chapter 1

The construction industry

OVERVIEW

Construction means creating buildings and services. These might be houses, hospitals, schools, offices, roads, bridges, museums, prisons, train stations, airports, monuments – and anything else you can think of that needs designing and building! What about an Olympic stadium? The 2012 London games will bring a wealth of construction opportunity to the UK and so it is an exciting time to be getting involved.

In the UK, 2.2 million people work in the construction industry – more than in any other – and it is constantly expanding and developing. There are more choices and opportunities than ever before and pay and conditions are improving all the time. Your career doesn't have to end in the UK either – what about taking the skills and experience you are developing abroad? Construction is a career you can take with you wherever you go. There's always going to be something that needs building!

This chapter will cover the following topics:

- Understanding the industry
- Communication
- General site paperwork
- Getting involved in the construction industry
- Sources of information and advice.

These topics can be found in the following modules:

CC 1001K	CC 2002K
CC 1001S	CC 2002S

Understanding the industry

The construction industry is made up of countless companies and businesses that all provide different services and materials. An easy way to divide these companies into categories is according to their size.

- A small company is defined as having between 1 and 49 members of staff.
- A medium company consists of between 50 and 249 members of staff.
- A large company has 250 or more people working for it.

A business might only consist of one member of staff (a sole trader).

Find out

Think of an example of a small, medium and large construction company. Do you know of any construction companies that have only one member of staff?

The different types of construction work

There are four main types of construction work:

1. New work – this refers to a building that is about to be or has just been built.
2. Maintenance work – this is when an existing building is kept up to an acceptable standard by fixing anything that is damaged so that it does not fall into disrepair.
3. Refurbishment/renovation work – this generally refers to an existing building that has fallen into a state of disrepair and is then brought up to standard by repair. It also refers to an existing building that is to be used for a different purpose, for example changing an old bank into a pub.
4. Restoration work – this refers to an existing building that has fallen into a state of disrepair and is then brought back to its original condition or use.

New work is just one type of construction area

These four types of work can fall into one of two categories depending upon who is paying for the work:

1. Public – the government pays for the work, as is the case with most schools and hospitals etc.
2. Private – work is paid for by a private client and can range from extensions on existing houses to new houses or buildings.

Job and careers

Jobs and careers in the construction industry fall mainly into one of four categories:

- building
- civil engineering
- electrical engineering
- mechanical engineering.

Building involves the physical construction (making) of a structure. It also involves the maintenance, restoration and refurbishment of structures.

Civil engineering involves the construction and maintenance of work such as roads, railways, bridges etc.

Electrical engineering involves the installation and maintenance of electrical systems and devices such as lights, power sockets and electrical appliances etc.

Mechanical engineering involves the installation and maintenance of things such as heating, ventilation and lifts.

The category that is the most relevant to your course is building.

Job types

The construction industry employs people in four specific areas:

1. professionals
2. technicians
3. building craft workers
4. building operatives.

Professionals

Professionals are generally of graduate level (i.e. people who have a degree from a university) and may have one of the following types of job in the construction industry:

- architect – someone who designs and draws the building or structure
- structural engineer – someone who oversees the strength and structure of the building
- land surveyor – someone who checks the land for suitability to build on
- building surveyor – someone who provides advice on construction projects
- service engineer – someone who plans the services needed within the building, for example gas, electricity and water supplies.

Technicians

Technicians link professional workers with craft workers and are made up of the following people:

- architectural technician – someone who looks at the architect's information and makes drawings that can be used by the builder
- building technician – someone who is responsible for estimating the cost of the work and materials and general site management

Definition

Trusses – prefabricated components of a roof which spread the load of a roof over the outer walls and form its shape

Plaster skim – a thin layer of plaster that is put on to walls to give a smooth and even finish

Coving – a decorative moulding that is fitted to the top of a wall where it meets the ceiling

Architrave – a decorative moulding, usually made from timber, that is fitted around door and window frames to hide the gap between the frame and the wall

Skirting – a decorative moulding that is fitted at the bottom of a wall to hide the gap between the wall and the floor

- quantity surveyor – someone who calculates ongoing costs and payment for work done.

Building craft workers

Building craft workers are the skilled people who work with materials to physically construct the building. The following jobs fall into this category:

- carpenter or joiner – someone who works with wood but also other construction materials such as plastic and iron. A carpenter primarily works on site while a joiner usually works off site, producing components such as windows, stairs, doors, kitchens, and **trusses**, which the carpenter then fits into the building
- bricklayer – someone who works with bricks, blocks and cement to build the structure of the building
- plasterer – someone who adds finish to the internal walls and ceilings by applying a **plaster skim**. They also make and fix plaster **covings** and plaster decorations
- painter and decorator – someone who uses paint and paper to decorate the internal plaster and timberwork such as walls, ceilings, windows and doors, as well as **architraves** and **skirting**
- electrician – someone who fits all electrical systems and fittings within a building, including power supplies, lights and power sockets
- plumber – someone who fits all water services within a building, including sinks, boilers, water tanks, radiators, toilets and baths. The plumber also deals with lead work and rainwater fittings such as guttering
- slater and tiler – someone who fits tiles on to the roof of a building, ensuring that the building is watertight
- woodworking machinist – someone who works in a machine shop, converting timber into joinery components such as window sections, spindles for stairs, architraves and skirting boards, amongst other things. They use a variety of machines such as lathes, bench saws, planers and sanders.

Building operatives

Definition

Plant – industrial machinery

There are two different building operatives working on a construction site.

1. Specialist building operative – someone who carries out specialist operations such as dry wall lining, asphalting, scaffolding, floor and wall tiling and glazing.
2. General building operative – someone who carries out non-specialist operations such as kerb laying, concreting, path laying and drainage. These operatives also support other craft workers and do general labouring. They use a variety of hand tools and power tools as well as **plant**, such as dumper trucks and JCBs.

The building team

Constructing a building or structure is a huge task that needs to be done by a team of people who all need to work together towards the same goal. The team of people is often known as the building team and is made up of the following people.

Client

The client is the person who requires the building or refurbishment. This person is the most important person in the building team because they finance the project fully and without the client there is no work. The client can be a single person or a large organisation.

Architect

The architect works closely with the client, interpreting their requirements to produce contract documents that enable the client's wishes to be realised.

Clerk of works

Selected by the architect or client to oversee the actual building process, the clerk of works ensures that construction sticks to agreed deadlines. They also monitor the quality of workmanship.

Local Authority

The Local Authority is responsible for ensuring that construction projects meet relevant planning and building legislation. Planning and building control officers approve and inspect building work.

Quantity surveyor

The quantity surveyor works closely with the architect and client, acting as an accountant for the job. They are responsible for the ongoing evaluation of cost and interim payments from the client, establishing whether or not the contract is on budget. The quantity surveyor will prepare and sign off final accounts when the contract is complete.

Specialist engineers

Specialist engineers assist the architect in specialist areas, such as civil engineering, structural engineering and service engineering.

Health and safety inspectors

Employed by the Health and Safety Executive (HSE), health and safety inspectors ensure that the building contractor fully implements and complies with government health and safety legislation. For more information on health and safety in the construction industry, see Chapter 2 (page 31).

Building contractors

The building contractors agree to carry out building work for the client. Contractors will employ the required workforce based on the size of the contract.

Estimator

The estimator works with the contractor on the cost of carrying out the building contract, listing each item in the bill of quantities (e.g. materials, labour and plant). They calculate the overall cost for the contractor to complete the contract, including further costs as overheads, such as site offices, management administration and pay, not forgetting profit.

Site agent

The site agent works for the building contractor and is responsible for the day-to-day running of the site such as organising deliveries etc.

Suppliers

The suppliers work with the contractor and estimator to arrange the materials that are needed on site and ensure that they are delivered on time and in good condition.

General foreman

The general foreman works for the site manager and is responsible for co-ordinating the work of the ganger (see below), craft foreman and subcontractors. They may also be responsible for the hiring and firing of site operatives. The general foreman also liaises with the clerk of works.

Craft foreman

The craft foreman works for the general foreman organising and supervising the work of particular crafts. For example, the carpentry craft foreman will be responsible for all carpenters on site.

Ganger

The ganger supervises general building operatives.

Chargehand

The chargehand is normally employed only on large building projects, being responsible for various craftsmen and working with joiners, bricklayers, and plasterers.

Operatives

Operatives are the workers who carry out the building work, and are divided into three subsections:

1. Craft operatives are skilled tradesman such as joiners, plasterers, bricklayers.
2. Building operatives include general building operatives who are responsible for drain laying, mixing concrete, unloading materials and keeping the site clean.
3. Specialist operatives include tilers, pavers, glaziers, scaffolders and plant operators.

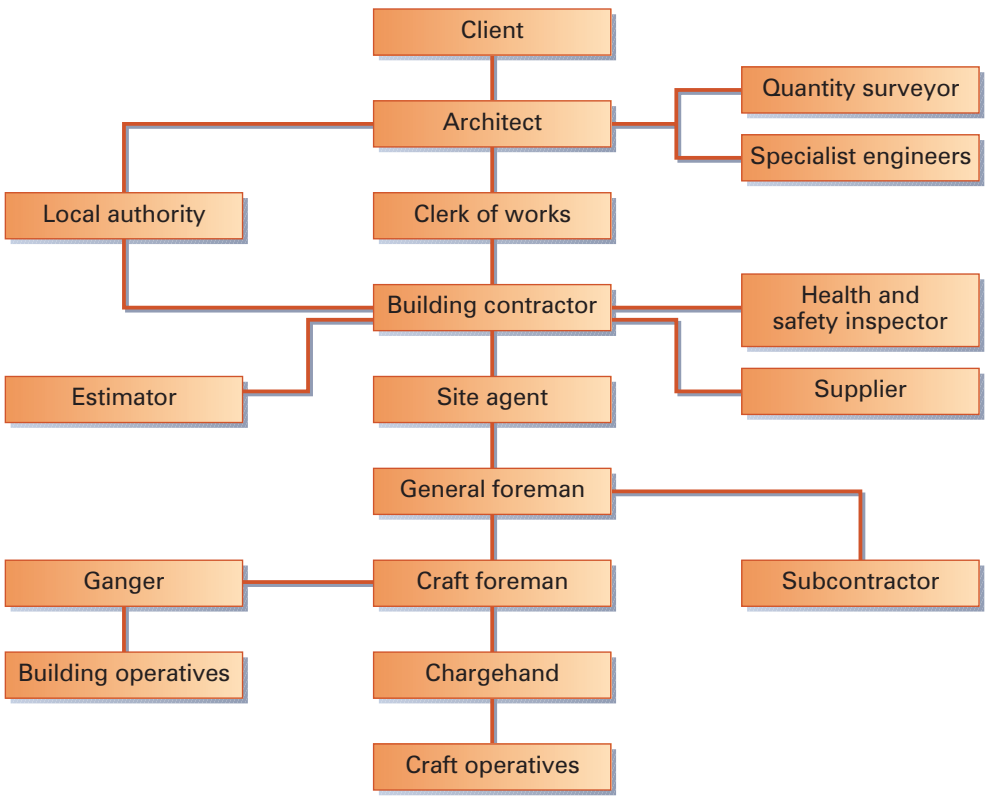


Figure 1.1 The building team

A low rise residential building

The different types of building

There are of course lots of very different types of building, but the main types are:

- residential – houses and flats etc.
- commercial – shops and supermarkets etc.
- industrial – warehouses and factories etc.

These types of building can be further broken down by the height or number of storeys that they have (one storey being the level from floor to ceiling):

- low rise – a building with one to three storeys
- medium rise – a building with four to seven storeys
- high rise – a building with seven storeys or more.

Buildings can also be categorised according to the number of other buildings they are attached to:

- detached – a building that stands alone and is not connected to any other building
- semi-detached – a building that is joined to one other building and shares a dividing wall, called a party wall
- terraced – a row of three or more buildings that are joined together, of which the inner buildings share two party walls.

Building requirements

Definition

Conservation – preservation of the environment and wildlife

Every building must meet the minimum requirements of the *Building Regulations*, which were first introduced in 1961 and then updated in 1985. The purpose of building regulations is to ensure that safe and healthy buildings are constructed for the public and that **conservation** is taken into account when they are being constructed. Building regulations enforce a minimum standard of building work and ensure that the materials used are of a good standard and fit for purpose.

What makes a good building?

When a building is designed, there are certain things that need to be taken into consideration, such as:

- security
- safety
- privacy
- warmth
- light
- ventilation.

A well-designed building will meet the minimum standards for all of the considerations above and will also be built in line with building regulations.

The properties and principles of building work will be covered in greater detail in Chapter 4.

Communication

Communication, in the simplest of terms, is a way or means of passing on information from one person to another. Communication is very important in all areas of life and we often do it without even thinking about it. You will need to communicate well when you are at work, no matter what job you do. What would happen if someone couldn't understand something you had written or said? If we don't communicate well, how will other people know what we want or need and how will we know what other people want?

Companies that do not establish good methods of communicating with their workforce or with other companies, will not function properly and will end up with bad working relationships. Good working relationships can *only* be achieved with co-operation and good communication.

Methods of communication

There are many different ways of communicating with others and they all generally fit into one of these four categories:

1. speaking (verbal communication), for example talking face to face or over the telephone
2. writing, for example sending a letter or taking a message
3. body language, for example the way we stand or our facial expressions
4. electronic, for example email, fax and text messages.

Each method of communicating has good points (advantages) and bad points (disadvantages).

Verbal communication is probably the method you will use most

Verbal communication

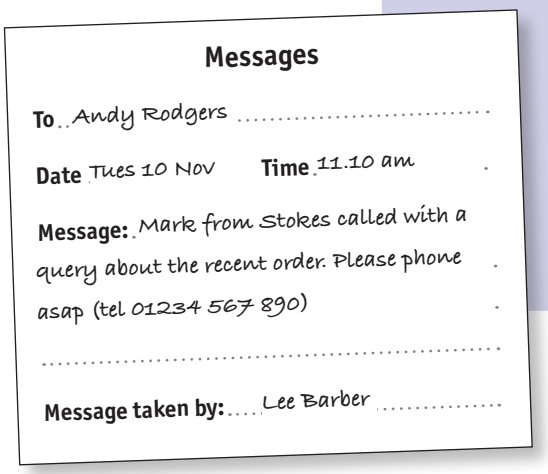
Verbal communication is the most common method we use to communicate with each other. If two people don't speak the same language or if someone speaks very quietly or not very clearly, verbal communication cannot be effective. Working in the construction industry you may communicate verbally with other people face to face, over the telephone or by radio/walkie-talkie.

Advantages	Disadvantages
Verbal communication is instant, easy and can be repeated or rephrased until the message is understood.	Verbal communication can be easily forgotten as there is no physical evidence of the message. Because of this it can be easily changed if passed to other people. Someone's accent or use of slang language can sometimes make it difficult to understand what they are saying.

Written communication

Written communication can take the form of letters, faxes, messages, notes, instruction leaflets, text messages, drawings and emails, amongst others.

Advantages	Disadvantages
There is physical evidence of the communication and the message can be passed on to another person without it being changed. It can also be read again if it is not understood.	Written communication takes longer to arrive and understand than verbal communication and body language. It can also be misunderstood or lost. If it is handwritten, the reader may not be able to read the writing if it is messy.


Messages

To Andy Rodgers

Date Tues 10 Nov Time 11.10 am

Message: Mark from Stokes called with a query about the recent order. Please phone asap (tel 01234 567 890)

Message taken by: Lee Barber

Figure 1.2 A message is a form of written communication

Body language

It is said that, when we are talking to someone face to face, only 10 per cent of the communication is verbal. The rest of the communication is body language and facial expression. This form of communication can be as simple as the shaking of a head from left to right to mean 'no' or as complex as the way someone's face changes when they are happy or sad or the signs given in body language when someone is lying.

We often use hand gestures as well as words to get across what we are saying, to emphasise a point or give a direction. Some people communicate entirely through a form of body language called sign language.

Advantages	Disadvantages
If you are aware of your own body language and know how to use it effectively, you can add extra meaning to what you say. For example, say you are talking to a client or a work colleague. Even if the words you are using are friendly and polite, if your body language is negative or unfriendly, the message that you are giving out could be misunderstood. By simply maintaining eye contact, smiling and not folding your arms, you have made sure that the person you are communicating with has not got a mixed or confusing message. Body language is quick and effective. A wave from a distance can pass on a greeting without being close, and using hand signals to direct a lorry or a load from a crane is instant and doesn't require any equipment such as radios.	Some gestures can be misunderstood, especially if they are given from very far away, and gestures that have one meaning in one country or culture can have a completely different meaning in another.

Try to be aware of your body language

Electronic communication

Electronic communication is becoming more and more common with the advances in technology allowing us to communicate more easily. Electronic communication can take many forms, such as email and fax. It is now even possible to send and receive emails via a mobile phone, which allows important information to be sent or received from almost anywhere in the world.

Advantages	Disadvantages
Electronic communication takes the best parts from verbal and written communication in as much as it is instant, easy and there is a record of the communication being sent. Electronic communication goes even further as it can tell the sender if the message has been received and even read. Emails in particular can be used to send a vast amount of information and can even give links to websites or other information. Attachments to emails allow anything from instructions to drawings to be sent with the message.	There are few disadvantages to electronic communication, the obvious ones being no signal or a flat battery on a mobile phone and servers being down which prevent emails etc. Not every one is up to speed on the latest technology and some people are not comfortable using electronic communication. You need to make sure that the person receiving your message is able to understand how to access the information. Computer viruses can also be a problem as can security where hackers can tap into your computer and read your emails and other private information. A good security set-up and anti-virus software are essential.

Which type of communication should I use?

Of the many different types of communication, the type you should use will depend upon the situation. If someone needs to be told something formally, then written communication is generally the best way. If the message is informal, then verbal communication is usually acceptable.

The way that you communicate will also be affected by who it is you are communicating with. You should of course always communicate in a polite and respectful manner with anyone you have contact with, but you must also be aware of the need to sometimes alter the style of your communication. For example, when talking to a friend, it may be fine to talk in a very informal way and use slang language, but in a work situation with a client or a colleague, it is best to alter your communication to a more formal style in order to show professionalism. In the same way, it may be fine to leave a message or send a text to a friend that says 'C U @ 8 4 work', but if you wrote this down for a work colleague or a client to read, it would not look very professional and they may not understand it.

Communicating with other trades

Communicating with other trades is vital because they need to know what you are doing and when, and you need to know the same information from them. Poor communication can lead to delays and mistakes, which can both be costly. It is quite possible for poor communication to result in work having to be stopped or redone. Say you are decorating a room in a new building. You are just about to finish when you find out that the electrician, plumber and carpenter have to finish off some work in the room. This information didn't reach you and now the decorating will have to be done again once the other work has been finished. What a waste of time and money. A situation like this can be avoided with good communication between the trades.

You will work with people from other trades

Common methods of communicating in the construction industry

A career in construction means that you will often have to use written documents such as drawings, specifications and schedules. These documents can be very large and seem very complicated but, if you understand what they are used for and how they work, using such documents will soon become second nature.

General site paperwork

No building site could function properly without a certain amount of paperwork. Here is a brief, but not exhaustive, description of some of the other documents you may encounter. Some companies will have their own forms to cover such things as scaffolding checks.

Timesheet

Timesheets record hours worked, and are completed by every employee individually. Some timesheets are basic, asking just for a brief description of the work done each hour, but some can be complicated. In some cases timesheets may be used to work out how many hours the client will be charged for.

P. Gresford Building Contractors

Timesheet

Employee _____ **Project/site** _____

Date	Job no.	Start time	Finish time	Total time	Travel time	Expenses
M						
Tu						
W						
Th						
F						
Sa						
Su						
Totals						

Employee's signature _____

Supervisor's signature _____

Date _____

Figure 1.3 Timesheet

Day worksheets

Day worksheets are often confused with timesheets, but are different as they are used when there is no price or estimate for the work, to enable the contractor to charge for the work. Day worksheets record work done, hours worked and sometimes materials used.

P. Gresford Building Contractors

Day worksheet

Customer Chris MacFarlane **Date** _____

Description of work being carried out _____

Hang internal door in kitchen.

Labour	Craft	Hours	Gross rate	TOTALS
Materials	**Quantity**	**Rate**	**% addition**	
Plant	**Hours**	**Rate**	**% addition**	

Comments

Signed _____ **Date** _____

Site manager/foreman signature _____

Figure 1.4 Day worksheet

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Job sheet

Customer Chris MacFarlane

Address 1 High Street
Any Town
Any County

Work to be carried out

Hang internal door in kitchen

Special conditions/instructions

Fit with door closer
3 × 75mm butt hinges

Figure 1.5 Job sheet

Job sheet

A job sheet is similar to a day worksheet – it records work done – but is used when the work has already been priced. Job sheets enable the worker to see what needs to be done and the site agent or working foreman to see what has been completed.

VARIATION TO PROPOSED WORKS AT 123 A STREET

REFERENCE NO:

DATE _____

FROM _____

TO _____

POSSIBLE VARIATIONS TO WORK AT 123 A STREET

ADDITIONS
OMISSIONS

SIGNED ----------

Variation order

This sheet is used by the architect to make any changes to the original plans, including omissions, alterations and extra work.

Figure 1.6 Variation order

Confirmation notice

This is a sheet given to the contractor to confirm any changes made in the variation order, so that the contractor can go ahead and carry out the work.

CONFIRMATION FOR VARIATION TO PROPOSED WORKS AT 123 A STREET

REFERENCE NO:

DATE _____

FROM _____

TO _____

I CONFIRM THAT I HAVE RECEIVED WRITTEN INSTRUCTIONS
FROM _____
POSITION _____
TO CARRY OUT THE FOLLOWING POSSIBLE VARIATIONS TO THE ABOVE NAMED CONTRACT

ADDITIONS
OMISSIONS

SIGNED ----------

Figure 1.7 Confirmation notice

Orders/requisitions

A requisition form or order is used to order materials or components from a supplier.

P. Gresford Building Contractors

Requisition form

Supplier _____ **Order no.** _____

_____ **Serial no.** _____

Tel no. _____ **Contact** _____

Fax no. _____ **Our ref** _____

Contract/Delivery address/Invoice address

_____

_____

Tel no. _____

Fax no. _____

Statements/applications for payments to be sent to

_____

_____

_____

Item no.	Quantity	Unit	Description	Unit price	Amount

Total £ _____

Payment terms _____ **Date** _____

Originated by

_____

Authorised by

_____

Figure 1.8 Requisition form

Bailey & Sons Ltd

Building materials supplier

Tel: 01234 567890

Your ref: AB00671

Our ref: CT020 **Date:** 17 Jul 2006

Order no: 67440387

Invoice address:
Carillion Training Centre,
Deptford Terrace, Sunderland

Delivery address:
Same as invoice

Description of goods	Quantity	Catalogue no.
OPC 25kg	10	OPC1.1

Comments:
Date and time of receiving goods:
Name of recipient (caps):
Signature:

Figure 1.9 Delivery note

Delivery notes

Delivery notes are given to the contractor by the supplier, and list all the materials and components being delivered. Each delivery note should be checked for accuracy against the order (to ensure what is being delivered is what was asked for) and against the delivery itself (to make sure that the delivery matches the delivery note). If there are any discrepancies or if the delivery is of a poor quality or damaged, you must write on the delivery note what is wrong *before* signing it and ensure the site agent is informed so that he/she can rectify the problem.

Invoices

Invoices come from a variety of sources such as suppliers or subcontractors, and state what has been provided and how much the contractor will be charged for it.

INVOICE

JARVIS BUILDING SUPPLIES
3rd AVENUE
THOMASTOWN

L Weeks Builders
4th Grove
Thomastown

Quantity	Description	Unit price	Vat rate	Total
30	Galvanised joint hangers	£1.32	17.5%	£46.53
			TOTAL	£46.53

To be paid within 30 days from receipt of this invoice

Please direct any queries to 01234 56789

Figure 1.10 Invoice

Remember

Invoices may need paying by a certain date – fines for late payment can sometimes be incurred – so it is important that they are passed on to the finance office or financial controller promptly

Delivery records

Delivery records list all deliveries over a certain period (usually a month), and are sent to the contractor's Head Office so that payment can be made.

JARVIS BUILDING SUPPLIES
3rd AVENUE
THOMASTOWN

Customer ref_____

Customer order date_____

Delivery date_____

Item no	Qty Supplied	Qty to follow	Description	Unit price
1	30	0	Galvanised joinst hangers	£1.32

Delivered to: L Weeks builders
4th Grove
Thomastown

Customer signature ----------

Figure 1.11 Delivery record

DAILY REPORT/SITE DIARY

PROJECT_____
DATE _____

Identify any of the following factors, which are affecting or may affect the daily work activities and give a brief description in the box provided

WEATHER ( ) ACCESS ( ) ACCIDENTS ( ) SERVICES ( )
DELIVERIES ( ) SUPPLIES ( ) LABOUR ( ) OTHER ( )

SIGNED ----------
POSITION ----------

Figure 1.12 Daily report or site diary

Daily report/ site diary

This is used to pass general information (deliveries, attendance etc.) on to a company's Head Office.

Remember

You should always check a delivery note against the order and the delivery itself, then write any discrepancies or problems on the delivery note *before* signing it

Accident and near miss reports

It is a legal requirement that a company has an accident book, in which reports of all accidents must be made. Reports must also be made when an accident nearly happened, but did not in the end occur – known as a 'near miss'. It is everyone's responsibility to complete the accident book. If you are also in a supervisory position you will have the responsibility to ensure all requirements for accident reporting are met.

Safety tip

If you are involved in or witness an accident or near miss, make sure it is entered in the book – for your own safety and that of others on the site. If you don't report it, it's more likely to happen again

Report of an Accident, Dangerous Occurrence or Near Miss

Date of incident _____ **Time of incident** _____

Location of incident _____

Details of person involved in accident

Name _____ Date of birth _____

Address _____

_____

_____ Occupation _____

Date off work (if applicable) _____ **Date returning to work** _____

Nature of injury _____

Management of injury

☐ First Aid only ☐ Advised to see doctor

☐ Sent to casualty ☐ Admitted to hospital

Account of accident, dangerous occurrence or near miss
(Continued on separate sheet if necessary)

Witnesses to the incident
(Names, addresses and occupations)

Was the injured person wearing PPE? If yes, what PPE? _____

_____

Signature of person completing form _____

Occupation _____ **Date** _____

Figure 1.13 Accident/near miss report

Drawings

Drawings are done by the architect and are used to pass on the client's wishes to the building contractor. Drawings are usually done to scale because it would be impossible to draw a full-sized version of the project. A common scale is 1:10, which means that a line 10 mm long on the drawing represents 100 mm in real life. Drawings often contain symbols instead of written words to get the maximum amount of information across without cluttering the page.

Specifications

Specifications accompany a drawing and give you the sizes that are not available on the drawing, as well as telling you the type of material to be used and the quality that the work has to be finished to.

Schedules

A schedule is a list of repeated design information used on big building sites when there are several types of similar room or house. For example, a schedule will tell you what type of door must be used and where. Another form of schedule used on building sites contains a detailed list of dates by which work must be carried out and materials delivered etc.

See Chapter 6 *Drawings* for more information.

Work programme

A work programme is a method of showing very easily what work is being carried out on a building and when. The most common form of work programme is a bar chart. Used by many site agents or supervisors, a bar chart lists the tasks that need to be done down the left side and shows a timeline across the top. A work programme is used to make sure that the relevant trade is on site at the correct time and that materials are delivered when needed. A site agent or supervisor can quickly tell from looking at the chart if work is keeping to schedule or falling behind.

Bar charts

The bar or Gantt chart is the most popular work programme as it is simple to construct and easy to understand. Bar charts have tasks listed in a vertical column on the left and a horizontal timescale running along the top.

Did you know?

The Gantt chart is named after the first man to publish it. This was Henry Gantt, an American engineer, in 1910

Time in days										
Activity	1	2	3	4	5	6	7	8	9	10
Dig for foundation and service routes										
Lay foundations										
Run cabling, piping etc. to meet existing services										
Build up to DPC										
Lay concrete floor										

Figure 1.14 Basic bar chart

Each task is given a proposed time, which is shaded in along the horizontal timescale. Timescales often overlap as one task often overlaps another.

Time in days										
Activity	1	2	3	4	5	6	7	8	9	10
Dig for foundation and service routes										
Lay foundations										
Run cabling, piping etc. to meet existing services										
Build up to DPC										
Lay concrete floor										

Proposed time Actual time

Figure 1.15 Bar chart showing proposed time for a contract

The bar chart can then be used to check progress. Often the actual time taken for a task is shaded in underneath the proposed time (in a different way or colour to avoid confusion). This shows how what *has* been done matches up to what *should have* been done.

As you can see, a bar chart can help you plan when to order materials or plant, see what trade is due in and when, and so on. A bar chart can also tell you if you are behind on a job; if you have a penalty clause written into your contract, this information is vital.

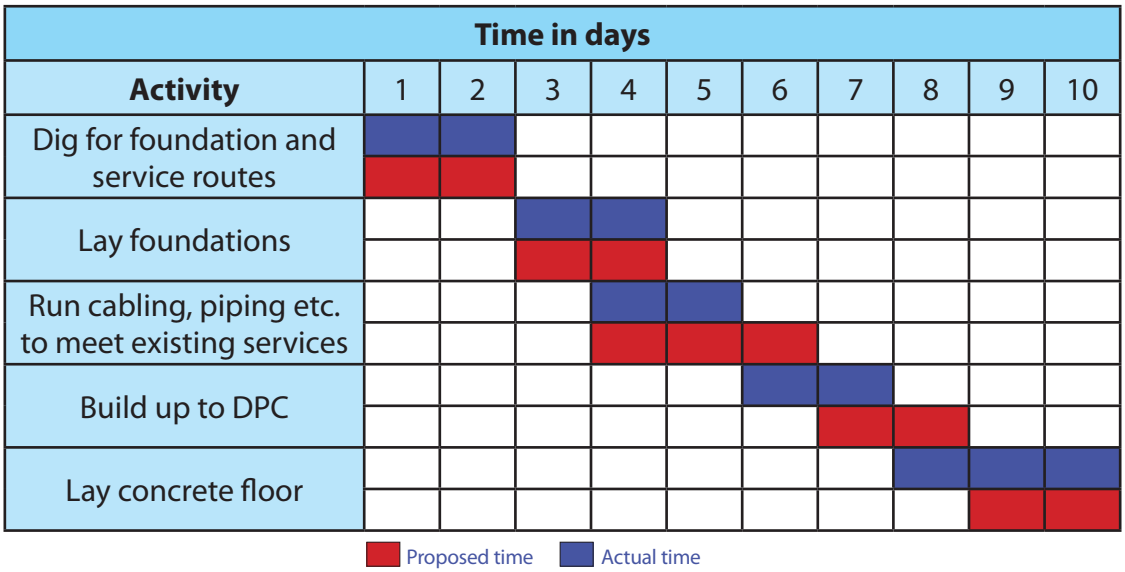

Figure 1.16 Bar chart showing actual time half way through a contract

When creating a bar chart, you should build in some extra time to allow for things such as bad weather, labour shortages, delivery problems or illness. It is also advisable to have contingency plans to help solve or avoid problems, such as:

- capacity to work overtime to catch up time
- bonus scheme to increase productivity
- penalty clause on suppliers to try to avoid late or poor deliveries
- source of extra labour (for example from another site) if needed.

Good planning, with contingency plans in place, should allow a job to run smoothly and finish on time, leading to the contractor making a profit.

Did you know?

Bad weather is the main external factor responsible for delays on building sites in the UK. A Met Office survey showed that the average UK construction company experiences problems caused by the weather 26 times a year

Getting involved in the construction industry

There are many ways of entering the construction industry, but the most common way is as an apprentice.

Apprenticeships

You can become an apprentice by:

1. being employed directly by a construction company who will send you to college
2. being employed by a training provider, such as Carillion, which combines construction training with practical work experience.

On 1 August 2002, the construction industry introduced a mandatory induction programme for all apprentices joining the industry. The programme has four distinct areas:

1. apprenticeship framework requirements
2. the construction industry
3. employment
4. health and safety.

Apprenticeship frameworks are based on a number of components designed to prepare people for work in a particular construction occupation.

Construction frameworks are made up of the following mandatory components:

- NVQs
- technical certificates (construction awards)
- key skills.

However, certain trades require additional components. Bricklaying, for example, requires abrasive wheels certification.

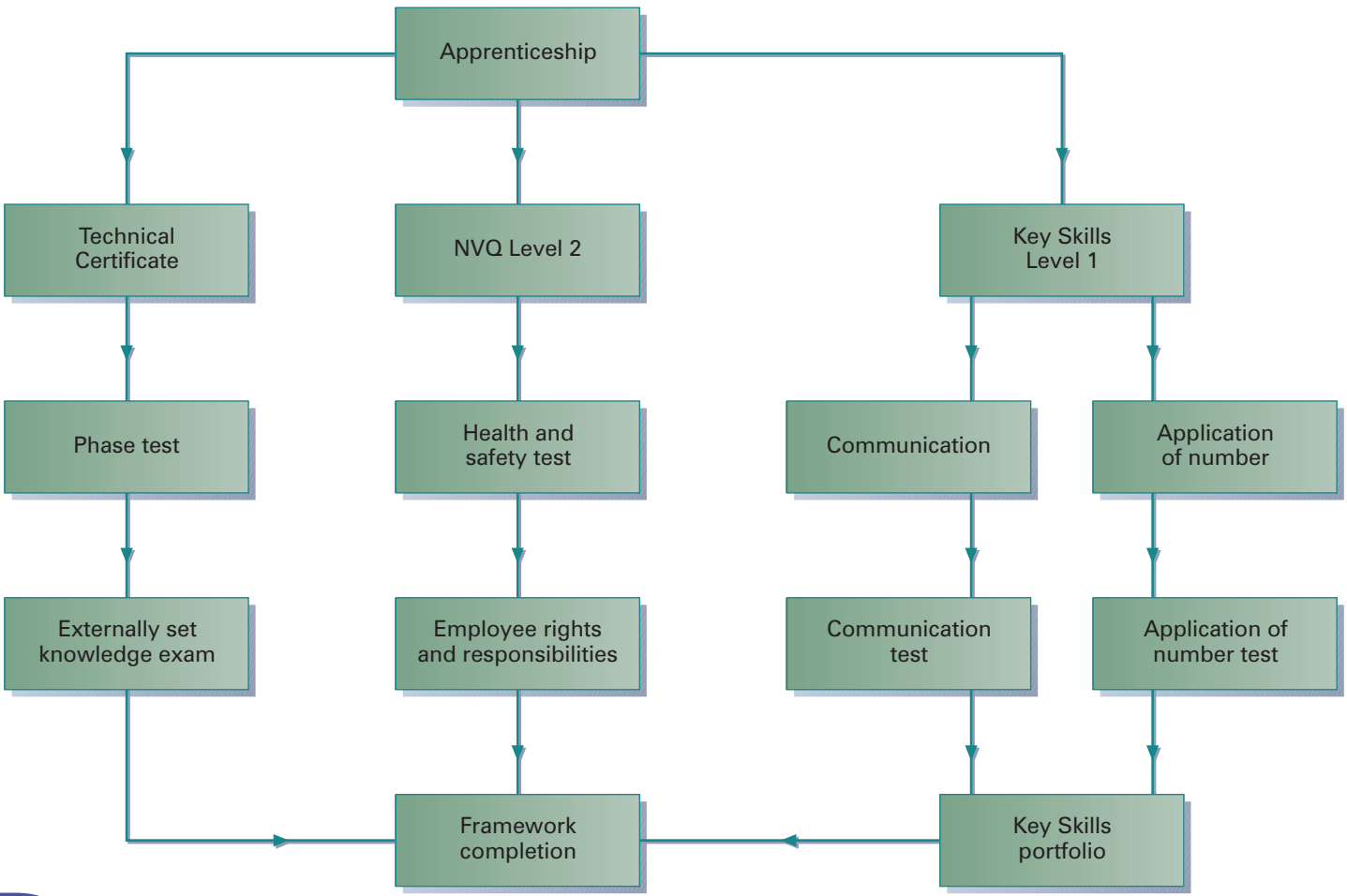

Figure 1.17 Apprenticeship framework

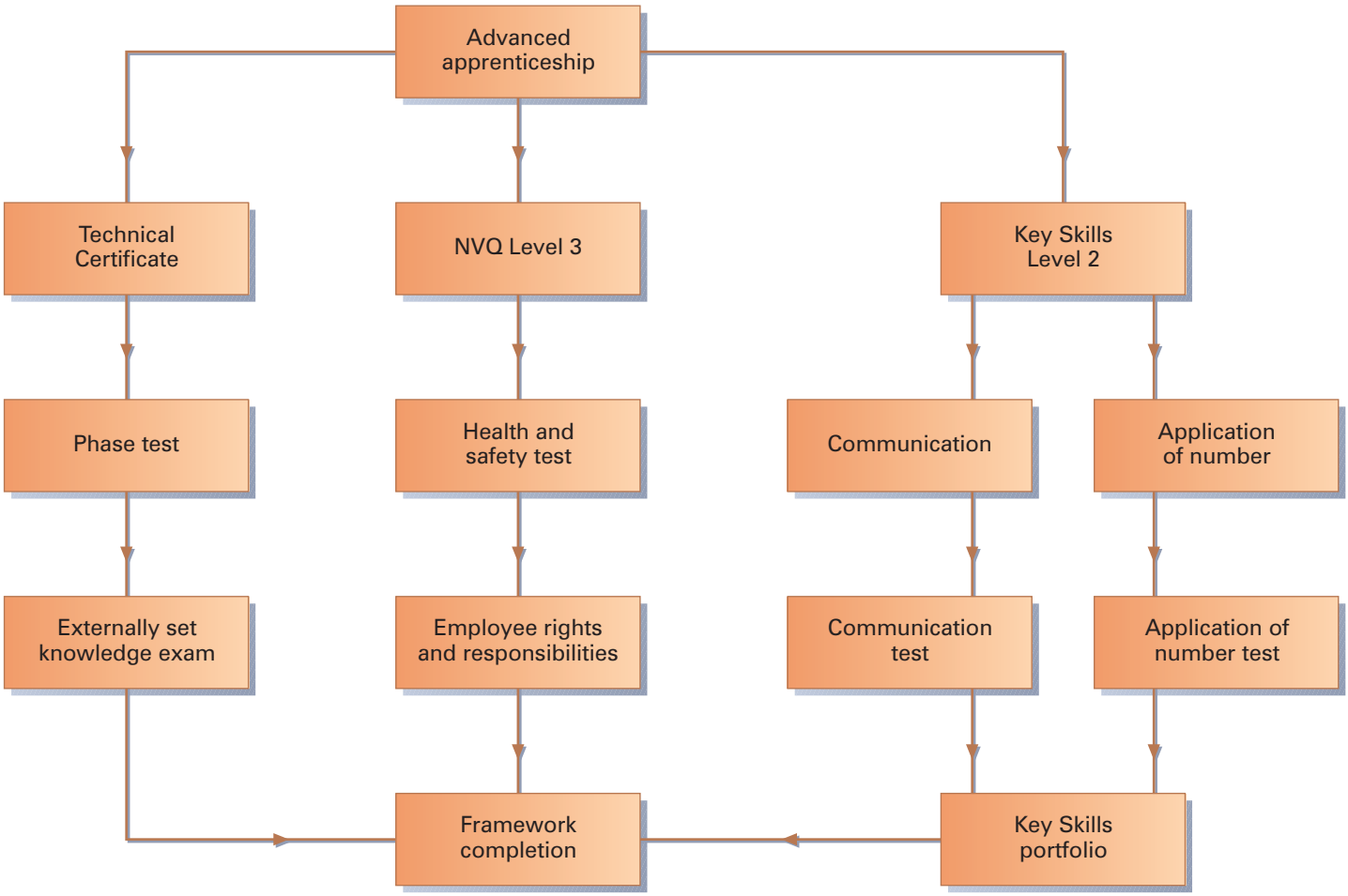

Figure 1.18 Advanced apprenticeship framework

National Vocational Qualifications (NVQs)

NVQs are available to anyone, with no restrictions on age, length or type of training, although learners below a certain age can only perform certain tasks. There are different levels of NVQ (for example 1, 2, 3), which in turn are broken down into units of competence. NVQs are not like traditional examinations in which someone sits an exam paper. An NVQ is a 'doing' qualification, which means it lets the industry know that you have the knowledge, skills and ability to actually 'do' something.

The Construction Industry Training Board (CITB) is the national training organisation for construction in the UK and is responsible for setting training standards. NVQs are made up of both mandatory and optional units and the number of units that you need to complete for an NVQ depends on the level and the occupation.

NVQs are assessed in the workplace, and several types of evidence are used:

- Witness testimony consists of evidence provided by various individuals who have first-hand knowledge of your work and performance relating to the NVQ. Work colleagues, supervisors and even customers can provide evidence of your performance.
- Your natural performance can be observed a number of times in the workplace while carrying out work-related activities.
- The use of historical evidence means that you can use evidence from past achievements or experience, if it is directly related to the NVQ.
- Assignments or projects can be used to assess your knowledge and understanding of a subject.
- Photographic evidence showing you performing various tasks in the workplace can be used, providing it is authenticated by your supervisor.

Technical certificates

Technical certificates are often related to NVQs. A certificate provides evidence that you have the underpinning knowledge and understanding required to complete a particular task. An off-the-job training programme, either in a college or with a training provider, may deliver technical certificates. You generally have to sit an end-of-programme exam to achieve the full certificate.

Key skills

Some students have key skills development needs, so learners and apprentices must achieve key skills at Level 1 or 2 in both Communications and Application of number. Key skills are signposted in each level of the NVQ and are assessed independently, so you will need to be released from your training to attend a key skills test.

Employment

Conditions of employment are controlled by legislation and regulations. The Department of Trade and Industry (DTI) publishes most of this legislation. To find out more about your working rights, visit the DTI website. A quick link has been made available at www.heinemann.co.uk/hotlinks – just enter the express code 0886P.

The main pieces of legislation that will apply to you are:

- The Employment Act 2002 which gives extra rights to working parents and gives new guidance on resolving disputes, amongst other things.

- The Employment Relations Act 1999 covers areas such as trade union membership and disciplinary and grievance proceedings.
- The Employment Rights Act 1996 details the rights an employee has by law, including the right to have time off work and the right to be given notice if being dismissed.
- The Sex Discrimination Acts of 1975 and 1986 state that it is illegal for an employee to be treated less favourably because of their sex, for example paying a man more than a woman or offering a woman more holiday than a man, even though they do the same job.
- The Race Relations Act 1976 states that it is against the law for someone to be treated less favourably because of their skin colour, race, nationality or ethnic origin.
- The Disability Discrimination Act 2005 makes it illegal for someone to be treated less favourably just because they have a physical or mental disability.
- The National Minimum Wage Act 1998 makes sure that everyone in the UK is paid a minimum amount. How much you must be paid depends on how old you are and whether or not you are on an Apprenticeship Scheme. The national minimum wage is periodically assessed and increased so it is a good idea to make sure you know what it is. At the time of writing, under 18s and those on Apprenticeship Schemes do not qualify for the minimum wage. For those aged 18–21, the minimum wage is £4.60 per hour and for adult workers aged 22 or over, the minimum wage is £5.52 per hour.

Men and women must be treated equally at work

Contract of employment

Within two months of starting a new job, your employer must give you a contract of employment. This will tell you the terms of your employment and should include the following information:

- job title
- place of work
- hours of work
- rates of pay
- holiday pay
- overtime rates
- statutory sick pay
- pension scheme
- discipline procedure

Find out

What is the national minimum wage at the moment? You can find out from lots of different places, including the DTI website. You can find a link to the site at www.heinemann.co.uk/hotlinks – just enter the express code 0886P

- termination of employment
- dispute procedure.

If you have any questions about information contained within your contract of employment, you should talk to your supervisor before you sign it.

When you start a new job, you should also receive a copy of the safety policy and an employee handbook containing details of the general policy, procedures and disciplinary rules.

Discrimination in the workplace

Discrimination means treating someone unjustly, and in the workplace it can range from bullying, intimidation or harassment to paying someone less money or not giving them a job. Discriminating against people within the working environment is against the law. This includes discrimination on the grounds of:

- sex, gender or sexual orientation
- race, colour, nationality or ethnic origin
- religious beliefs
- disability.

The Race Relations Act protects people of all skin colours, races and nationalities

The law states that employment, training and promotion should be open to all employees regardless of any of the above. Pay should be equal for men and women if they are required to do the same job.

Sources of information and advice

There are many places you can go to get information and advice about a career in the construction industry. If you are already studying, you can speak to your tutor, your school or college careers adviser or you can get in touch with Connexions for careers advice especially for young people. Visit www.heinemann.co.uk/hotlinks and enter the express code 0886P for a link to Connexions' website. You can also find their telephone number in your local phone book.

Organisations such as those listed below are very good sources of careers advice specific to the construction industry.

- CITB (Construction Industry Training Board) – the industry's national training organisation
- City and Guilds – a provider of recognised vocational qualifications
- The Chartered Institute of Building Services Engineers
- The Institute of Civil Engineers

- Trade unions such as GMB (Britain's General Union), UCATT (Union of Construction, Allied Trades and Technicians), UNISON (the public services union), Amicus (the manufacturing union, previously MSF).

Links to all these organisations' websites can be found by visiting www.heinemann.co.uk/hotlinks and entering the express code 0886P.

FAQ

Why do I need to learn about different trades?

It is very important that you have some basic knowledge of what other trades do. This is because you will often work with people from other trades and their work will affect yours and vice versa.

What options do I have once I have gained my NVQ Level 2 qualification?

Once you are qualified, there is a wide range of career opportunities available to you. For example, you could progress from a tradesman to a foreman and then to a site agent. There may also be the opportunity to become a clerk of works, an architect or a college lecturer. Some tradesmen are happy to continue as tradesmen and some start up their own businesses.

Knowledge check

1. How many members of staff are there in a small company, a medium company and a large company?
2. Give an example of a public construction project. Who pays for public work?
3. Name a job in each of the four construction employment areas: professional; technician; building craft worker; building operative.
4. Why is the client the most important member of the building team?
5. Explain the meaning of the following building types: residential; low rise; semi-detached.
6. What are the four different methods of communication?
7. What information might a schedule give you?
8. What does NVQ stand for?
9. What information must be in your contract of employment?