

Brickwork Level 2

Second Edition

MALCOLM THORPE



For Construction Diploma, Technical Certificate and Apprenticeships

Brickwork Level 2

Brickwork Level 2 has been adapted from John Hodges's classic *Brickwork for Apprentices* – the established textbook on brickwork for bricklayers. Designed to meet new requirements of the City and Guilds bricklaying programmes, this book has been written to match the latest industry-based requirements and technical developments in the field, including recent changes to the Building Regulations. Each chapter follows the syllabus and contains a section of multiple-choice questions to provide trainees with vital practice for the job knowledge and multiple-choice tests.

Highly illustrated throughout and now in full colour, this is the essential reference for qualified bricklayers and other professionals working in the construction industry, as well as students wishing to embark on a career in bricklaying.

There is also the facility to access the Support Material on the Routledge website, which includes:

- PowerPoint slides for each chapter
- Lesson plans and schemes of work
- Multiple-choice questions and answers
- Job knowledge questions and answers
- Practical drawings and mark sheets

Malcolm Thorpe is a Life Member of the Guild of Bricklayers and former Head of Construction at West Nottinghamshire College, UK. He has acted as a CITB adviser and was involved in the drafting of bricklaying programmes. He was a verifier for CITB and spent several years producing examination material for examining bodies. He also spent over thirty years designing and organising Guild of Bricklayers local and national bricklaying competitions.



Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

Brickwork Level 2

**For Construction Diploma, Technical Certificate and
Apprenticeship Programmes**

Second Edition

Malcolm Thorpe

Second edition published 2021
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

and by Routledge
52 Vanderbilt Avenue, New York, NY 10017

Routledge is an imprint of the Taylor & Francis Group, an informa business

© 2021 Malcolm Thorpe

The right of Malcolm Thorpe to be identified as author of this work has been asserted by him in accordance with sections 77 and 78 of the Copyright, Designs and Patents Act 1988.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Trademark notice: Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

First edition published by Routledge 2010

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data

A catalog record has been requested for this book

ISBN: 978-0-367-62549-8 (hbk)

ISBN: 978-0-367-62536-8 (pbk)

ISBN: 978-1-003-10965-5 (ebk)

Typeset in Utopia
by MPS Limited, Dehradun

Access the Support Material: www.routledge.com/9780367625368

Contents

<i>Preface</i>	<i>vi</i>
Chapter 1 The Construction Industry (Community Buildings)	1
Chapter 2 Health and Safety in the Construction Industry	17
Chapter 3 Communication and Records	35
Chapter 4 Construction Technology	95
Chapter 5 Moving and Handling Resources	155
Chapter 6 Solid Walls and Piers	199
Chapter 7 Constructing Cavity Walls with Openings	263
Chapter 8 Cladding to Timber, Steel and Concrete Frames	311
Chapter 9 Thin Joint Masonry	339
Chapter 10 Bridging Openings with Lintels and Arches	359
Chapter 11 Domestic Drainage	385
Chapter 12 Answers to Multiple-Choice Questions	425
<i>Index</i>	429

Preface

Changes in construction training have led to the need to update this series of books which incorporate the new Occupational Standards.

The content of each book follows the On-Programme Training Specification.

The On-Programme specification is divided into Knowledge Requirements (K) and Skill Requirements (S).

After the initial chapter, which gives the apprentice an insight into the construction industry they are entering, each chapter follows very closely the Training Specification for Technical Certificate, Apprenticeship and Diploma units.

The aim of each book is to provide an informative resource and workbook for all building craft apprentices. It can be used to provide teaching and assessment material, or used simply to reinforce college lectures.

Each chapter has a set of multiple-choice questions designed to test your level of knowledge before you move on to the next chapter.

There is also the facility to access the Support Material on the Routledge website, which includes lesson plans, schemes of work, completed units tracking sheets, mapping sheeting, PowerPoint displays, activity packs, job knowledge questions and answers, multiple-choice questions and answers, practical training units and practical competency units with marking sheets.

It can be accessed here: www.routledge.com/9780367625368

Malcolm Thorpe

Introduction

When students are thinking of entering the building trade they may ask many questions. The three main questions are:

- What is the construction industry?
- What can the construction industry offer me?
- What type of education will I need?

The construction industry

The construction industry is one of the largest employers of labour in the country, with a labour force of just over one million, a figure that has dropped steadily over the past years.

Construction means creating, not only the houses we need to live in but many other buildings such as schools, hospitals and shopping centres.

The majority of buildings and structures are designed and constructed for a specific purpose. The use of the building will determine the size, shape, style and ultimately the cost.

Every person employed in the construction industry makes a direct contribution to the community in general but also to the nation.

The industry is made up of a large number of firms which can be classified as:

- builders
- contractors
- subcontractors, etc.

The firms range in size from one-person firms to multinational companies.

- A small company is defined as having between one and 49 employees.
- A medium company is defined as having between 50 and 249 employees.
- A large company is defined as having more than 250 employees.

There are also several different types of construction work to consider when thinking of joining the construction industry.

The whole industry can be further divided into four:

- *New work* refers to all types of building work and services which are about to start.
- *Maintenance work* refers to any work on an existing building which requires damaged or out-of-date items to be brought up to an acceptable standard.

Examples of maintenance work include new kitchen and bathroom units, or external brickwork requiring repointing, etc.

- *Refurbishment* is when an old building has been allowed to fall into a state of disrepair and it needs to be brought back to standard. Changing existing buildings for another purpose is also classed as refurbishment. An example is when an old warehouse has been changed into a block of flats.

- *Restoration work* is when an old building is brought back to its original state.

Examples are old historic buildings bought by the National Trust and then painstakingly restored to their former glory.

The construction process

The construction process is said to be the most complex of all industries.

People employed in manufacturing industries travel each day to the same place and do the same type of work.

In the construction industry the employees move to a different place of work as soon as the particular job has been completed. The distance depends on the nature and size of the contractor and the availability of work.

No two construction sites are ever the same, and it is seldom that more than a few dwellings are the same.

The construction industry does not lend itself to production-line methods, so it is very labour intensive.

The construction team is therefore comprised of people possessing a vast range of skills, from the tradespeople to the professionals.

The construction industry differs from other industries in the following ways:

- Work is carried out in the open and is subject to stoppages from the weather.
- Every day the plan of work is different.
- The labour force is not static and can change daily.
- Great distances have to be travelled by employees, so they are often many miles from the head office.
- Every job is different, so there is no repetition through which employees can produce more after gaining experience.
- Many of the contracts are completed by one person after being designed by another person.
- Safety in the industry has a very poor record.
- The industry is very labour intensive.

All the above statements can cause many problems and it is very difficult for any one person to rectify them; therefore the construction team becomes very important indeed.

Types of building

Many different types of construction are required to fulfil the needs of today's ever-demanding society.

These consist of the following and are shown in Figure 1.1:

- dwelling units – for people to live in
- communal buildings – for all people to share
- industrial units – for people to work in
- recreational units – for people to relax in
- communications – roads, rail, sea and air networks – to allow people to move from one place to another.

Community buildings

For the purpose of Level 2, only buildings for communal purposes will be dealt with.

These buildings cover those found in recreational, educational, spiritual and leisure sectors. Buildings in this category are used for the benefit of the community. They are used to accommodate the facilities that society provides for:

- health care
- welfare
- education
- entertainment.

Examples of buildings that provide for the spiritual needs of the community are:

- churches
- chapels
- cathedrals.

Examples of community buildings include:

- shopping centres
- hospitals
- police and fire stations.

Other buildings in this category provide buildings for leisure, such as:

- public houses
- dance halls
- theatres
- cinemas
- concert halls.

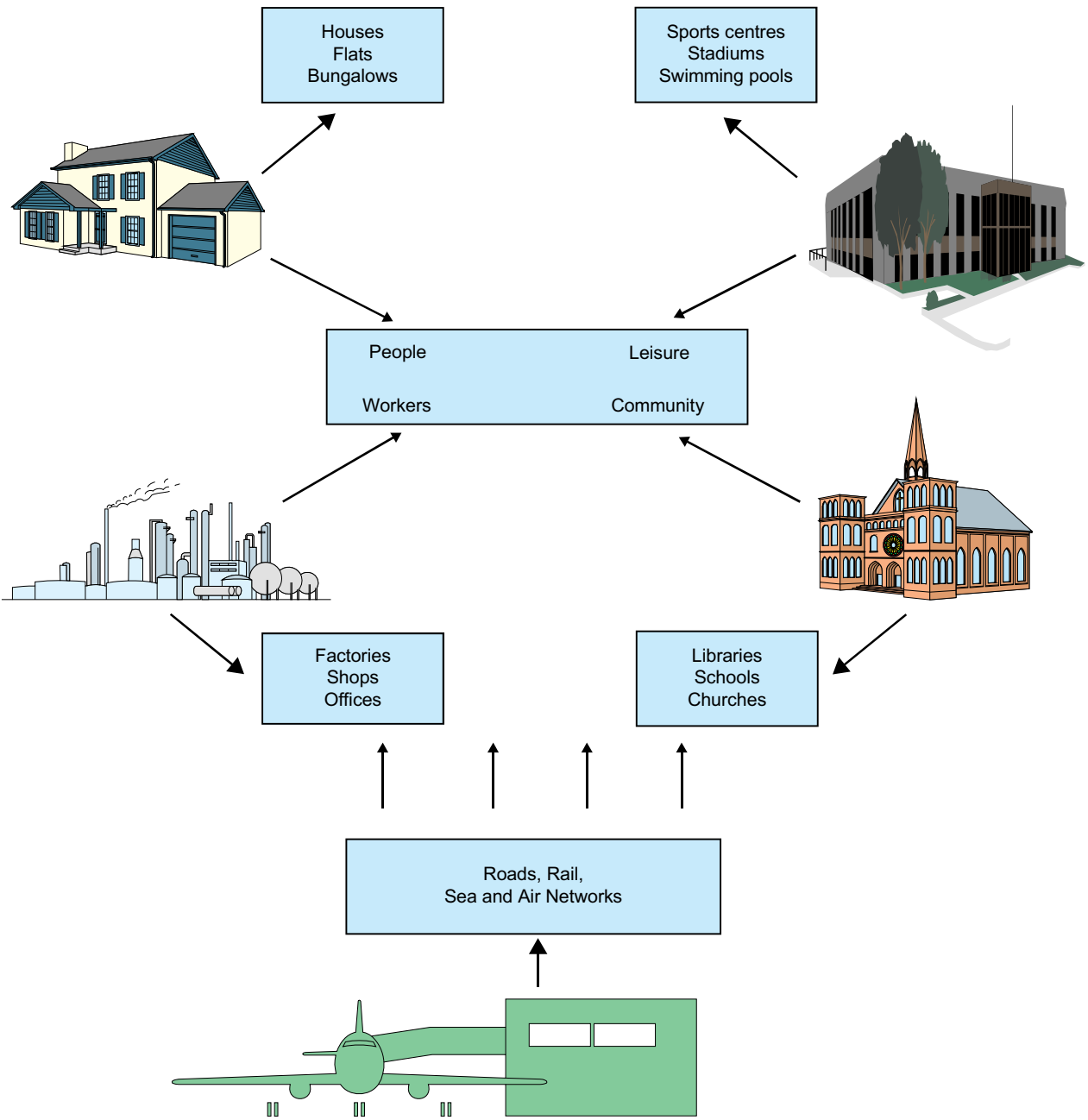


FIGURE 1.1
Types of construction

Buildings designed and constructed for education include:

- schools
- colleges
- libraries.

Buildings in this category are designed and built for the use of all the community. The list is by no means exhaustive.

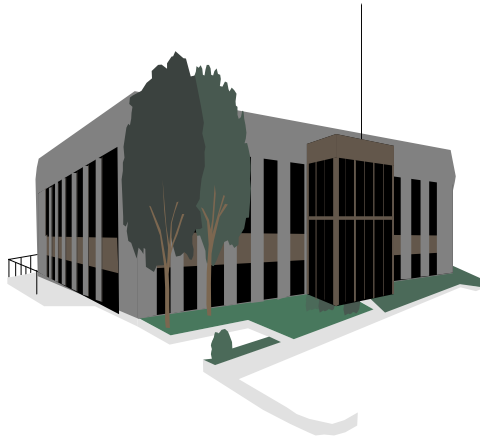
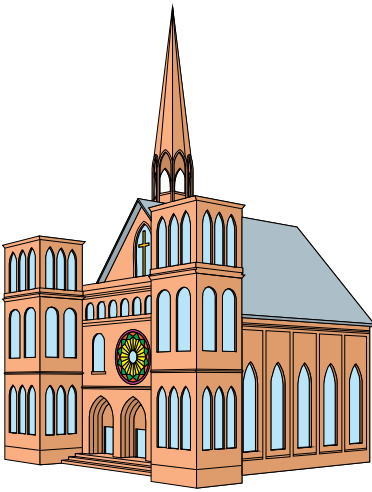


FIGURE 1.2

Communal buildings

Classification of communal buildings

All buildings are designed to fulfil a role, none more so than community buildings. This category covers a very wide range of buildings, some of which are shown in Figure 1.2.

Classification of buildings by purpose or use

The classes of use for England as set out in the Town and Country Planning (Use Classes) Order 1987 (as amended) puts uses of land and buildings into various categories known as 'Use Classes'. The relevant building regulations also need to be considered for any proposed change of use.

Whenever you are thinking of creating, changing or demolishing buildings or land it is important to understand what use class they fall under. This also applies if you are changing how a building or land is used (for instance, turning a residential property into a business) but not necessarily making physical changes.

Sometimes, depending on which use class they come under, work carried out on buildings or land may be covered by permitted development rights. This means that you do not need to apply for planning permission but you may still need to seek prior approval or notify us before you make the changes.

List of use classes

Part A

A1 Shops

Shops, retail warehouses, hairdressers, undertakers, travel and ticket agencies, post offices, pet shops, sandwich bars, showrooms, domestic hire shops, dry cleaners, funeral directors and internet cafes

A2 Financial and professional services

Financial services such as banks and building societies, professional services (other than health and medical services) and including estate and employment agencies. It does not include betting offices or pay day loan shops – these are now classed as “sui generis” uses (see below)

A3 Restaurants and cafés

For the sale of food and drink for consumption on the premises – restaurants, snack bars and cafes

A4 Drinking establishments

Public houses, wine bars or other drinking establishments (but not night clubs) including drinking establishments with expanded food provision

A5 Hot food takeaways

For the sale of hot food for consumption off the premises.

Part B

B1 Business

Uses which can be carried out in a residential area without detriment to its amenity. This class is formed of three parts:

- B1(a) Offices - Other than a use within Class A2 (see above)
- B1(b) Research and development of products or processes
- B1(c) Industrial processes

B2 General industrial

Use for industrial process other than one falling within class B1 (excluding incineration purposes, chemical treatment or landfill or hazardous waste)

B8 Storage or distribution

This class includes open air storage.

Part C

C1 Hotels

Hotels, boarding and guest houses where no significant element of care is provided (excludes hostels)

C2 Residential institutions

Residential care homes, hospitals, nursing homes, boarding schools, residential colleges and training centres

C2A Secure residential institution

Use for a provision of secure residential accommodation, including use as a prison, young offenders institution, detention centre, secure training centre, custody centre, short term holding centre, secure hospital, secure local authority accommodation or use as a military barracks

C3 Dwelling houses – This class is formed of three parts

C3(a)

covers use by a single person or a family (a couple whether married or not, a person related to one another with members of the family of one of the couple to be treated as members of the family of the other), an employer and certain domestic employees (such as an au pair, nanny, nurse, governess, servant, chauffeur, gardener, secretary and personal assistant), a carer and the person receiving the care and a foster parent and foster child

C3(b)

covers up to six people living together as a single household and receiving care e.g. supported housing schemes such as those for people with learning disabilities or mental health problems

C3(c)

allows for groups of people (up to six) living together as a single household. This allows for those groupings that do not fall within the C4 HMO definition, but which fell within the previous C3 use class, to be provided for i.e. a small religious community may fall into this section as could a homeowner who is living with a lodger

C4 Houses in multiple occupation

Small shared houses occupied by between three and six unrelated individuals, as their only or main residence, who share basic amenities such as a kitchen or bathroom.

Part D

D1 Non-residential institutions

Clinics, health centres, crèches, day nurseries, day centres, schools, art galleries (other than for sale or hire), museums, libraries, halls, places of worship, church halls, law court. Nonresidential education and training centres

D2 Assembly and leisure

Cinemas, music and concert halls, bingo and dance halls (but not night clubs), swimming baths, skating rinks, gymnasiums or area for indoor or outdoor sports and recreations (except for motor sports, or where firearms are used).

Sui generis

'Sui generis' is a Latin term that, in this context, means 'in a class of its own'.

Certain uses are specifically excluded from classification by legislation, and therefore become 'sui generis'. These are:

- theatres
- amusement arcades/centres or funfairs
- launderettes
- fuel stations
- hiring, selling and/or displaying motor vehicles
- taxi businesses
- scrap yards, or a yard for the storage/distribution of minerals and/or the breaking of motor vehicles
- 'Alkali work' (any work registerable under the Alkali, etc. Works Regulation Act 1906 (as amended))
- hostels (providing no significant element of care)
- waste disposal installations for the incineration, chemical treatment or landfill of hazardous waste
- retail warehouse clubs
- nightclubs
- casinos
- betting offices/shops
- pay day loan shops

Legislation

As the population has steadily grown from the Middle Ages through until the modern day the standard of dwellings has improved.

Man has created some form of dwelling from very simple shelters to protect himself from the weather and wild animals until the present elaborate designs planned for modern day comfort.

The design and construction of buildings has improved to include the advances in technology.

It took the Great Fire of London to make the Government realise that some form of control was required.

The London Building Act, controlling the rebuilding of the City of London, came into force in 1667. The main aim of this Act was 'fire protection'.

Various other Acts followed including the Factories Act, The Public Health Act, The Building Byelaws, The Town and Country Planning Act.

In 1965 the Building Regulations were enacted. This was the first set of regulations covering buildings to apply nationally.

The Building Regulations are designed to set minimum standards for all building work and to safeguard public health and safety. They are administered by the local authorities through their building surveyors department.

Heritage

Types of heritage

There are three types of sites: cultural, natural, and mixed.

Cultural heritage sites include hundreds of historic buildings and town sites.

Natural heritage sites include important archaeological sites.

Mixed heritage includes works of monumental sculpture or painting.

Typically, a heritage building means a structure that requires preservation because of its historical, architectural, cultural, aesthetic or ecological value.

Archaeological sites, ruins and remains are also covered under the term heritage sites.

Historic preservation is an endeavour that seeks to preserve, conserve and protect buildings, objects, landscapes or other artefacts of historical significance.

As we move into the future with the explosion of new technologies, historic preservation provides an anchor to our past.

Restoration, refurbishment, preservation and renovation

Building restoration

Restoration is the act of repairing or renewing something.

An example of restoration is fixing an old house to its original state as seen in Figure 1.3.

Restoration work is most commonly undertaken on historic buildings; accurately recreating its form, features and character as it appeared at a particular time, while protecting its heritage value.

Building refurbishment

Refurbishment is a term used to describe a process of improvement by cleaning, decorating and re-equipping. It may also include elements of retrofitting with the aim of making a building more energy efficient and sustainable. See Figure 1.4.

The lifecycle of a building can be significantly extended by effective refurbishment.



FIGURE 1.3
Restored building



FIGURE 1.4
Refurbished building

Building preservation

Preserving historic buildings is crucial to retaining our nation's heritage and history. It is also environmental and practical, basically large scale recycling. It reduces the need for new materials and the other costs of demolition.

**FIGURE 1.5**

Preserved building

Preserving and restoring the old buildings is also important because those old monuments are the reflection of our history, they help us to understand and respect people who lived in different eras with different habits and traditions. See Figure 1.5.

**FIGURE 1.6**

Renovated building

Building renovation

If you restore an old 1950s house, you use period materials and effects. Restoration always means a putting back.

A renovation of the same property might include new things such as a new bathroom and kitchen. A typical renovation project is shown in Figure 1.6.

Multiple-choice questions

Self-assessment

This section of the book is designed to allow you to check your level of knowledge. The section consists of revision questions for this chapter. The questions are all multiple choice and have four possible answers. The answers are to be found at the end of the book.

The main type of multiple-choice question will be the four-option multiple-choice question. This will consist of a question or statement, known as the stem, followed by a choice of four different answers, called the responses. Only one of these responses is the correct answer; the others are incorrect and are known as distracters.

You should attempt to answer the questions by choosing either (a), (b), (c) or (d).

Example

The person employed by the local authority to ensure that the Building Regulations are observed is called the:

- (a) clerk of works
- (b) building control officer
- (c) council inspector
- (d) safety officer

The correct answer is the building control officer, and therefore (b) would be the correct response.

The construction industry

Question 1 Classification of buildings is set out in the:

- (a) Town and country Planning Order
- (b) The Factories Act
- (c) The Public Health Act
- (d) The Building Bylaws

Question 2 State the type of community unit shown.



- (a) library
- (b) school
- (c) church
- (d) theatre

Question 3 Groups of shops all under one roof are known as:

- (a) high-street shops
- (b) shopping centres
- (c) community centres
- (d) arenas

Question 4 The act of repairing or renewing a building is known as:

- (a) conserving
- (b) preserving
- (c) renewing
- (d) restoring

Question 5 Archaeological sites are known as:

- (a) brown-field sites
- (b) heritage sites
- (c) historical sites
- (d) building sites

Question 6 Which of the following communal buildings has been designed for educational needs?

- (a) church
- (b) hospital
- (c) school
- (d) football stadium

Question 7 Identify the following communal building:



- (a) Theatre
- (b) Hospital
- (c) Public house
- (d) School

Question 8 A person who designs a communal building is known as the:

- (a) architect
- (b) surveyor
- (c) estimator
- (d) client



Taylor & Francis

Taylor & Francis Group

<http://taylorandfrancis.com>

CHAPTER 2

Health and Safety in the Construction Industry

This chapter will cover the following City and Guilds units:

- | | | |
|--------------------------|--------------|---|
| • Apprenticeship Level 2 | Module 2 | K2.1, K2.2, K2.3, K3.1, K3.2, K3.3, K3.4 |
| | Module 10 | S3.1, S3.2, S3.3 |
| | Module 9 | S1.1, S2.1 |
| • Certificate Level 2 | Unit 201 | 2.4 |
| • Diploma Level 2 | Unit 201/601 | 1.1,1.2,1.3,1.4, 1.5, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 3.1, 3.2, 3.3, 3.4, 3.5, 4.1, 4.2, 4.3, 6.1, 6.2, 6.3, 6.4, 7.1, 7.2, 7.3, 7.4, 8.1, 8.2, 8.3, 8.4, 8.5, 9.1, 9.2, 9.3, 9.4 |

This chapter is about:

- Awareness or relevant current statutory requirements and official guidance
- Personal responsibilities relating to workplace safety, wearing appropriate protective equipment and compliance with warning signs
- Personal behaviour in the workplace
- Security in the workplace
- Relationships

The following Skills and Knowledge requirements will be covered:

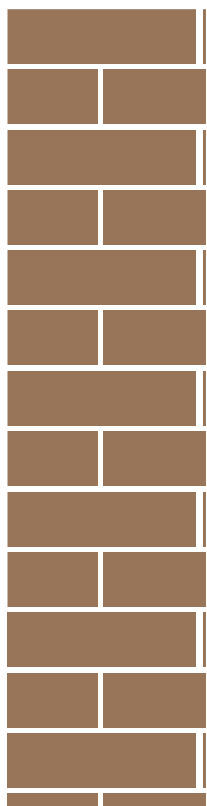
- Understand how site procedures contribute to maintaining health and safety
- Maintain a safe and secure work environment for customers during construction works

The following Certificate learning outcomes will be covered:

- Understand Health and Safety guidance used during the construction process

The following Diploma learning outcomes will be covered:

- Know health and safety regulations, roles and responsibilities
- Know accident and emergency reporting procedures
- Know how to identify hazards in the workplace
- Know about health and welfare in the workplace
- Know how to handle materials and equipment safely
- Know about access equipment and working at heights
- Know how to work with electrical equipment in the workplace
- Know how to use PPE
- Know the cause of fire and emergency procedures



Safety legislation

Safety in the workplace will be covered only briefly in this chapter as it has already been covered in depth in Chapter 2 of Level 1. If more detailed information is required please refer to Level 1.

The construction industry is often involved in very difficult and often hazardous sites. It is therefore very important that the new recruit is aware of these dangers and that there are various regulations in place to control and reduce these possible hazards.

Prevention of hazards in the workplace

Hazards within a workplace can occur because of several circumstances. There may be faults in equipment, tools, stored substances, dangerously stacked materials, materials obstructing safe access, or simply a lack of site safety.

The health and safety of employees at their workplace and any other persons at risk through work activities are covered through various Acts of legislation and regulations.

These include the following:

- The Health and Safety at Work Act 1974
- The Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- The Noise at Work Regulations 2005
- Work at Height Regulations 2005
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)
- The Personal Protective Equipment at Work Regulations amended 2018
- The Fire Precautions (Workplace) Regulations amended 1999
- Provision of the Use of Work Equipment Regulations 1998 (PUWER)
- The Electricity at Work Regulations 1989
- The Manual Handling Operations Regulations 1992
- Control of Vibration at Work Regulations
- Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)
- The Construction (Design and Management) Regulations 2015

The main health and safety legislation applicable to building sites and workshops is covered by the Health and Safety at Work Act 1974.

Health and safety at work ACT 1974

The four main objectives of the HASAWA are:

- To secure the health, safety and welfare of all persons at work.

NOTE

As Regulations are updated regularly it is always advisable to check with the latest version.

- To protect the general public from risks to health and safety arising from out of work activities.
- To control the use, handling, storage and transportation of explosives and highly flammable substances.
- To control the release of noxious or offensive substances into the atmosphere.

This Act requires employers to ensure so far as is reasonably practicable the health and safety of their employees, other people at work and members of the public who may be affected by their work.

Employees have to co-operate with their employer on health and safety matters and not do anything that puts them or others at risk.

Employees should be trained and clearly instructed in their duties.

The main purpose of this Act is to cover all aspects of safety.

The framework promotes, stimulates and encourages high standards of health and safety in the workplace.

The Act involves everyone, management, employees, the self-employed, the employees' representatives, the controllers of premises, and the manufacturers of plant, equipment and materials, in matters of health and safety.

The Act also deals with the protection of the public, where they may be affected by the activities of people at work.

Outline of the Act

The Act itself is very complex and is an extensive document with numerous parts and sections. There are four main parts.

Part 1 of the Act describes:

Employers' and management duties:

1. Provide and maintain a safe working environment.
2. Ensure safe access to and from the workplace.
3. Provide and maintain safe machines, equipment and methods of work.
4. Ensure the safe handling, transport and storage of all machinery, equipment and materials.
5. Provide their employees with the necessary information, instruction, training and supervision to ensure safe working.
6. Prepare, issue to employees and update as required a written statement of the firm's safety policy.
7. Involve trade union safety representatives (where appointed) with all matters concerning the development, promotion and maintenance of health and safety requirements.

Employees' duties:

1. Take care at all times and ensure that they do not put themselves, their workmates or any other person at risk by their actions.
2. Co-operate with their employers to enable them to fulfil the employer's health and safety duties.
3. Use the equipment and safeguards provided by the employers.
4. Never misuse or interfere with anything provided for health and safety.

Safety procedures and documentation

In order to comply with the various safety legislation, an employer is required:

- To display notices and certificates – e.g. a copy of a valid fire certificate.
- To notify relevant records – e.g. commencement of any building works likely to last in excess of six weeks has to be notified to the relevant authority.
- To keep relevant records –e.g. the accident book in which details of *all* accidents are recorded.

Workplace safety

Accidents

When joining the construction industry it is important to remember that you will be joining an industry with one of the highest injury and accident ratings. It therefore cannot be stressed enough that you could be at constant risk unless you start as you intend to continue, with a good safety attitude.

Any type of work carried out by the construction industry is often difficult and hazardous. Every site will be different, and therefore every site will bring possible new dangers.

It is of utmost importance that *all* trainees are capable of using hand tools and equipment efficiently and safely at an early stage in their development.

Furthermore, they should be aware of the causes of accidents and be able to take action and deal with any accident that may occur.

An accident is an unexpected or unplanned happening which results in personal injury or damage, sometimes death.

Reported accidents are those which result in death, major injury and more than three days' absence from work or are caused by dangerous occurrences reported to the HSE.

Every day a large number of the industrial accidents that are reported involve construction workers.

ACCIDENTS DO NOT JUST HAPPEN, THEY ARE CAUSED.

Learning to spot a dangerous situation is not as difficult as it sounds, because accidents follow a regular pattern. The same kind of accident happens over and over again. Every day of the year, all over the country, the same set of dangerous conditions builds up and the same unsafe acts take place.

Do any of the things you normally see and do at work add up to a source of danger? Next time you are tempted to take a risk – STOP and THINK again.

Types of hazard

Everyone involved in the construction industry should be aware of the possible dangers and hazards on the construction site.

Site safety will be improved if everyone is safety conscious.

Types of hazard include the following:

- falling objects
- falls of operatives
- transportation of plant and materials
- electricity
- machinery and equipment
- fire and explosions.

Remember

It is your responsibility to act in a safe manner.

Personal protective equipment

Depending on the type of workshop or site situation, the wearing of correct safety clothing and safe working practices are the best methods of avoiding accidents or injury. On some sites certain PPE is compulsory.

All construction operatives have a responsibility to safeguard themselves and others. Making provision to protect oneself often means wearing the correct protective clothing and safety equipment.

Your employer is obliged by law to provide PPE, a selection of which is shown in Figure 2.1.

Safety signs

As you go about your work on the building or construction site you will see various signs and notices. Your employer will give you instruction on what they mean and what you should do when you see one.

Safety signs fall into four separate categories, which can be recognized by their shape and colour. Sometimes they may be just a symbol; others may include letters or figures and provide extra information such as the clearance height of an obstacle or the safe working load of a crane.



FIGURE 2.1

A selection of personal protective equipment

The four categories are:

Prohibition signs

- Shape – circular
- colour – red border and cross bar; black symbol on white background
- meaning – shows what must not be done
- example – no smoking.



Mandatory signs

- Shape – circular
- colour – white symbol on blue background
- meaning – shows what must be done
- example – wear hand protection.



Warning signs

- Shape – triangular
- colour – yellow background with black border and symbol
- meaning – warns of hazard or danger
- example – caution, fork-lift truck working.



Information signs

- Shape – square or oblong
- colour – white symbols on green background
- meaning – indicates or gives information of safety provision
- example – first aid point.



Signs with supplementary text

Any of the symbols shown on the last page may also contain text. A few examples of these are shown in Figure 2.2.

Signs may be produced and erected according to the situation, as shown in Figure 2.3. For example, where there is a dangerous hazard a sign can be produced and placed in a prominent position to warn anyone approaching to take care.



FIGURE 2.2

A selection of signs: (a) prohibition sign; (b) mandatory sign; (c) warning sign; (d) information sign

Security arrangements

It is the responsibility of everyone on the work site to ensure that the security of that site is maintained. Security can take many forms and they are all equally important

Remember

Vandalism and theft do not always happen at night.

Visual security

- Alarms – positioned in an accessible place within view of the general public
- bars, mesh and locks – fitted to glass-panelled doors and windows
- padlocks, padlock and chains – fitted to compound gates, pieces of plant and machinery
- lighting – floodlights and movement-activated lights
- security firms.

Individual security

It is the responsibility of all employees to contribute to the overall security of the firm, for example:

- Tidiness – Do not invite crime by leaving tools and equipment where they may be easily seen. If there is a secure store, lock them away.
- Plant – If possible, return all plant to a secure compound, or if necessary immobilize.
- Unauthorized access – It is the responsibility of all employees on site to challenge anyone who they feel has no authorization to be within a particular area. (Politeness is the best approach.)

If, despite the security measures taken, your site is breached, there are certain procedures you should follow. These should be given to you by your line manager, and may include:

- reporting the incident to the site supervisor
- reporting the incident to the police
- checking the inventory to find out what has been taken
- recording damage done to the premises and/or equipment.

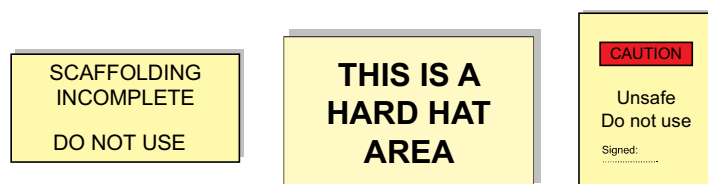


FIGURE 2.3

Types of notice

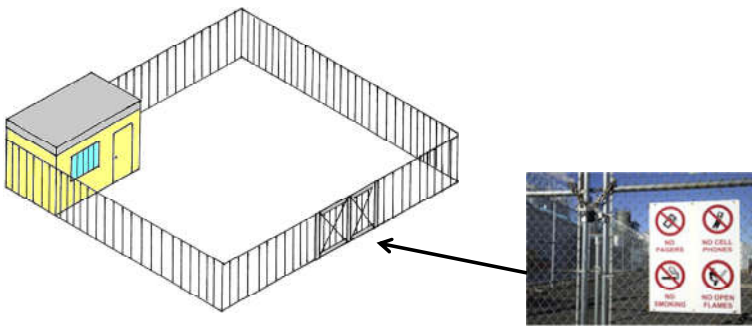


FIGURE 2.4

Site compound with cabin and secure gates

Site security

Always take care of tools and equipment you are working with and report any suspicious persons or events to your line manager.

Site access

It is important on larger sites to have a signing in and signing out procedure to increase the security of the site and its workers.

On larger sites all employees are checked/searched to make sure they are fit to work. They are provided with facilities for parking their cars, changing into work clothes, rest areas for eating food and washing and toilet facilities.

Personal security

All PPEs provided must be worn at all times in the work areas.

Some sites will not allow newspapers, food or drink in the work areas and the provided toilet areas have to be used.

Some sites use a card system similar to football referees, a yellow card is handed out for an offence.

Three yellow cards and a red is issued which could lead to refusal to enter the work area.

Loss of goods and materials

The contractor has a duty to prevent the entry to the work area by providing an adequate security fence.

Lockable cabins and storage areas should also be provided to protect materials and equipment.

The whole site should be surrounded with a security fence and adequate security to the gates and a secure site cabin as shown in Figure 2.4.

Emergency procedures

Responding to emergencies

It is important that all new trainees are aware of the emergency procedures, which could change according to the type of site or workplace they are in.

From day one you should be aware of what to do in the event of a fire or an accident. Should an emergency happen you should be able to:

- Know what to do – acting quickly and calmly, carry out the correct procedure
- Follow the fire procedure – take the correct action in the event of discovering a fire:
 1. Select and use the correct type of fire extinguisher. (Only if the fire is small enough for you to put it out.)
 2. Call for help, sound the alarm.
 3. Telephone the Fire Service: 999. Give the correct address of the building.
 4. Leave the building by the nearest exit.
 5. Go directly to the assembly area. Await the roll call.

Accidents

An accident involving injury to a person can happen at any time. It may be a workmate who has fallen off a ladder or someone with a burn or a cut, or who has fainted. To help them when they most need it you should know what to do!

Immediate action

1. Unless you are a fully trained first aider – *do not attempt to treat the injured person*. (Only move an injured person if their life is in danger, e.g. danger from fire.)
2. GET HELP. Report the accident to a person in charge or:
3. Telephone the Emergency Services: 999.
When your call is answered you should have the following information at hand:

Remember

An accident is an event causing injury or damage that could have been avoided by following correct methods and procedures.

- type or types of services required – fire, ambulance, police
- type of accident
- location/address at which it has happened
- telephone number you are calling from
- your name.

Risk assessments

The employer has a duty to protect the workforce as far as is reasonably practicable. Risk assessment is a very important part of protecting all site operatives.

Risk assessment is simply a careful examination of what could cause harm to the workforce. The workforce has a right to be protected from harm caused by a failure to take reasonable control measures.

In the construction industry risk assessments are carried out by experienced people who have been taught to identify what risks are possible when carrying out tasks.

There are five main steps to risk assessments:

- Step 1 – Identify the hazard.
- Step 2 – Decide who might be at risk and how.
- Step 3 – Evaluate the risks and decide on the best precautions.
- Step 4 – Record your findings and implement them.
- Step 5 – Review your assessment and update if necessary.

Site organisation

Welfare facilities

Certain minimum safety, health and welfare considerations are laid down in relation to construction sites by the Factories Acts and Working Rule Agreements, these call for:

1. Canteens (places to eat food)
2. Drying and changing rooms
3. Shelter from inclement weather
4. Washing and toilet facilities

Portable welfare facilities can be provided as shown in Figure 2.5.

It may also be possible when refurbishing existing premises to use the facilities already in existence.

Table 2.1 shows a chart containing the facilities to be provided according to the number of workers on site.

Whenever possible toilets should be flushed by water, but if not possible, use chemical toilets.

Rooms containing sanitary conveniences should be adequately ventilated and lit.

Men and women may use the same toilet, provided it is a lockable room and is suitably positioned away from any urinals which may also be provided.

A wash hand basin with water, soap and towels or dryers should be close to the toilets if the toilets are not near other washing facilities provided on the site.

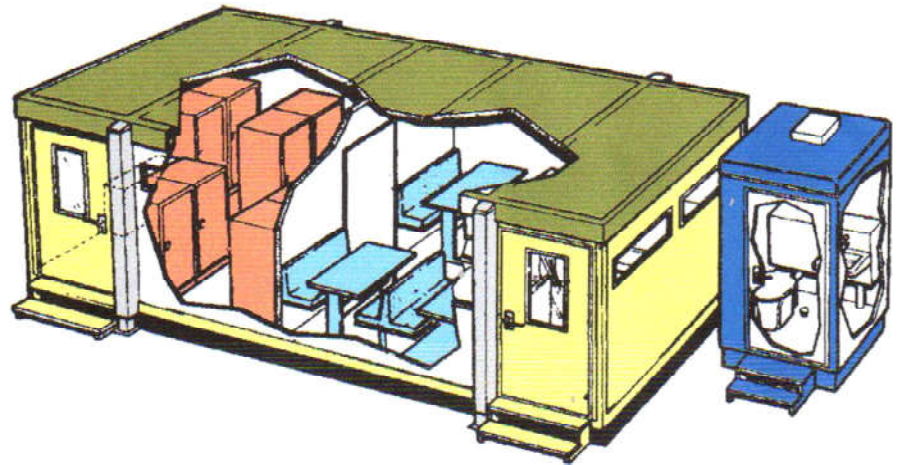


FIGURE 2.5
Typical pre-formed cabins for all requirements

Table 2.1 Welfare facilities

WELFARE FACILITIES		No of persons employed by the contractor on site							
		0	5	10	20	25	40	50	100
First Aid Box	Box to be clearly marked with named person				First aid boxes			First aid boxes and trained person	
Stretcher Ambulance								Stretcher provided. Local Authority informed.	
First aid Room	To be used only for treatment and in charge of trained person							Where persons on site exceed 250, each employer of more than 40 must provide First aid room	
Shelter and clothing	All persons to have shelter and place for depositing clothing			(Where possible)				Provision for warming persons and drying wet clothes	
Meals room	All persons to have drinking water provided and facilities for boiling water and eating meals							Facilities for heating food if hot meals are not available on site	
Washing facilities	All persons on site for more than 4 hours to have washing facilities							When the site lasts over 6 weeks Hot and cold water, soap and towels	More than 1 year 4 wash places per 35.
Sanitary facilities	To be maintained and kept clean – provision for lighting							1 convenience for every 25 persons	1 for every 35
NOTES: Washing facilities to be close to meals room Protective clothing to be provided where person is required to work in inclement weather Sub-contractors may use the facilities provided by another contractor and their work force is include in the total for the site									

Health and hygiene

Certain precautions must be taken to ensure that the health of employees in construction firms is protected against hazards, as mentioned in the previous section. As far as is practicable, their health must also be protected.

Vulnerable parts of the body

The health of the site operatives can be divided into the following areas of the human body:

- **Skin** – one of the most common problems with the skin is dermatitis. This is caused by contact between the skin and the many cements and plasters on site. To reduce the problem barrier creams could be used or appropriate gloves worn.
- **Eyes** – protection of the eyes has been mentioned previously, but as they are the only ones you have it is important to take extra care and use the appropriate glasses or goggles for the job.
- **Ears** – again, most sites provide a selection of ear protectors or plugs to be used when working with or close to noise.
- **Lungs** – many construction operations involve dust. It is therefore very important to protect yourself against inhaling any harmful dust. Protective breathing apparatus or simple disposable masks should be available.

Personal hygiene

Always keep yourself clean and tidy; just because you are in one of the dirtiest occupations, there is no need to look untidy.

If you are working in a client's home you need to present yourself correctly. Always wash regularly and have your work clothes regularly washed.

Wash your hands after going to the toilet and before eating and drinking.

Site control

Site layout must also allow for adequate management and control facilities.

There are FOUR aspects of quality control which will have to be catered for on the construction site.

- 1/2. Materials delivered to the site should be checked for correct amount and quality.
3. All components delivered or components manufactured on the site will have to be inspected to ensure they are according to the specification provided.
4. Workmanship.

Remember

Do not overcomplicate the process. If you run a small business and you are confident you understand what is involved, you could do the assessment yourself. You do not have to be a health and safety expert.

Most of the risks come from tripping, slipping and moving heavy loads.

If you are an employer of a large company you should ask a health and safety advisor to help out.

Remember

A hazard is anything that can cause harm, such as chemicals, electricity or working from ladders. The risk is the chance, high or low, that an employee could be harmed by these and other hazards.
