

Forewarned is forearmed



Designers have a huge influence on the health and safety of a construction project – that is why they have a set of legal duties. Know what these are, and how to discharge them.

The early stages of a project are very important when it comes to setting health and safety standards.

That is why the Construction (Design and Management) Regulations 2015 (CDM 2015) require designers to play a major part in minimising the hazards associated with construction, at as early a stage as possible. Coordinating the activity of designers and decision makers is the Principal Designer, a design organisation or for very small projects, an individual.

In order to discharge their duties, designers need to understand:

- **Which hazards may exist on a construction site**
- **The problems faced by those required to maintain, repair and refurbish a structure**
- **The issues facing those who use a structure as their workplace**
- **How to communicate hazards and risk information effectively**

This Design Guide is intended to raise awareness of the hazards **designers** may be required to deal with, and help them to understand their duties under CDM 2015.

Legislative background

In 1992, the EU passed the Temporary or Mobile Construction Sites Directive (92/57/EEC).

The provisions of this Directive were brought into UK law by two sets of Regulations. Those relating to the planning stages of a project were implemented by the Construction (Design and Management) Regulations 1994 (CDM 1994). Meanwhile, the elements relating to the construction phase were included in the Construction (Health, Safety and Welfare) Regulations 1996 (CHSW 1996).

CDM 1994 and CHSW 1996 were then replaced by CDM 2007. CDM 2007 has now been replaced by CDM 2015. CDM 2015 applies to all construction work.

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CDM 2015

CDM 2015 places a set of specific duties on designers. In summary, a designer must:

- **Commence work only when the client is aware of their duties under CDM 2015**
- **Where possible, eliminate hazards that may give rise to risks**
- **Reduce risks, where elimination is not possible**
- **Avoid foreseeable risks to the health and safety of any person:**
 - Carrying out construction work
 - Likely to be affected by construction work
 - Cleaning windows, roofs or other transparent surfaces in or on a structure
 - Maintaining the permanent fixtures and fittings of a structure
 - Using a structure designed as a workplace
- **Take account of the provisions of the Workplace (Health, Safety and Welfare) Regulations 1992 that relate to the design of, and materials used in, a structure**
- **Provide sufficient information to clients, contractors and other designers to enable them to discharge their own duties under CDM 2015**

Bear in mind that, as a designer, you also have to understand and respond to your general duties as part of the construction team.

For full details of these duties, you should refer to the full text of CDM 2015.

What is ‘design’?

Under CDM 2015, the term ‘design’ includes “drawings, design details, specification and bill of quantities (including specification of articles or substances) relating to a structure, and calculations prepared for the purposes of a design”. It can be helpful to consider “decision making” as part of design. This more closely describes the definition of design.

A good designer is required to have:

- **Good education and training in their chosen discipline**
- **A good awareness of practical processes (from their own experience, or industry guidance)**
- **A good knowledge of the properties of the materials they are specifying**
- **Up-to-date knowledge**
- **An ability to communicate verbally, graphically and in writing**

The design process

Prior to 1994, a designer’s duties included:

- **Designing a structure or product that was fit for purpose**
- **Designing to satisfy the client’s budget**
- **Communicating (as a minimum) the following information to the contractor:**
 - The type of construction
 - The materials to be used
 - The quantities of materials required
 - A quality specification
 - Special requirements
 - Testing requirements
- **Cooperating with the contractor/manufacturer**

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CDM 1994 and CDM 2007 have required designers to extend their knowledge considerably. You now need to have a much better understanding of the properties of the materials you specify, and of the practical processes involved in a construction project. Without this knowledge, it would be impossible to satisfy the requirements of CDM 2015. The law CDM 2015 requires design and decision making prior to site activities to be coordinated by a principal designer.

Additional awareness requirements

To make provision for the safe construction, operation, maintenance, use or demolition of a structure, you will need to develop your awareness of the following:

- **Common site-related hazards**
- **The construction and demolition processes**
- **Requirements for the provision of safe temporary works equipment**
- **The potential for harm arising out of the materials you specify**
- **Processes that can release potentially harmful agents**
- **The potential for harm arising out of activities carried out by others**
- **Which particular 'in use' hazards are likely to require special consideration**
- **Which service requirements will be needed, and the risks that they might present (particularly in terms of access)**
- **How maintenance staff will be able to work in safety, and without compromise to their health**

Without this awareness, it is unlikely that you will be able to satisfy the requirements of CDM 2015.

Making the harmless harmful

Designers should be aware that a relatively inert material could be made harmful by the application of a construction process to it. For example, concrete (a harmless material) may need to be cut – creating dust, and a health hazard.

Take care in the processes you specify and remember that, if you remain silent on such matters, you are unlikely to satisfy your duties under CDM 2015.

Further information on this subject can be found in Design Guide MAT401 **Hazards associated with materials**.

Dealing with hazards in construction

In order to deal with a hazard, a designer must first be able to recognise that it exists. There are three main types of hazard that may be encountered on a construction site. These are:

- **Hazards harmful to health**
- **Hazards likely to cause personal injury**
- **Hazards likely to lead to catastrophic events**



The following guidance provides information about these hazards, and suggests control measures (see the key in Table 1).

Table 1: Suggested control measure

Key	Suggested control measure
↔	Try to avoid specifying the materials or processes that lead to these hazards occurring
◆	Try to design to avoid the processes that lead to these hazards being realised
♠	Try to avoid by following the advice or methods described in referenced information sheets
♥	Make easier to manage by passing adequate information about their existence to the contractor

Hazards harmful to health

Hazard	Suggested control measure	Design Guide
Coming into contact with a harmful substance, such as:		
(i) Asbestos	(i) ↔	(i) SIT105
(ii) Corrosive substances, such as acids and alkalis	(ii) ↔	(ii) MAT401
(iii) Irritants, such as solvent fumes	(iii) ↔	(iii) MAT401
(iv) Dust associated with a process	(iv) ◆	(iv) MAT401
(v) Toxins in toxic materials	(v) ↔	
(vi) Noxious gases	(vi) ↔	
(vii) Infectious diseases	(vii) ♥	
(viii) Radiation from radioactive materials	(viii) ♥	
Possible exposure to:		
(i) Noise	(i) ◆	(i) CON303
(ii) Harmful vibration	(ii) ◆	(ii) CON301
Working in strenuous conditions	↔	CON301, CON301.1, CON309

Hazardous situations likely to cause personal injury

Hazard	Suggested control measure	Design Guide
Working close to:		
(i) Moving plant and machinery		
(ii) Areas into which objects can fall		
(iii) Moving site vehicles and plant		
(iv) Live electrical circuits – for example, overhead and buried power lines	(iv) ◆ ♥	
(v) Fragile materials		

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Hazard	Suggested control measure	Design Guide
Working in the following situations: (i) At height (ii) On fragile materials (iii) In or over water (iv) On congested sites (v) In confined spaces (vi) In excavations (vii) On uneven or slippery surfaces (viii) In non-ergonomic positions	(i) ♠ (ii) ↔ (iv) ♠ (v) ♥ (vi) ♠ (vii) ♦	(i) CON307 (ii) CON308 (iv) GND201
Handling heavy or unwieldy loads	↔	CON301, CON301.1, CON309, MTN501
Instability/unplanned collapse	♥	CON304, CON302.1

Hazards likely to lead to catastrophic events

Hazard	Suggested control measure	Design Guide
Outbreaks of fire	↔	MAT401
Explosions	↔	MAT401
Flooding	♦ or ♥	
Premature collapse of: (i) Structures (ii) Cranes (iii) Tunnels and excavations (iv) Temporary works	♠ ♠ ♠ ♠	(i) CON304, CON305, MTN501 (ii) CON302.1 (iii) GND201 (iv) CON306

Useful resources

Construction (Design and Management) Regulations 2015 and Guidance

See elsewhere on SID:

SIT, GND, CON, MAT, MTN and DEM Design Guides
ADM003 UK construction health and safety overview