Module 010: Occupational Health Safety and Environment in Construction

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Level: A +B
CPD Points: 5.0
Guided learning hours: 50

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Aim and purpose

The aim of this course is to introduce candidates to and equipping them with basic requirements and expectation of management health and safety in the construction industry.

Learning outcomes

On completion of this module a learner should:
1. Demonstrate the basic understanding of existing legislation relative to occupation health and safety.
2. Demonstrate understanding of roles of various key stakeholders in the occupational health and safety on the project.
3. Demonstrate understanding Project planning and risk management relative to health and safety.
Module Overview

Health and safety is the broader concept from project conceptualisation to closeout. Ideally the training areas for health and safety should be managed in stages addressing individual role players. However, since the implementation of the project is done by the contractor, the implementation of health and safety on every project is also done by the contractor. The contractor therefore needs to know the roles of each player on the project in order to manage their expectations.

This module helps delegates to understand the basics of the health and safety requirement on the project. Therefore in this module, delegates will explore the roles of and management skills expected in managing OHS on the project. The roles and involvement of the players throughout the project life cycle will help the contract appreciate the importance attached to OHS. The Module materials is adapted from CDM2007 and the CR2014 of South Africa.

Designed for: the material is designed for clients, designers, contractors, and sub-contractors. The material is a basic information session for the small to medium construction companies and their employers, Active participants on a project team, especially those who have not yet been exposed to health and safety requirements and risk management, but can see themselves moving in that direction are welcome.
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1.0 LEGISLATIVE FRAMEWORK

1.1 CONSTITUTIONAL PROVISIONS FOR OCCUPATIONAL SAFETY AND HEALTH
There is no express provision made in the Constitution of Zambia for the safety and health of workers. However, under Part 3 of the Constitution which addresses the “Protection of the Fundamental Rights and Freedoms of the Individual”, issues of public health and public safety have been alluded to in general terms. Further, Article 14 provides for the protection of individuals from forced labour.

The only provision in the Constitution that is closely related to occupational safety and health is clause (1) of Article 24 which states that “A young person shall not be employed and shall in no case be caused or permitted to engage in any occupation or employment which would prejudice his health or education or interfere with his physical, mental or moral development…”.

1.2 MAIN LAWS ON OCCUPATIONAL HEALTH AND SAFETY

1.2.1 The Factories Act, Chapter 441
This Act generally provides for the regulation of the conditions of employment in factories and other places as regards to the safety, health and welfare of persons employed therein. The Act specifically provides for: supervision of safety and health in factories; inspection of factories and certain plant and machinery by inspectors from the Occupational Safety and Health Services department; and reporting and investigation of occupational accidents and diseases. Further, there are regulations under the Act that cover safety and health in the construction sector, electrical installations and woodworking machinery among others. Employers and employees are assigned various duties in various sections of the Act.

The Act’s scope includes factories belonging to or in occupation of the Republic and building operations and works of engineering construction undertaken by or on behalf of the Republic. The mining sector and explosives manufacturing/assembling factories are excluded from its coverage because these sectors are covered by other Acts of Parliament. Because of the Act’s limited interpretation of a factory, a number of sectors such as the agricultural and service sectors are either partially covered or not covered at all.

1.2.2 Main Regulations under the Factories Act

### Table 1.1 Main Regulations under the Factories Act

<table>
<thead>
<tr>
<th>Regulations</th>
<th>What Regulations Provide For</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Construction (Safety and Health) Regulations</td>
<td>These regulations provide for the regulation of safety and health in building operations and works of engineering construction.</td>
</tr>
<tr>
<td>The Factories (Electricity) Regulations</td>
<td>These regulations provide for the regulation of safety and health in the generation, transformation, distribution and use of electrical energy in any undertaking.</td>
</tr>
<tr>
<td>The Woodworking Machinery Regulations</td>
<td>These regulations apply to the safe use of woodworking machines in any undertaking.</td>
</tr>
<tr>
<td>The Factories (Benzene) Regulations</td>
<td>These regulations provide for safety and health in the use of benzene.</td>
</tr>
<tr>
<td>The Factories (First-Aid) (Prescribed Standard of Training) Regulations</td>
<td>These regulations provide for the standard of training in first-aid treatment for first-aiders.</td>
</tr>
<tr>
<td>The First-Aid Boxes Regulations</td>
<td>These regulations provide for the regulation of the contents of first-aid boxes or cases.</td>
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</tbody>
</table>

**Source:** ILO (2012) - Zambia country profile on occupational safety and health 2012

Several other minor regulations dealing with various issues including prescribed forms, particulars and other documentation exist under the Factories Act.

1.2.3 The Mining Regulations

These regulations provide for the supervision of safety and health in mines, inspection of mines by inspectors from Mines Safety department (MSD), reporting and investigation of occupational accidents, and the compilation and publication of statistics on accidents, occupational diseases and dangerous occurrences. These regulations also provide for the responsibilities, duties and conduct of mine owners/employers and workers.

The Mining Regulations are divided into fifteen parts, namely:

- Part I – Preliminary; Part II – Responsibility in Mines; Part III – Powers of Inspector;
- Part IV – General duties and Conduct; Part V – Mine Plans; Part VI – Surface Protection;
- Part VII – Protection in Working Places; Part VIII – Outlets, Ladder ways and Travelling Ways Underground; Part IX – Ventilation and Air Pollution; Part x – Transport and Tramming by Vehicles; Part XI – Lighting; Part XII – First-Aid and Fire Fighting; Part XIII – Machinery; Part XIV – Winding; Part XV – Steam Boilers, Steam Containers and Steam and Air Receivers; Part xVI – Accidents; Part xVII – Lifts; Part XVIII – Buildings and Construction; Part XIX – Electricity; Part XX – diesel Units and Fuel Storage; and Part XXI – Miscellaneous.

The principal act under which the Mining Regulations fall is the Mines and Minerals Act. The application of the Mines and Minerals Act is specific to the mining sector, including quarrying.
1.2.4 The Occupational Health and Safety Act, 2010

This Act provides for the following: establishment of the Occupational Health and Safety Institute and its functions; establishment of health and safety committees at workplaces and for the health, safety and welfare of persons at work; the duties of manufacturers, importers and suppliers of articles, devices, items and substances for use at work; the protection of persons, other than persons at work, against risks to health or safety arising from, or in connection with, the activities of persons at work; and related matters.

The Occupational Health and Safety (OHS) Act is divided into seven parts, namely:

a) Part I – Preliminary;
b) Part II – The Occupational Health and Safety Institute;
c) Part III – Health and Safety Committees;
d) Part IV – Health and Safe Workplaces;
e) Part V – Enforcement Provisions;
f) Part VI – The Occupational Health and Safety Services; and
g) Part VII – General Provisions.

In this Act, duties of employers, employees and other persons with a part in occupational safety and health have been spelt out in parts III and IV of the Act (see Boxes 1.1 and 1.2 below).

BOX 1.1: DUTIES OF EMPLOYERS

- Establish a health and safety committee where he/she employees ten or more persons;
- Ensure the health, safety and welfare of the employees;
- Place and maintain an employee in an occupational environment adapted to the employee’s physical, physiological and psychological ability;
- Provide plant and systems of work that are safe and without any risks to human health and maintain them in that condition;
- Ensure that articles, devices, items and substances provided for the use of employees at a workplace are used, handled, stored and transported in a manner that is safe and without any risk to the health and safety of the employees at the workplace;
- Provide such information, instruction, training and supervision as is necessary to ensure the health and safety of employees at their workplace;
- Maintain a workplace under the employer’s control, in a condition that is safe and without any risk to the health and safety of employees at their workplace;
- Provide and maintain the means of access to, or exit from, a workplace that are safe and without any risk to the health and safety of employees using it;
- Provide and maintain a working environment for the employees that is safe and without any risks to their health and safety, and which is adequate as regards facilities and arrangements for their welfare at the workplace;
- Inform and consult with a health and safety representative on various OHS issues;
- Provide for measures to deal with emergencies and accidents, including adequate first-aid arrangements;
- Provide at the employer’s expense all appropriate protective clothing and equipment to be used in the workplace by employees, who in the course of employment, are likely to be exposed to the risk of bodily injuries, and adequate instructions in the use of such protective clothing or equipment.

BOX 1.2: DUTIES OF EMPLOYEES

- Take reasonable care of the employee’s own health and safety and that of other persons who may be affected by the employee’s acts or omissions at the workplace;
- Not to operate any machine or engage in a process which is unsafe or is an imminent risk to the employee’s own health or safety and that of others;
- Cooperate with the employer or any other person in relation to any duty imposed on the employer or that other person, so far as it’s necessary to enable that duty or requirement to be performed or complied with;
- Where an employee has reasonable grounds to believe that any item, device, article, plant or substance, condition or aspect of the workplace is or may be dangerous to the employees’ occupational health or safety at or near the workplace, the employee shall immediately inform the employer and the committee or health and safety representative.


1.2.5 The Ionizing Radiation Act, Chapter 311

The purpose of the Ionizing Radiation Act is to protect the public and workers from dangers arising from the use of devices or materials capable of producing ionising radiation. The Act stipulates the Occupational Exposure Limits (OELs) for various categories of workers. It also regulates the possession, sell, disposal, importation and exportation of radioactive materials. Furthermore, it regulates the installation, servicing and maintenance of radioactive devices and radiation premises. This Act also requires that those who venture into prospecting and/or mining of radioactive minerals apply for a license prior to commencement of operations.

To operationalise its provisions, the Act has provided for the appointment of a Board and Radiation Protection Officers under a Radiation Protection Authority (RPA).

1.2.6 The Workers’ Compensation Act, Chapter 271 (Act No. 10 of 1999)

This Act provides for the establishment and administration of a Fund for the compensation of workers who are disabled by accidents or diseases contracted by such workers in the course of their employment. It also provides for the payment of compensation to dependants of workers who die as a result of such accidents or diseases, and for the grant of pensions and allowances to certain dependants of workers who being in receipt of pensions for such disablement die from causes not connected with such accidents or diseases. The Act further provides for the payment of contributions to such a Fund by employers.

Regulations established under the Act include among other things, a schedule of occupational diseases and employers’ register of accidents to workers.

The Act excludes members of the public service and the Zambia defence and Security Forces/Services from its application.

1.3 RELATED OCCUPATIONAL SAFETY AND HEALTH LAWS
1.3.1 The Explosives Act, Chapter 115
The purpose of this Act is to regulate the manufacture, use, possession, storage, importation, exportation, transportation and destruction of explosives. For the administration of the Act, provision has been made for appointment of Inspectors of Explosives who ought to be public officers. The Act further empowers the Inspectors of Mines and Inspectors of Machinery, from Mines Safety department, to carry out the duties of Inspectors of Explosives in explosives factories. Various parts of the Explosives Regulations, formulated under this Act, deal with various aspects of safety. Part 16 in particular deals entirely with the health, safety and welfare of persons employed in explosives factories. This part regulates, among other things, welding operations, provision of sanitary conveniences, provision of change house accommodation and personal protective equipment and clothing.

The Explosives Act’s application does not include the Zambia defense and Security Forces.

1.3.2 The Public Health Act, Chapter 295
This Act provides for the prevention and suppression of diseases and generally regulates all matters connected with public health in Zambia. Some of the issues dealt with in the Act include the provision of sanitary conveniences in various workplaces. Further, some of the regulations under this Act deal with the control of habitation in factories, workshops and trade premises and their application extend to most of the Local Authorities in the country. Regulations dealing with the handling of meat products prescribe periodic medical examinations for those who work in this sector.

To enforce its provisions, the Act has provided for the appointment of Health Inspectors in the employment of the Government or any Local Authority. A Health Inspector also includes any person appointed by the director of Medical Services to act as such within the district of one or more Local Authorities.

1.3.3 The Environmental Management Act, No. 12 of 2011
The Environmental Management Act provides for the protection of the environment and the control of pollution. Among the key issues addressed in this Act are those to do with air pollution, waste management, pesticides and toxic substances, noise and ionizing radiation. Apart from being addressed in the main text of the Act, some of these issues have also been addressed in regulations specific to them. Some of the regulations, such as the ones on pesticides and toxic substances, address safety and health matters including use of personal protective equipment and clothing in some detail.

To administer its provisions, the Act has provided for the establishment of an inspectorate and the appointment of inspectors to man the inspectorate.

1.3.4 The Employment Act, Chapter 268
This Act relates to the employment of persons and makes provision for the engagement of persons on contracts of service and also provides for the form of and enforcement of contracts of service. The Act further provides for the protection of wages of employees and the regulation of employment agencies.
Some of the safety, health and welfare related issues addressed in this Act include: medical examination of a worker to determine his/her fitness to undertake the work which he/she has been contracted to do; provision of an adequate supply of wholesome drinking water; continuous payment of wages, for up to 26 days, to a worker who becomes temporarily incapacitated in consequence of sickness or accident not occasioned by his own default.

Persons employed in the defense and Security Forces (other than locally engaged civilian employees) are exempted from the coverage of this Act.

1.3.5 The Industrial and Labour Relations Act, Chapter 269
This Act provides for the formation of workers and employers representative organizations and the constitution of the Tripartite Consultative Labour Council (TCLC). The TCLC provides a national forum for employers, workers and government to discuss and resolve labour issues, including occupational safety and health, which may be affecting the labour market. The Act also provides for the formulation of recognition and collective agreements, settlement of disputes, strikes and lockouts. In the collective agreements, employers and workers reach consensus on various issues including those to do with occupational safety and health, such as provision of personal protective equipment and clothing.

Excluded from the coverage of this Act are: the Zambia Defence and Security Forces/Services and Judges; Registrars of the Court Magistrates; and Local Court Justices.

1.4 Ratified ILO Conventions on OHS and OHS-related Issues
Zambia has ratified 39 ILO Conventions and denounced another 4 conventions, Annex 1. Although it has not ratified the key ILO Conventions on occupational safety and health apart from the Safety and Health in Mines Convention (1995), seven of the 39 Conventions it has ratified are related to occupational safety and health. The OHS and OHS-related Conventions that have been ratified include:

1.4.1 C12: Workmen’s Compensation (Agriculture) Convention, 1921
This Convention covers agricultural wage-earners and it provides for the compensation of workers, in this sector, for personal injury by accident arising out of or in the course of their employment. The provisions of this Convention have been domesticated under the Workers’ Compensation Act, No.10 of 1999.

1.4.2 C17: Workmen’s Compensation (Accidents) Convention, 1925
This Convention undertakes to ensure that workers, who suffer personal injury due to an industrial accident, or their dependants, are compensated. This Convention’s provisions have been domesticated in the Workers’ Compensation Act, No. 10 of 1999. The specific area that gives effect to this Convention is Part 5 of the Act, Sections 41 -54, which deals with the right to compensation.

1.4.3 C18: Workmen’s Compensation (Occupational Diseases) Convention (1925)
This Convention provides for the payment of compensation to workers incapacitated by occupational diseases, or, in case of death from such diseases, to their dependants.
The national legislation which has domesticated the provisions of this Act is the Workers’ Compensation Act, No. 10 of 1999. Sections 91 – 96 of Part 9 of the Act, which deals with occupational diseases, give effect to the Convention.

1.4.4 C19: Equality of Treatment (Accident Compensation) Convention (1925)
Convention 19 undertakes to grant to the nationals of any other Member, which shall have ratified the Convention, who suffer personal injury due to industrial accidents happening in another Member’s territory the same treatment in respect of workers’ compensation as it grants to its own nationals. The Convention guarantees this equality of treatment to foreign workers and their dependants without any condition as to residence.

The provisions of this Convention have been domesticated in the Workers’ Compensation Act, No. 10 of 1999. An example is the Workers’ Compensation Reciprocal Arrangements (Zimbabwe) Rules.

1.4.5 C124: Medical Examination of young Persons (underground Work) Convention, 1965
This Convention stipulates that thorough medical examinations and periodic re-examinations at intervals of not more than one year, for fitness for employment, shall be required for the employment or work underground in mines, of persons under 21 years of age. This Convention has been domesticated by way of adoption as a Schedule under the Mines and Minerals Act, Chapter 213 of the Laws of Zambia.

1.4.6 C136: Benzene Convention, 1971
The purpose of the Benzene Convention is to protect workers against hazards arising from benzene. It applies to all activities involving exposure of workers to benzene and products the benzene content of which exceeds 1 per cent by volume. This Convention has been given effect by means of the Benzene Regulations that were formulated under the Factories Act.

1.4.7 C148: Working Environment (Air Pollution, Noise and Vibration) Convention, 1977
The Working Environment Convention requires national laws or regulations to prescribe measures to be taken for the prevention and control of, and protection against, occupational hazards in the working environment due to air pollution, noise and vibration. The Mines and Minerals (Environmental) Regulations have given adequate effect to the Convention with regards to the prevention and control of air pollution, noise and vibration in the mining sector. The Factories Act, on the other hand has not given adequate effect to the Convention. Consequently, the sectors covered by the Factories Act do not have adequate, up-to-date legislation dealing with issues of air pollution, noise and vibration within the working environment. Draft regulations have already been agreed upon with stakeholders, and what remains is to get Cabinet approval before they can be assented to by the Minister.

1.4.8 C176: Health and Safety in Mines Convention, 1995
This Convention stipulates that Members shall formulate, carry out and periodically review a coherent policy on safety and health in mines, particularly with regard to the measures to give effect to the provisions of the Convention. The contents of this Convention
have been domesticated in regulations that fall under the Mines and Minerals Act, particularly the Mining Regulations and the Mines and Minerals (Environmental) Regulations. Other aspects of the Convention have also been domesticated under the Explosives Act, Chapter 115 of the Laws of Zambia.

1.4.9 Designs and Specifications
The first step in the bidding process deals with coming up with the designs and specifications for the job. The entity looking for bids has to develop specifications for the bidding process. For example, if the client needs a building constructed, a schematic or blueprints, specifications must be developed first. All of the details for the entire project must be outlined in the documentation.

2.0 OCCUPATIONAL ACCIDENTS AND DISEASES
The International Labour Organization estimates that over 300 million occupational injuries and at least 320,000 fatal occupational injuries occur each year. A further 2 million cases of fatal work-related diseases are reported annually. Considering fatal occupational injuries and work-related diseases together, the global estimate of work-related deaths amounts to 2.3 million annually.

In Zambia, approximately 1,200 occupational accidents and diseases are reported from all industries annually while many others go unreported.

2.1 NOTIFICATION AND RECORDING OF OCCUPATIONAL ACCIDENTS AND DISEASES
There are three key institutions responsible for the collection and compilation of data on occupational accidents and diseases. These are the Occupational Health and Safety Services department, the Mines Safety department and the Workers Compensation Fund Control Board.

2.2 OCCUPATIONAL HEALTH AND SAFETY SERVICES DEPARTMENT (OHSSD)
Occupational Health and Safety Services department’s sources are accident reports submitted by all industries covered by the Factories Act. In workplaces that fall under the Factories Act, employers are required, by law, to record all accidents, dangerous occurrences and occupational diseases that occur in their workplaces in a prescribed manner.

Though employers are required to record all accidents that occur in their workplaces, it is not all accidents that they are supposed to report to the OHSSd. Reportable accidents are those that either cause loss of life to a person employed in a workplace or disable any such person for more than three days from performing the work for which he/she was employed. Other incidents that may not necessarily lead to death or disablement but cause damage to plant and/or property as outlined in the first schedule of the Act are considered reportable.

2.3 MINES SAFETY DEPARTMENT (MSD)
MSD’s sources are mainly accident reports submitted by the mining industry. Under the Mining Regulations the Mine Manager is required to give notice of any accident specified in the regulations, on a form prescribed, and inform an inspector immediately, by the quickest means available, of any such accident. In addition to the specified accidents, those accidents
in which any person injured is incapacitated from performing his/her usual work for more than three days, excluding the day of the accident but including weekends or official holidays, are also to be reported to the department. Whether personal injury is caused or not, certain incidents that are outlined in the regulations are required to be reported to the department within 24 hours of their occurrence.

In the case of an occupational fatality, the manager is required to immediately notify the Police by the quickest means possible and to also inform the nearest magistrate in writing.

2.4 WORKERS COMPENSATION FUND CONTROL BOARD
WCFCB’s sources include data based on workers’ accident compensation insurance benefits. This data includes accidents that are reportable to both OHSSd and MSd. The Workers’ Compensation Act (Number 10 of 1999), administered by WCFCB, requires that as soon as an employer gains knowledge of the occurrence of an accident or incidence of a disease, he/she reports the same, in a prescribed form, to the Commissioner within three days. Upon receipt of the written report, the Claims Manager forwards the report to the Manager Health and Safety. The Manager Health and Safety then extracts some information from the report and records it in an accident register for statistical purposes. The accident register maintained by the Manager Health and Safety includes details such as sex and age of victim, time and day of accident, nature of injury etc.

3.0 SCHEDULE OF OCCUPATIONAL DISEASES
Both the Factories Act and the Workers’ Compensation Act (Number 10, of 1999) contain schedules of occupational diseases.

3.1 SCHEDULE OF OCCUPATIONAL DISEASES UNDER THE FACTORIES ACT
The list of occupational diseases under the Factories Act appears under Schedule 2 of the Principal Act. The total number of diseases considered occupational is 15 and most of them are attributed to chemical poisoning. Provisions of the Factories Act regarding notification of accidents also apply to occupational diseases. However, the prescribed form for reporting of occupational diseases is separate from that of occupational accidents.

Section 78 (1) of the Factories Act obligates “Every medical practitioner who attends any patient whom he believes to be suffering from any disease specified in the Second Schedule contracted as a result of his employment in a factory…” to forthwith report the matter to an inspector. However, few, if any, medical practitioners are aware of this provision and the schedule of occupational diseases. Further, there is a critical shortage of medical personnel trained in occupational medicine thus making the identification and subsequent notification of occupational diseases very difficult.

3.2 SCHEDULE OF OCCUPATIONAL DISEASES UNDER THE WORKERS’ COMPENSATION
Under the Workers’ Compensation Act, the list of occupational diseases also appears under schedule 2 of the Principal Act. The total number of diseases considered occupational under this schedule is 42.

3.3 MECHANISMS FOR PERIODIC REVIEW OF LIST OF OCCUPATIONAL DISEASES
3.3.1 Mechanisms for Periodic Review under the Factories Act
With regards to the list of diseases under the Factories Act, the only provision that appears close to a review mechanism for occupational diseases is what is provided for in Section 79 (a) of the Act. This section empowers the Minister to extend legal provisions regarding the scheduled diseases to any disease that may not have been specified in the schedule by way of regulations.

3.3.2 Mechanisms for Periodic Review under the Workers’ Compensation Act
As far as the schedule of occupational diseases under the Workers’ Compensation Act is concerned, the review mechanism is not clearly outlined. However, the generally accepted approach is to review and update the schedule whenever the ILO amends its “List of Occupational diseases” under Recommendation 194. Once reviewed, the list is expected to be issued as a Statutory Instrument (SI) by the Minister of Labour and Social Security. Currently, however, the two schedules of occupational diseases have not been reviewed in line with the ILO’s reviewed Recommendation 94.

3.4 Data on Occupational Accidents and Diseases

3.4.1 Accident Classification by Type of Industry and Degree of Disablement
According to WCFCB’s annual reports for the period 2003 – 2007, a total of 5,758 occupational accidents and diseases were recorded in all industries. The eight industries that registered the highest number of occupational accidents were: Mining and Quarrying (1,492); Agriculture and Forestry (730); Building Construction (487); Iron and Steel Industry (461); Textile Industry (385); Personal Services, Hotels etc (374); Chemical Industry (360); Food, drink and Tobacco Industry (327).

<table>
<thead>
<tr>
<th>INDUSTRY TYPE</th>
<th>DEGREE OF DISABLEMENT</th>
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<tbody>
<tr>
<td></td>
<td>FATAL</td>
</tr>
<tr>
<td>Agriculture &amp; Forestry</td>
<td>52</td>
</tr>
<tr>
<td>Banking Finance &amp; Insurance</td>
<td>3</td>
</tr>
<tr>
<td>Building Construction</td>
<td>58</td>
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<tr>
<td>Charities, Religious, Political</td>
<td>6</td>
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<tr>
<td>Chemical Industry</td>
<td>59</td>
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<tr>
<td>Educational Services</td>
<td>5</td>
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<tr>
<td>Food, drink &amp; Tobacco</td>
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<tr>
<td>Glass, Brick Site &amp; Asbestos</td>
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<td>Iron, Steel Industries, etc</td>
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<td>Leather Industries, etc</td>
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<td>Publishing, Printing, Paper</td>
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</table>
3.4.2 Accident Classification by Cause and Degree of Disablement

WCFCB’s annual reports for 2003 – 2007 show that the largest number of recorded accidents during this period was due to unspecified causes at 2,141. Apart from unspecified causes, the major causes of accidents were:

- Struck by Falling Objects (857);
- Vehicles, Excel Hand Trucks (703);
- Caught on or between (648);
- Falling (462);
- Explosions (182);
- Use of Hands (163);
- Machines (125).

Table 1.3: Accident Classification by Cause and Degree of Disablement, 2003-2007

<table>
<thead>
<tr>
<th>INDUSTRY TYPE</th>
<th>DEGREE OF DISABLEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FATAL</td>
</tr>
<tr>
<td>Prime Movers (Steam, Gas &amp; Other Engines)</td>
<td>0</td>
</tr>
<tr>
<td>Lifting Machinery</td>
<td>2</td>
</tr>
<tr>
<td>Use of Hands</td>
<td>4</td>
</tr>
<tr>
<td>Struck by Falling Object</td>
<td>49</td>
</tr>
<tr>
<td>Falling</td>
<td>13</td>
</tr>
<tr>
<td>Caught on or Between</td>
<td>11</td>
</tr>
<tr>
<td>Stepping on or Struck Against</td>
<td>8</td>
</tr>
<tr>
<td>Trans - Shafting</td>
<td>0</td>
</tr>
<tr>
<td>Machines - Bolts, Ropes, Pulleys &amp; Gearing</td>
<td>1</td>
</tr>
<tr>
<td>Metal-milling Machinery</td>
<td>1</td>
</tr>
<tr>
<td>Power Press</td>
<td>1</td>
</tr>
<tr>
<td>Circular Saws - All Types</td>
<td>0</td>
</tr>
<tr>
<td>Wood-planning Machinery</td>
<td>0</td>
</tr>
<tr>
<td>Machinery - Vertical Spindle Moulding</td>
<td>1</td>
</tr>
<tr>
<td>Railways (Locomotives &amp; Rolling Stock)</td>
<td>5</td>
</tr>
<tr>
<td>Vehicle (Excel Hand Trucks)</td>
<td>126</td>
</tr>
<tr>
<td>Electricity</td>
<td>12</td>
</tr>
<tr>
<td>Explosions</td>
<td>73</td>
</tr>
</tbody>
</table>

Source: Compilation based on Annual Reports of Workers’ Compensation Fund Control Board from 2003-2007 (ILO, 2012)
3.4.3 Accident Classification by Injury Description and Degree of Disablement

The largest number of injuries due to occupational accidents fell in the unclassified category at 1,901. Of the injuries that were classified, the largest numbers were recorded in the following categories:

- Contusions, Abrasions (1,646);
- Fracture (914);
- Amputation (754);
- Burns (247).

This accident data is in accordance with WCFCB’s annual reports for 2003 – 2007.

Table 1.4: Accident Classification by Injury Description and Degree of Disablement, 2003-2007 (ILO, 2012)

<table>
<thead>
<tr>
<th>INDUSTRY TYPE</th>
<th>DEGREE OF DISABLEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FATAL</td>
</tr>
<tr>
<td>Amputation</td>
<td>1</td>
</tr>
<tr>
<td>Burns</td>
<td>9</td>
</tr>
<tr>
<td>Contusions, Abrasions, Cuts</td>
<td>44</td>
</tr>
<tr>
<td>Dislocation</td>
<td>3</td>
</tr>
<tr>
<td>Fracture</td>
<td>12</td>
</tr>
<tr>
<td>Internal Injuries</td>
<td>12</td>
</tr>
<tr>
<td>Sprain</td>
<td>0</td>
</tr>
<tr>
<td>Concussion</td>
<td>1</td>
</tr>
<tr>
<td>Asphyxiation</td>
<td>0</td>
</tr>
<tr>
<td>Hernia</td>
<td>2</td>
</tr>
<tr>
<td>Electric Shock</td>
<td>3</td>
</tr>
<tr>
<td>Unclassified</td>
<td>442</td>
</tr>
<tr>
<td>TOTAL</td>
<td>529</td>
</tr>
</tbody>
</table>

Source: Compilation based on Annual Reports of Workers’ Compensation Fund Control Board from 2003-2007 (ILO, 2012)

3.4.4 Accident Classification by Age Group and Degree of Disablement

WCFCB’s annual reports for 2005– 2007 showed that the highest number of accidents by age were recorded in the following age groups: 30 – 34 (698); 25 – 29 (612); 35 -39 (603); 45 – 49 (449); 40 – 44 (440)

Table 1.5: Accident Classification by Age Group and degree of disablement, 2005-2007
<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>DEGREE OF DISABLEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FATAL</td>
</tr>
<tr>
<td>19 &amp; Below</td>
<td>1</td>
</tr>
<tr>
<td>20 -24</td>
<td>10</td>
</tr>
<tr>
<td>25 -29</td>
<td>61</td>
</tr>
<tr>
<td>30 -34</td>
<td>55</td>
</tr>
<tr>
<td>35 -39</td>
<td>56</td>
</tr>
<tr>
<td>40 - 44</td>
<td>35</td>
</tr>
<tr>
<td>45 -49</td>
<td>43</td>
</tr>
<tr>
<td>50 -54</td>
<td>18</td>
</tr>
<tr>
<td>55 -59</td>
<td>23</td>
</tr>
<tr>
<td>60 &amp; Above</td>
<td>14</td>
</tr>
<tr>
<td>TOTAL</td>
<td>316</td>
</tr>
</tbody>
</table>

Source: Compilation based on Annual Reports of Workers’ Compensation Fund Control Board from 2005-2007 (ILO, 2012)
3.4.5 Estimate of underreporting of Accidents
Underreporting of accidents to both Occupational Safety and Health Services department (OSHSD) and Mines Safety department (MSd) appears high in comparison to the number of accident reports often sent to Workers’ Compensation Fund Control Board (WCFCB). Accident reports sent to both OSHSD and MSd are fewer than the actual occurrences due to perceptions, on the part of most employers, that such reports may subject those to punitive measures from the enforcement authorities. On the other hand, a lot of employers report accident occurrences in their workplaces to WCFCB because of the motivation for compensation.

4.0 CONSTRUCTION HEALTH AND SAFETY GOOD PRACTICE

4.1 INTRODUCTION TO GOOD PRACTICE OF CONSTRUCTION HEALTH AND SAFETY
To be effective, the current legislations require sector specific regulations – in this case Construction Industry health and safety regulations. Best practice regulations in H&S can be derived from the Construction (Design and Management) Regulations 2007 (CDM2007) of United Kingdom and the Construction Regulations of 2014 of South Africa.

In general, the regulations would integrate health and safety into the management of the project and to encourage everyone involved to work together to:
• improve the planning and management of projects from the very start;
• identify hazards early on, so they can be eliminated or reduced at the design or planning stage and the remaining risks can be properly managed;
• target effort where it can do the most good in terms of health and safety; and
• discourage unnecessary bureaucracy.

Regulations should focus attention on planning and management throughout construction projects, from design concept onwards. The effort devoted to planning and managing health and safety should be in proportion to the risks and complexity associated with the project. When deciding what you need to do to comply with the Regulations, your focus should always be on action necessary to reduce and manage risks. Any paperwork produced should help with communication and risk management. Paperwork which adds little to the management of risk is a waste of effort, and can be a dangerous distraction from the real business of risk reduction and management.

Time and thought invested at the start of the project will pay dividends not only in improved health and safety, but also in:
(a) reductions in the overall cost of ownership, because the structure is designed for safe and easy maintenance and cleaning work, and because key information is available in the health and safety file;
(b) reduced delays;
(c) more reliable costings and completion dates;
(d) improved communication and co-operation between key parties; and
(e) improved quality of the finished product.
4.2 DEFINITIONS

4.2.1 Construction work
Construction work is defined in Occupational Health and Safety of 2010. The CDM2007 and the CR 2014 both have a much more detailed definition of construction. The following are not construction work as defined:

(a) putting up and taking down marquees and similar tents designed to be re-erected at various locations;

(b) general maintenance of fixed plant, except when this is done as part of other construction work, or it involves substantial dismantling or alteration of fixed plant which is large enough to be a structure in its own right, for example structural alteration of a large silo; complex chemical plant; power station generator or large boiler;

(c) tree planting and general horticultural work;

(d) positioning and removal of lightweight movable partitions, such as those used to divide open-plan offices or to create exhibition stands and displays;

(e) surveying – this includes taking levels, making measurements and examining a structure for faults;

(f) work to or on vessels such as ships and mobile offshore installations;

(g) off-site manufacture of items for later use in construction work (for example roof trusses, pre-cast concrete panels, bathroom pods and similar pre-fabricated elements and components);

(h) fabrication of elements which will form parts of offshore installations;

(i) the construction of fixed offshore oil and gas installations at the place where they will be used.

Some construction projects include operations, such as those described in the previous paragraph, which are not themselves construction work. Where this is the case, the overlap between the construction and non-construction work should be addressed in the management arrangements and the construction phase plan.

4.2.2 Co-operation and co-ordination
The architect, Engineer, lead designer or contractor who is carrying out the bulk of the design work should normally co-ordinate the health and safety aspects of the design work; the builder or main contractor, if there is one, should normally co-ordinate construction work.

It is vital that those doing the work understand the risks involved and what to do about them. If the risks are low and the precautions well understood by those carrying out the work, then there will be no need for a written plan. In other simple cases a brief summary that clearly sets out who does what and in what order will be enough. Where the risks are higher, for example where the work involves:

(a) structural alterations;

(b) deep excavations, and those in unstable or contaminated ground;

(c) Unusual working methods or safeguards;

(d) ionising radiation or other significant health hazards;

(e) Nearby high voltage powerlines;

(f) a risk of falling into water which is, or may become, fast flowing;

(g) diving;

(h) explosives;
(i) heavy or complex lifting operations;

then something closer to the construction phase plan will be needed. When carrying out
demolition, a method statement should be submitted for approval to those in control of the
work to produce a written plan showing how danger will be prevented.

4.2.3 Taking account of the general principles of prevention
When considering what precautions are necessary to control risks associated with a project,
everyone who has a duty must take account of the general principles of prevention.

4.2.3.1 Clients
The client has one of the biggest influences over the way a project is run. They have
substantial influence and contractual control and their decisions and approach determine:

(a) the time, money and other resources available for projects;
(b) who makes up the project team, their competence, when they are appointed and who
does what;
(c) whether the team is encouraged to co-operate and work together effectively;
(d) whether the team has the information that it needs about the site and any
existing structures;
(e) the arrangements for managing and co-ordinating the work of the team.

Because of this, CDM 2007 and CR2014 has made the client accountable for the impact their
approach has on the health and safety of those working on or affected by the project. However, the Regulations also recognise that many clients know little about construction
health and safety, so clients are not required or expected to plan or manage projects
themselves. Nor do they have to develop substantial expertise in construction health and
safety, unless this is central to their business. Clients must ensure that various things are
done, but are not normally expected to do them themselves.

Who are clients?

i) Domestic clients
Domestic clients are people who have work done on their own home or the home of a family
member, that does not relate to a trade or business, whether for profit or not. It is the type of
client that matters, not the type of property.

Local authorities, housing associations, charities, landlords and other businesses may own
domestic property, but they are not domestic clients. If the work is in connection with the
furtherance of a business attached to domestic premises, such as a shop, the client is not a
domestic client.

Sometimes groups who would otherwise be domestic clients form companies to administer
construction work. A common example of this is a company formed by leaseholders of flats
to undertake maintenance of the common parts of a structure. In such a case, the company is
not a domestic client.
Designers and contractors working for domestic clients have to manage their own work and co-operate with and co-ordinate their work with others involved with the project so as to safeguard the health and safety of all involved in the project.

**ii) Insurance and warranty claims**

An insurance company arranging for construction work to be carried out under the terms of an insurance policy is the client. However, where the insured arranges the work and the insurance company reimburses them, the insured is the client. If the insurer specifies designers or contractors for certain aspects of the work, then the insurer is responsible for establishing that they are competent. It is common, with insurance-related work, for agents to be appointed to act on behalf of either the insured or insurer. These agents resolve claims and may co-ordinate the remedial works. Such agents may legally be clients with all the relevant duties.

**iii) Developers**

In some instances, domestic clients may buy a house or flat before the whole project is complete, for example where house builders develop a site with a view to selling a number of homes. In such cases the purchaser may have an interest in the property, but it is still the developer who arranges for the construction work to be done and they are legally the client.

**iv) PFI, PPP and similar forms of procurement**

The role and responsibilities of the client can transfer from one party to another as the project proceeds. This is normally the case when the SPV is appointed to carry out detailed specification and delivery of the project. Any such transfer should:

(a) be clear to, and agreed by all those involved;
(b) be clearly recorded;
(c) provide the practical authority to discharge the client’s duties.

If there is doubt

In some circumstances it may not be immediately obvious who is legally the client and there can sometimes be more than one client involved in a project. To avoid confusion, this needs to be resolved by those involved at the earliest stage possible. Take into account who:

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

**v) What clients must do for all projects**

**Clients must make sure that:**

a) designers, contractors and other team members that they propose to engage are competent (or work under the supervision of a competent person), are adequately resourced and appointed early enough for the work they have to do.

b) they allow sufficient time for each stage of the project, from concept onwards;
c) they co-operate with others concerned in the project as is necessary to allow other duty holders to comply with their duties under the Regulations;

d) they co-ordinate their own work with others involved with the project in order to ensure the safety of those carrying out the construction work, and others who may be affected by it;

e) there are reasonable management arrangements in place throughout the project to ensure that the construction work can be carried out, so far as is reasonably practicable, safely and without risk to health. (This does not mean managing the work themselves, as few clients have the expertise and resources needed and it can cause confusion);

f) contractors have made arrangements for suitable welfare facilities to be provided from the start and throughout the construction phase;

g) any fixed workplaces (for example offices, shops, factories, schools) which are to be constructed will comply, in respect of their design and the materials used, with any requirements of the Workplace

h) relevant information likely to be needed by designers, contractors or others to plan and manage their work is passed to them in order to comply with regulation 10.

Co-operation, co-ordination, timeliness and resources

Co-operation between parties and co-ordination of the work are key to the successful management of construction health and safety. Co-operation and co-ordination can only be meaningful if the relevant members of the project team have been appointed early enough to allow them to contribute to risk reduction. This is particularly important during the design stage when both clients and contractors should contribute to discussions on buildability, usability and maintainability of the finished structure. Clients should seek to appoint those who can assist with design considerations at the earliest opportunity so that they can make a full contribution to risk reduction during the planning stages.

Unrealistic deadlines and a failure to allocate sufficient funds are two of the largest contributors to poor control of risk on site. When engaging designers and contractors, and for notifiable projects appointments, clients have to consider the resources (for example staff, equipment and, particularly, time) needed to plan and do the work properly. Any contractors who are being considered for appointment should be informed of the minimum time period allowed to them for planning and preparation before construction work begins on site. Contractors should be given sufficient time after their appointment to allow them to plan the work and mobilise the necessary equipment (for example welfare facilities) and staff to allow the work to proceed safely and without risk to health. This is particularly important where the project involves demolition work - contractors must be given sufficient time for the planning and safe execution of any demolition activities.

Arranging design work

Clients must only employ designers who are competent to carry out health and safety duties. Clients often employ more than one designer, for example architects, civil, structural and services engineers. In such cases they all need to know who does what, and the timing of the appointments needs to enable the design work to be co-ordinated from an early stage. Nominating one designer as the ‘lead designer’ is often the best way to ensure co-ordination and co-operation during work which involves a number of designers.

Management arrangements
Most clients, particularly those who only occasionally commission construction work, will not be experts in the construction process and for this reason they are not required to take an active role in managing the work. Clients are required to take reasonable steps to ensure that suitable management arrangements are in place throughout the life of the project so that the work can be carried out safely and without risk to health. The arrangements put in place should focus on the needs of the particular job and should be proportionate to the risks arising from the work.

The client will need to ensure that arrangements are in place to ensure that:

(a) there is clarity as to the roles, functions and responsibilities of members of the project team;
(b) those with duties have sufficient time and resource to comply with their duties;
(c) there is good communication, co-ordination and co-operation between members of the project team (for example between designers and contractors);
(d) designers are able to confirm that their designs (and any design changes) have taken account of the requirements of health and safety, and that the different design elements will work together in a way which
   i. does not create risks to the health and safety of those constructing, using or maintaining the structure;
   ii. that the contractor is provided with the pre-construction information
   iii. contractors are able to confirm that health and safety standards on site will be controlled and monitored, and welfare facilities will be provided by the contractor from the start of the construction phase through to handover and completion.

Most of these arrangements will be made by others in the project team, such as designers and contractors. Before they start work, a good way of checking is to ask the relevant members of the team to explain their arrangements, or to ask for examples of how they will manage these issues during the life of the project. When discussing roles and responsibilities, on simple projects all that may be needed is a simple list of who does what.

Having made these initial checks before work begins, clients should, as necessary, review to ensure that the arrangements which have been made are maintained.

Providing the pre-construction information

Example 1

A client was aware that there were electrical and gas services passing under the site. He arranged for plans for these to be provided by the relevant utility suppliers, and confirmed the exact location of the services by carrying out on-site tests. This information was then provided to contractors who were asked to tender for the work so that they could take account of the presence of the services when bidding for the work.

Clients must provide designers and contractors who may be bidding for the work (or who they intend to engage), with the project-specific health and safety information needed to identify hazards and risks associated with the design and construction work. (The pre-construction information).
The information should be provided as part of the early procurement process or tendering, and responses to the issues identified can be a real help when judging competence of those tendering for the work. It therefore needs to be identified, assembled and sent out in good time, so that those who need it when preparing to bid or when preparing for the work can decide what resources (including time) will be needed to enable design, planning and construction work to be organised and carried out properly. Where design work continues during the construction phase, the pre-construction information will need to be provided to designers before work starts on each new element of the design. Similarly, where contractors are appointed during the construction phase, each contractor (or those who are bidding for the work) must be provided with the pre-construction information in time for them to take this into account when preparing their bid, or preparing for work on the site.

Clients who already have a health and safety file from earlier work, or who have previously carried out surveys or assessments, including assessments and plans may already have all, or much of the information needed. However, where there are gaps in this information, the client should ensure that these are filled by commissioning surveys or by making other reasonable enquiries. It is not acceptable for clients to make general reference to hazards which might exist - for example that ‘…. there may be asbestos present in the building’. Clients should carry out the necessary surveys in advance and provide the necessary information to those who need it.

Example 2

A row of single storey brick-built garages was to be demolished. The site was to be completely fenced off. The pre-construction information stated that there were no hazardous substances or services to the garages. It provided details of the access route to the garages and stated that in recent months children had been playing in the area.

The principal contractor and demolition contractor agreed that no other information was needed.

The information needs to be in a form that is convenient, ie clear, concise and easily understood, but it can be included in other documents, for example the specification, providing the relevant health and safety issues are fully covered. Brief notes on ‘as built’ drawings are particularly useful, but should be checked in case significant alterations have been carried out.

Clients are also required to tell contractors who they engage to carry out construction work the minimum notice that they will be given before they are expected to start construction work. This is to ensure that contractors have sufficient time to plan and prepare – for example mobilise their workforce and equipment, and make arrangements for welfare facilities to be provided.

4.2.3.2 Designers

Designers are in a unique position to reduce the risks that arise during construction work, and have a key role to play in CDM2007 and CR2014. There are no specifications on the roles of designers in handling H&S in the legislations of Zambia. Designs develop from initial concepts through to a detailed specification, often involving different teams and people at various stages. At each stage, designers from all disciplines can make a significant
contribution by identifying and eliminating hazards, and reducing likely risks from hazards where elimination is not possible.

Designers’ earliest decisions fundamentally affect the health and safety of construction work. These decisions influence later design choices, and considerable work may be required if it is necessary to unravel earlier decisions. It is therefore vital to address health and safety from the very start.

**Example 4**

On a major office development with a large central atrium, the electrical contractor highlighted an innovative product for the roof glazing that was unknown to the other team members, including the designers. This was a double glazed unit incorporating internal prismatic reflectors. It removed the problem of glare and the need for high-level roller blinds. It was virtually maintenance free, and led to significant savings over the life the building, and significantly reduced the need to work at height.

Designers’ responsibilities extend beyond the construction phase of a project. They also need to consider the health and safety of those who will maintain, repair, clean, refurbish and eventually remove or demolish all or part of a structure as well as the health and safety of users of workplaces. For most designers, buildability considerations and ensuring that the structure can be easily maintained and repaired will be part of their normal work, and thinking about the health and safety of those who do this work should not be an onerous duty. Failure to address these issues adequately at the design stage will usually increase running costs, because clients will then be faced with more costly solutions when repairs and maintenance become necessary.

Where significant risks remain when they have done what they can, designers should provide information with the design to ensure that other designers and contractors are aware of these risks and can take account of them.

**i) Who are designers?**

Designers are those who have a trade or a business which involves them in:

(a) preparing designs for construction work, including variations. This includes preparing drawings, design details, specifications, bills of quantities and the specification (or prohibition) of articles and substances, as well as all the related analysis, calculations, and preparatory work; or

(b) arranging for their employees or other people under their control to prepare designs relating to a structure or part of a structure.

It does not matter whether the design is recorded (for example on paper or a computer) or not (for example it is only communicated orally).

**Designers therefore include (CDM2007, CR 2014):**

(a) architects, civil and structural engineers, building surveyors, landscape architects, other consultants, manufacturers and design practices (of whatever discipline) contributing to, or having overall responsibility for, any part of the design, for example drainage engineers designing the drainage for a new development;
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(b) anyone who specifies or alters a design, or who specifies the use of a particular method of work or material, such as a design manager, quantity surveyor who insists on specific material or a client who stipulates a particular layout for a new building;

(c) building service designers, engineering practices or others designing plant which forms part of the permanent structure (including lifts, heating, ventilation and electrical systems), for example a specialist provider of permanent fire extinguishing installations;

(d) those purchasing materials where the choice has been left open, for example those purchasing building blocks and so deciding the weights that bricklayers must handle;

(e) contractors carrying out design work as part of their contribution to a project, such as an engineering contractor providing design, procurement and construction management services;

(f) temporary works engineers, including those designing auxiliary structures, such as formwork, falsework, façade retention schemes, scaffolding, and sheet piling;

(g) interior designers, including shopfitters who also develop the design;

(h) heritage organisations who specify how work is to be done in detail, for example providing detailed requirements to stabilise existing structures; and

(i) those determining how buildings and structures are altered, for example during refurbishment, where this has the potential for partial or complete collapse.

Local authority or government officials may provide advice relating to designs and relevant statutory requirements, for example the Building Regulations but this does not make them designers. This is because these are legal requirements where the designer has no choice in respect of compliance. Any such requirements should be treated as ‘design constraints’ in the usual way. However, if the statutory bodies require that particular features which are not statutory requirements are included or excluded (for example stipulating the use of hazardous substances for cleaning or the absence of edge protection on flat roofs), then they are designers and must ensure that they comply.

Manufacturers supplying standardised products that can be used in any project are not. The person who selects the product is a designer and must take account of health and safety issues arising from its use. If a product is purpose-made for a project, the person who prepares the specification is a designer and so is the manufacturer who develops the detailed design.

What designers should do for all projects

Designers should:

(a) make sure that they are competent and adequately resourced to address the health and safety issues likely to be involved in the design;

(b) check that clients are aware of their duties;

(c) When carrying out design work, avoid foreseeable risks to those involved in the construction and future use of the structure, and in doing so, they should eliminate hazards (so far as is reasonably practicable, taking account of other design considerations) and reduce risk associated with those hazards which remain;

(d) provide adequate information about any significant risks associated with the design;

(e) co-ordinate their work with that of others in order to improve the way in which risks are managed and controlled.
In carrying out these duties, designers need to consider the hazards and risks to those who:

(a) carry out construction work including demolition;
(b) clean any window or transparent or translucent wall, ceiling or roof in or on a structure or maintain the permanent fixtures and fittings;
(c) use a structure designed as a place of work;
(d) may be affected by such work, for example customers or the general public.

Preparing a design

Designers have to weigh many factors as they prepare their designs. Health and safety considerations have to be weighed alongside other considerations, including cost, fitness for purpose, aesthetics, buildability, maintainability and environmental impact. Designers are required to avoid foreseeable risks ‘so far as is reasonably practicable, taking due account of other relevant design considerations’. The greater the risk, the greater the weight that must be given to eliminating or reducing it.

Designers are not expected to consider or address risks which cannot be foreseen, and the Regulations do not require zero risk designs because this is simply impossible. However, designers must not produce designs that cannot be constructed, maintained, used or demolished in reasonable safety.

Designers should critically assess their design proposals at an early stage, and then throughout the design process, to ensure that health and safety issues are identified, integrated into the overall design process and addressed as they go along. It is pointless to complete the design first, then try to address the risks which the design has introduced. By then, all of the key decisions are likely to have been taken and no one will be willing to make any changes because of the time and cost involved.

The first thing that designers need to do is eliminate hazards (things with a potential to cause harm) from their designs so far as is reasonably practicable, taking account of other design considerations. Examples would be to design out things like fragile roofing materials or products; eliminating rooflights from areas where roof access is needed; positioning plant which needs regular maintenance at ground level so there is no need for work at height or providing permanent safe access for work at height. Eliminating hazards removes the associated risk, and is therefore the best option and should always be the first choice.

Example 5

A designer specified the use of lifting attachments. Not only did this reduce work at height, but it was estimated by the steel erectors that they were saving at least one hour per day.

It is not always reasonably practicable to eliminate hazards, and where this is the case consideration should be given to incorporating design solutions which reduce the overall risk to an acceptable level. This can be done by reducing the:

(a) likelihood of harm (injury or adverse health effect);
(b) potential severity of the harm;
(c) number of people exposed to the harm; and
(d) frequency or duration of exposure to harm.
The amount of effort put into eliminating hazards and reducing risks should depend on the degree of risk. There is little point in spending a lot of money, time and trouble on low risk issues. There is also little to be gained by detailed comparison of construction techniques that present similar risks, for example whether to specify a steel frame or concrete portal building. The focus should be on issues that are known to have the potential to cause significant harm, and where there are known solutions that reduce the risks to everyone exposed.

Designers also need to take account of other relevant health and safety requirements when carrying out design work. Where the structure will be used as a workplace, (for example factories, offices, schools, hospitals) they need to take account of the provisions of the workplace. This means taking account of risks directly related to the proposed use of the structure, including associated private roadways and pedestrian routes, and risks arising from the need to clean and maintain the permanent fixtures and fittings. For example, hospitals will need to be designed in a way which will accommodate the safe lifting and movement of patients; food preparation and serving areas will need non-slip floors.

Providing information

Example 6

During the construction of a multi-storey office block the design sequence required the stairways to be installed progressively, as the floors were completed. This provided much quicker and safer access for people and materials than ladders.

Example 7

A designer considered using augered piles for a scheme to be built on contaminated land. He recognised that workers could be exposed to a toxic hazard. As a raft foundation was not viable from an engineering viewpoint, driven piles were specified. However, if augered piles had been the only reasonably practicable solution, the designer would have needed to include the possibility of exposure to toxic substances in the pre-construction information.

Designers must provide information that other project team members are likely to need to identify and manage the remaining risks. This should be project specific, and concentrate on significant risks which may not be obvious to those who use the design. For example, providing generic risk information about the prevention of falls is pointless, because competent contractors will already know what needs to be done, but if the design gives rise to a specific and unusual fall risk which may not be obvious to contractors, designers should provide information about this risk.

Designers also need to provide information about aspects of the design that could create significant risks during future construction work or maintenance. If in doubt about the level of information needed, the best way to find out is to ask those who will use it.

Significant risks are not necessarily those that involve the greatest risks, but those, including health risks that are:

(a) not likely to be obvious to a competent contractor or other designers;
(b) unusual; or
likely to be difficult to manage effectively.

Information should be brief, clear, precise, and in a form suitable for the users. This can be achieved using:

(a) notes on drawings – this is preferred, since the notes will then be immediately available to those carrying out the work. They can refer to other documents if more detail is needed, and be annotated to keep them up to date;

(b) written information provided with the design - this should be project specific, and should only contain information which will be useful to those constructing or maintaining the structure;

(c) suggested construction sequences showing how the design could be erected safely, where this is not obvious, for example suggested sequences for putting up pre-cast panel concrete structures. Contractors may then adopt this method or develop their own approach.

It is not always possible to provide all the information at the same time, particularly when design work is continuing whilst construction work is underway. In these circumstances information should be released as the design develops, but construction work should not be allowed to proceed unless all the information necessary for the work to be carried out safely has been provided.

Co-operation

Example 8
A structural engineering consultancy was engaged to provide detailed design drawings for the steelwork to be incorporated in a complex alteration to an existing structure. The company recognised that many of the structural steel elements were of different lengths and the site layout meant that it would be difficult to lift the beams into position during assembly. The structural engineer ensured that simple lifting brackets were designed into each structural steel element, and that the lifting points were marked on the design drawings. This reduced the likelihood of error on site and the time taken for installation of the steel was reduced by a third.

Designers must co-operate with the client, and other designers and contractors, including those designing temporary works. This is to ensure that incompatibilities between designs are identified and resolved as early as possible, and that the right information is provided in the pre-construction information.

For smaller projects where most of the work is done by a single designer, this can be achieved through discussion with those who use or are affected by the design. For larger projects or those involving significant risks, a more managed approach will be necessary.

Co-operation can be encouraged by:

(a) setting up an integrated team involving designers, principal contractor and other relevant contractors;

(b) the appointment of a lead designer, where many designers are involved;

(c) agreeing a common approach to risk reduction during design;

(d) regular meetings of all the design team with contractors, and others;

(e) regular reviews of developing designs;
site visits, through which designers can gain a direct insight into how the risks are managed in practice.

Regular reviews of the design involving all members of the design team are particularly important in making sure that proper consideration is given to buildability, usability and maintainability. When considering buildability, meetings should include the contractor so that difficulties associated with construction can be discussed and solutions agreed before the work begins. When discussing usability and maintainability, involving the client or those who will be responsible for operating the building or structure will mean that proper consideration can be given to the health and safety of those who will maintain and use the structure once it has been completed. Doing this during the design stage will result in significant cost savings for the client, as rectifying mistakes after the structure has been built is always expensive.

Designers are not legally required to keep records of the process through which they achieve a safe design, but it can be useful to record why certain key decisions were made. Brief records of the points considered, the conclusions reached, and the basis for those conclusions, can be very helpful when designs are passed from one designer to another. This will reduce the likelihood of important decisions being reversed by those who may not fully understand the implications of doing so.

Too much paperwork is as bad as too little, because the useless hides the necessary. Large volumes of paperwork listing generic hazards and risks, most of which are well known to contractors and others who use the design are positively harmful, and suggest a lack of competence on the part of the designer.

4.2.3.3 The contractor

Good management of health and safety on site is crucial to the successful delivery of a construction project. The key duty of principal contractors is to properly plan, manage and co-ordinate work during the construction phase in order to ensure that the risks are properly controlled. Principal contractors must also comply with the duties placed on all contractors under the Regulations.

Principal contractors are usually the main or managing contractor. This allows the management of health and safety to be incorporated into the wider management of project delivery. This is good business practice as well as being helpful for health and safety purposes.

What principal contractors must do

Principal contractors must:

(a) make sure that they are competent to address the health and safety issues
(b) likely to be involved in the management of the construction phase;
(c) ensure that the construction phase is properly planned, managed and monitored, with adequately resourced, competent site management appropriate to the risk and activity.
(d) ensure that every contractor who will work on the project is informed of the minimum amount of time which they will be allowed for planning and preparation before they begin work on site;
(e) ensure that all contractors are provided with the information about the project that they need to enable them to carry out their work safely and without risk to health. Requests from contractors for information should be met promptly;

(f) ensure safe working and co-ordination and co-operation between contractors;

(g) ensure that a suitable construction phase plan ('the plan') is:

(h) prepared before construction work begins;

(i) developed in discussion with, and communicated to, contractors affected by it,

(j) implemented, and

(k) kept up to date as the project progresses;

(g) satisfy themselves that the designers and contractors that they engage are competent and adequately resourced; ensure suitable welfare facilities are provided from the start of the construction phase;

(h) take reasonable steps to prevent unauthorised access to the site;

(i) prepare and enforce any necessary site rules;

(j) provide (copies of or access to) relevant parts of the plan and other information to contractors, including the self-employed, in time for them to plan their work;

(k) liaise with the designer on design carried out during the construction phase, including design by specialist contractors, and its implications for the plan;

(l) provide the designer promptly with any information relevant to the health and safety file (see paragraphs

(m) ensure that all the workers have been provided with suitable health and safety induction, information and training;

(n) ensure that the workforce is consulted about health and safety matters;

(o) display the project notification.

Co-operation and co-ordination

Good co-operation and co-ordination of work between all of the parties involved in a project is essential if risks are to be identified early on and properly controlled. Principal contractors should take the lead and actively encourage co-operation and co-ordination between contractors from an early stage. A team approach involving the client, designers, contractors and even manufacturers who work closely together will often produce the best results. This allows the client, designers, contractors and facilities management experts, together, to identify the best solution for the client’s needs, taking account of the practicalities of construction work, maintenance and use. Even on projects where it is not practical to formally establish an integrated team, the client, designer, contractors and others involved in the project still need to work together.

If there are other projects on the same or neighbouring sites (for example adjacent units on the same industrial estate) then the co-operation and co-ordination needs to extend to those involved with such projects. If this need can be identified early on, the risks that one project may cause for the other can also be identified and addressed in the early stages of project planning. If potential problems are not identified until the actual work has started they can be much more difficult to address.

Good, timely communication is essential to co-operation and co-ordination of activities. Information about risks and precautions needs to be shared sensibly (ie relevant information, not everything) when it is needed to plan and manage work. Drawings can be used to highlight hazards or unusual work sequences identified by designers, with advice on where to
find more information, if required. Induction training and toolbox talks help to ensure workers understand the risks and precautions, and are a good opportunity to inform workers of site rules or any special risks relating to the project.

**Planning and managing health and safety in the construction phase**

Principal contractors must plan, manage and co-ordinate work during the construction phase taking account of the information contained in the pre-construction information provided by the client, and any other information provided by contractors.

The effort devoted to planning and managing health and safety should be in proportion to the risks and complexity associated with the project.

The principal contractor should work with other contractors to identify the hazards and assess the risks related to their work, including the risks they may create for others. Using this information and applying the general principles of prevention the principal contractor, in discussion with the contractors involved, must plan, manage and co-ordinate the construction phase. This includes supervising and monitoring work to ensure that it is done safely and that it is safe for new activities to begin.

Where the project involves high-risk work, for example alterations that could result in structural collapse, or work on contaminated land; specialist advice is likely to be needed at the planning stage.

**Example 9**

On a busy construction site employing several contractors, the key details of the construction phase plan were transferred to a wall chart and displayed in the site office and in the canteen. This enabled all visitors and workers on site to find relevant information quickly and easily.

The chart was reviewed on a weekly basis and any necessary revisions made.

**The construction phase plan**

The way in which the construction phase will be managed and the key health and safety issues for the particular project must be set out in writing in the construction phase plan. This plan should set out the organisation and arrangements that have been put in place to manage risk and co-ordinate the work on site. It should not be a repository for detailed generic risk assessments, records of how decisions were reached or detailed method statements, but it may, for example set out when such documents will need to be prepared. It should be well focused, clear and easy for contractors and others to understand – emphasising key points and avoiding irrelevant material. It is crucial that all relevant parties are involved and co-operate in the development and implementation of the plan as work progresses.

The plan must be tailored to the particular project. Generic plans that do not contain the information relevant to the particular risks associated with the work will not satisfy the requirements. Photographs and sketches can greatly simplify and shorten explanations. It should also be organised so that relevant sections can easily be made available to designers and contractors.

Often the design and preparation for later work is not complete at the start of the construction phase. Nevertheless, the plan for the initial phase of the construction work must be prepared.
before any work begins. It should also address later activities that will require careful planning. It may only be practical to address such activities in outline form before work starts and most will require revision in the light of developments.

Implementing and monitoring the plan
A plan is no use if it is treated as merely a paper exercise and gathers dust. To improve standards, it must be a practical aid to the management of health and safety on site. Principal contractors and other contractors have a particular role in both implementing and monitoring the plan to ensure that it works in practice. Monitoring arrangements will need to be discussed and agreed with the client as they form part of the management arrangements.

The purpose of monitoring is to ensure that the precautions described in the construction phase plan are appropriate and followed in practice. Where contractors do not work safely or comply with the plan, principal contractors must take appropriate action to deal with the risk. They can give reasonable directions to any contractor and contractors have to comply, whether they have been appointed by the principal contractor or not – regulation 19(2). Principal contractors are responsible for ensuring the health and safety of everyone on site. Everyone on site (including the client, anyone working for the client and workers of utility companies) must co-operate with the principal contractor to enable them to comply with their duties.

Example 10
New chemical processing plant was being installed in a factory. The clients had included requirements in relation to the safety of their workforce and plant in the pre-construction information. The information included details of those parts of the site the client would continue to occupy, information about the permit-to-work system, emergency procedures and traffic management arrangements. Regular meetings were held to ensure good communication and co-ordination.

The plan needs to be routinely reviewed, revised and refined by the principal contractor as the project develops. For example, where the plan is not being followed, and health and safety is put at risk, those involved must take appropriate action to deal with the risk. Monitoring may show the plan has shortcomings and needs to be modified. Any significant changes in the plan should be brought to the attention of all those affected.

Site rules
Principal contractors should include any necessary rules for the management of construction work in the construction phase plan, which others on the site have to follow. These may cover issues such as restricted areas, permit-to-work systems, hot work and emergency plans. In order to avoid cluttering the plan with detailed arrangements for implementing site rules, the plan should refer to other documents or put detailed arrangements in appendices. Site rules should be:

(a) set out in writing;
(b) understandable to those who have to follow them;
(c) brought to the attention of everyone who has to follow them;
(d) enforced.
Copies of the site rules should be displayed on site in a place where they can be seen by those who work there.

**Controlling access onto sites**

A principal contractor must take reasonable steps to prevent access by unauthorised persons to the construction site. Only people who are explicitly authorised, individually or collectively, by the principal contractor, should be allowed access. The authorisation may cover the whole site or be restricted to certain areas. Authorised people should have relevant site rules explained to them and undertake any necessary site induction, and should comply with site rules and co-operate with the principal contractor. Some authorised visitors may need to be supervised or accompanied while on site or visiting specific areas.

How access is controlled depends on the nature of the project, the risks and location. The boundaries of all sites should be physically defined, where necessary, by suitable fencing. The type of fencing should reflect the nature of the site and its surroundings. Special consideration is needed where:

(a) rights of way cross sites;
(b) sites are in, or next to, other work areas;
(c) new houses are being built on a development where some houses are already occupied; or
(d) there are children or other vulnerable people nearby.

A site compound was set up near the site entrance. This meant that every person who entered or left the site had to pass through the compound, where a register was kept listing all those who entered or left the site.

The effectiveness of the arrangements needs to be reviewed in the light of experience. In particular, their adequacy should be carefully reviewed if there is evidence of children playing on, or near the site.

**Example 11**

In addition to a site-specific safety induction, every worker who entered the site was provided with a small pocket card detailing the site health and safety rules. Any new rules introduced as a result of work being carried out on the site were clearly displayed at the site entrance and the cards were reprinted and re-issued.

**Site induction, training and information**

Site induction, training and information are vital to securing health and safety on site. The principal contractor has to ensure, so far as is reasonably practicable, that every worker has:

(a) a suitable induction; and
(b) any further information and training needed for the particular work.

This does not mean that the principal contractor has to train everyone on the site - this will be the responsibility of individual contractors.

**Induction**
Inductions are a way of providing workers with specific information about the particular risks associated with the site and the arrangements that have been made for their control. Induction is not intended to provide general health and safety training, but it should include a site-specific explanation of the following:

(a) senior management commitment to health and safety;
(b) the outline of the project;
(c) the individual’s immediate line manager and any other key personnel;
(d) any site-specific health and safety risks, for example in relation to access, transport, site contamination, hazardous substances and manual handling;
(e) control measures on the site, including:
   i. any site rules,
   ii. any permit-to-work systems,
   iii. traffic routes,
   iv. security arrangements,
   v. hearing protection zones,
   vi. arrangements for personal protective equipment, including what is needed, where to find it and how to use it,
   vii. arrangements for housekeeping and materials storage, (viii) facilities available, including welfare facilities,
   viii. emergency procedures, including fire precautions, the action to take in the event of a fire, escape routes, assembly points, responsible people and the safe use of any fire-fighting equipment;
(f) arrangements for first aid;
(g) arrangements for reporting accidents and other incidents;
(h) details of any planned training, such as ‘toolbox’ talks;
(i) arrangements for consulting and involving workers in health and safety, including the identity and role of any:
   i) appointed trade union safety representatives,
   ii) representatives of employee safety,
   iii) safety committees;
(j) Information about the individual’s responsibilities for health and safety.

Example 11
All new employees on a large transport infrastructure project attended an induction session, in works time, on their first day. Employer and trade union representatives jointly explained the key issues.

The joint approach reinforced the messages and made the induction more effective.

Competency
To be competent, an organisation or individual must have:
(a) sufficient knowledge of the specific tasks to be undertaken and the risks which the work will entail;
(b) sufficient experience and ability to carry out their duties in relation to the project; to recognise their limitations and take appropriate action in order to prevent harm to those carrying out construction work, or those affected by the work.
Organisations and individuals will need specific knowledge about the tasks they will be expected to perform, and the risks associated with these tasks. This will usually come from formal or ‘on the job’ training.

Appropriate experience is also a vital ingredient of competence. People are more likely to adopt safe working practices if they understand the reasons why they are necessary, and past experience should be a good indicator of the person’s/ company’s track record.

The development of competence is an ongoing process. Individuals will develop their competence through experience in the job and through training which is part of ‘life-long learning’. Professionals such as designers and advisors should be signed up to a ‘Continuing Professional Development’ programme either through their company or professional institution. This will allow them to remain ‘up to date’ with changes in legislation and professional practice. Construction trades workers and labourers should also receive refresher training or regular training updates either through an in-house planned programme of learning and development, or a more formal skills-based training programme such as those offered by the NCC Construction Skills.

Doing an assessment requires you to make a judgement as to whether the organisation or individual has the competence to carry out the work safely. If your judgement is reasonable, taking into account the evidence that has been asked for and provided, you will not be criticised if the organisation you appoint subsequently proves not to have been competent to carry out the work.

4.3 HOW TO ASSESS THE COMPETENCE OF ORGANISATIONS
Competency assessments of organisations (including principal contractors, contractors, and designers) should be carried out as a two-stage process:

Stage 1: An assessment of the company’s organisation and arrangements for health and safety to determine whether these are sufficient to enable them to carry out the work safely and without risk to health.
Stage 2: An assessment of the company’s experience and track record to establish that it is capable of doing the work; it recognises its limitations and how these should be overcome and it appreciates the risks from doing the work and how these should be tackled.

In order to provide more consistency in the way in which competency assessments of companies are carried out, a set of ‘core criteria’ should be agreed by industry, NCC and Department of Labour. Stage 1 and Stage 2 assessments should be made against these core criteria.

Organisations who are bidding for work should put together a package of information that shows how their own policy, organisation and arrangements meet these standards. If regularly updated, this information should then be used each time they are asked to demonstrate competence as part of a tender process.

Example 12
A principal contractor engaged a roofing company, with whom they had worked before, to carry out refurbishment work on the roof of an existing warehouse. Competence checks were
made, and these were cross-referenced with the performance of the roofing firm on the previous contracts. The contract was awarded, but the roofing firm sub-let the work to another company at a considerably reduced price. The company, which carried out the work, had never done such a large job before and was not competent to do the job. A worker from this company fell to his death from the roof. The principal contractor and the roofing firm were each prosecuted for failing to adequately check the competence of the company which actually carried out the work.

Remember that assessments should focus on the needs of the particular project and be proportionate to the risks, size and complexity of the work. Unnecessary bureaucracy associated with competency assessment can obscure the real issues and divert effort away from them.

### 4.3.1 Assessing an individual’s basic understanding of site risks

A basic understanding of the general risks arising from construction work is essential underpinning knowledge for everyone who works in the industry in order that they can protect their own health and safety and understand the effect that their own actions could have on others. This is particularly important for those who will regularly visit or work on construction sites. This basic understanding should be the foundation for health and safety knowledge and understanding on which more detailed competencies are developed.

The NCC Construction Skills or another accredited firm should design specification to test this basic knowledge and understanding. Passing the touch screen test or equivalent schemes is one way of demonstrating this basic knowledge and understanding. All those who work on or regularly visit sites (including individuals from client, and designer) should be able to demonstrate that they have achieved at least this level of understanding before starting work on site.

Those who are new to construction work will need close supervision by an experienced person until they can demonstrate that they are aware of these risks and know how to avoid harm.

For small projects where there are no special risks, Stage 1 of the assessment should concentrate on the person’s knowledge of the construction processes and the health and safety risks associated with the work. An appropriate health and safety qualification such as a Degree, Research in H&S, ILO, NEBOSH and NIOSH construction certificate will demonstrate that the person has adequate knowledge of health and safety, but this will need to be coupled with a Stage 2 assessment to demonstrate that they have experience in applying this knowledge in the construction environment.

For larger or more complex projects, or for those with unusual or higher risks, the skills and knowledge of the designers will need to reflect the complexity of the project and the specialist knowledge necessary to ensure that risks are properly controlled. It is more likely in these circumstances that a corporate appointment will be made and the competence assessment will be made against the core criteria mentioned.
### Management responsibility
The right person for the right job Level

<table>
<thead>
<tr>
<th>The job</th>
<th>Training and supervision</th>
<th>Measuring performance</th>
</tr>
</thead>
</table>
| Trainee | Carry out a risk assessment and as a result: Specify the tasks for the trainee; the tools, PPE and equipment; the limits of activity; the procedures to learn; assign to a supervisor; spell out the behaviour expected. | a. Provide supervision according to the risk assessment; provide induction training; train to pass the health and safety test; provide support to learn procedures and behaviours.  
  b. Set training targets and check regularly to see if these are achieved; monitor the performance and behaviours of both supervisor and trainee. |
| Site worker | Specify tasks; authorise use of plant, equipment etc according to qualifications and experience; communicate site rules for consultation co-operation. | a. Check qualifications, provide induction training; ongoing development and support to learn site-wide procedures and play a full part in consultation.  
  b. Carry out regular observations of performance against standards and site rules; encourage best practice, use management procedures which correctly reward good practice and deter bad practice. |
| Supervisor | Specify the standards that supervisors should be achieving, particularly on consultation and behaviour expectations. | a. Check qualifications; set up a reporting chain; provide management and technical support; provide training and development on management issues as required.  
  b. Performance agreement with supervisor correctly identifies and rewards health and safety elements; monitor implementation of management procedures by supervisors. |

### Individual competence

<table>
<thead>
<tr>
<th>Trainee</th>
<th>Description</th>
<th>Example of attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk control knowledge</td>
<td>Adequate knowledge of tasks to be undertaken; understands what is expected and when to ask for help; understands role and importance of supervisor; can identify key risks of activities; knows how to react to basic risks; knows main health hazards and why PPE is important.</td>
<td>Health and Safety Test or Certificate or equivalent recognised training S/NVQ Level 1.</td>
</tr>
<tr>
<td>Experience and ability</td>
<td>From no experience; has physical capability to carry out duties; minimum standard of language skills; can identify deteriorating conditions which may lead to increased risk; is aware of personal responsibility for him or herself and others, is aware of what constitutes a good attitude.</td>
<td>Attends site induction; attends mandatory in-house training; works safely to agreed standard under supervision; demonstrates safe behaviour and wears appropriate PPE at all times.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Site worker</th>
<th>Description</th>
<th>Example of attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk control knowledge</td>
<td>As for trainee, plus: knows standards of health and safety required for site operations; can identify all foreseeable risks arising from their work activity and know what actions to take to control these risks; can apply existing knowledge to new circumstances.</td>
<td>As for trainee, plus: S/NVQ Level 2 or 3.</td>
</tr>
<tr>
<td>Experience and ability</td>
<td>As for trainee, plus: consistently works to agreed standards of health and safety; quickly identifies defects and unacceptable risks; demonstrates good attitude and example at work; capable of working safely with minimal supervision.</td>
<td>As for trainee, plus: commensurate with Level 2 achievement; plays full role in site consultation; demonstrates ability to report unsafe conditions to supervisor; demonstrates motivation to learn.</td>
</tr>
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</table>
### Supervisor and Description

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Description</th>
<th>Example of attainment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk control knowledge</td>
<td>As for site worker plus: knows how to lead in identifying remedial actions to mitigate risk in all foreseeable circumstances; understands implications of his or her own decisions on others; knows when to ask for specialist help.</td>
<td>As for site worker plus: S/NVQ Level 3. Knowledge of supervision equivalent to CITB-CS 2-day supervisors’ course, NEBOSH certificate etc.</td>
</tr>
<tr>
<td>Experience and ability,</td>
<td>Able to identify causes of problems and to deploy resources to solve problems on own initiative; demonstrates leadership skills, appropriate communication strategies; can read plans, think through problems and is flexible to adapt to changing circumstances. 3-5 years’ experience of this operation;</td>
<td>Experience and ability trained and qualified to a level where he can describe risks of the range of work activities he is responsible for, is capable of identifying remote risks, and anticipating problems of change.</td>
</tr>
</tbody>
</table>

### What you are required to do for all projects

#### Providing information
All those in control of construction work are required to provide workers (including the self-employed) under their control with any information that worker needs to carry out the construction work safely and without risk to health.

**Example 13**
A major contractor recognised that for a site operative to fully participate in management meetings on health and safety, certain skills were needed. For example to know how to prioritise issues, how to present an evidence-based argument for change and how to judge what is a reasonable and constructive response from a manager. Training on this site was provided to safety representatives, both trade unions recognised and non-trade union, through a site-based recognised training course for safety representatives.

All workers should be provided with a suitable site-specific induction to inform them of the arrangements for health, safety and welfare at their work site. This should include any relevant findings resulting from a risk assessment, including risks arising from the activities of other workers working nearby. If contractors have site rules these should be explained, along with the procedures to be followed in the event of any worker finding themselves in a position of serious and imminent danger. Contractors must communicate to their workers the identity of the person who is responsible for implementing health and safety procedures on site. Every worker has a duty to report anything, which is likely to endanger the health and safety of himself or others.

To ensure involvement of the entire workforce, contractors may need to make special arrangements for workers who have little or no understanding of English, or who cannot read English. These could include providing translation, using interpreters or replacing written notices with clearly understood symbols or diagrams.

Arrangements for worker engagement on smaller sites should always be tailored to the size and nature of the project and risks involved. On smaller sites informal arrangements for collecting workers’ views can be effective. An effective way of achieving this is to arrange reviews of method statements immediately before the work itself is being carried out. Those workers who will be involved in the work can then comment directly on the risks and the ways in which these are being controlled.
Example 14
A medium-sized contractor uses the site induction as an opportunity, not only to communicate messages to the workers attending, but also to involve those workers in initial discussion on health and safety matters. The contractor recognises induction as a first opportunity to make a strong impression on workers, but also to assess individual attitudes and competence.

4.4 SOME COMMON HAZARDS
Safety risks in construction have been recognised for some time. Health risks have received less attention even though absence due to work-related ill-health is far greater than absence due to injuries at work. The ill-health effects from some types of construction activity are not always immediately obvious and can take a long time, even years, to develop. The main ill-health problems in construction are:

- Back problems and musculoskeletal disorders
- Hearing loss
- Hand-arm vibration
- Dermatitis and other skin problems
- Breathing problems such as asthma

4.4.1 Working at height
Falls from height are one of the main cause of deaths in the construction industry. There is a simple ‘hierarchy of controls’ for managing risks for work at height:

- firstly avoid work at height wherever possible,
- then prevent falls from height and, failing that,
- reduce the consequences of a fall, should one occur.

Preference should always be given to control measures that protect everyone, like providing scaffolding or safety nets. These types of measures are known as ‘collective measures’ and are considered safer than measures which only protect individuals, like fall arrest equipment. The risks from working at height must be assessed by the employer or person in charge and safe systems of work developed and followed. All work at height must be properly planned in advance to ensure the right equipment is used. Workers must be properly trained and in good health. Work at height should not be carried out in conditions which would create a significant risk, such as high winds or snow and ice. All equipment provided for work at height must be suitable for the job and regularly inspected by a competent person to ensure it remains safe to use.

Edge protection and scaffolds Suitable edge protection should be provided wherever there is a risk of falling from existing or temporary structures. This should consist of a top guard rail, a mid rail and toe boards. Edge protection is also required at the edges of excavations or where working next to deep water. Scaffold platforms should be fully boarded with no sections missing or uneven. Working platforms should be kept tidy. Slip or trip hazards should be removed promptly. If there is a risk of tools, materials or rubble falling from height, additional precautions should be taken such as fixing sheeting, brick guards or netting to the scaffold. Workers should store their hand tools safely and prevent them from falling by using a tool belt.
i) Mobile tower scaffolds

Lightweight aluminium tower scaffolds are common on construction sites and considered a lot safer than working from a ladder, but they are not without risk.

Typical hazards include:
- Collapse of the tower, due to incorrect assembly
- Fall of people
- Falling objects
- Vehicles colliding with the tower
- Overturning of a tower that is unstable

Mobile towers can become unstable and overturn if they are built too high or overloaded with too many people, materials or heavy equipment. Use of towers in high winds, placing them on uneven ground or climbing up them the wrong way can cause a tower to topple over.

Rules for the safe use of tower scaffolds:

**DO**
- Follow the manufacturer’s instructions for assembly and use
- Position the tower on firm, level ground
- Lock wheels / castors in place when the tower is in use
- Ensure guard rails and toe boards are fitted to the working platform and platforms are fully boarded
- Keep the platform tidy with tools and materials stored away to prevent slips, trips and falls
- Keep a safe distance from overhead power lines or other structures
- Wear head protection if there is a risk of falling materials from above

**DON’T**
- Exceed the recommended safe working load
- Erect, modify or dismantle a tower scaffold unless you are trained and authorised to do so
- Exceed the recommended maximum height unless suitable outriggers / stabilisers are used
- Move the tower while people or materials are still on it
- Climb up the outside of the tower (ladder access should be internal and fixed to the narrowest side)
- Stand on the guardrails of the tower, overreach from the platform or use the tower to access other structures
- Use the tower in bad weather such as high winds, icy conditions or heavy rain

ii) Ladders

Where work at height is necessary you need to decide whether a ladder or stepladder is the most suitable access equipment compared to other options. Ladders and stepladders should only be used if it is not reasonably practicable to use a tower scaffold, and then only for short duration, light work.

Rules for the safe use of ladders: DO
Only use industrial class ladders, not domestic types
Inspect the ladder before use (it should be free from damage)
Position the ladder on firm, level ground
Position the ladder at the correct angle (75° or 1 in 4 ratio)
Keep a safe distance from overhead power lines or other structures
Secure the ladder by tying it at the top and bottom
Protect the base from being hit by vehicles
Clean wet, icy or greasy rungs before use
Make sure footwear is clean and in good condition before climbing

DON’T
Allow more than one person on the ladder at any one time
Exceed the safe working load
Use metal ladders near electric cables
Overreach from a ladder (this is a common cause of accidents)
Stand on the top two steps of a stepladder unless there is a handrail
Use a ladder in bad weather such as high winds or heavy rain. If a ladder is used for access, there should be 1 metre of ladder above the stepping off point.

iii) Roof work
Many construction projects involve roof work. The main hazards are:
- Falls from edges of flat roofs or sloping roofs
- Falls through fragile roofs or fragile roof lights
- Falls from equipment such as ladders or scaffolds
- Objects like tools and materials falling from the roof or scaffold

All roof work should be pre-planned and properly supervised. A risk assessment should be carried out by the persons in charge of the work to identify hazards and ensure proper controls are in place. A safe system of work should be developed and written down in the form of a method statement which is then communicated to all workers involved. Roof work should only be undertaken by workers who are physically fit and have the necessary knowledge and experience of such work. Roof work should not be carried out in weather conditions that threaten the safety of workers. Suitable edge protection and a safe means of getting up to the roof and moving across the roof must be provided.

Sloping roofs
Sloping roofs require scaffolding and edge protection to prevent people or materials falling from the edge. Where work is of short duration (a few minutes only), properly secured ladders may be used.

Flat roofs
Falls from flat roof edges can be prevented by providing fixed or temporary edge protection or barriers to prevent workers from reaching within 2 metres of an open edge. For very short duration work, like carrying out an inspection, travel restraint equipment can be used, which prevents the worker from actually reaching the edge of the roof as they are anchored to a fixed point.

Fragile surfaces
Work on or near fragile roof surfaces is high risk and requires careful planning and proper control measures. Always follow a safe system of work using a platform beneath the roof where possible. Sometimes it is possible to reach the roof safely using a scaffold. Otherwise a combination of platforms, guard rails, fall arrest equipment and safety nets will be needed. All roof surfaces should be treated as fragile unless a competent person has confirmed they are not. Do not trust any sheeted roof, whatever the material, to bear the weight of a person. This includes the roof ridge and purlins (supporting framework under the roof surface). Fragile roof lights are a particular hazard. Some are difficult to see in certain conditions and others may be hidden by paint, moss or algae. Protection must be provided in these areas, either by using barriers or covers to prevent falls. In addition to roof lights, typical fragile surfaces include fibre cement sheets (including asbestos cement), glass (including wired glass), metal sheets (where corroded), rotten chipboard and liner panels. Even slates and tiles can become fragile. Buildings with fragile roofs should have a warning notice prominently displayed at the approaches to the roof. Many roofs on older industrial or agricultural buildings are made of asbestos cement sheets. These are fragile but can also, if damaged or disturbed, release harmful asbestos fibres.

4.4.2 Moving vehicles and mobile plant

i) Construction site traffic
Numerous vehicles visit or move around construction sites during the course of a project. These include cars, vans, lorries, low-loaders and mobile plant such as excavators, lift trucks and dumper trucks. Hazards from vehicle movements include:

- Collision between vehicles and pedestrians
- People falling from vehicles
- Objects falling from vehicles
- Overturning of vehicles
- Vehicles striking stationary objects

The best way to reduce transport accidents on construction sites is by organising and controlling sites so that vehicles and pedestrians can move around safely and are kept apart as much as possible. Key controls include:

- Providing separate entry and exit gateways for vehicles and pedestrians
- Installing barriers between roadways and walkways where possible
- Providing clearly signed and lit crossing points where drivers and pedestrians can see each other clearly
- Making sure drivers exiting on to public roads can see both ways along the pavement before they move on to it
- Keeping vehicle and pedestrian routes clear of obstructions
- Making sure there is adequate clearance around slewing vehicles
- Ensuring that everyone on site wears high visibility clothing
- Providing adequate lighting throughout the site

The number of vehicle movements should be kept to a minimum. Reversing vehicles are particularly high risk. Providing one-way systems and turning circles can reduce the amount of reversing needed. It may be necessary to use a ‘reversing assistant’ to guide and direct vehicle movements. All workers should be instructed in the safe pedestrian routes on site, the meaning of signs and notices and any site rules controlling traffic and pedestrian movements.
ii) Communication between drivers and others

Many construction vehicles have significant blind spots (areas that the driver cannot see) in various locations around the vehicle. In some cases this can create risks to both pedestrians and to the vehicle when the vehicle is moving. Workers may at some time need to approach a moving vehicle. They should be instructed in a safe procedure for making the driver aware of their intention to approach, and ensuring that the vehicle is safely at rest before they approach. Additional safety rules for operating mobile plant:

1. People who drive vehicles and operate mobile plant, including those that direct vehicle movements (signallers), must be competent and trained.
2. Only workers who are authorised should operate plant. Access to keys should be controlled and keys should never be left in an unattended vehicle.
3. No-one should ride on vehicles or mobile plant except where the vehicle has been designed to carry a passenger.
4. Loads should be properly secured to prevent objects falling off or dropping while being transported. Plant and equipment should never be loaded beyond the safe working load.
5. Plant should be well-maintained. Drivers should check their vehicle daily and report any defects immediately.
6. Using mobile plant on sloping, uneven or unstable ground can be hazardous and cause vehicles to overturn. Safe systems of work should be followed to ensure equipment is not used on dangerous slopes. Wearing seat belts and providing ‘roll over protection’ like roll bars and cabs on vehicles, can help prevent serious injuries in the event of a vehicle overturning.