is likely to be in furtherance of a business (potentially tax liable on any profit).

2. Clients

2.1 Who are Clients

15 Clients are persons for whom or on whose behalf a construction project is carried out in connection with a business, whether the business operates for profit or not. This includes clients based overseas who commission construction projects in Malaysia. Clients can be individuals or organisations, including local authority, state government or federal government. Clients also include corporations, limited companies, partnerships and the *management corporation*[8] of the subdivided building undertaking modification projects on existing building.

16 Homeowners or domestic clients who engage contractors to build their homes or undertake project to build or rebuild houses for personal dwelling not intended for use as a business are not intended to be covered under these guidelines.

17 Clients are at the top of the construction value chain and have the greatest influence on the project. Regardless of the size of the project, the client has contractual control, appoints designers and contractors, and determines the money, time and other resources available. These guidelines make the client accountable for the impact their decisions and approach have on safety, health and welfare on the project.

18 In any project there may be more than one client, but all the possible clients should agree that only one of them should be responsible for carrying out the recommendations of these guidelines.

19 In some circumstances, it may not be clear who the client or clients are. Any uncertainty should be resolved as early as possible by considering who:

(a) ultimately decides what is to be constructed, where, when and by whom;
(b) commissions the design and construction works (the employer in contract terminology);
(c) initiates the work;
(d) is at the head of the procurement chain; and
(e) appoints contractors (including the principal contractors) and designers (including the principal designers).

20 Those clients who have not been identified as the client for the purposes of these guidelines will still have duties. These are to:

(a) provide any information in their possession that may be relevant to help pull together the pre-construction information; and
(b) co-operate with anyone involved in the project.

[8]Management corporation, in relation to any subdivided building refers to any corporation established under sections 39, 64 or 64A, *Strata Titles Act 1985 [Act 318].*

2.2 What should a client do?

Making suitable arrangements for managing a project

21 Most clients, particularly those who only occasionally commission construction work, would not be experts in the construction process. For this reason, they are not required to take an active role in managing the work. However, the client is required to make *suitable* arrangements for managing the project so that safety, health and welfare is secured.

22 To be *suitable*, the arrangements should focus on the needs of the particular project and be proportionate to the size of the project and risks involved in the work. Arrangements should include:

(a) assembling the project team – appointing designers (including a principal designer) and contractors (including a principal contractor). See paragraphs 26–31 for more guidance;
(b) ensuring the roles, functions and responsibilities of the project team are clear;
(c) ensuring *sufficient time*, budget and resources are allocated for each stage of the project – from concept to completion. See paragraphs 28–31 and Example 2 for more guidance on *sufficient time*, and the Construction Industry Development Board's *Guidelines for 1. Occupational Safety and Health (OSH) Specification; 2. OSH Schedule of Price* for more guidance on OSH budget;
(d) ensuring effective mechanisms are in place for members of the project team to communicate and cooperate with each other and coordinate their activities;
(e) how the client will take reasonable steps to ensure that the principal designer and principal contractor comply with their separate duties. This could take place at the project progress meetings or via written updates;
(f) setting out the means to ensure that the safety and health performance of designers and contractors is maintained throughout; and
(g) ensuring that workers are provided with suitable welfare facilities for the duration of construction work.

Example 2. Client to provide sufficient time.

A client awarded a contract to a principal contractor for the demolition of an old shopping complex. While it was unknown during the tender stage, it was later discovered that the building that was to be demolished had a pre-stressed floors. With this new information, the principal contractor would need more time to engage and work with contractors who are pre-stressed specialists to help demolish this building. Hence, the client should provide the principal contractor with additional time and resources to resolve this situation.

23 Clients should take ownership of these arrangements and ensure they communicate them clearly to other duty holders. Clients could prepare a clear '*client's brief*' as a way of setting out the arrangements. The client brief normally:

(a) sets out the main function and operational requirements of the finished project;
(b) outlines how the project is expected to be managed including its safety and health risks;
(c) sets a realistic timeframe and budget; and
(d) covers other relevant matters, such as establishing design direction and a single points of contact in the client's organisation.

24 Where the range and nature of risks involved in the works warrants it, the management arrangements should also include;

(a) the expected standard of the safety and health, including safe working practices, and the means by which these standards will be maintained throughout;
(b) what is expected from the design team in terms of the steps they should reasonably take to ensure the designs help manage foreseeable risks during the construction phase and when maintaining and using the building once it is built; and
(c) the arrangements for commissioning the new building and a well-planned handover procedure to the new user.

25 If a client needs help in making these arrangements, the principal designer should be in a position to help with this. Clients could also draw on the advice of safety and health officer or consultant if they are required to appoint such a person under the *Occupational Safety and Health (Safety and Health Officer) Order.*

Assembling the project team

26 The managements arrangements should cover what clients will do to ensure that the people and organisation they appoint have the skills, knowledge, experience and (if an organisation) the organisational capability to manage safety and health risks (see paragraphs 38–44) for further guidance.

27 The extent of the checks a client should make into the capability of duty holders they appoint will depend on the complexity of the project and the range and nature of the risks involved. Refer to *Appendix 1 Example of OSH Capabilities Questionnaire in the Guideline on Contract Management 2015*. See paragraphs 38–42 for further guidance on the help available to clients in selecting the right duty holder.

Appointing principal designers and principal contractors

28 The principal designers should be appointed as early as possible in the design process, if practicable at the concept stage. Appointing the principal designer early will provide the client with help in matters such as pulling together the pre-construction information (see paragraphs 33–34) and giving the principal designer enough time to carry out their duties. The duration of the principal designer's appointment should take into account any design work which may continue into the construction phase or any issue that may arise during construction involving the need to make suitable modifications to the designs. For projects involving early works by a concept architect or project management company where a design and build contractor or novated designer is subsequently involved, it may be appropriate for the initial principal designer appointment to be ended and a new principal designer appointed.

29 The principal contractor should be appointed early enough in the pre-construction phase to help client meet their duty to ensure a *construction phase plan*[9] is drawn up before the construction phase starts. This also gives the principal contractor time to carry out their duties, such as preparing the construction phase plan and liaising with the principal designer in sharing any relevant information for safety and health.

30 The principal designer should be in place for as long as there is a need for their role to be performed. But where a principal designer's appointment finishes before the end of the project, the client should ensure that the principal contractor is fully briefed on matters arising from designs relevant to any subsequent construction work. The client should also make sure that the principal designer passes the safety and health file to the principal contractor so it can be revised during the remainder of the project if necessary.

31 If a client fails to appoint either a principal designer or principal contractor, the client should carry out their duties.

Maintaining and reviewing the management arrangements

32 The client should maintain and review their arrangements to ensure they remain relevant throughout the life of the project, see Example 3. Some projects do not go smoothly and clients may experience difficulties and delays as they progress. Examples of actions the clients can take to maintain and review their arrangements are:

(a) establishing key milestones so they can assess the progress of the project and determine whether safety and health standards are being met;

[9] The construction phase plan is similar to the safety and health plan as recommended in the *Guidelines for 1. Occupational Safety and Health (OSH) Specification; 2.OSH Schedule of Prices* by the Construction Industry Development Board.

(b) where necessary, seeking advice (see paragraph 25). On larger projects, the clients may value an independent review of the standards; and

(c) ensuring arrangements for handing over the building to a new user are sufficient to protect anyone (including members of the public) who may be affected by risks arising from any ongoing construction work, for example snagging work.

Example 3. Review meeting.

The client should conduct review meeting with designers (including principal designer, permanent, specialist or temporary works) and contractors (including principal contractors, permanent, specialist, temporary or maintenance works), who may affect the design, construction and maintenance of the project, at various key stages of the project. Note that they may not be on the project team during the key stages of the project but their inputs should be sought once they are appointed, so that the review meetings will be fruitful.

When an identified foreseeable design risk cannot be eliminated, the client should ensure that the design risk is reduced to as low as reasonably practicable and all residual design risks highlighted during the review meetings are recorded. All residual risks highlighted and recorded should be communicated to contractors engaged for the relevant scope of works so that they are aware of the risks involved and take steps to manage them. While review meetings are typically done during the pre-construction phase, the client may still conduct review meetings during the construction stage of the project to:

- review any new or revised designs (for example, variations, designs for temporary works, and designs by specialist contractors),
- provide necessary briefings and clarifications to the principal contractor as part of passing-on information of residual design risks from the review meetings.

The review meeting looks at risks associated with the design which begins on the drawing board, and considers how a building or structure can be constructed, maintained, cleaned and demolished safely, and if there are safety and health issues at every stage of the building's or structure's life cycle.

For example, during the review, one of the items discussed was the installation of glossy ceramic floor tiles, which would get wet and slippery during washing or when water got spilled onto them, in the kitchen, cold rooms and toilet areas. Installation of the tiles in these areas would possibly lead to cleaners or kitchen staff slipping or falling. With this consideration, the team agreed that floor finishes at these areas should be of non-slip material to reduce the risk of slips and falls.

Providing pre-construction information

33 Pre-construction information is information already in the client's possession (such as an existing safety and health file, an asbestos survey, structural drawings, utility and services plans, soil investigation reports, information on design risks, etc.) or which is reasonable to obtain through sensible enquiry. The information must be relevant to the project, have an appropriate level of detail and be proportionate to the nature of the risks.

34 The client has the main duty for providing pre-construction information. This should be provided as soon as practicable to each designer (including the principal designer) and contractor (including the principal contractor) who is bidding for work on the project or has already been appointed. For projects involving more than one contractor, the client should expect the principal designer to help bring the pre-

construction information together and provide it to the designers and contractors involved. Sub-section 6.1 gives further guidance on the requirements relating to pre-construction information. Appendix 3 shows how pre-construction information relates to and influences other types of information during a construction project involving more than one contractor.

Ensuring preparation of the construction phase plan

35 The client should ensure that a construction phase plan for the project is prepared before the construction phase begins. The plan outlines the safety and health arrangements, site rules and specific measures concerning any work involving the particular risks listed in Appendix 4. For single-contractor projects, the contractor should ensure the plan is prepared. For projects involving more than one contractor, it is the principal contractor's duty. See sub-section 6.2 for further guidance on the requirements relating to construction phase plans and Appendix 3 for how a construction phase plan relates to and influences other types of information during a construction project involving more than one contractor.

Ensuring preparation of the safety and health file

36 **A safety and health file is only required for projects involving more than one contractor.** The client should ensure that the principal designer prepares a safety and health file for their project. Its purpose is to ensure that, at the end of the project, the client has information that anyone carrying out subsequent construction work on the building will need to know about in order to be able to plan and carry out the work safely and without risks to health.

37 To ensure that an appropriate safety and health file is produced at the end of the project, the client should:

(a) provide the principal designer with any existing file produced as part of an earlier project so the information it contains can be used to plan the pre-construction phase of the current project;
(b) ensure the principal designer prepares a new file (or revises any existing one);
(c) ensure the principal designer reviews and revises the file regularly and passes the completed file back at the end of the project;
(d) ensure the file is handed to the principal contractor if the principal designer's appointment finishes before the end of the project;

(e) ensure the file is kept available for anyone who needs it to comply with relevant legal requirements; and
(f) pass the file to whoever takes over the building and takes on the client duties if the client decides to dispose of their interest in it.

Sub-section 6.3 gives further guidance on the requirements relating to the safety and health file. Appendix 3 shows how the safety and health file relates to and influences other types of information during a construction project involving more than one contractor.

3. Appointment of designers and contractors

3.1 Appointing designers and contractors

38 Anyone appointing a designer or contractor to work on a project should take reasonable steps to satisfy themselves that those who will carry out the work have the skills, knowledge, experience, and, where they are an organisation, the organisational capability to carry out the work in a way that secures safety and health. Reasonable steps will depend on the complexity of the project and the range and nature of the risks involved.

39 Organisational capability means the policies and systems an organisation has in place to set acceptable safety and health standards which comply with the law, and the resources and people to ensure the standards are delivered.

40 When appointing a designer or a contractor, sensible and proportionate enquiries should be made about their organisational capability to carry out the work. Only enquiries for information that will address the anticipated risks and capability of the supplier should be made – excessive or duplicated paperwork should be avoided because it can distract attention from the practical management of risks. Those making appointments will find the standard safety and health questions in *Appendix 1 Example of OSH Capabilities Questionnaire* in the *Guideline on Contract Management* or *Publicly Available Specification 91:2013 Construction related procurement. Pre qualification questionnaires* are useful aids. Using these questions is one way of helping to assess organisational capability.

41 As well as carrying out pre-qualification checks on organisations, those responsible for making appointments should also check that the designer or contractor has enough experience and a good record in managing the risks involved in projects. These checks should ideally be carried out at the final stage after pre-qualification checks have been completed and before appointments are made.

42 When considering the requirements for designers and other construction professionals, due weight should also be given to membership of an established professional institution or body. For example, do these bodies have arrangements in place which provide some reassurance that safety and health is part of the route to membership of their profession? However, questions should also be asked of individuals to ensure that they have sufficient skills, knowledge, and experience to carry out the work involved, and that they keep those capabilities up to date.

3.2 Designers and contractors seeking appointment

43 Designers and contractors (including individuals and sole traders) should be able to demonstrate they have the safety and health skills, knowledge and experience to carry out the work for which they are seeking appointment. This is the case for individuals working for larger organisations or for themselves – in particular, self-employed designers.

44 Any business or individual is recommended to use the standard safety and health questions in *Appendix 1 Example of OSH Capabilities Questionnaire* in the *Guideline on Contract Management* to assess their own capability and supply relevant documentation to a client in support of a bid for work. The standard safety and health pre-qualification questions in *Publicly Available Specification 91* may also be helpful in carrying out a self-assessment (see paragraph 40).

45 For example, in addition to the core design capabilities relevant to the designer's professional role, a designer should also have:

(a) knowledge of occupational safety and health legislation, industry codes of practice and other regulatory requirements;
(b) an understanding of the intended purpose of the structure;
(c) knowledge of risk management processes;
(d) knowledge of technical design standards;
(e) an appreciation of construction methods and their impact on the design; and
(f) the ability to source and apply relevant data on human dimensions, capacities and behaviours.

Many design projects are too large and complex to be fully understood by one person. Various persons with specific skills and expertise may need to be included in the design team or consulted during the design process to fill any skill, knowledge or experience gaps, for example ergonomists, engineers and occupational hygienists.

3.3 Cooperating with each other

46 Everyone with duties under these guidelines should cooperate with others involved with the project or any project on an adjoining site. This means working with each other to ensure safety and health for all concerned. This should involve communicating with others and understanding what they are doing and in what sequence, for example, by holding regular coordination and progress meetings.

47 For lower-risk projects involving more than one contractor, a low-key approach will be sufficient. In higher risk projects, a more rigorous approach to cooperation, coordination and planning will be needed. There should also be effective communications between different organisations where they work in close proximity on the same site or on adjoining sites, for example, daily updates to make sure there

is a common understanding of the work being planned. In all cases, action taken should be in proportion to the risks the construction work activity presents. Appendix 2 provides examples of cooperation, communication and coordination between duty holders in various contractual relationships.

3.4 Reporting dangerous conditions

48 Everyone involved in a project (including workers) has a duty to report instances where they or others are working in a way that puts them or anyone else in danger. Any instances must be reported to the person in control of the work. The person in control should instruct workers to stop work and report dangerous conditions when they see them.

3.5 Providing clear information or instructions

49 Anyone with a duty under these guidelines to provide safety and health information or instructions to anyone else should ensure that it is easy to understand. **Information** about hazards is essential to all project workers and managers to make sure they understand the risks involved with the work. **Instructions** are those agreed actions that must be followed to prevent or minimise those risks.

50 Any information or instruction provided should be in simple, clear Malay (and/or other languages where appropriate). It should also be set out in a logical order and have illustrations where appropriate. The use of photographs or diagrams in written communication can be very helpful. The amount of detail provided should be proportionate to the scale and complexity of the project, the risks and the nature and purpose of the messages. Only information that is necessary to help prevent harm should be provided – unnecessary information can prevent the clear communication of key messages. Examples of types of information include the:

(a) pre-construction information the client is required to provide to designers and contractors;
(b) safety and health information about the design that designers are required to provide to other duty holders;
(c) information the principal designer should provide to enable preparation of the construction phase plan;
(d) site rules that are part of the construction phase plan; and
(e) information that principal contractors must provide to workers (or workers' representatives).

51 Information or instructions must be provided at the right time – before the work begins, so that the recipients can understand and take account of it in carrying out their duties. Wherever possible, it should be made available directly to the people carrying out the work. Where this is not possible, duty holders and workers need to know what information is available and where it can be found.

4 Designers

4.1 Who are Designers

52 A designer is an organisation or individual, who in the course or furtherance of a business:

(a) prepares or modifies a design for a construction project (including the design of temporary works); or
(b) arranges for, or instructs someone else under their control to do so,

relating to a structure, or to a product or mechanical or electrical system intended for a particular structure, and a person is deemed to prepare a design where a design is prepared by a person under their control.

53 The term 'design' includes drawings, design details, specifications, bills of quantity and calculations prepared for the purpose of a design. Designers include architects, architectural technologists, consulting engineers, quantity surveyors, interior designers, temporary work engineers, chartered surveyors, technicians or anyone who specifies or alters a design. This would include Professional Engineers, engineers, architects, and even contractors or clients if they prepare a design plan for permanent or temporary structures. They can include others if they carry out design work, such as principal contractors, and specialist contractors, for example an engineering contractor providing design, procurement and construction management services. Where clients become actively involved in designing in relation to their project, they may also be considered to be designers.

54 Local authority or government officials may give advice and instruction on designs meeting statutory requirements (for example the *Uniform Building By-Law*), but this does not make them designers. A designer may have no choice but to comply with these requirements, which are a 'design constraint'. However, if statutory bodies ask for particular features to be included or excluded which go beyond what the law requires (for example, stipulating the absence of edge protection on flat roofs if there is no basis in planning law or policies to do so), they may become designers under these guidelines and should comply with its requirements.

55 The person who selects products for use in construction is a designer and must take account of safety and health issues arising from their use. If a product is purpose-built, the person who prepares the specification is a designer and so are manufacturers, if they develop a detailed design.

4.2 Why is a designer important?

56 A designer has a strong influence during the concept and feasibility stage of a project. The earliest decisions can fundamentally affect the safety and health of those who will construct, maintain, repair, clean, refurbish and eventually demolish a building. The safety and health of those who use a building as a workplace may also be affected. Decisions such as selecting materials that are lighter to handle or windows that can be cleaned from the inside can avoid or reduce the risks involved in constructing the building and maintaining it after construction. Although it is understood that residual risks may well remain, decisions such as these have an important influence on the overall safety and health performance of the project and the use and maintenance of the building once it is built.

57 **A designer should address safety and health issues from the very start.** Where issues are not addressed early on, projects can be delayed and it can become significantly harder for contractors to devise safe ways of working once they are on site. The client may also be forced to make costly late changes, so the building can be used and maintained safely once it is built.

4.3 When do a designer's duties apply?

58 The designer's duties apply as soon as designs which may be used in construction work in Malaysia are started. This includes concept design, competitions, bids for grants, modification of existing designs and relevant work carried out as part of feasibility studies. It does not matter whether planning permission or funds have been secured, or the client is a domestic client.

59 If a design is prepared or modified outside Malaysia, the designer duties apply to the person or organisation who commissions it if they are established in Malaysia, or if not, the client (but not a domestic client).

4.4 What should a designer do?

Making clients aware of their duties

60 A designer should not start any design work unless they are satisfied the client is aware of the duties clients have under these guidelines. This duty can be fulfilled as part of routine business, for example, in early meetings or liaison with the client to discuss the project. A designer should have a sufficient knowledge of client duties to give sufficient advice about the project. The level of advice will depend on the knowledge and experience of the client and the complexities of the project.

61 On projects involving more than one contractor, the task of informing the client of their duties should normally fall to the principal designer. Any other designers appointed can seek confirmation from the principal designer that the client has been made aware of their duties.

Preparing or modifying designs

62 When preparing or modifying designs, a designer should take account of the general principles of prevention, and the pre-construction information provided to them, with the aim, as far as reasonably practicable, of **eliminating** foreseeable risks. Where this is not possible they should take reasonably practicable steps to **reduce** the risks or **control** them through the design process, and provide information about the remaining risks to other duty holders. See paragraphs 63–71 for further guidance.

Taking account of the general principles of prevention in design work

63 The general principles of prevention are set out in Appendix 1 and provide a framework within which designers should consider their designs and any potential risks which may affect:

(a) workers or anyone else (for example, members of the public) who may be affected during construction;
(b) those who may maintain or clean the building once it is built; or
(c) those who use the building as a workplace.

This means thinking about design solutions for reasonably foreseeable hazards that may occur as the structure is built, commissioned, used, maintained, repaired, refurbished or modified, decommissioned, demolished or dismantled and disposed or recycled. Designs prepared for places of work also need to comply with the *Factories and Machinery (Safety, Health and Welfare) Regulations*, taking account of factors such as lighting and the layout of traffic routes, or other relevant regulations. For example, when designing a building with a lift for occupants, the design should also include space and safe access to the lift well or machine room for maintenance work, in compliance with the *Factories and Machinery (Electric Passenger and Goods Lifts) Regulations*.

64 Safety and health risks need to be considered alongside other factors that influence the design, such as cost, fitness for purpose, aesthetics and environmental impact. Working with contractors (including principal contractors) involved in the project can help identify the potential risks and ways they may be controlled.

65 Once the risks have been considered, the level of detail in the information provided to those who need it should be proportionate to the risks remaining. Insignificant risks can usually be ignored, as can those arising from routine construction activities, unless the design worsens or significantly alters these risks.

Taking account of pre-construction information

66 A designer should take account of pre-construction information the client or principal designer provides when making decisions about the extent to which they can eliminate foreseeable risks through the designs they produce; and, where these risks cannot be eliminated, the steps they take to reduce or control them. Sub-section 6.1

gives further guidance on the requirements relating to pre-construction information. Appendix 3 shows how pre-construction information relates to and influences other types of information during a construction project involving more than one contractor.

Eliminating, reducing or controlling foreseeable risks through design

67 When designing, a designer should consider the risks people may be exposed to through the course of both constructing a building and using it once it is constructed. Designing is a process that often continues throughout the project and the following questions should be considered when design is carried out:

(a) Can I get rid of the problem (or hazard) altogether? For example, can air-conditioning plant on a roof be moved to ground level, so work at height is not required for either installation or maintenance?
(b) If not, how can I reduce or control the risks, so that harm is unlikely or the potential consequences less serious? For example, can I place the plant within a building on the roof, or provide a barrier around the roof?

68 If risks cannot be eliminated altogether, a designer should apply the principles below in deciding how to reduce or control the remaining risks – if possible, in the following order:

(a) provide a less risky option, for example, switch to using paving lighter in weight, to reduce musculoskeletal disorders such as back problems;
(b) make provisions so the work can be organised to reduce exposure to hazards, for example, make provision for traffic routes so barriers can be provided between pedestrians and traffic;
(c) ensure that those responsible for planning and managing the work are given the information they will need to manage remaining risks, for example, tell them about loads that will be particularly heavy or elements of the building that could become unstable. This can be achieved through providing key information on drawings or within models, for example, by using Building Information Modelling (BIM) (see Example 4).

See paragraphs 82–83 for further guidance on the ways of controlling risks.

Example 4. Use of 3 dimensional (3D) modelling as a tool for designers.

A building designer had traditionally used sketches and 2D drawings in early project discussions with clients. Not all clients could appreciate the three dimensional implications from 2D drawings and fewer could afford the expense of scale models.
With the advent of downloadable 3D modelling software, it became possible (and feasible) to provide the client with a fully rendered, coloured, and three dimensional representation of their project. Capable of being submitted electronically, the file allows the client to view the proposal from any direction.
This software also allowed the designer to work with the client to explain the construction process as well as identifying safety issues such as excavations, work at heights and traffic movements that could be resolved by adjusting the design. The designers' clients are also better informed so that they can consider the use of the building after construction is completed and to make any adjustments to the design at the earliest possible stage.

69 When addressing risks, a designer is expected to do as much as is reasonable at the time the design is prepared. Risks that cannot be addressed at the initial stage of a project may need to be reviewed later on during detailed design. As the design progresses and design decisions become more fine-tuned and detailed, there are still opportunities for either eliminating or minimising risks. At various points in the design process, designers should review design solutions to confirm the effectiveness of risk controls and if necessary, redesign to minimise the risks so far as is reasonably practicable. Wherever possible, design safety reviews should involve the people who will eventually construct the structure. If this is not possible, the client and designer should make every effort to include people with knowledge and experience in the construction and maintenance processes in the design safety reviews. Their expertise will assist in identifying safety issues which may have been overlooked in the design. Safety and health aspects of the design should be reflected in the requirements of contract documents for the construction stage and assist in the selection of suitable and competent contractors for the project. On projects involving more than one contractor, the principal designer will lead in managing the review process.

Providing design information

70 A designer should provide information to other duty holders using or implementing the design. This includes information for:

(a) the principal designer:
  (i) about *significant risks*[10] associated with the design that cannot be eliminated, so it can form part of the pre-construction information (see sub-section 6.1 and Appendix 3 for further guidance);

[10]Significant risks not necessarily those that involve the greatest risks, but those (including health risks) that are not likely to be obvious, are unusual, or likely to be difficult to manage effectively.

(ii) to take into account in preparing or revising the safety and health file (see sub-section 6.3 for further guidance);

(b) other designers;

(c) the principal contractor (or the contractor on a single-contractor project) who has responsibility for preparing, reviewing and revising the construction phase plan for the project (see sub-section 6.2 for further guidance); and

(d) contractors who construct the design.

71 The designer should agree with the principal designer the arrangements for sharing information to avoid omissions or duplicated effort. Those who need the information should be given it at the right time. For example, in preparing the construction phase plan, the information should be provided well before the construction phase begins.

Cooperating with other duty holders

72 Designers should liaise with any other designers, including the principal designer, so that work can be coordinated to establish how different aspects of designs interact and influence safety and health. This includes temporary and permanent works designers. Designers should also cooperate with contractors and principal contractors so that their knowledge and experience about, for example, the practicalities of building the design, is taken into account.

73 Depending on the nature and extent of design work, there may be a need to carry out design reviews. Reviews enable the project team to focus on safety and health matters alongside other key aspects of the project. This can be done as part of the normal design process. The need for such reviews is likely to continue throughout the project although their frequency and the level of detail covered should remain proportionate to the scale and complexity of the design work.

4.5 Who is a principal designer?

74 A principal designer is the designer with control over the pre-construction phase of the project. This is the very earliest stage of a project from concept design through to planning the delivery of the construction work. The principal designer should be appointed in writing by the client.

75 The principal designer can be an organisation or an individual that has:

(a) the technical knowledge of the construction industry relevant to the project;

(b) the skills, knowledge and experience to understand, manage and coordinate the pre-construction phase, including any design work carried out after construction begins.

Where the principal designer is an organisation, it should have the organisational capability to carry out the role.

76 Principal designers may have separate duties as designers (see paragraphs 60–73).

4.6 Why is the principal designer important?

77 In liaison with the client and principal contractor, the principal designer has an important role in influencing how the risks to safety and health should be managed and incorporated into the wider management of a project. Decisions about the design taken during the pre-construction phase can have a significant effect on whether the project is delivered in a way that secures safety and health. The principal designer's role involves coordinating the work of others in the project team to ensure that significant and foreseeable risks are managed throughout the design process.

4.7 What should a principal designer do?

Planning, managing, monitoring and coordinating the pre-construction phase

78 In carrying out the duty to plan, manage, monitor and coordinate the pre-construction phase, principal designers should take account of the general principles of prevention (see paragraph 5 and Appendix 1) and, where relevant, the content of:

(a) pre-construction information (see sub-section 6.1);
(b) any construction phase plan (see sub-section 6.2). This will be relevant when the plan has implications for design work carried out after the construction phase has started, for example, ground contamination discovered affecting the choice of piling method; and
(c) any existing safety and health file (see sub-section 6.3). In cases where a safety and health file has been prepared as part of previous construction work on the building, it should have information which will help the planning, management and coordination of the pre-construction phase.

This information should be taken into account particularly when decisions are being taken about design, technical and organisational issues to plan which items or stages of work can take place at the same time or in what sequence; and when estimating the time needed to complete certain items or stages of work.

79 The principal designer's work should focus on ensuring the design work in the pre-construction phase contributes to the delivery of positive safety and health outcomes. Bringing together designers as early as possible in the project, and then on a regular basis, to ensure everyone carries out their duties, will help to achieve this.

This can be done as part of the normal design process. Regular design meetings chaired by the principal designer are an effective way to:

(a) discuss the risks that should be addressed during the pre-construction phase;
(b) decide on the control measures to be adopted; and
(c) agree the information that will help prepare the construction phase plan.

80 If the principal designer appoints any designers they should check they have sufficient skills, knowledge, experience and (if they are an organisation) the organisational capability to carry out the work. These checks should be carried out before appointment (see paragraphs 38-42 for further guidance).

81 The principal designer's role continues into the construction phase when design work is carried out and when gathering and preparing information for the safety and health file.

Identifying, eliminating or controlling foreseeable risks

82 Principal designers should ensure, as far as reasonably practicable, that foreseeable risks to safety and health are identified. In practice, this will involve the principal designer working with other designers involved with the project. The risks that should be identified are the significant ones (see Example 5) and which are likely to arise:

(a) while carrying out construction work; or
(b) during maintenance, cleaning or using the building as a workplace once it is built.

Identifying insignificant risks is not an effective way of alerting other duty holders to the important design issues they need to know about. Designers should be able to demonstrate they have addressed only the significant risks.

83 Once the risks have been identified, principal designers should follow the approach to managing them set out in the general principles of prevention (see Appendix 1). For example, the principal designer should, as far as reasonably practicable, ensure that the design team:

(a) **eliminate** – the most effective effective control measure involves eliminating the hazard and associated risk. By designing-in or designing-out certain features, hazards may be eliminated. For example, designing components that facilitate pre-fabrication on the ground can avoid the need for working at height and therefore eliminate the risk of falls risks associated with design elements.

If this is not possible (for instance because of competing design considerations such as planning restrictions, specifications, disproportionate costs or aesthetics):

(b) **substitute** – replace a hazardous process or material with one that is less hazardous to reduce the risk. For example, using pre-cast panels rather than constructing a masonry wall or using pre-finished materials in preference to on-site finishing;
(c) **isolate** – separate the hazard or hazardous work practice from people, for example designing the layout of a building so that noisy machinery is isolated from workstations;
(d) **engineering controls** – use engineering control measures to minimise the risk, for example, including adequate ventilation and lighting in the design, designing and positioning permanent anchorage and hoisting points into buildings where maintenance needs to be undertaken at height;
(e) **administrative controls** – if engineering controls cannot reduce the risk sufficiently, then administrative controls should be used, for example using warning signs or exclusion zones where a hazardous activity is carried out; or
(f) **personal protective equipment** – for example hard hats, respiratory protection, gloves, ear muffs) should be used to protect the worker from any residual risk. It is the least effective control measure as it relies on the worker's behaviour and therefore requires thorough training and a high level of supervision to be effective.

In many cases, a combination of control measures will be required to minimise the risks to safety and health. This relies on exercising judgement, knowledge and experience in considering how to manage the risks. For example, traffic flow at a workplace may be controlled by incorporating traffic islands (engineering) and erecting warning signs (administrative).
Example 6 provides design options to control risks in various stages of the project lifecycle. The focus should be on those design elements where there is a significant risk of injury or ill health.

Ensuring coordination and cooperation

84 Principal designers should ensure as far as reasonably practicable that:

(a) everyone involved in working on the pre-construction phase cooperates with each other. They should establish that effective communication is occurring and that information is shared within the project team. This could involve holding meetings with others in the design team. Progress meetings with the client and the principal contractor also provide a way of ensuring work on the project is properly coordinated;
(b) designers comply with their duties. Appropriate checks should be made to ensure designers are dealing with design risks appropriately. This can be done as part of the design process and through regular progress meetings;
(c) designers provide information about elements of the design which present significant risks that cannot be eliminated. This should include information about unusual or complex risks that are more likely to be missed or misunderstood by contractors or others on the project rather than risks that are well known and understood.

Example 5. Foreseeable risks of a project may come from broad groupings of hazards. The following list may be used to assist in identifying hazards and controlling foreseeable risks associated with the design of a structure throughout its lifecycle.

Electrical safety
- Earthing of electrical installations
- Location of underground and overhead power cables
- Protection of leads/cables
- Number and location of power points

Fire and emergencies
- Fire risks
- Fire detection and fire fighting
- Emergency routes and exits
- Access for and structural capacity to carry fire tenders
- Other emergency facilities

Movement of people and materials
- Safe access and egress, including for people with disability
- Traffic management
- Loading bays and ramps
- Safe crossings
- Exclusion zones
- Site security

Working environment
- Ventilation for thermal comfort and general air quality and specific ventilation requirements for the work to be performed on the premises
- Temperature
- Lighting including that of plant rooms
- Acoustic properties and noise control, for example, noise isolation, insulation and absorption
- Seating
- Floor surfaces to prevent slips and trips
- Space for occupants

Plant
- Tower crane locations, loading and unloading
- Mobile crane loads on slabs
- Plant and machinery installed in a building or structure
- Materials handling plant and equipment
- Maintenance access to plant and equipment
- The guarding of plant and machinery
- Lift installations

Amenities and facilities
- Access to various amenities and facilities such as storage, first aid rooms/sick rooms, rest rooms, meal and accommodation areas and drinking water

Noise exposure
- Exposure to noise from plant or from surrounding area

Earthworks
- Excavations (for example, risks from earth collapsing or engulfment)
- Location of underground services

Structural safety
- Erection of steelwork or concrete frameworks
- Load bearing requirements
- Stability and integrity of the structure

Manual tasks
- Methods of material handling
- Accessibility of material handling
- Loading docks and storage facilities
- Workplace space and layout to prevent musculoskeletal disorders, including facilitating use of mechanical aids
- Assembly and disassembly of pre-fabricated fixtures and fittings

Substances
- Exposure to hazardous substances and materials including insulation and decorative materials
- Exposure to volatile organic compounds and off gassing through the use of composite wood products or paints
- Exposure to irritant/ toxic dust and fumes
- Storage and use of hazardous chemicals, including cleaning products

Falls prevention
- Guard rails
- Window heights and cleaning
- Anchorage points for building maintenance and cleaning
- Access to working spaces for construction, cleaning, maintenance and repairs
- Scaffolding
- Temporary work platforms
- Roofing materials and surface characteristics such as fragility, slip resistance and pitch

Specific risks
- Exposure to radiation, for example, electromagnetic radiation
- Exposure to biological hazards
- Fatigue
- Working alone
- Use of explosives
- Confined spaces
- Over and under water work, including diving and work in caissons with compressed air supply

Example 6. Design options to control risks in various stages of the lifecycle.

Design for safe construction

Control measures for risks relating to the construction of a structure include:

- Providing adequate clearance between the structure and overhead electric lines by burying, disconnecting or re-routing cables before construction begins, to avoid 'contact' when operating cranes and other tall equipment.
- 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, for example fixing windows in place at ground level prior to erection of panels.
- Designing parapets to a height that complies with guardrail requirements, eliminating the need to construct guardrails during construction and future roof maintenance.
- 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.
- 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.
- Reducing the space between roof trusses and battens to reduce the risk of internal falls during roof construction.
- Choosing construction materials that are safe to handle.
- Limiting the size of pre-fabricated wall panels where site access is restricted.
- Selecting paints or other finishes that emit low volatile organic compound emissions.
- Indicating, where practicable, the position and height of all electric lines to assist with site safety procedures.

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.

Risks relating to the function of a structure can be controlled by:

- Designing traffic areas to separate vehicles and pedestrians.
- Using non-slip materials on floor surfaces in areas exposed to the weather or dedicated wet areas.
- Providing sufficient space to safely install, operate and maintain plant and machinery.
- Providing adequate lighting for intended tasks in the structure.
- Designing spaces which accommodate or incorporate mechanical devices to reduce manual task risks.
- Designing adequate access, for example, allowing wide enough corridors in hospitals and nursing homes for the movement of wheelchairs and beds.
- Designing effective noise barriers and acoustical treatments to walls and ceilings.
- Specifying plant with low noise emissions or designing the structure to isolate noisy plant.
- 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

Design for safe maintenance

Risks relating to cleaning, servicing and maintaining a structure can be controlled by:

- 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.
- Designing features to avoid dirt traps.
- Designing and positioning permanent anchorage and hoisting points into structures where maintenance needs to be undertaken at height.
- Designing safe access, such as fixed ladders, and sufficient space to undertake structure maintenance activities.
- Eliminating or minimising the need for entry into confined spaces
- Using durable materials that do not need to be re-coated or treated.

Modification

Design is not always focussed on the generation of an entirely new structure. It can involve the alteration of an existing structure which may require demolition in part or whole.

Any modification of a structure requires reapplication of the processes detailed in the design phases. Consultation with professional engineers or other experts may be necessary in order to assess the impact of any proposed modifications or changes in design, for example changes in the load spread across a building floor when heavy equipment is relocated, modified or replaced.

This ensures that any new hazards and risks are identified and controlled, and that the safety features already incorporated into the design are not affected. Additional design issues identified in these phases should be passed back to the designer.

Demolition and dismantling

This is particularly important with modern designs where 'limit state' design techniques are used by the structure designer. In this system, the designer considers the structure in its completed form with all the structural components, including bracing, installed. The completed structure can withstand much higher loads (for example, wind and other live loads) than when the structure is in the construction or demolition stage.

A structure should be designed to enable demolition using existing techniques. The designer should provide information so that potential demolishers can understand the structure, load paths and any features incorporated to assist demolition, as well as any features that require unusual demolition techniques or sequencing.

Designers of new structures are well placed to influence the ultimate demolition of a structure by designing-in facilities such as lifting lugs on beams or columns and protecting inserts in pre-cast panels so that they may be utilised for disassembly. Materials and finishes specified for the original structure may require special attention at the time of demolition and any special requirements for the disposal and/or recycling of those materials or finishes should be advised to the client through the risk assessment documentation.

Providing pre-construction information

85 Pre-construction information is information already in the client's possession or which is reasonably obtainable. It should be relevant, have an appropriate level of detail and be proportionate to the nature of risks involved in the project.

86 The client has responsibility for pre-construction information (see paragraphs 33-34). The principal designer should help the client bring together the information the client already holds (such as any existing safety and health file or asbestos survey). The principal designer should then:

(a) assess the adequacy of existing information to identify any gaps in the information which it is necessary to fill;
(b) provide advice to the client on how the gaps can be filled and help them in gathering the necessary additional information; and
(c) provide, as far as they are able to, the additional information promptly and in a convenient form to help designers and contractors who:
    (i) are being considered for appointment; or
    (ii) have already been appointed, to carry out their duties.

Sub-section 6.1 gives further guidance on the requirements relating to pre-construction information. Appendix 3 shows how pre-construction information relates to and influences other types of information during a construction project involving more than one contractor.

Liaising with the principal contractor

87 The principal designer should liaise with the principal contractor for the duration of their appointment. During the pre-construction phase this should cover sharing information that may affect the planning, management, monitoring and coordination of the construction phase – in particular, the information needed by the principal contractor to prepare the construction phase plan (see sub-section 6.2). Liaison should also extend into the construction phase to deal with ongoing design and obtaining information for the safety and health file. This could be done by holding regular progress meetings with the principal contractor.

88 If the principal designer's appointment finishes before the end of the project, they should ensure that the principal contractor has all the relevant information so that the principal contractor:

(a) is aware of the risks which have not been eliminated in the designs;
(b) understands the means employed to reduce or control those risks; and
(c) understands the implications for implementing the design work for the rest of the project.

The principal designer should also arrange a handover of the safety and health file to the principal contractor and make them aware of any issues to take into account when reviewing, updating and completing it.

5 Contractors

5.1 Who is a principal contractor

89 A principal contractor is the organisation or person that coordinates the work of the construction phase of a project involving more than one contractor, so it is carried out in a way that secures safety and health. They are appointed by the client and should possess the skills, knowledge, and experience, and (if an organisation) the organisational capability to carry out their role effectively given the scale and complexity of the project and the nature of the safety and health risks involved.

90 There may be occasions where two or more projects are taking place on the same site at the same time, but are run independently of one another. Whatever the circumstances, **it is essential that there is clarity over who is in control during the construction phase in any part of the site at any given time**. Where it is not possible for one principal contractor to be in overall control, those principal contractors involved should:

(a) cooperate with one another;
(b) coordinate their work; and
(c) take account of any shared interfaces between the activities of each project (for example, shared traffic routes).

5.2 Why is a principal contractor important?

91 Good management of safety and health on site is crucial to the successful delivery of a construction project. In liaison with the client and principal designer, principal contractors have an important role in managing the risks of the construction work and providing strong leadership to ensure standards are understood and followed.

5.3 What should a principal contractor do?

Planning, managing, monitoring and coordinating the construction phase

General

92 In planning, managing, monitoring and coordinating the construction phase, a principal contractor should take account of the general principles of prevention (see Appendix 1). They should take account of these principles when:

(a) decisions are being taken to plan which items or stages of work can take place at the same time or in sequence; and
(b) estimating the time certain items or stages of work will take to complete.

93 The principal contractor should be appointed by the client before the construction phase begins to allow them to work closely with:

(a) the client for the life of the project; and
(b) the principal designer for the remainder of their appointment.

This work should include liaising with the principal designer for the purposes of planning, managing, monitoring and coordinating the pre-construction phase. As the project moves into the construction phase, the principal contractor should take the lead in planning, managing, monitoring and coordinating the project while continuing to liaise with the client and principal designer.

94 The effort the principal contractor devotes to carrying out their duties should be in proportion to the size and complexity of the project and the risks involved. The principal contractor should expect and receive help from other duty holders in identifying the risks associated with the work and determining the controls that need to be put in place. In particular:

(a) the client should provide (with help from the principal designer) the pre-construction information (see sub-section 6.1); and
(b) the principal designer should provide any other information needed for the preparation of the construction phase plan (see sub-section 6.2).

95 A principal contractor should also ensure anyone they appoint has the skills, knowledge, and experience and, where they are an organisation, the organisational capability to carry out the work in a way that secures safety and health (see paragraphs 38–42).

Planning

96 Planning must take into account the risks to all those affected – workers, members of the public and the client's employees, if working in an occupied premise. It must cover:

(a) the risks likely to arise during construction work;
(b) the measures needed to protect those affected by planning to provide:
    (i) and maintain the right plant and equipment;
    (ii) the necessary information, instruction and training; and
    (iii) the right level of supervision;
(c) the resources (including time) needed to organise and deliver the work, including its management, monitoring and coordination.

97 The pre-construction information (see sub-section 6.1) and any key design information, identifying risks that need to be managed during construction work, will be helpful in planning the construction phase and drawing up the construction phase plan (see sub-section 6.2). Appendix 3 shows how pre-construction information and the construction phase plan relate to and influence other types of information during a construction project involving more than one contractor.

Managing

98 To manage the construction phase, principal contractors must ensure that:

(a) those engaged to carry out the work are capable of doing so;
(b) effective, preventative and protective measures are put in place to control the risks; and
(c) the right plant, equipment and tools are provided to carry out the work involved.

99 Managing people to prevent and control risk requires leadership. Principal contractors can demonstrate visible leadership through the actions of their managers. These actions include setting standards for working practices and providing an example by following them. Leaders in safety and health should have a strong grasp of what is needed in a given situation, make clear decisions, and be able to communicate effectively.

100 A systematic approach to managing should be taken to ensure workers understand:

(a) the risks and control measures on the project;
(b) who has responsibility for safety and health;
(c) that consistent standards apply throughout the project and will be checked frequently;
(d) where they can locate safety and health information which is easily understandable, well organised and relevant to the site; and
(e) that incidents will be investigated and lessons learned.

101 Good supervision is part of showing leadership in safety and health. It:

(a) focuses workers' attention on risks, and how to prevent them;
(b) shows commitment to establishing and maintaining the control measures;
(c) involves consulting effectively with workers, taking into account their views; and
(d) challenges unsafe conditions and working practices when they arise.

Principal contractors do not have to undertake detailed supervision of contractors' work.

Monitoring

102 Standards should be checked regularly given the rapidly changing nature of a construction site. Effective monitoring involves:

(a) time and effort (with sufficient resource having been set aside for this at the planning stage – see paragraph 96);
(b) treating safety and health in the same way as other important aspects of the business;
(c) taking prompt action where necessary; and
(d) using a mix of performance measures – both active and reactive in nature, for example:
    (i) routine checks of site access and work areas and plant and equipment, or health risk management to prevent harm (active);
    (ii) investigating near-miss incidents and injuries as well as monitoring cases of ill health (reactive).

Coordinating

103 A principal contractor has a specific duty to ensure that contractors under their control cooperate with each other so the risks to themselves and others affected by the work are managed effectively. This includes ensuring contractors who start work at different stages of the construction phase cooperate with each other so any information and instruction relevant for a new contractor to carry out their work safely is provided to them. Regular planning meetings between the principal contractor and contractors are an effective way of ensuring this.

104 The need for coordination does not just apply when implementing the requirements in these guidelines, but also when complying with any other safety and health requirements. In coordinating the work of employers and self-employed under their control, principal contractors must ensure they:

(a) apply the general principles of prevention (see Appendix 1); and
(b) where required, follow the construction phase plan (see sub-section 6.2).

This will involve the principal contractor liaising with those involved to establish a common understanding of the safety and health standards expected and gaining their cooperation in meeting these standards. The extent to which the principal contractor should liaise will depend on the risks involved.

105 The principal contractor should also work with the client to ensure there is cooperation with others outside the construction site who may be affected by the activities on site. This includes coordinating the activities of contractors on the principal contractor's site with contractors on any neighbouring sites, particularly where the activities on each site combine to create hazards outside the sites that need to be addressed jointly.

Providing suitable site inductions

106 The principal contractor must ensure every site worker is given a suitable site induction. The induction should be site specific and highlight any particular risks (including those listed in Appendix 4) and control measures that those working on the project need to know about. The following issues should be considered:

(a) senior management commitment to safety and health;
(b) outline of the project;
(c) management of the project;
(d) first-aid arrangements;
(e) accident and incident reporting arrangements;
(f) arrangements for briefing workers on an ongoing basis, for example, toolbox talks;
(g) arrangements for consulting the workforce on safety and health matters;
(h) individual worker's responsibility for safety and health.

107 Site inductions should also be provided to those who do not regularly work on the site, but who visit it on an occasional (for example, architects) or once-only basis (for example, students). **The inductions should be proportionate to the nature of the visit.** Inductions provided to escorted visitors need not have the detail that unescorted visitors should have. Escorted visitors only need to be made aware of the main hazards they may be exposed to and the control measures.

Preventing unauthorised access to the site

108 The principal contractor must ensure reasonable steps are taken to prevent unauthorised access onto the construction site. They should liaise with the contractors on site to physically define the site boundaries by using suitable barriers which take account of the nature of the site and its surrounding environment. The principal contractor should also take steps to ensure that only those authorised to access the site do so.

109 Special consideration will be required for sites that have:

(a) rights of way through them;
(b) other work areas next to them, for example, a shop refurbishment in a shopping centre;
(c) occupied houses next to them, especially on new-build housing estates;
(d) children or vulnerable people nearby, for example, schools or care homes located near the site.

Providing welfare facilities

110 The principal contractor must ensure that suitable and sufficient welfare facilities are provided and maintained throughout the construction phase. What is suitable and sufficient will depend on the size and nature of the workforce involved in the project. Facilities must be made available before any construction work starts and should be maintained until the end of the project. See paragraphs 147–149.

111 The principal contractor should liaise with other contractors involved with the project to ensure appropriate welfare facilities are provided. Such liaison should continue for the duration of the construction phase and take account of any changes in the nature of the site which require, in turn, changes to the provision of welfare facilities.

Liaising with the principal designer

112 The principal contractor should liaise with the principal designer for the duration of the project. The early appointment of a principal contractor by the client will allow their construction expertise to be used from the earliest stages of designing and planning a project. They should also liaise with the principal designer throughout the construction phase on matters such as changes to the designs and the implications these changes may have for managing the safety and health risks.

113 Liaison should cover drawing together information the principal designer will need:

(a) to prepare the safety and health file (see sub-section 6.3); or
(b) that may affect the planning and management of the pre-construction phase. The pre-construction information is important for planning and managing this phase and the subsequent development of the construction phase plan (see sub-section 6.2). Sub-section 6.1 contains further guidance on pre-construction information, including the information principal contractors should consider providing to both the principal designer and the client.

Consult and engage with workers

114 The importance of involving workers in decisions about safety and health is a vital element to securing safety and health in the construction industry. A principal contractor has a duty under the *Occupational Safety and Health Act* to involve the workforce in matters of safety, health and welfare. This is in addition to the duty on all employers to consult with their employees (or their representatives) on safety and health matters under separate legislation (see the *Occupational Safety and Health (Safety and Health Committee) Regulations* and the *Occupational Safety and Health (Safety and Health Officer) Regulations*).

115 The principal contractor must consult and engage with the workforce to ensure that measures for their safety, health and welfare are developed, promoted and checked for effectiveness. Consultation must be carried out in a timely manner. If consultation has already taken place through a direct employer, it is not required again.

116 Effective worker involvement will develop from effective consultation and cooperation between the principal contractor and other contractors on site. The following techniques help in achieving this:

(a) commitment by managers to lead by example, to provide the resources and set the standards of safety and health expected;
(b) implementation of a range of ways to communicate, ensure cooperation with and consult the workforce in managing safety and health; and
(c) collecting evidence that worker involvement is effective and that cooperation between contractors is effective.

117 The construction workforce should also have access to, and be able to take copies of, any information the principal contractor has which may affect their safety, health and welfare. The exceptions to this are, any information:

(a) the disclosure of which would be against the interests of national security;
(b) which the principal contractor could not disclose without contravening a prohibition imposed by or under an enactment;
(c) relating specifically to an individual, unless that individual has consented to its being disclosed;
(d) the disclosure of which would, for reasons other than its effect on safety, health or welfare at work, cause substantial injury to the principal contractor's undertaking or, where the information was supplied to the principal contractor by another person, to the undertaking of that other person;
(e) obtained by the principal contractor for the purpose of bringing, prosecuting or defending any legal proceedings.

5.4 Who is a contractor

118 Anyone who directly employs or engages construction workers or manages construction is a contractor. Contractors include sub-contractors, any individual, sole trader, self-employed worker, or business that carries out, manages or controls construction work as part of their business. This also includes companies that use their own workforce to do construction work on their own premises. The duties on contractors apply whether the workers under their control are employees, self-employed or agency workers.

119 Where contractors are involved in design work, including for temporary works, they also have duties as designers (see paragraphs 60–73).

5.5 Why is a contractor important?

120 Contractors and the workers under their control are those most at risk of injury and ill health. They can influence the way work is carried out to secure their own safety and health and that of others affected. They have an important role in planning, managing and monitoring the work (in liaison with the principal contractor, where appropriate) to ensure risks are properly controlled. The key to this is the proper coordination of the work, underpinned by good communication and cooperation with others involved.

5.6 What should a contractor do?

121 Contractors have a number of specific duties. They must also comply with the requirements of paragraphs 38-51 as they apply to contractors. These include the requirements:

(a) on anyone appointing a designer or contractor (such as the contractor appointing a sub-contractor) to ensure the designer or contractor has the skills, knowledge and experience and, where relevant, organisational capability to carry out the work for which they are being appointed; and
(b) to cooperate with other duty holders.

Making clients aware of their duties

122 Contractors should not carry out any construction work on a project unless they are satisfied that the client is aware of the duties the client has under these guidelines. In cases where the contractor is the only one involved, they should liaise directly with the client to establish this. Liaison can be done as part of routine business during early meetings with the client to discuss the project. Contractors should make sure they have a sufficient knowledge of client duties as they affect the project so they can give proper advice. The level of advice will depend on the knowledge and experience of the client and the complexities of the project.

Planning, managing and monitoring construction work

General

123 Contractors are required to plan, manage and monitor the construction work under their control so it is carried out in a way that controls the risks to safety and health. The effort devoted to planning, managing and monitoring should be proportionate to the size and complexity of the project and the nature of risks involved.

124 On projects involving more than one contractor, this will involve the contractor coordinating the planning, management and monitoring of their own work with that of the principal contractor and other contractors, and where appropriate the principal designer. Such coordination could involve regular progress meetings with other duty holders to ensure that the contractor's arrangements for planning, managing and

monitoring their own work can feed into, and remain consistent with, the project-wide arrangements. For single contractor projects, the arrangements to plan, manage and monitor the construction phase will normally be simpler. Paragraphs 125–130 provide guidance in each circumstance.

Planning

125 In planning the work, the contractor must take into account the risks to those who may be affected, for example, members of the public and those carrying out the construction work. Planning should cover the same considerations as those for the principal contractor (see paragraphs 96- 97), including considering the risks and ensuring the measures needed to protect those affected are in place.

126 On projects involving more than one contractor, each contractor should plan their own work so it is consistent with the project-wide arrangements. Contractors should expect help from other duty holders, for example, the client who should provide the pre-construction information (Sub-section 6.1 gives more guidance on the provision of pre-construction information).

127 On single contractor projects, the contractor is responsible for planning the construction phase and for drawing up the construction phase plan before setting up the construction site. The client should provide any relevant pre-construction information they possess and the time and other resources to help the contractor do this. See paragraph 132 and sub-section 6.2 for further guidance on drawing up the construction phase plan.

Managing

128 The arrangements for managing construction work must take into account the same issues that principal contractors must consider (see paragraphs 98 -101).

Monitoring

129 The contractor should monitor their work to ensure that the safety and health precautions are appropriate, remain in place and are followed in practice. Effective monitoring by the contractor must address the same issues principal contractors must consider (see paragraph 102). This includes using a mix of measures to check performance and taking prompt action when issues arise.

130 On projects involving more than one contractor, as part of the duty to cooperate with other duty holders, the contractor should provide the principal contractor with any relevant information that stems from their own monitoring so the principal contractor can monitor the management of safety and health at a project-wide level.

Complying with directions and the construction phase plan

131 For projects involving more than one contractor, the contractor is required to comply with any directions to secure safety and health given to them by the principal designer or principal contractor. They are also required to comply with the parts of the construction phase plan that are relevant to their work, including the site rules (see sub-section 6.2).

Drawing up a construction phase plan

132 For single contractor projects, the contractor should ensure a construction phase plan is drawn up as soon as practicable **before** the construction site is set up. Guidance on contractors' duties in relation to the construction phase plan is set out in sub-section 6.2.

Appointing and employing workers

Appointing workers

133 When a contractor employs or appoints an individual to work on a construction site, they should make enquiries to make sure the individual:

(a) has the skills, knowledge, training and experience to carry out the work they will be employed to do in a way that secures safety and health for anyone working on the site; or
(b) is in the process of obtaining them. Paragraphs 134 -144 guidance on what a contractor should consider when appointing anyone who has gaps in the skills, knowledge or experience necessary for the work.

134 Sole reliance should not be placed on industry certification cards or similar being presented to them as evidence that a worker has the right qualities. Nationally recognised qualifications (such as Upper Secondary Vocational Education and National Occupational Skills Standard) can provide contractors with assurance that the holder has the skills, knowledge, training and experience to carry out the task(s) for which they are appointed. Contractors should recognise that training on its own is not enough. Newly trained individuals need to be supervised and given the opportunity to gain positive experience of working in a range of conditions.

135 When appointing individuals who may be skilled but who do not have any formal qualifications, contractors may need to assess them in the working environment.

Training workers

136 To establish whether training is necessary for any worker, a contractor should:

(a) assess the existing safety and health skills, knowledge, training and experience of their workers;
(b) compare these existing attributes with the range of skills, knowledge, training and experience they will need for the job; and
(c) identify any shortfall between (a) and (b). The difference between the two will be the 'necessary training'.

As a general rule, if the person being assessed demonstrates the required qualities, no further training should be needed.

137 This assessment should take account of the training required by other safety and health legislation (for example, sub-section 15(2)(c) and section 24 of *Occupational Safety and Health Act* and *Factory and Machinery (Building Operations and Work of Engineering Construction) (Safety) Regulations*) as well as that needed to meet the requirements of these guidelines.

138 Assessing training needs should be an ongoing process throughout the project. Further training may be required if:

(a) the risks to which people are exposed alter due to a change in their working tasks;
(b) new technology or equipment is introduced; or
(c) the system of work changes.

Skills can also decline if they are not used regularly. Particular attention should be paid to people who deputise for others on an occasional basis – they may need more frequent further training than those who do the work regularly.

139 Contractors should also consider 'softer skills', such as the ability to foresee risk, maintain sensitivity to risk, anticipate mistakes others might make and to communicate clearly, as well as the more technical skills workers require for their work.

Providing supervision

140 A contractor who employs workers or manages workers under their control must ensure that appropriate supervision is provided. The level of supervision provided will depend on the risks to safety and health involved, and the skills, knowledge, training and experience of the workers concerned.

141 Workers will require closer supervision if they are inexperienced or starting a new work activity. Other factors that should be considered when assessing the level of supervision needed include the level of individuals' safety awareness, education, physical agility, literacy and attitude. Even experienced workers may need an appropriate level of supervision if they do not have some or all of the skills, knowledge,

training and experience required for the job and the risks involved. Workers should always know how to get supervisory help, even when a supervisor is not present.

142 Supervisors are a vital part of effective management arrangements. Effective supervisors are those who have the skills, knowledge, training, experience and leadership qualities to suit the job in hand. Good communication and people management skills on site are important qualities for supervisors. Supervisors should possess competencies relating to *pre-job planning; organising of work flow; establishing effective communication; a knowledge of routine and non-routine work tasks; knowledge and application of effective team building skills; assessing employee stress levels; directing worker tasks; and responsibilities and disciplinary procedures and conflict resolution*[11].

143 The role of the supervisor may include team leading, briefing and carrying out toolbox talks. It may also include coaching and encouragement of individual workers and supporting other formal and informal means of engaging with workers. The supervisor has a particularly important part to play as a front-line decision maker in emergencies or when workers on site face immediate risks that may require work to stop (see paragraph 48).

Providing information and instructions

144 Contractors should provide their employees and workers under their control with the information and instructions they need to carry out their work without risk to safety and health. This should include:

(a) suitable site induction where this has not been provided by the principal contractor. In such cases, the guidance provided in paragraphs 106-107 for principal contractors is relevant to contractors;
(b) the procedures to be followed in the event of serious and imminent danger to safety and health. These should make clear that any worker exposed to any such danger should stop work immediately, report it to the contractor and go to a place of safety. The procedures should:
    (i) include details of the person to whom such instances should be reported and who has the authority to take whatever prompt action is needed;
    (ii) take account of the relevant requirements which set out provisions relating to emergency procedures, emergency routes and exits and fire detection and fire-fighting;
(c) information on the hazards on site relevant to their work (for example, site traffic), the risks associated with those hazards and the control measures put in place (for example, the arrangements for managing site traffic).

See paragraphs 49–51 for more guidance.

[11]Hardison *et. al*. *Identifying construction supervisor competencies for effective site safety*. Safety Science 65: 2014. pp. 45-53.

Preventing unauthorised access to the site

145 A contractor should not begin work on a construction site unless reasonable steps have been taken to prevent unauthorised access to the site. For projects involving more than one contractor that are:

(a) small and straightforward, this can be carried out via a simple notice or at an early meeting with the principal contractor (who is required to ensure reasonable steps are taken in this respect) before the contractor starts work on site;
(b) larger and more complex (for example, where different contractors are authorised to access different parts of the site), contractors should liaise with the principal contractor to make sure they understand which parts of the site they are authorised to access and when before they start work.

146 For projects involving only one contractor, the contractor must do whatever is proportionate to prevent unauthorised access before starting work on the site. In these circumstances, the guidance provided for principal contractors is also relevant for contractors (see paragraphs 108–109).

Providing welfare facilities

147 Contractors are required to provide welfare facilities which meet the minimum requirements set out in Appendix 5. This duty only extends to the provision of welfare facilities for the contractor's own employees who are working on a construction site or anyone else working under their control. Facilities must be made available before any construction work starts and should be maintained until the end of the project.

148 The duty is as *far as is reasonably practicable*, so contractors should do whatever is proportionate in providing the welfare facilities set out in Appendix 5.

149 On projects involving more than one contractor, meeting this duty will involve discussing and agreeing with the principal contractor who has a similar duty to provide welfare facilities (see paragraphs 110–111). For projects involving only one contractor, the contractor themselves must ensure that suitable welfare facilities are available.

6 The construction work information

6.1 The pre-construction information

150 This sub-chapter gives guidance on the requirements for pre-construction information and the actions on each duty holder. Appendix 3 shows how pre-construction information relates to and influences other types of information during a construction project involving more than one contractor.

What is pre-construction information?

151 Pre-construction information provides the safety and health information needed by:

(a) designers and contractors who are bidding for work on the project, or who have already been appointed to enable them to carry out their duties;
(b) principal designers and principal contractors in planning, managing, monitoring and coordinating the work of the project.

Pre-construction information provides a basis for the preparation of the construction phase plan (see sub-section 6.2). Some material may also be relevant to the preparation of the safety and health file (see sub-section 6.3).

152 Pre-construction information is defined as information about the project that is already in the client's possession or which is reasonably obtainable by or on behalf of the client. The information should:

(a) **be relevant to the particular project;**
(b) **have an appropriate level of detail; and**
(c) **be proportionate to the risks involved.**

153 Pre-construction information should be gathered and added to as the design process progresses and reflect new information about the safety and health risks and how they should be managed. Preliminary information gathered at the start of the project is unlikely to be sufficient.

154 The level of detail in the information should be appropriate and proportionate to the risks involved in the project. It should include the categories of information below where the topic is relevant to the work proposed.

Description of the project

(a) The project description and programme details, including

(i) key dates (including the planned start and finish of the construction phase); and

(ii) the minimum time to be allowed between the appointment of the principal contractor and instruction to commence work on the site;

(b) Details of the client, designers and other consultants;

(c) Whether or not the structure will be used as a workplace (in which case the finished design will need to take account of the relevant requirements of the *Factories and Machinery (Safety, Health and Welfare) Regulations*);

(d) The extent and location of existing records and plans;

Client's considerations and management requirements

(a) Arrangements for

(i) planning for and managing the construction work, including any safety and health goals for the project;

(ii) communication and liaison between the client and others;

(iii) security of the site;

(iv) welfare provisions;

(b) Requirements relating to the safety and health of the client's employees or customers or those involved in the project such as

(i) site hoarding, safety nets, peripheral nets and waste chutes requirements;

(ii) site transport arrangements or vehicle movement restrictions;

(iii) client permit-to-work systems

(iv) fire precautions;

(v) emergency procedures and means of escape;

(vi) 'no-go' areas or other authorisation requirements for those involved in the project;

(vii) any areas that the client has designated as confined spaces;

(viii) smoking and parking restrictions; and

(ix) the client's workplace details, for example construction board displaying information as follow, but not be limited to, the name of client, name of designer, name of contractor, site registration numbers and site coordinate in accordance with *MS 2558 Safety and Health Signage Used in the Workplace (Specification)*, *BS EN ISO 7010:2012+A5:2015 Graphical symbols – Safety colours and safety signs – Registered safety signs* or any equivalent standards;

Environmental restrictions and existing on-site risks

(a) Safety hazards, including
  (i) boundaries and access, including temporary access (for example, narrow streets, or lack of parking, turning or storage space);
  (ii) any restrictions on deliveries or waste collection or storage;
  (iii) adjacent land uses (for example, schools, railway lines or busy roads);
  (iv) the existing storage of hazardous materials;
  (v) the location of existing services, particularly those that are concealed (for example, water, electricity or gas);
  (vi) ground conditions, underground structures or water courses where this might affect the safe use of plant (for example, crane or piling rig) or the safety of groundwork;
  (vii) information about existing structures (for example, stability, structural form, fragile or hazardous materials, or anchorage points for fall arrest systems – particularly where demolition is involved);
  (viii) previous structural modifications, including weakening or strengthening of the structure – particularly where demolition is involved;
  (ix) fire damage, ground shrinkage, movement or poor maintenance that may have adversely affected the structure;
  (x) any difficulties relating to plant and equipment in the premises, such as overhead gantries whose height restricts access;
  (xi) safety and health information in earlier design, construction or 'as-built' material such as drawings (for example, details of pre-stresses or post-tensioned structures);
(b) Health hazards, including
  (i) asbestos, including results of surveys (particularly where demolition is involved);
  (ii) the existing storage of hazardous materials;
  (iii) contaminated land, including results of surveys;
  (iv) existing structures containing hazardous materials;
  (v) health risks arising from the client's activities.
  (vi) the safety and health hazards of the site, including design and construction hazards and how they will be addressed;

Significant design and construction hazards

(a) Significant design assumptions and suggested work methods, sequences or other control measures;
(b) Arrangements for the coordination of ongoing design work and handling design changes;
(c) Information on significant risks identified during design; and
(d) Materials requiring particular precautions.

The safety and health file

(e) Description of its format and any conditions relating to its content.

155 The information should be in a convenient form and be clear, concise and easily understandable to help other duty holders involved in the project to carry out their duties.

What should duty holders do?

The client

156 The client has the main duty for providing pre-construction information. They should provide this information as soon as practicable to each:

(a) designer (including the principal designer); and
(b) contractor (including the principal contractor)

being considered for appointment, or already appointed to the project. For projects involving more than one contractor, the client can expect help from the principal designer appointed for the project (see paragraphs 160–162) who should assist the client in drawing this information together and providing it to the designers and contractors involved. For single contractor projects, it is the client's responsibility alone – although they should liaise with the contractor (and any designer) they appoint to provide whatever information is needed.

157 The pre-construction information will evolve as the project progresses towards the construction phase. At first, drawing together the information should involve identifying relevant documents the client already holds. These might include a safety and health file produced as a result of earlier construction work, any surveys or assessments that have already been carried out (for example, asbestos surveys), structural drawings, etc. For projects involving more than one contractor, the client should pass this information to the principal designer as soon after their appointment as possible. In liaison with the principal designer, the client should then:

(a) assess the adequacy of this information to see if there are significant gaps;
(b) take reasonable steps to obtain the information needed to fill any gaps identified by, for example, commissioning relevant surveys; and
(c) then provide the information to every designer and contractor as soon as practicable.

158 The stage at which it is practicable to provide information will depend on a number of factors such as the scale and complexity of the project, when duty holders are appointed and when information is obtained. However, the client, together with the

principal designer, should also take account of when designers and contractors will need pre-construction information to enable them to carry out their duties. For example:

(a) designers or contractors who are seeking appointment for work on the project should have sufficient information made available to them at a time which allows them to put together a bid based on a clear understanding of the nature of the work involved;
(b) designers already appointed should be provided with sufficient information at a stage early enough to enable them to judge whether it is reasonably practicable to eliminate any foreseeable safety and health risks in the design process and, where it is not, the steps they should take to reduce or control the remaining risks. It may not be possible to provide this information all at once, in which case it should be provided as soon as it becomes available;
(c) contractors already appointed should be provided with the information they will need to plan, manage and monitor their work.

The designer

159 The designer should take account of the pre-construction information when preparing or modifying designs. They should be provided with this information by the client as soon as practicable (see paragraphs 156–158), assisted by the principal designer where appropriate (see paragraphs 11–13). The information should be:

(a) sufficient to enable the designer to judge whether it is reasonably practicable to eliminate foreseeable risks in their designs, and, where it is not, help identify the steps they should take to reduce and control the remaining risks; and
(b) provided at a stage where designers can take account of it – as early in the design process as is practicable.

The principal designer

160 The principal designer should help the client in providing the pre-construction information to each designer and contractor appointed, or being considered for appointment. The extent of the help required will depend on the nature of the project, the risks involved and the client's level of knowledge and experience of construction work. Taking this into account, the principal designer should agree with the client the level of support the client needs to ensure the information is made available when others need it.

161 Soon after their appointment, the principal designer should be provided with any relevant information the client already holds. This might include any safety and health file produced as a result of earlier construction work, any surveys that have already been carried out (for example, asbestos surveys), structural drawings, etc. The principal designer should then help the client to:

(a) assess the adequacy of this information to see if there are significant gaps; and
(b) take reasonable steps to obtain the information needed to fill the gaps identified by, for example, commissioning surveys.

162 As far as it is within their control, the principal designer should then work with the client to provide the information in a convenient form and as soon as practicable. The information provided to those seeking appointment should be sufficient and at the right time to allow them to put together a bid based on a clear understanding of the nature of the work involved. After their appointment, the stage at which information is provided will depend on factors such as the scale and complexity of the project, and when the information is obtained. However, the principal designer, together with the client, should also take account of when designers and contractors will need pre-construction information to enable them to carry out their duties. The client guidance (see paragraph 158) is also relevant for principal designers.

The principal contractor

163 The principal contractor has no specific duty in relation to pre-construction information. However, they should liaise with the principal designer for the duration of the principal designer's appointment and share any information relevant to the planning, management, monitoring or coordination of the pre-construction phase.

The contractor

164 The contractor has no specific duty in relation to pre-construction information. However, for projects involving more than one contractor, contractors should cooperate with the client, principal designer and principal contractor to ensure the pre-construction information is right.

6.2 The construction phase plan

165 This sub-section gives guidance on the requirements for the construction phase plan and the actions on each duty holder. Appendix 3 shows how the construction phase plan relates to and influences other types of information during a construction project involving more than one contractor.

166 For projects involving more than one contractor, the principal contractor should ensure the plan is drawn up during the pre-construction phase and **before** the construction site is set up. It should take into account the information the principal designer holds, such as the pre-construction information (see sub-section 6.1) and any information obtained from designers. During the construction phase, the principal contractor should ensure the plan is appropriately reviewed, updated and revised, so it remains effective.

167 For single contractor projects, the contractor should ensure the construction phase plan is drawn up. Guidance on this can be found in paragraph 132.

What is construction phase plan?

168 The success in improving the management of safety and health in construction will rely heavily on the effectiveness of the construction phase plan drafted for the project. A construction phase plan is a document that should record the:

(a) safety and health arrangements for the construction phase;
(b) site rules; and
(c) where relevant, specific measures concerning work that falls within one or more of the categories listed in Appendix 4.

169 The plan should record the arrangements for managing the significant safety and health risks associated with the construction phase of a project. It is the basis for communicating these arrangements to all those involved in the construction phase, so it should be easy to understand and as simple as possible, with relevant photographs, sketches, tables and graphs. The plan should be kept in a form that is reproducible and secure.

170 The construction phase plan will be evidence of the principal contractor's appreciation of the risks to safety and health to workers and all other persons at risk and their commitment to a management plan that facilitates coordination and cooperation.

171 The plan will be the first source of information that any officer of the Department of Occupational Safety and Health would wish to see on visiting a site or investigating an accident. The construction phase plan is likely to be vital evidence in the Department's decision-making process when considering enforcement action or prosecution. Equally, in pursuance of any civil proceedings for injury or death, the plan will be important evidence.

172 In considering what information is included, the emphasis is that it:

(a) is relevant to the project;
(b) has sufficient detail to clearly set out the arrangements, site rules and special measures needed to manage the construction phase; but
(c) is still proportionate to the scale and complexity of the project and the risks involved.

The plan should **not** include documents that get in the way of a clear understanding of what is needed to manage the construction phase, such as generic risk assessments, records of how decisions were reached or detailed safety method statements.

173 The following list of topics should be considered when drawing up the plan:

(a) a description of the project, that includes
  (i) name and address of the client;
  (ii) name and address of the principal designer;
  (iii) names and addresses of the designers;
  (iv) names and addresses of the contractors;
  (v) description of the project and identification of specific structures;
  (vi) project programme with key dates; and
  (vii) statement of the principal contractor's safety and health policy;
(b) the safety and health management of the work including:
  (i) management structure of the principal contractor and all other participants in the management structure, and for the project, identifying responsibilities generally but, in particular, with regard to safety and health;
  (ii) guidelines for monitoring and review of safety and health performance and safety and health targets for the project;
  (iii) arrangements for the site rules;
  (iv) arrangements to ensure cooperation between project team members and coordination of their work, for example regular site meetings and other means to promote cooperation and coordination between parties on the site;
  (v) arrangements for consultation and involving employees and workers;
  (vi) arrangements for disseminating design information as suggested in paragraphs 70 -71;
  (vii) arrangements for implementation and communication of design changes during the project;
  (viii) arrangements for selection and supervision of contractors;
  (ix) arrangements for the implementation of relevant legal requirements for safety and health information between all affected parties;
  (x) arrangements for site security;
  (xi) arrangements for site induction and specific trainings;
  (xii) arrangements for welfare facilities, as mentioned in Appendix 5, and first aid;
  (xiii) arrangements for reporting and investigation of accidents and other incidents including near misses;
  (xiv) arrangements for production and approval of risk assessments and method statements and systems of work; and
  (xv) arrangements for fire and emergency procedures;
(c) identification of significant site risks, the elimination or mitigation of any of the specific site risks listed in Appendix 4 where they are relevant to the work involved.

What should duty holders do?

The client

174 The client should ensure a construction phase plan is drawn up **before** the construction phase begins. The client is not required to check the details of the plan, as the principal contractor should take responsibility for the sufficiency of the construction phase plan. For projects involving more than one contractor, the principal contractor is responsible for drawing up the plan or for making arrangements for it to be drawn up (see paragraphs 180–184). For single contractor projects, it is the contractor who is responsible for ensuring that the plan is drawn up (see paragraphs 186–187).

175 On a large or complex project, it would be advisable for a client to make some enquiry into or inspection of the construction phase plan before construction work begins. As a minimum, a client should inspect the plan before construction begins to check if specific measures have been included for the construction site activities that are specifically identified in the *Factories and Machinery (Building Operations and Works of Engineering Construction) (Safety) Regulations* and that there will be adequate welfare facilities in accordance with Appendix 5. Such an inspection of the construction phase plan does not require any special expertise.

176 The client should ensure that the principal contractor (or, where relevant, the contractor) is provided with all the available relevant information they need to draw up the plan, for example, the pre-construction information (see sub-section 6.1).

177 The client should also ensure that:

(a) when it is drawn up, the plan adequately addresses the arrangements for managing the risks; and
(b) the principal contractor (or contractor) regularly reviews and revises the plan to ensure it takes account of any changes that occur as construction progresses and continues to be fit for purpose.

The designer

178 The designer has no specific duty in relation to the construction phase plan. However, the designer should take all reasonable steps to provide with the design sufficient information about aspects of the design to help contractors (including principal contractors) to comply with their duties. This should include information about the significant risks designers have been unable to eliminate through the design process and the steps designers have taken to reduce or control those risks. They should continue to cooperate with contractors and principal contractors as the construction phase progresses to ensure that they are kept up to date with any design changes.

The principal designer

179 The principal designer should help the principal contractor to prepare the construction phase plan by providing any relevant information they hold. This includes:

(a) the pre-construction information given to them by the client and which they have an important role in pulling together and providing (see sub-section 6.1); and
(b) any information given to them by designers about the risks that have not been eliminated through the design process and the steps taken to reduce or control those risks.

Before the start of the construction phase, the principal designer should regularly check that the principal contractor has the information needed to prepare the plan. They should continue to liaise with the principal contractor as the construction phase progresses to share any information relevant to the planning and management of the construction phase.

The principal contractor

180 For projects involving more than one contractor, the principal contractor should take the lead in preparing, reviewing, updating and revising the construction phase plan. They should draw up the plan or make arrangements for it to be drawn up during the pre-construction phase and **before** the construction site is set up.

181 On large projects especially, it is unlikely that a construction phase plan can be completed before setting up a construction site. Therefore, it is possible that there can be more than one construction phase plan for a project, viz. a construction phase plan is prepared according to project phase or construction work. As there is a need for the construction phase plan to be reviewed, updated and revised, the plan should therefore be as complete as possible and address activities that are still subject to completion of the design process or decisions concerning construction methods, at least in outline.

182 The principal contractor should expect help from both the client and principal designer in doing this. The client's duty is to ensure that the plan is drawn up and the principal designer's duty is to help the principal contractor by providing any relevant information they hold (see paragraph 179). This information should include:

(a) the pre-construction information that the client should provide to every designer and contractor involved in the project and which the principal designer will have been involved in preparing; and
(b) any information provided by designers about the risks that designers have been unable to eliminate through the design process and the steps they have taken to reduce or control them.

The principal contractor should also liaise with the contractors to ensure that the plan takes into account their views on the arrangements for managing the construction phase.

183 Where the plan includes **site rules**, the rules should cover (but not be limited to) topics such as personal protective equipment, parking, use of radios and mobile phones, smoking, restricted areas, hot works and emergency arrangements. The rules should be clear and easily understandable. They should be brought to the attention of everyone on site who should be expected to follow them. The principal contractor should also consider any special requirements, for example, it might be necessary to have translations of the site rules available.

184 The construction phase plan is **a management tool**, and therefore should be a changing and dynamic document. The principal contractor must ensure that the construction phase plan is appropriately reviewed, updated and revised from time to time. The plan is a working document and will need to be reviewed regularly enough to address significant changes to the risks involved in the work or in the effectiveness of the controls that have been put in place. This means that the principal contractor must monitor how effective the plan is in addressing identified risks and whether it is being implemented properly.

185 The need for revising and monitoring the construction phase plan is essential when the planned construction work has yet to be designed for later phases at the start of construction work. In any event, the construction phase plan should be routinely reviewed, revised and refined by the principal contractor or sole contractor as the construction work proceeds. Any change in the design, alternative construction techniques, unusual environmental factors and accidents should all be reasons for a principal contractor, or the sole contractor, to consider the adequacy and effectiveness of the construction phase plan. Ensuring the plan remains fit for purpose, the principal contractor should also involve co-operating with:

(a) the contractors who are most likely to see if the arrangements for controlling safety and health risks are working; and
(b) the principal designer and designers when changes in designs during the construction phase have implications for the plan.

The contractor

186 For projects involving more than one contractor, the contractor should follow the parts of the construction phase plan prepared by the principal contractor that are relevant to their work. The contractor should also liaise with the principal contractor to pass on their views on the effectiveness of the plan in managing the risks.

187 For single contractor projects, the contractor has the responsibility for ensuring that a construction phase plan is drawn up. They should either draw up a plan themselves, or make arrangements for it to be drawn up, as soon as practicable **before** setting up the construction site. In preparing the plan they should cooperate with the client and any designers involved in the project and take account of sources of relevant information such as the pre-construction information (see sub-section 6.1).

6.3 The safety and health file

188 This sub-section gives guidance on the preparation, provision and retention of a safety and health file and the actions on each duty holder. Appendix 3 shows how the safety and health file relates to and influences other types of information during a construction project involving more than one contractor.

189 **The safety and health file is only required for projects involving more than one contractor**. It should contain relevant information about the project which should be taken into account when any construction work is carried out on the building **after** the current project has finished. Information included should only be that which is needed to plan and carry out future work safely and without risks to health. What is likely to be needed for future construction work will be based on the judgement of the principal designer after the construction work has been completed, their detailed knowledge of the project and the receipt of information from the principal contractor.

190 The principal designer should prepare the file, and review, update and revise it as the project progresses. If their appointment continues to the end of the project they should also pass the completed file to the client to keep. If the principal designer's appointment finishes before the end of the project, the file should be passed to the principal contractor for the remainder of the project. The principal contractor should then take responsibility for reviewing, updating and revising it and passing it to the client when the project finishes.

What is the safety and health file?

191 The safety and health file is defined as a file appropriate to the characteristics of the project, containing relevant safety and health information to be taken into account during any subsequent project. **The file is only required for projects involving more than one contractor.**

192 The file should contain information about the current project likely to be needed to ensure safety and health during any subsequent work, such as maintenance, cleaning, refurbishment or demolition. When preparing the safety and health file, a non-exhaustive information on the following should be considered for inclusion:

(a) a brief description of the work carried out;
(b) historic site data;

(c) any hazards that have not been eliminated through the design and construction processes, and how they have been addressed, ground investigation reports and records (for example, surveys or other information concerning asbestos or contaminated land), site survey information and pre- and post-construction phase;
(d) investigation reports and records;
(e) photographic records of essential site elements;
(f) statement of design philosophy, key structural principles (for example, bracing, sources of substantial stored energy – including pre- or post-tensioned members) and safe working loads for floors and roofs, calculations and applicable design standards;
(g) drawings and plans used throughout the construction process, including drawings prepared for tender purposes;
(h) record drawings and plans of the completed structure showing, where appropriate, means of safe access to service voids;
(i) materials used in the structure identifying, in particular, hazardous materials (for example, lead paints and special coatings), including data sheets prepared and supplied by suppliers and information provided by the client;
(j) information regarding the handling and/or operation together with the relevant maintenance manuals, with particular regard to removal or dismantling of installed plant and equipment (for example, any special arrangements for lifting such equipment);
(k) safety and health information about equipment provided for cleaning or maintaining the structure;
(l) the results of proofing or load tests;
(m) the commissioning test results;
(n) the nature, location and markings of significant services, including underground cables; gas or fuel supply equipment; in-built safety features, for example emergency fire-fighting systems and fail-safe devices;
(o) information and as-built drawings of the building, its plant and equipment (for example, the means of safe access to and from service voids and fire doors).

193 There should be enough detail to allow the likely risks to be identified and addressed by those carrying out the work. However, the level of detail should be proportionate to the risks. The file should **not** include things that will be of no help when planning future construction work such as:

(a) pre-construction information;
(b) the construction phase plan;
(c) information provided to the contractors at tender stage;
(d) information provided by tenderers;
(e) contractual documents;
(f) construction costing;
(g) safety method statements;
(h) records, notes and minutes of meetings

(i) safety and health statistics and accident reports;
(j) notices to the authority and utilities.

Information should be in a convenient form, clear, concise and easily understandable.

194 It will not always be necessary to include all design information and 'as-built' records if such information is unlikely to have any consequences for ensuring the safety and health of any persons engaged in future construction work. Information in the file is not needed for the benefit of the occupants or persons using the facilities created by the project. The purpose of creating the file is for the benefit of designing and managing future projects involving construction work. For that reason, there should be a distinction in the documentation between the safety and health file and manuals or instructions for operational and maintenance matters.

195 When a new construction team has to plan and become involved in subsequent construction for a new project, risks to safety and health from the prior project will be such risks as are evident from a visual inspection and unquantifiable or unseen hazards. However, the information that will not be evident and should be included in the safety and health file will not only assist in identifying hazards for the new project but will contribute to saving costs.

What should duty holders do?

The Client

196 The client should ensure that the principal designer prepares the safety and health file for a project. A prudent client should require a warranty from the principal designer, or principal contractor is appropriate, that the safety and health file will comply with paragraph 192. As the project progresses, the client should ensure that the principal designer regularly updates, reviews and revises the safety and health file to take account of the work and any changes that have occurred. The client should be aware that if the principal designer's appointment finishes before the end of the project, the principal designer should pass the safety and health file to the principal contractor, who then should take on the responsibility for the file.

197 Once the project is finished, the client should expect the principal designer to pass them the safety and health file. In cases where the principal designer has left the project before it finishes, it will be for the principal contractor to pass the file to the client.

198 The client should then retain the file and ensure it is available to anyone who may need it for as long as it is relevant – normally the lifetime of the building – to enable them to comply with safety and health requirements during any subsequent project. It can be kept electronically, on paper, on film, or any other durable form.

199 If a client disposes of their interest in the building, they should give the file to the individual or organisation who takes on the client duties and ensure that the new client is aware of the nature and purpose of the file. If they sell part of a building, any relevant information in the file should be passed or copied to the new owner. If the client leases out all or part of the building, arrangements should be made for the file to be made available to leaseholders. If the leaseholder acts as a client for a future construction project, the leaseholder and the original client should arrange for the file to be made available to the new principal designer.

The designer

200 Where it is not possible to eliminate safety and health risks when preparing or modifying designs, designers should ensure appropriate information is included in the safety and health file about the reasonably practicable steps they have taken to reduce or control those risks. This will involve liaising with:

(a) the principal designer, in helping them carry out their duty to prepare, update, review and revise the safety and health file. This should continue for as long as the principal designer's appointment on the project lasts; or
(b) the principal contractor, where design work is carried out after the principal designer's appointment has finished and where changes need to be made to the safety and health file. In these circumstances, it will be the principal contractor's duty to make those changes, but the designer should ensure that the principal contractor has the appropriate information to update the file.

This information should be provided to the principal designer and principal contractor as early as possible before the designer's work ends on the project.

The principal designer

201 The principal designer should prepare the safety and health file. They are accountable to the client and should liaise closely to agree the structure and content of the file as soon as practicable after appointment. In preparing the file, the principal designer should expect the client to provide any safety and health file that may exist from an earlier project.

202 The principal designer should also cooperate with the rest of the project team and should expect their cooperation in return. Cooperation with the principal contractor is particularly important in agreeing the structure and content of the information included in the file. Liaison with designers and other contractors is also important. They may hold information that is useful for the safety and health file, which may be difficult to obtain after they have left the project.

203 The principal designer, in cooperation with other members of the project team, should also ensure that the file is appropriately updated, reviewed and revised to ensure it takes account of any changes that occur as the project progresses.

204 The principal designer should pass the updated file to the client at the end of the project. In doing this, they should ensure the client understands the structure and content of the file and its significance for any subsequent project. If the principal designer's appointment finishes before the end of the project, they should pass the file to the principal contractor who should then take on responsibility for it. In doing this, the principal designer should ensure the principal contractor is aware of any outstanding issues that may need to be taken into account when reviewing, updating and revising the file.

The principal contractor

205 For the duration of the principal designer's appointment, the principal contractor plays a secondary role in ensuring the safety and health file is fit for purpose. They should provide the principal designer with any relevant information that needs to be included in the safety and health file.

206 Where the principal designer's appointment finishes before the end of the project, the principal contractor should take on responsibility for ensuring that the file is reviewed, updated and revised for the remainder of the project. At the end of the project the principal contractor should pass the file to the client. In doing this, they should ensure the client understands the structure and content of the file and its significance for any subsequent project.

The contractor

207 The contractor has no specific duties placed on them in relation to the safety and health file.

7 References

Managing Health and Safety in Construction, Construction (Design and Management) Regulations 2015, Guidance on Regulations, Health and Safety Executive, United Kingdom, 2015.

Workplace Safety and Health Guidelines, Design for Safety, WSH Council, Singapore, 2016.

Work Health and Safety (Safe Design of Structures) Code of Practice 2015, Safe Work, Australia, 2015.

Note: These guidelines have made reference to various published laws, textbooks, guidances, guidelines, articles and notes. It is highly recommended to the reader to sought references used as cited in this section. In addition to these, there are other notable references that the reader may find it useful, such as, *Introduction to Health and Safety in Construction* by Phil Hughes and Ed Ferret, *CDM Regulations 2015 Explained* by Raymond Joyce, *ICE Manual of Health and Safety in Construction* by Ciaran McAleenan and David A. O. Oloke and *Practical Guide to Using the CDM Regulations 2015, Teamwork not Paperwork* by Tony Putsman and Paul McArthur.

Appendix

Appendix 1. General principles of prevention

1 These principles apply to all industries, including construction. They provide a framework to identify and implement measures to control risks on a construction project.

2 The general principles of prevention are to:

(a) avoid risks;
(b) evaluate the risks which cannot be avoided;
(c) combat the risks at source;
(d) adapt the work to the individual, especially regarding the design of workplaces, the choice of work equipment and the choice of working and production methods, with a view, in particular, to alleviating monotonous work, work at a predetermined work rate and to reducing their effect on health;
(e) adapt to technical progress;
(f) replace the dangerous by the non-dangerous or the less dangerous;
(g) develop a coherent overall prevention policy which covers technology, organisation of work, working conditions, social relationships and the influence of factors relating to the working environment;
(h) give collective protective measures priority over individual protective measures; and
(i) give appropriate instructions to employees.

Appendix 2. Cooperation, communication and coordination between duty holders in various contractual arrangements.

1 Some design tasks, although related, may be controlled by different parties due to contractual arrangements. For a traditional project delivery model — where the client directly engages a designer to undertake detailed design — the project safety decisions during the design stage are the result of collaboration between the designer and the client. However, in a design and construct or a collaborative project delivery model, the primary collaboration will be between the constructor and the client, with participation of the designer subject to the terms of their engagement. Figures 1-5 show some of the often complex arrangements established for construction projects, and how the parties can cooperate, communicate and coordinate with each other.

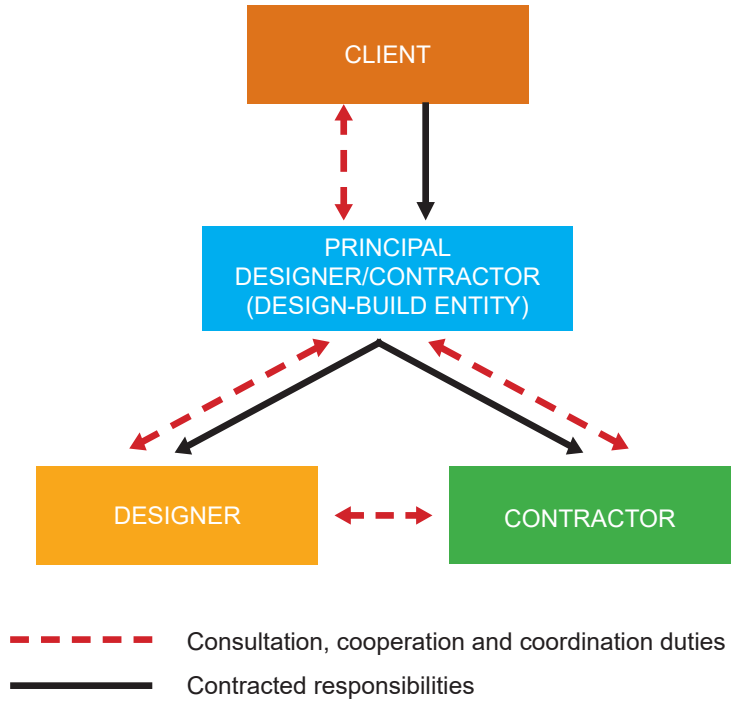


Figure 1. This model represents design and build arrangements where all parties are contractually bound.

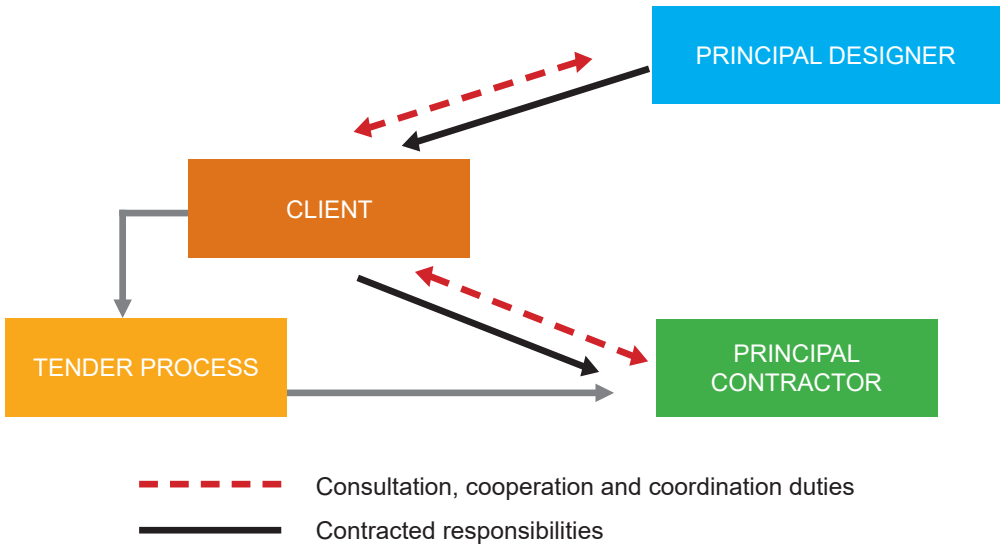


Figure 2. This model may apply where design and construction are carried out separately, for example when a client is seeking to finance construction at a later date.

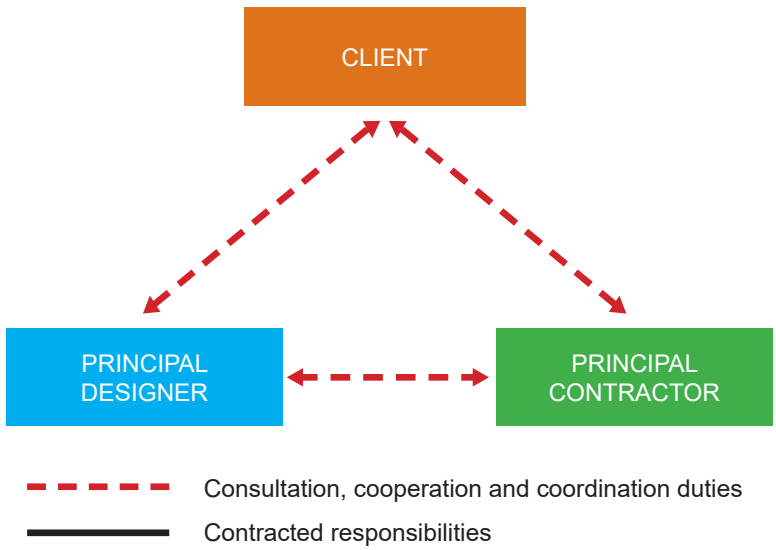


Figure 3. This model may apply where design and construction activities are integrated such as a domestic residence or apartment complex.

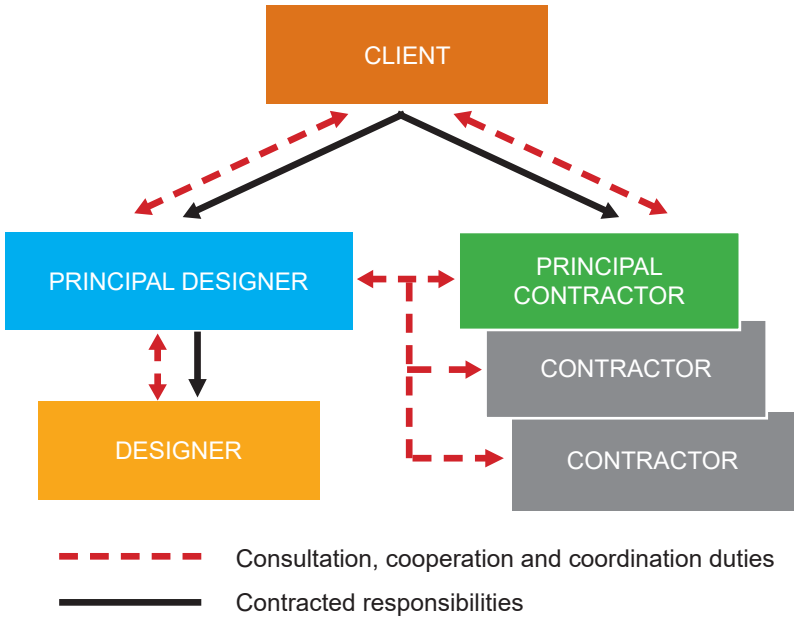


Figure 4. This model may apply to a complex construction project such as a hospital or airport terminal where specialist contractors carry out large parts of the project.

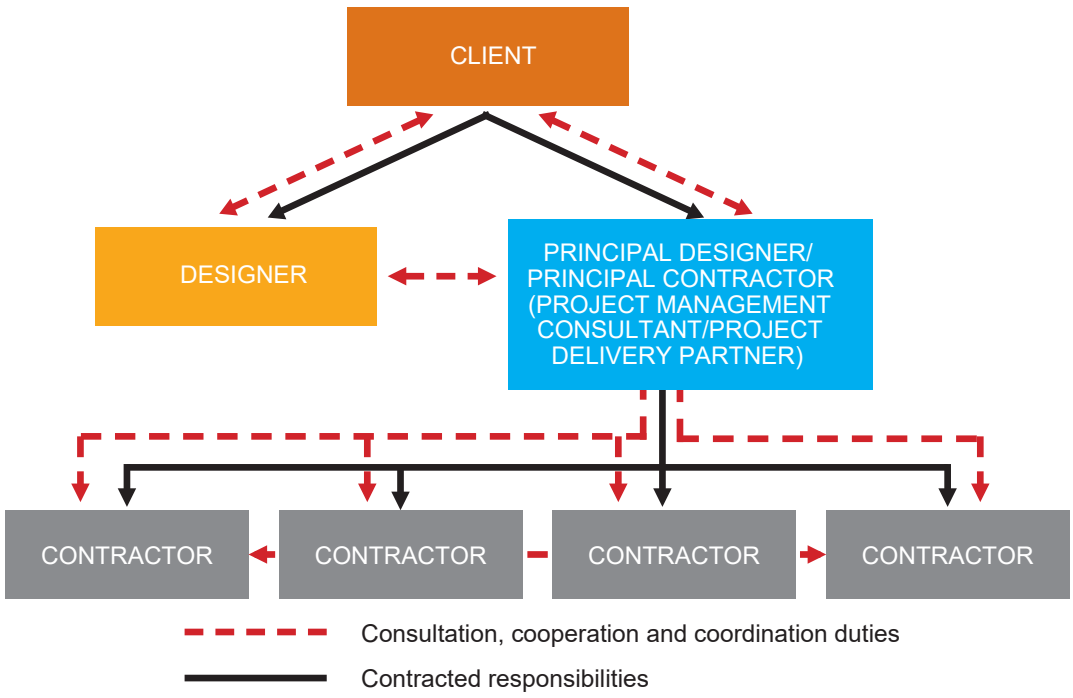
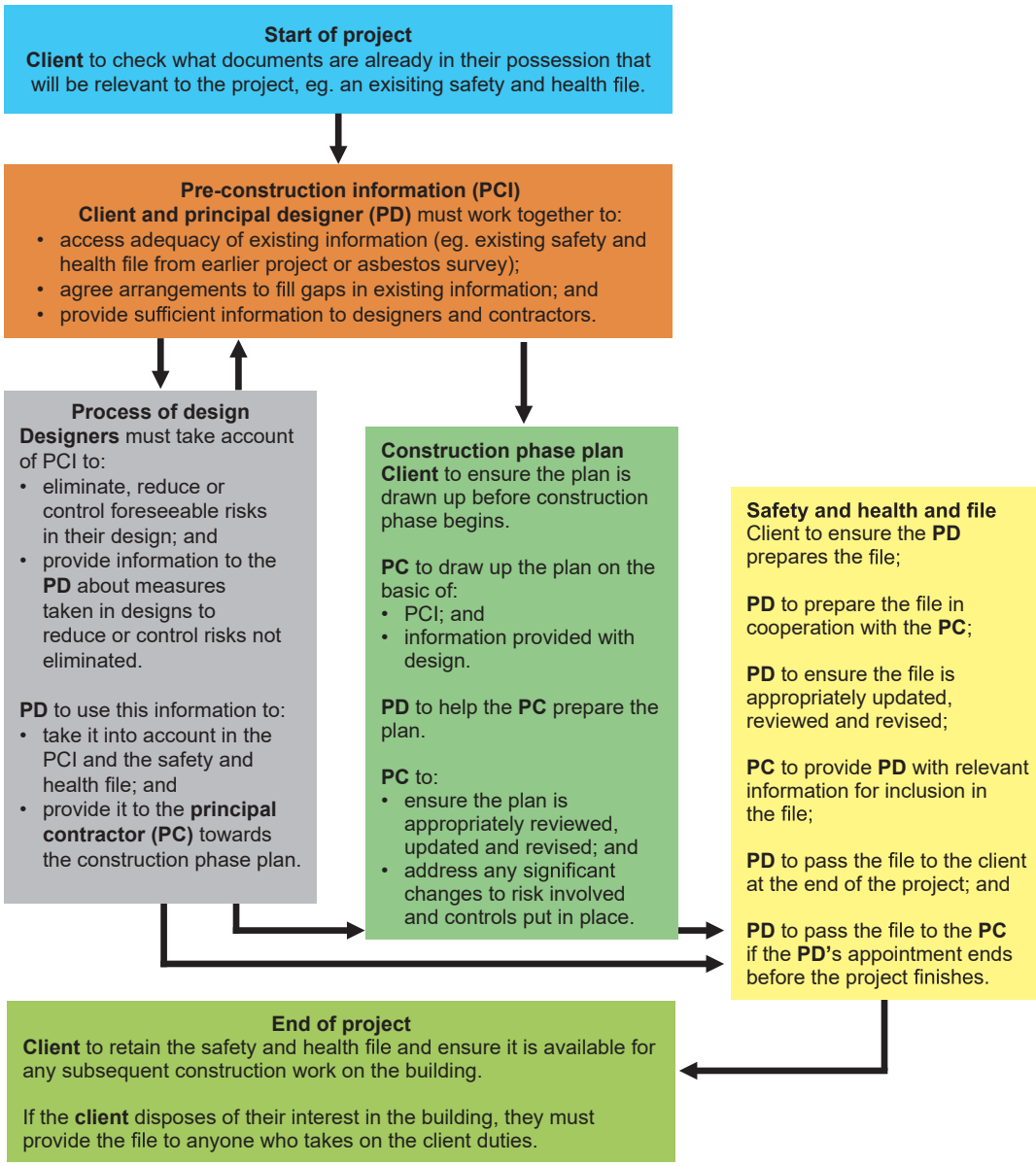


Figure 5. This model may apply to large construction projects where the management role is carried out by a specialist construction manager.

Appendix 3. How different types of information relate to and influence each other in a construction project involving more than one contractor: A summary

Note: This design show how the various types of information relate to each other and influence the content of other types of information during the construction the arrows the possible different flows of information. So far example as pre-construction information is developed, the influences the risk designers should consider and the information they provide about how their designs reduce or control foreseeable risks. In turn, this may influence further development of the pre-construction information, as well as the construction phase plan and the safety and health file.



Appendix 4. Work involving particular risks

1 Work which puts workers at risk of burial under earthfalls, engulfment in swampland or falling from a height, where the risk is particularly aggravated by the nature of the work or processes used or by the environment at the place of work or site.

2 Work which puts workers at risk from chemical or biological substances constituting a particular danger to the safety or health of workers or involving a legal requirement for health monitoring.

3 Work with ionizing radiation.

4 Work near high voltage power lines.

5 Work exposing workers to the risk of drowning.

6 Work on wells, underground earthworks and tunnels.

7 Work carried out by divers having a system of air supply.

8 Work carried out by workers in caissons with a compressed air atmosphere.

9 Work involving the use of explosives.

10 Work involving the assembly or dismantling of heavy prefabricated components.

Appendix 5. Minimum welfare facilities required for construction sites

Sanitary conveniences

1 Suitable and sufficient sanitary conveniences must be provided or made available at readily accessible places.

2 Sanitary conveniences must be arranged as follows[12]:

(a) where 25 males or less: one water closet or latrine and four feet of urinal;
(b) where more than 25 males but less than 50: two water closets or latrines and eight feet of urinal;
(c) where more than 50 males but less than 100: three water closets or latrines and 13 feet of urinal;
(d) where more than 100 males: three water closets or latrines and 13 feet of urinal and an additional water closet or latrine and additional four feet of urinal are provided for every 50 males in excess;
(e) where 20 females or less: one water closet;
(f) where more than 20 females: one water closet and one additional water closet is provided for every 20 females in excess.

If this is not possible, a ratio of one toilet to 7 persons is recommended[13].

3 Closets and urinals in the interior of buildings must be of the water-flush type[14].

4 Where conditions require, running water, connected to mains water and drainage systems, must be provided for every toilet facility[15].

5 Toilets facilities must not communicate directly with the actual workplace but must open only on to corridors, halls, landings or courtyards[16].

6 So far as is reasonably practicable, rooms containing sanitary conveniences must be adequately ventilated and lit[17].

7 So far as is reasonably practicable, sanitary conveniences and the rooms containing them must be kept in a clean and orderly condition.

8 Separate rooms containing sanitary conveniences must be provided for men and women[18].

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[12]Reg. 33(b), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[13]*BS6465-1:2006, Sanitary installations. Code of practice for the design of sanitary facilities and scales of provision of sanitary and associated appliances*
[14]Reg. 33(c), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[15]Reg. 33(d), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[16]Reg. 33(e), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[17]Reg. 33(f), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[18]Reg. 37(a), *Factories and Machinery (Safety, Health and Welfare) Regulations*

Washing facilities

9 Suitable and sufficient washing facilities, including showers if required by the nature of the work or for health reasons, must, so far as is reasonably practicable, be provided or made available at readily accessible places.

10 Washing facility must comprise at least one wash-hand basin or equivalent trough of ample size, having a smooth impervious surface and fitted with a waste pipe and plug for every 20 or part of 20 persons employed at any one time[19].

11 Washing facilities must be provided –

(a) in the immediate vicinity of every sanitary convenience, whether or not also provided elsewhere; and
(b) in the vicinity of any changing rooms required by paragraphs 21 to 25, whether or not provided elsewhere.

12 Washing facilities must include –

(a) a supply of clean water (which must be running water so far as is reasonably practicable);
(b) soap or other suitable means of cleaning; and
(c) towels or other suitable means of drying[20].

13 The floors at all washing facilities must be made of impervious material and shall be properly graded for effective drainage[21].

14 Rooms containing washing facilities must be sufficiently ventilated and lit.

15 Washing facilities and the rooms containing them must be kept in a clean and orderly condition.

16 Subject to sub-paragraph 17, separate washing facilities must be provided for men and women, except where they are provided in a room the door of which is capable of being secured from inside and the facilities in each room are intended to be used by only one person at a time.

17 Sub-paragraph 16 does not apply to facilities which are provided for washing hands, forearms and the face only.

[19]Reg. 36(a), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[20]Reg. 36(a), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[21]Reg. 36(b), *Factories and Machinery (Safety, Health and Welfare) Regulations*

Drinking water

18 An adequate supply of clean, safe and wholesome drinking water must be provided or made available at readily accessible and suitable places and must be from a piped main or some other source approved by the Inspector[22].

19 Where necessary for reasons of safety and health (for example, if the supply of drinking water other than the piped supply), every supply of drinking water must be conspicuously marked by an appropriate sign to indicate that the water is safe for drinking and such supply be renewed daily and all necessary precautions taken to preserve the water and vessels from contamination[23].

20 Where a supply of drinking water is provided, a sufficient cups or other drinking vessels must also be provided, unless the supply of drinking water is in a jet from which a person can drink easily. The use of common drinking cups must be prohibited[24].

Changing rooms and lockers

21 Suitable and sufficient changing rooms must be provided or made available at readily accessible places if a worker –

(a) has to wear special clothing (due to exposure to contamination with poisonous, infectious, irritating or radioactive substances) for the purposes of construction work[25]; and
(b) cannot, for reasons of health or propriety, be expected to change elsewhere.

22 Where necessary for reasons of propriety, there must be separate changing rooms for, or separate use of rooms by, men and women.

23 No such contaminated special clothing shall be worn in premises or areas where meals are being taken[26].

24 Changing rooms must –

(a) be provided with seating; and
(b) include, where necessary, facilities to enable a person to wash and dry any special clothing and any personal clothing or effects[27].

[22]Reg. 34(a), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[23]Reg. 34(b), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[24]Regs. 34(c) & (d), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[25]Reg. 33(1)(b), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[26]Reg. 33(1)(c), *Factories and Machinery (Safety, Health and Welfare) Regulations*
[27]Reg. 33(2), *Factories and Machinery (Safety, Health and Welfare) Regulations*

25 Suitable and sufficient facilities must, where necessary, be provided or made available at readily accessible places to enable persons to lock away –

(a) any special clothing which is not taken home;
(b) their own clothing which is not worn during working hours[28]; and
(c) their personal effects.

Facilities for rest

26 Suitable and sufficient rest rooms or rest areas must be provided or made available at readily accessible places.

27 Rest rooms and rest areas must –

(a) be equipped with an adequate number of tables and adequate seating with backs for the number of persons at work likely to use them at any one time;
(b) where necessary, include suitable facilities for any woman at work who is pregnant or who is a nursing mother to rest lying down;
(c) include suitable arrangements to ensure that meals can be prepared and eaten;
(d) include the means for boiling water; and
(e) be maintained at an appropriate temperature.

[28]Reg. 33(1)(a), *Factories and Machinery (Safety, Health and Welfare) Regulations*