

Construction Skills Foresight Report 2003

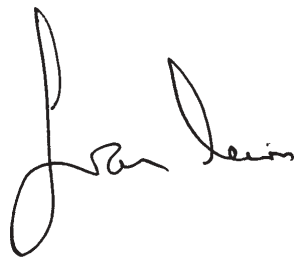
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Foreword

UK construction occupies a critical position in the national economy. As well as being a significant contributor to gross domestic product and a very substantial employer, it provides the infrastructure necessary for other sectors to succeed. It has delivered a sharp increase in output over the last year, growing faster than any other major sector, for which it is to be commended. Inevitably this has put pressure on the industry's capacity particularly in terms of its labour market. If it is to respond to the demands for new housing and the government's agenda for public sector infrastructure it must seek to increase its levels of productivity.

This is where this report from CITB, which analyses future demand in terms of requirements for new skills and training, has a key part to play. Drawing on information from industry employers it underpins the central role of the new Sector Skills Council, ConstructionSkills, to develop a strategy for skills aimed ultimately in increasing productivity in the industry. In order to gain the greatest impact on productivity, this strategy must of necessity grasp the opportunity to link skills with new and emerging technologies. By sharing this analysis with the Sector Skills Council's partners including the Learning and Skills Council, the national and devolved administrations and the Regional Development Agencies, as well as the network of training providers, it can help ensure a co-ordinated approach across the United Kingdom.

This report, which this year has been produced collaboratively between CITB GB, CITB NI and the CIC makes an important contribution to the development of a demand led education and training system.

A handwritten signature in black ink, appearing to read 'Ivan Lewis', with a stylized, cursive script.

Ivan Lewis
Minister for Skills and Vocational Education

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Summary and Conclusions

This *Skills Foresight Report* is the latest in a series of annual labour market publications from CITB dating back to 1998. Originally called *Construction Employment and Training Forecasts* the reports have evolved each year but still retain the core analysis of the Construction Industry's skill requirements. This year the scope of the report has been widened in order to meet the requirements of CITB's new status as a Sector Skills Council (SSC). With our partners the Construction Industry Council (CIC) and CITB Northern Ireland we will operate in future under the name of ConstructionSkills. Consequently this year's report contains new analysis from Northern Ireland and also of the Construction Professionals' sector.

The contents of the report are drawn from a variety of sources and, importantly, have been the subject of a consultation exercise involving representatives of the industry, academics and Government bodies both at the regional and national level. Each year a series of meetings is held to discuss the CITB Employment Model and proposed changes, the assumptions used and the results obtained, as well as the final report.

A summary of the main points of the report are set out below together with an analysis of the priorities for planning workforce development for the sector. This is followed by the main report which contains sections on short- and medium-term prospects for the industry, technological and other changes likely to occur in future, and an analysis of training supply and how well it matches up to our estimates of skills requirement.

The State of the Industry

The construction industry is of considerable economic and strategic importance across the UK, contributing about 6% of GDP (£60 billion), approximately £40 billion of which is attributed to projects having a value of less than £500,000. Construction is an essential prerequisite for growth in other sectors such as housing and infrastructure, and improvements in social inclusion and public services, e.g. urban renewal, health and education; 30% of total construction output is for the public sector, making Government the largest UK construction client.

In recent years the industry has experienced quite sharp growth. In 2002 it grew by 8%, well above that in the economy as a whole. Over the next five years it is expected to expand by 2–3%, but this is dependent on prospects for the rest of the economy, and on the fulfilment of Government plans for public expenditure over the next five years. Furthermore, although overall growth may be positive, there are likely to be regional and sectoral variations within the whole, and consequently areas where activity levels will fall.

The Construction Labour Market

Construction employs over 2 million people – more than 1 in 14 of the total UK workforce. Excluding electrical wiring and fitting and plumbing (SIC 45.33), just over 1.8 million are employed in the construction contracting sector (SIC 45). A further 225,000 are employed in professional consultancies (SIC 74.2).

The construction labour market is expected to continue to be 'tight'. This will mean a low level of unemployment, difficulties in recruitment, and earnings growth above the rate of inflation. There is likely to be variation between regions and subsectors, with 'hot spots' occurring in certain locations (especially London and the South East) and around large new developments. We are expecting employment to grow at between 1 and 2% annually, that equates to an average overall requirement of around 80,000 new recruits to the industry each year. These figures represent an increase from our forecasts last year, but some of this is attributable to a one-off change in definition of the sector in line with our remit as a Sector Skills Council.

Meeting the Industry's Skill Requirements

At this level of demand, the industry is likely to experience difficulties in meeting its skill requirements. This is because of competition for workers from other industries, insufficient people coming through training, and a gap in the workforce that occurred during low levels of recruitment in the early 1990s. Although levels of training have been increasing in recent years, there continues to be a major shortfall in terms of properly qualified recruits joining the industry. Also the majority of training continues to be focussed on the main building trades, with trainees in the growing specialist occupations remaining very rare. According to employers, skill shortages are still occurring in most regions, although there are recent signs of some easing. Shortages are most acute in London and the South East, and for carpenters/ joiners and bricklayers. These shortages create pressure for mobility of labour between regions and the employment of unqualified workers.

Impact of Industry's Employment Patterns on Skills

The construction industry is highly fragmented and the construction process a complex one, starting with design and planning through production to ongoing maintenance and refurbishment. Construction work is almost entirely done on a project by project basis, whereby contractors will draw together teams of people who often work for quite a short period of time and then move on to another location or disperse. Much of the work is managed by a main contractor who deals with the client but who sub-contracts parts of it to smaller firms who specialise in a particular aspect of the process.

To cope with fluctuating workload, much of the workforce at site level is hired on a self-employed basis. In this form of 'secondary' labour market there is little opportunity or incentive to invest in training. Research into companies who rely heavily on self-employment show them to be least involved in training. Coupled with the commonly held view that construction is a relatively slowly changing area, the industry is failing to meet its long-term requirements for skills. Although changes in the tax system and moves to consolidate the industry into large units could make an impact in the future, it seems more likely that existing patterns of work will continue at least in the short-term.

A Changing Industry

Construction is expected to undergo significant changes in process and technology in the next five to ten years. Some changes, notably the transfer of activity off site and the move towards manufactured and standardised components, will be continuations of existing trends. Others, notably improvements in supply chain management, quality assurance and partnering with clients, represent a change in direction for the industry and are expected themselves to create a climate of more innovation. Together, these changes are necessary to increase productivity and enable the industry to compete internationally.

Industry changes will have consequences for the workforce in terms of different skill requirements – in particular, the gradual trend away from manual labour and towards white-collar workers/technical staff will continue. (NB this is an overall trend which disguises continued growth in certain manual/ occupations at craft level.) On site there will be a need for higher-level assembly skills. Business management generally will become more critical for company success, in particular, through the adoption of new ICT systems. The move towards a fully qualified workforce, driven by demands for quality assurance, will represent a significant extra training requirement for the industry. However, continued fragmentation in the industry and extensive use of sub-contracting are likely to hinder the process and frustrate moves to modernise such as increased team-working, supply-chain integration and strategic management.

Professional Work and Graduate Recruitment

Professional work outside SIC 45 (mainly architecture, engineering and surveying) is conducted by approximately 23,500 private practices and partnerships in the UK. Most of these are small firms that employ fewer than 10 people. Overall the industry employs some 206,000 professionals and a further 112,000 technical staff; both groups are expected to grow and both represent a significant training need. Unfortunately student numbers on higher education courses in all construction and built environment-related disciplines dropped sharply during the industry's recession in the 1990s and (apart from architecture) have yet to fully recover. Consequently there is likely to be a shortfall in the number of professionals and managers that will be needed to deliver the Government's ambitious programme of schools, health, house building and infrastructure improvements. The sector needs to better understand the reasons for this decline, to improve its current image with young people and their influencers, and to attract more graduates from a range of disciplines and backgrounds.

Striving for a Diverse Workforce

The same analysis is true for the industry's performance regarding diversity. Proportions of women and members of ethnic minority groups remain low both within the existing workforce and, disappointingly, amongst those coming through training. Also although the age profile for the industry is similar to that for the economy as a whole, its recruitment activity has been concentrated on young people especially school leavers, and opportunities for bringing in older workers are relatively undeveloped. Widening access to the whole workforce through training is a major challenge.

Training Supply

During 2002/03, there were signs that news about the industry's current fortunes (four times the level of growth in the rest of the economy) was working its way through to the labour market. Applicants for courses rose dramatically and reports began to appear expressing concern about the training providers' capacity to respond. Expansion of formal apprentice-type training for new entrants will help. However, the training system faces four other critical challenges:

- Firstly, to redress the balance in training between different sectors and regions. Building Trades are relatively well served whereas in Civil Engineering (except for Plant) and Specialist Building Trades training levels are particularly low. Also there is a clear North/South divide whereby Scotland and the NorthEast are net providers of skills to London and the South East.

- Secondly, to open up routes for adults to gain the skills necessary to enter or return to the industry.
- Thirdly, to develop members of the existing workforce to meet the demands of a modern, more highly productive industry.
- Finally to help employers provide the work experience necessary to transform trainees into fully productive workers.

Without these measures, new recruits will be frustrated, and the industry will continue to be short of skills in future years.

Consequently the industry needs to increase its level of levels of training and development to:

- meet the current shortfall against demand
- account for growth
- fulfil the objective of a fully qualified workforce
- meet the need for higher level skills and occupational change.

Priorities for Workforce Development

Three main priority areas for construction workforce development can be identified which follow from our analysis. They are reflected in CITB's Business Plan and are as follows:

1. Improving Image and Recruitment

- Changing the perception of the industry amongst the public
- Working with schools and young people (careers guidance) to demonstrate the wide range of jobs in the industry beyond the usual stereotypes
- Improving the accessibility and flexibility of training programmes, including those aimed at adults ready to join or return to the industry
- Involving employers in the support and delivery of training programmes, particularly in providing Work-based learning opportunities
- Improving retention and qualification rates, including reducing 'drop-out' from courses and 'leakage' outside construction. More apprenticeships rather than full-time courses would help here
- Improving recruitment and retention of graduates into the industry, and expanding the number of places in Construction Higher Education

2. Qualifying the Workforce

- Assessment and certification of existing skills
- Upskilling, both to meet the need for a more highly skilled workforce and to help motivate and retain individuals
- Changing employer and employee perceptions of skill needs
- Improving the accessibility of training programmes-both 'off-the-job' and providing work experience.
- Improving basic skills

3. Improving Business Performance

- Promoting the culture of continuous improvement based on performance measures
- Promoting the Investors in People standard
- Increasing investment in training amongst small companies
- Promoting supply team integration and collaborative working
- Meeting the skill requirements of new technologies and working practices
- Improving supervisory, management and leadership skills in the industry

Working across these three themes are three vital priorities for action:

- Getting more employers involved in training
- Developing diversity in the industry and training
- Taking a more strategic, 'whole UK' view of skills which takes account of marked regional disparities in training

Overview

In order to properly assess the current and future skill requirements for the industry, this report adopts a three-stage approach:

1. Examining the current situation to establish the characteristics of the industry, particularly as regards self-employment and diversity in the workforce.
2. Evaluating the skill requirements in the short-term (the next three to six months).
3. Considering the medium-term perspective to identify the skill requirements over the next five years (this being chosen as a suitable period for planning and implementing training in the industry).

Section 1: The Current Situation

The scope of the current report has been widened to cover all employed in construction (SIC 45) and construction-specific professionals employed in partnerships (SIC 74.20). Also, the definition of construction employment has been changed to bring CITB into line with other Sector Skill Councils. Thus for 2003, the CITB Employment Model has been updated to cover the wider definition of construction employment based on the Labour Force Survey (2 million) instead of the narrower coverage of the Department of Trade and Industry (1.5 million).

This section looks at output and employment in the industry, the key points of which include:

- Construction is a major sector of the UK economy accounting for 6% of gross domestic product and 7% of total employment.
- In 2002, construction output in 1995 prices increased by an unexpected 8% bringing total output in the industry to over £65,000m with repair, maintenance and improvement accounting for nearly 46% of the total. This unexpected jump in output shows construction to be a highly flexible industry.
- Professional service firms in the built environment earned a total of £12.3 billion on UK construction projects during 2001/02.
- Construction employment has increased steadily since the mid-1990s to reach over 2 million by 2002. The share of self-employment after declining to 31% in 2000 increased to 35% in 2002.
- Nearly 99% of the directly employed workforce were employed in companies with fewer than 50 employees, while 43% were employed in companies with one employee. This resulted in small companies accounting for approximately 60% of all employees (compared with 24% for large companies with 250 plus employees) and 25% of total construction output (compared with 36% for large companies).

- Within total construction employment, the largest occupational group was wood trades followed by managers, electricians, clerical and bricklayers. The smallest occupational group was scaffolders.
- The age profiles of the construction workforce (SIC 45) and of professionals in both the construction industry and in partnerships (SIC 74.20 and SIC 45) are shown separately. For construction between 1998 and 2002 there was some increase in the share of 16–24 year-olds as well as in the 35 to 49 age group. For professionals, the decline in the age groups 30 to 49 for SIC 74.20 as a whole was counterbalanced by a gain in construction (SIC 45).

The skill levels of the current workforce complete the picture. The construction industry has 46% of all in employment qualified to NVO Level 3 or equivalent, or above. This is higher than in the distribution sector (33%) but lower than in energy and water (61%).

Section 2: Short-term Skill Requirements

For the short-term, an assessment of the industry's prospects and skill needs is best obtained from employers' surveys. This section provides a summary of the results from the CITB Employers Skill Needs Survey 2002. The evidence from this survey shows that difficulties in recruitment were still high affecting 79% of participating employers, slightly above what they had been in 2001. However in terms of unfilled vacancies, a more strict definition of skill shortages, a lower (but still significant) percentage of 20% was reported. Overall employers were satisfied with their existing workforce but a considerable proportion (approximately 50%) felt new employees lacked certain skills.

These findings from employers that skill gaps are not a particular problem for existing employees is further reinforced in the Department for Education and Skills (DfES) Employers Skill Survey 2002 and the Northern Ireland Skills Monitoring Survey 2000.

Results from three employers' federations (latest available) are also reported: Federation of Master Builders (FMB), Civil Engineering Contractors Association (CECA) and National Specialist Contractors Council (NSCC). Both FMB and NSCC expect further expansion of construction output and employment and therefore further tightening of the labour market. CECA, on the other hand, reports lower expectations for both construction output and employment and therefore some easing of the labour market.

Section 3: Medium-term Skill Requirements

For the medium-term (the five-year period from 2003 to 2007), this section relies on the results of the CITB Employment Model, which has been used on a regular basis since the early 1990s.

Over the forecast period of 2003–2007, total construction output is expected to increase at an annual average growth rate of 2.1%, resulting in an increase in total construction employment of 165,000 (or 1.9% per year). The relatively low increase in productivity these figures imply continues the historical trend based on Labour Force Survey employment data. Labour savings due to improvements in technology are likely to be partly offset by increased bureaucracy via legislation and Government regulations.

Approximately 83,000 new recruits will be required each year between 2003 and 2007 (making 415,000 over the five-year period). This annual average requirement can be broken down into 46,000 construction site operatives, 16,000 managerial and clerical staff, 7,000 construction professionals and 14,000 building services operatives.

The occupations with the largest annual requirement will be, in descending order: wood trades, managers, electricians, clerical, bricklayers and plumbers.

The total of 83,000 can be further analysed into the requirement due to supply side factors (42,000) and the requirement due to demand side factors or projected increase in employment (41,000).

In terms of employment, non-manual occupations are expected to gain approximately 2.3% (or 3.3% if we exclude clerical staff) over the period 2003–2007 compared with an average increase for all occupations of 1.9%. The only occupations expected to show a decrease are plastering (down by 3.6%) and clerical staff (down by 0.1%).

Total employment of all professionals working in the built environment is estimated at approximately 319,000 in 2003 increasing to 365,000 by 2007 resulting in an annual requirement of just over 15,000 and a cumulative requirement of 76,000.

These forecasts are based on expectations about technological and organisational change in the industry and their implications for skills. Changes in legislation and Government regulations are also taken into account.

The section ends with an extended subsection on technological change in the industry.

Section 4: The UK and the Regional Dimension

This section compares construction output and employment in the four countries and the nine RDA areas within England. In 2002, there were considerable regional differences in England both in terms of output (from £2,811m in the North East to £13,524m in London) and employment (72,090 in the North East to 304,370 in the South East).

There were also considerable regional differences for the share of self-employment (from 20% in the North East to 45% in the South East) and unemployment (from 2.2% in the South West to 10.2% in the North East).

For the short-term, this section also gives details of major projects, reported skill shortages and provision of training. For the medium-term, the regional forecasts are fully compatible with the forecast for the UK as a whole.

Over the forecast period of 2003–2007, there are considerable differences in the expected growth rate in:

- construction output (from 1.0% in both Scotland and Wales to 3.2% in the South East)
- employment (from 0.8% in Scotland to 3.8% in the Eastern region)
- the level of the required intake (from 3,540 in the North East to 16,250 in the South East).

Section 5: Training Supply

This section gives the results of the Trainee Numbers Survey for 2002/03, which measures the number of first-year trainees starting construction courses in Great Britain. Numbers are slightly higher than the previous year at just under 49,000 trainees, an increase of 3% compared with 2001/02. This continues a five-year upward trend, and puts numbers of first-year trainees at their highest level since 1990.

This increase is not uniform across all qualifications. Wood trades and bricklaying account for just under half of all new starts, however, this year has witnessed a growth in training outside the main building trades. With the exception of plastering the numbers entering training in the main building trades have all decreased slightly.

Training supply in Northern Ireland is also following an upward trend with 2,199 first-year enrolments on construction courses in 2001/02, an increase of 6% from the previous year.

As with the first-year intake in Great Britain, wood trades and brickwork dominate the training figures representing 70% of total enrolments in Northern Ireland.

Figures on training at a professional level are also given. First-year intake into construction courses is analysed by main occupation: architecture, civil engineering, environmental technology, town and country planning, and building.

In addition to training within educational establishments, this section also looks at training in companies, drawing on information produced by CITB, DfES and CITB Northern Ireland.

Section 6: Recruitment and Training

This section deals with recruitment into the industry and with training issues. The section distinguishes different sources of flows into employment, estimated at approximately 11% per year with approximately 10% leaving each year. It is estimated that approximately 50% of new recruits into employment will need training.

On the supply side, the section looks at the formally trained output, that is the estimated numbers entering the industry with a qualification as well as the partially trained output, that is the numbers entering the industry without a qualification but having received some formal training. The analysis reveals a considerable gap between the required intake and the formally trained output, a gap that needs to be filled if the industry is to move towards a fully qualified workforce.

Section 1:

The Current Situation

Introduction

Because of its new status as a Sector Skills Council, CITB, with its partners Construction Industry Council (CIC) and CITB Northern Ireland, now needs to cover all employed in the built environment. This includes total employment covered by the construction industry, which equates to SIC 45 of the Revised 1992 Standard Industrial Classification, excluding SIC 45.33 (electrical wiring and fitting and plumbing), as well as total employment in professional partnerships working for the built environment classified to SIC 74.20.

To achieve the wider coverage on a consistent basis, the best source of information is the Labour Force Survey (LFS), carried out by the Office for National Statistics (ONS) on a quarterly basis. According to the Labour Force Survey, the overall size of the construction sector is around 2 million individuals or 1.8 million excluding SIC 45.33. In order to capture employment in the built environment, we need to add approximately 230,000 people (as estimated by CIC) to the construction industry, resulting in a total employment figure of 2.2 million or 2.4 million including SIC 45.33.

This approach departs from former practice. CITB analysis of the labour market was previously based on the Department of Trade and Industry's narrower definition of the industry covering approximately 1.5 million individuals.

The change to the Labour Force Survey has been made possible partly by the improved coverage. Equally important, there are now sufficient observations, annual from 1984 to the present, to allow for a trend analysis of the data.

The change is necessary for the following reasons:

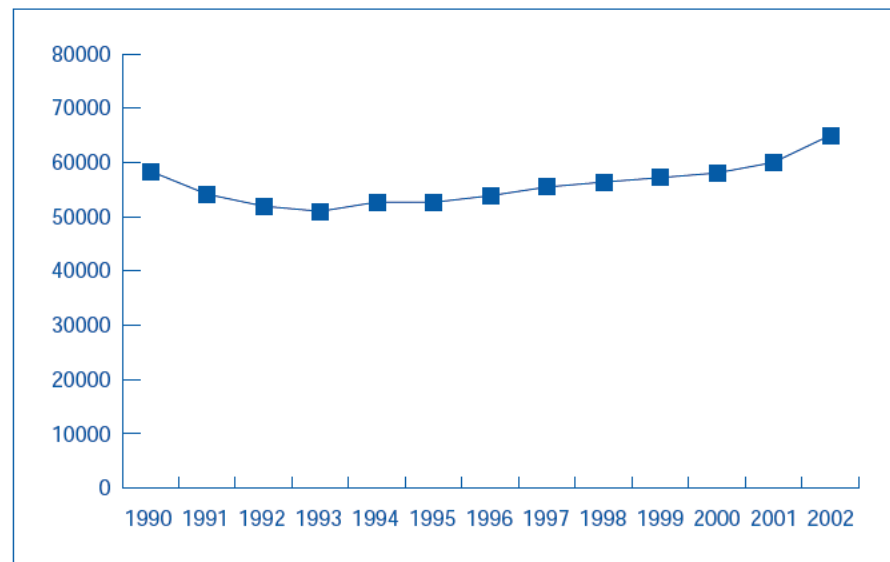
- To have employment data in the construction industry which is compatible with that in other industries (the Labour Force Survey covers employment in the whole economy).
- To have consistent data between all employed in SIC 45 and the proportion employed in SIC 74.20 that belongs to the built environment.
- To ensure that all working in the built environment are included in our definition of the industry.

Construction Activity

Construction is a major industry in the UK economy, accounting for 7% of total employment and 6% of Gross Domestic Product. Following steady but moderate increases in construction activity, the expectation in 2001 was for further growth in 2002. The forecasts ranged from 1.4% (Cambridge Econometrics) to 5.4% (Experian Business Strategies).

The actual increase of 8% was well above even the most optimistic forecast, resulting in a total construction output in 1995 prices of nearly £65,000m in 2002, as shown in Chart 1.

Chart 1
Construction Output in £m, 1995 Prices, Great Britain: 1990–2002



Source: Department of Trade and Industry

Within subsectors of the industry, growth was even more sharply pronounced. According to the Department of Trade and Industry (DTI), between 2001 and 2002:

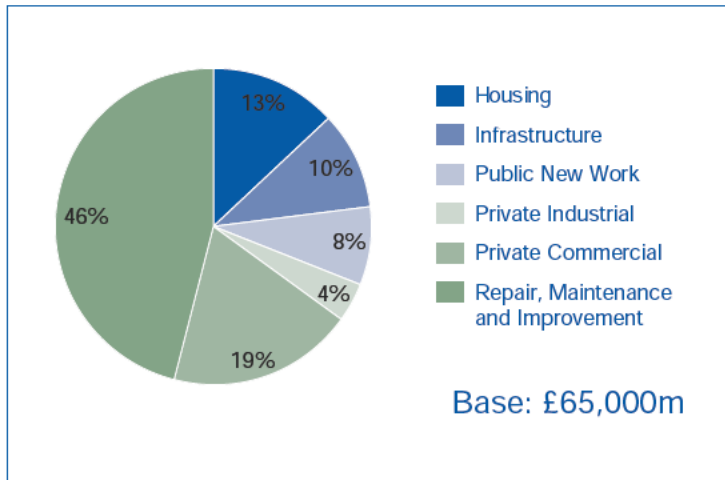
- total construction output increased by 8%
- new private housing increased by 11%
- new public housing increased by 16%
- infrastructure increased by 9%
- other public work increased by 25%
- commercial new work increased by 11%
- industrial new work decreased by 11%
- total repair, maintenance and improvement increased by 5%.

All above changes are measured in volume terms.

The strongest sector was by far other public work (up 25% year-on-year) while the weakest sector was industrial new work (down 11% year-on-year). The strong increase in new public housing (up 16% year-on-year) was from a relatively small base bringing total public housing output to approximately £1.4 billion compared to nearly £7 billion for private housing output.

Regarding the shares of each sector in total output, there has been very little change from the shares reported in the *Skills Foresight Report 2002*. Chart 2 shows that the only changes are for the share of private industrial output (down two percentage points to 4%) and public new work (up one percentage point to 8%).

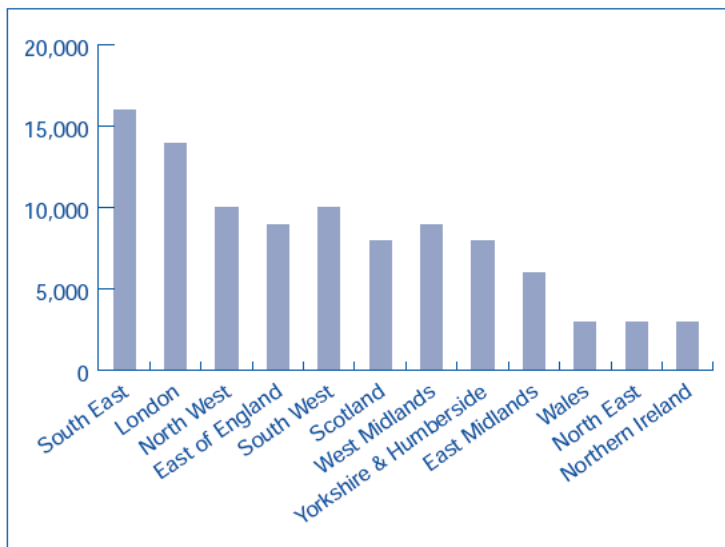
Chart 2
Construction Output by Sector in 1995 Prices, Great Britain: 2002



Source: Department of Trade and Industry
 Approximately half of total repair, maintenance and improvement is on housing. A considerable proportion of this consists of improvement work.

Chart 3 shows that there are considerable differences in the contribution of each country and region within the UK to total construction output, ranging from 16% by London and the South East to 3% by Wales, the North East and Northern Ireland.

Chart 3
Construction Output by Country and Region in £m (Current Prices), UK: 2002



Source: Department of Trade and Industry; CITB Northern Ireland

To the volume of construction output within SIC 45, we need to add the fees earned by UK professional firms (£12.3 billion) on projects in the UK. The majority of the fee income is earned on new work (60%), with 13% on repair, maintenance and improvement and 28% on refurbishment work. This information was obtained from the Survey of UK Construction Professional Services 2001–2002 by the Construction Industry Council.

Construction Employment

Construction is often perceived as a low pay industry with poor working conditions. However, in terms of relative pay, wages for manual and non-manual occupations are above the national average and rising faster. Moreover, in recent years, earnings in the industry have increased faster than in the rest of the economy, as shown by Table 1.

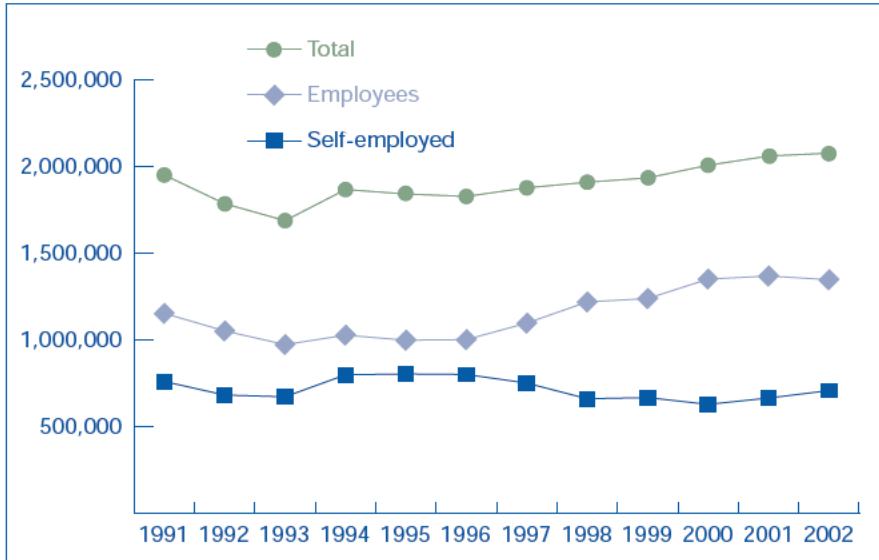
Table 1
Average Gross Weekly Earnings in Construction and All Industries, UK: 1992–2002

Year	Manual workers, males & females			Non-manual workers, males & females		
	Construction (pounds)	All Industries (pounds)	Ratio of Construction to All Industries	Construction (pounds)	All Industries (pounds)	Ratio of Construction to All Industries
1992	273.7	250.8	109	348.8	334.8	104
1993	273.9	256.6	107	356.8	350	102
1994	278.4	261.7	106	366.8	360.5	102
1995	293.9	271.5	108	382.2	373.3	102
1996	307.0	281.1	109	402.8	389.3	103
1997	323.4	292.9	110	421.4	406.8	104
1998	340.9	307.3	111	425.8	425.2	100
1999	350.9	315	111	461.7	443.3	104
2000	371.0	324.5	114	496.8	465.1	107
2001	393.0	338.9	116	524.4	492.8	106
2002	410.3	347.7	118	548.9	515.4	106

Source: Office for National Statistics: New Earnings Survey

The steady increase in construction output over recent years was accompanied by steady increases in construction employment which reached just over 2 million (as measured by the Labour Force Survey) by Spring 2002. Chart 4 shows that the share of self-employment decreased from 45% in 1996 to approximately 35% in 2002. Between 1996 and 2000 the increase in total employment was entirely due to gains in direct employment. This trend was reversed in Spring 2001 and 2002 when there were small increases in the number of self-employed people in the industry for each year. The share of self-employment in the construction industry remains well above the national average across all sectors (approximately 11%).

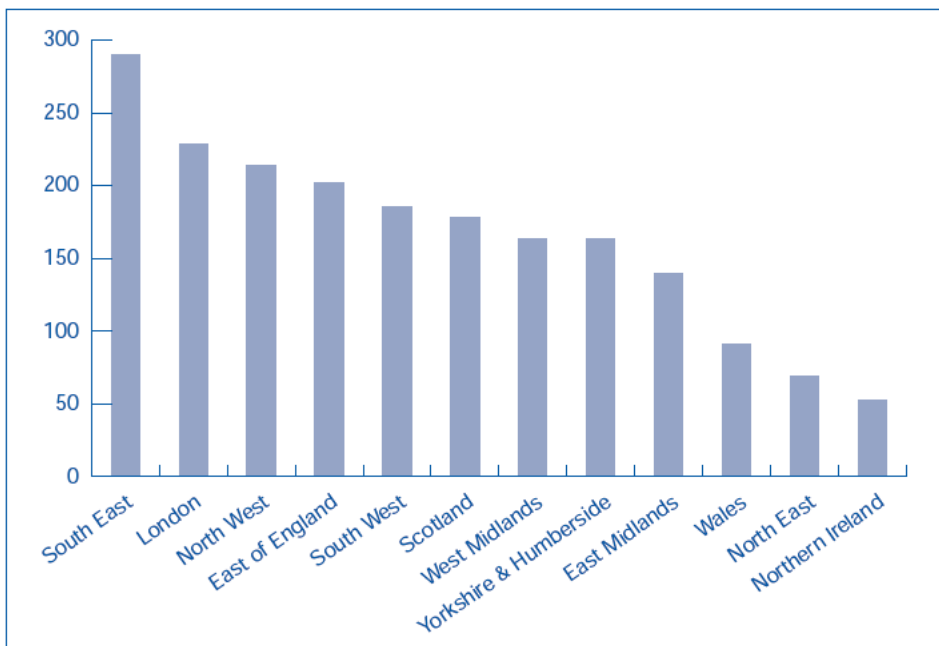
Chart 4
Construction Employment, UK: 1991–2002
Employees and Self-employed



Source: Office for National Statistics: Labour Force Survey
 Please note that there is a discontinuity in the series in 1994 due to an improvement in the method of collecting and analysing data.

Chart 5 shows construction employment is very unevenly distributed over the UK. At one extreme the South East accounts for 15% with Northern Ireland and the North East at the other end accounting for only 3% of the total.

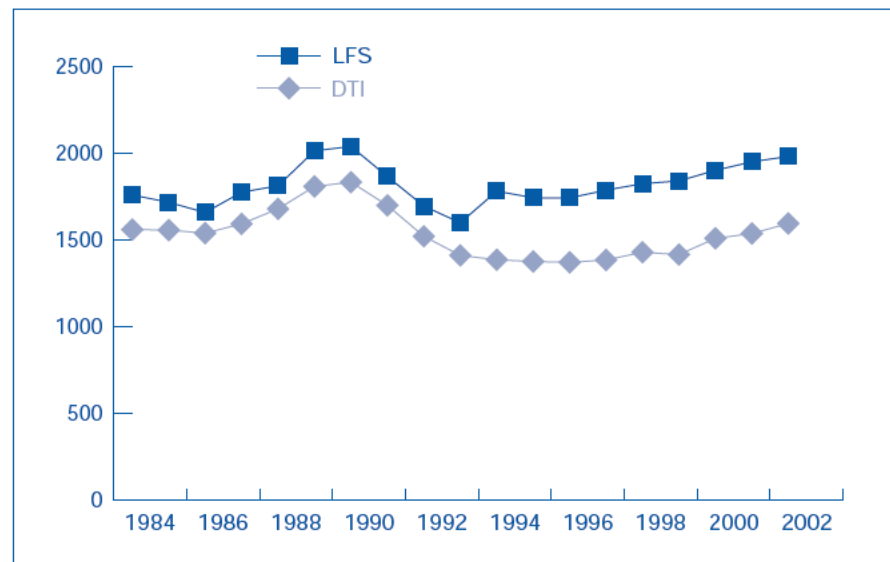
Chart 5
Construction Employment by Country and Region, Average (000s), UK: 2000–2002



Source: Office for National Statistics: Labour Force Survey

It should be noted that the coverage of construction employment by the Labour Force Survey is wider than that of the Department of Trade and Industry used in previous reports, and is more representative of the whole industry. It is also compatible with the definition of employment used by other Sector Skills Councils. Chart 6 shows the relationship between the Labour Force Survey and Department of Trade and Industry estimates of total construction employment. While they tend to change at a similar rate, the two series have further diverged after 1994. This may be partly attributed to the improved methodology used in the Labour Force Survey.

Chart 6
Total Construction Employment, Great Britain: 1984-2002
Comparison of Labour Force Survey and Department of Trade and Industry
Estimates (000s)

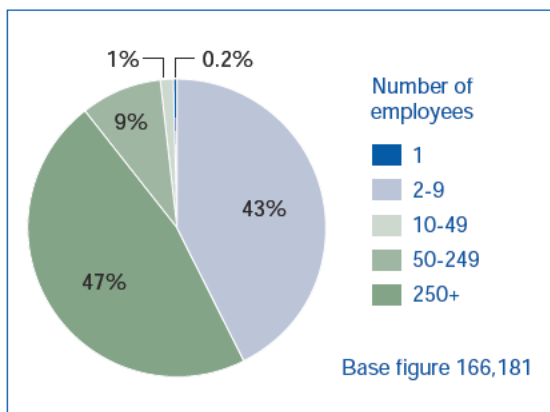


Source: Department of Trade and Industry; Office for National Statistics: Labour Force Survey
 The Department of Trade and Industry estimate of employees in the construction industry is derived from an employer-based survey. Their estimate of self-employment is based on the Labour Force Survey figures. The estimate from the Labour Force Survey is derived from an employee-based survey.

Structure of the Construction Industry

The construction industry is highly fragmented as is shown in Chart 7. Approximately half of all companies in the Department of Trade and Industry's Register have only one employee. Companies with between one and nine employees account for 90% of all companies while less than 1% have 250 or more employees.

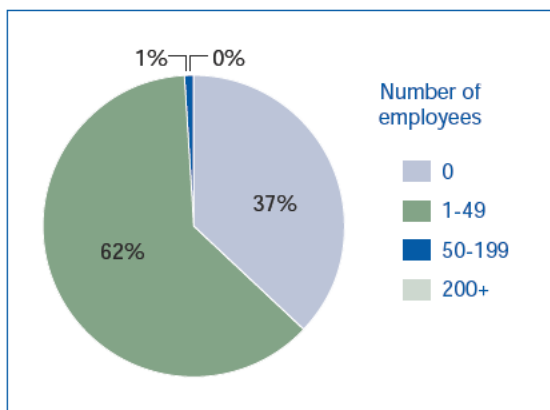
Chart 7
Number of Construction Companies by Size of Company, Great Britain: 2002, Quarter 3



Source: Department of Trade and Industry
 The base figure refers to the total number of companies on the DTI register.

Northern Ireland presents a similar picture, as is seen in Chart 8. Companies with between 1 and 49 employees account for almost 62% of construction firms. The information for Northern Ireland includes VAT-registered construction firms with no employees accounting for 37% of the total. This confirms the predominance of self-employed in the industry.

Chart 8
Number of Construction Companies by Size of Company, Northern Ireland: 2002

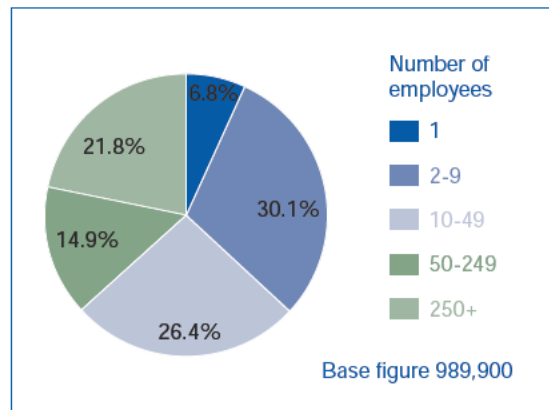


Source: Department of Enterprise, Trade and Investment:
 Facts and Figures from the Inter Departmental Business Registrar, May 2002
 Please note that the size bands in Northern Ireland are different from those used in Great Britain

Although they represent over 90% of all firms, those with fewer than ten employees only account for 30% of direct employment, and only produce 12% of output. Large companies, on the other hand, account for approximately 22% of direct employment and 36% of output (Charts 9 and 10). This is not surprising since large companies are more capital intensive, have a higher labour productivity and generally engage in high value projects.

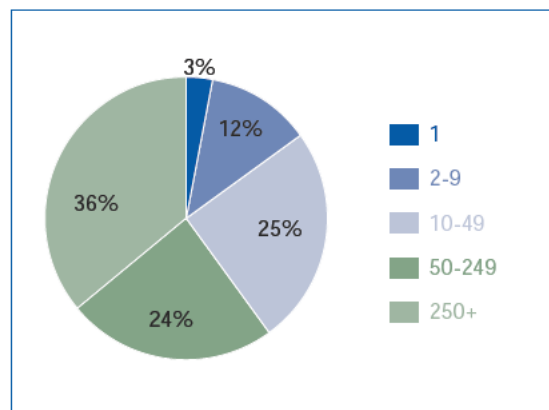
The share in total construction output by large companies has increased from 30% in 2000 to the current 36%. At the same time the share of small companies (1–9 directly employed) has declined from approximately 28% to 15%. This would indicate an increased proportion of large high value projects that would need to be carried out by large companies. The increase in the share of public new work is compatible with these changes.

Chart 9
Employees by Size of Company, Great Britain: 2002, Quarter 3



Source: Department of Trade and Industry
 The base figure refers to the total direct employment by contractors on the DTI register.

Chart 10
Construction Output by Private Contractors by Size of Company, Great Britain: 2002, Quarter 3



Source: Department of Trade and Industry
 The base figure refers to the total construction output in 2002, Quarter 3.

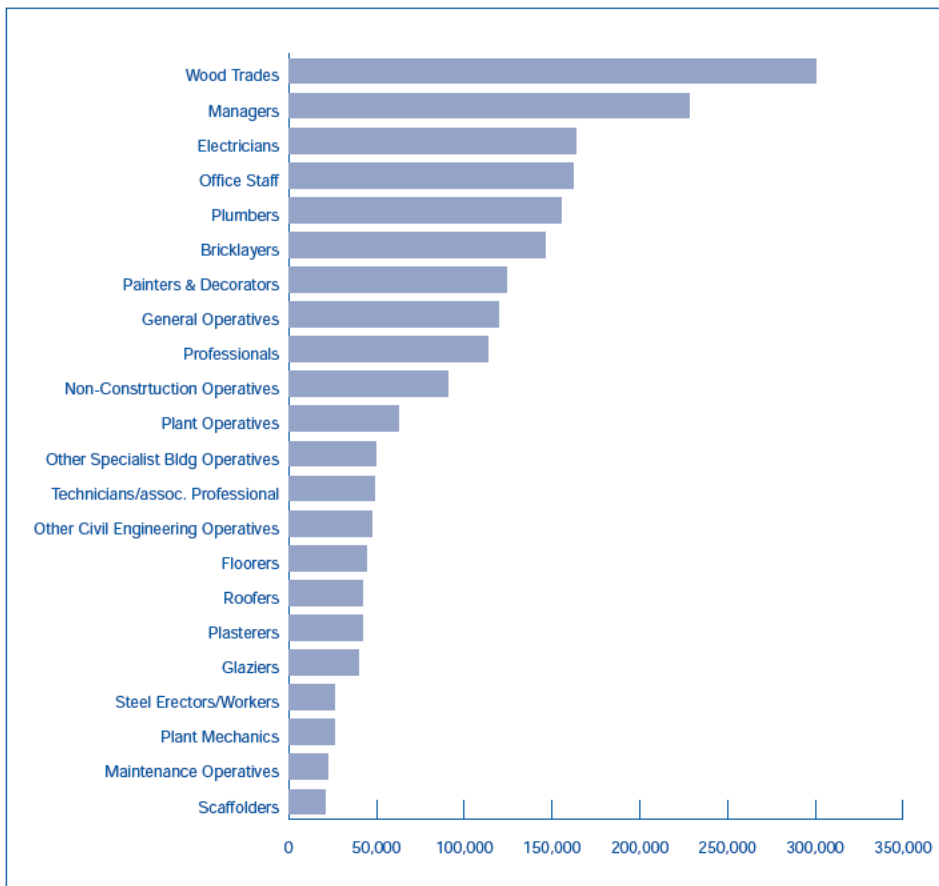
Key Features of the Employed Workforce

From the Labour Force Survey, which is a quarterly employee-based survey, we can obtain information on the employment status of the construction workforce.

The construction industry covers a variety of occupations. Chart 11 shows total construction employment by main occupational category in Great Britain. The Appendix gives further occupational breakdowns.

In terms of size, the largest manual occupation is wood trades followed by electricians, plumbers and bricklayers. For non-manual, managers are the largest occupational group followed by clerical staff. As regards professional and technical staff, a considerable proportion is employed outside the construction industry as defined by the Standard Industrial Classification (SIC 45). See the subsection on Professionals (page 27).

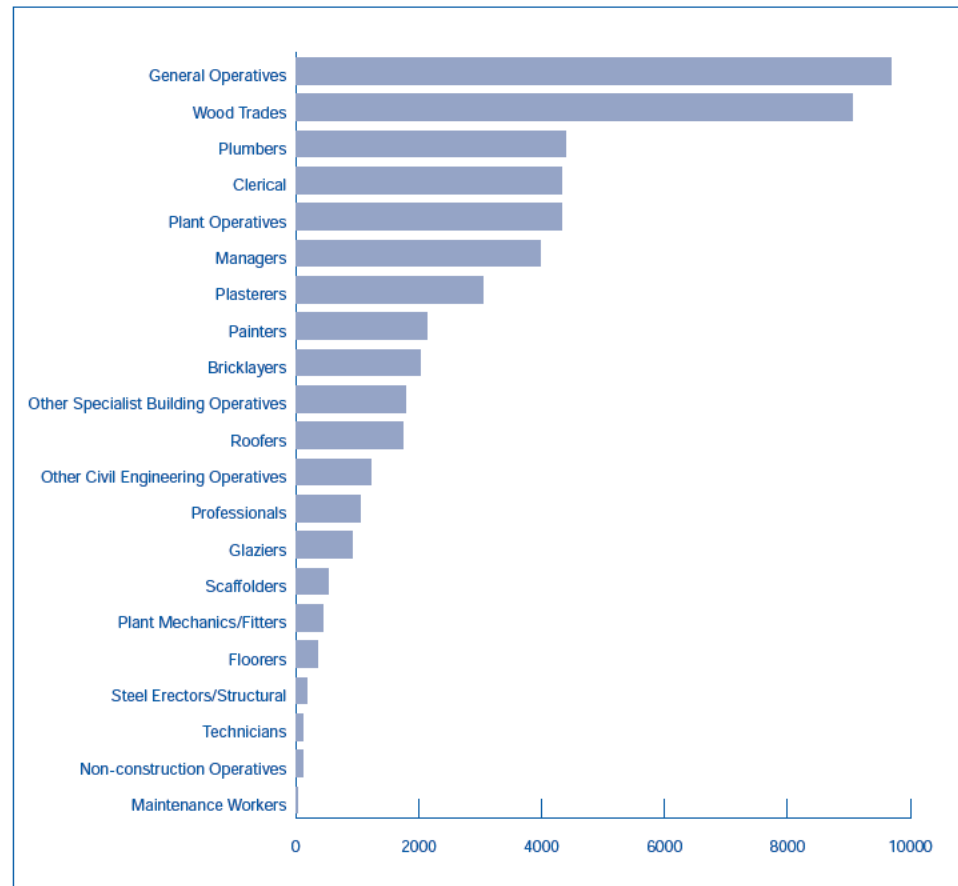
Chart 11
Construction Employment by Occupation, Great Britain: 2002



Source: Department of Trade and Industry; CITB Employment Model, 2003;
National Centre for Social Research Survey of Employment by Occupation, 2001

Northern Ireland presents a slightly different picture, as can be seen from Chart 12. General operatives are the largest occupational category followed by wood trades. Electricians are not included in the construction employment figure for Northern Ireland but are included in the figure for Great Britain.

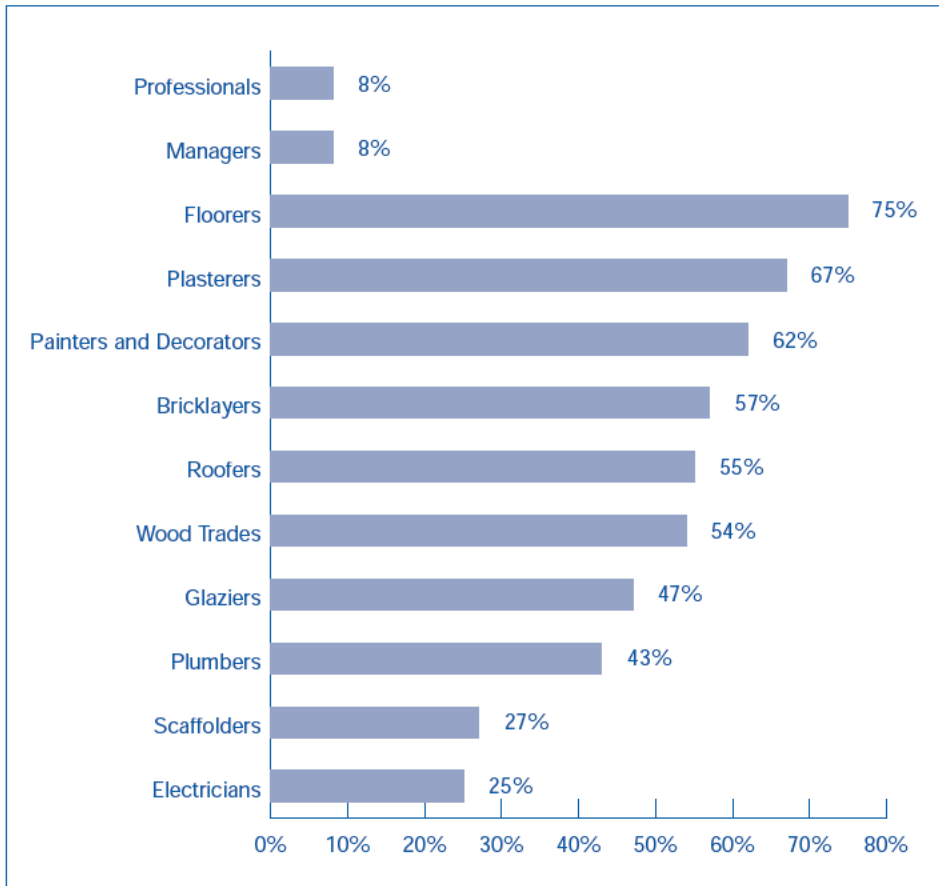
Chart 12
Construction Employment by Occupation, Northern Ireland: 2002



Source: CITB Northern Ireland Employment Model, 2003; Experian Business Strategies

Overall, self-employment accounts for 35% of total construction employment with considerable variations for different occupations, as shown in Chart 13. Self-employment is lowest for managerial and professional occupations and highest for flooring and plastering occupations.

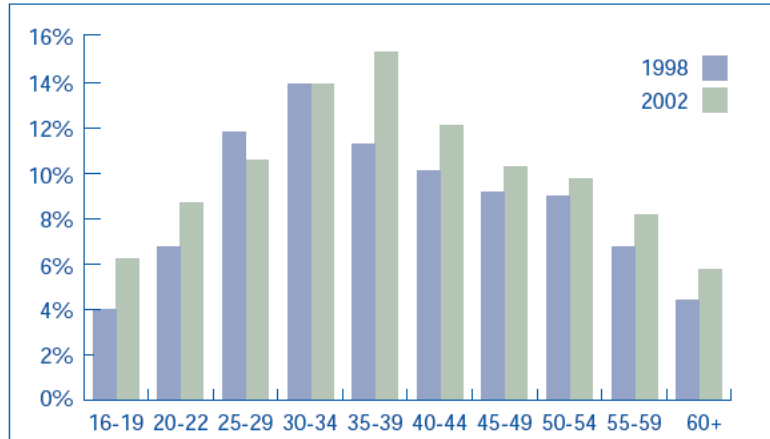
Chart 13
Percentage of Self-employed by Occupation, UK: Spring 2002



Source: Office for National Statistics: Labour Force Survey

The age profile of construction employment has undergone some change over the past four years. For manuals in the industry, Chart 14 shows that there has been an increase in the share of the 16–24 age group but a decrease in the share of the 25–29 age group due to the low level of recruitment in the early 1990s. The increase in the younger age group is very welcome but probably insufficient to overcome the ageing of the construction workforce.

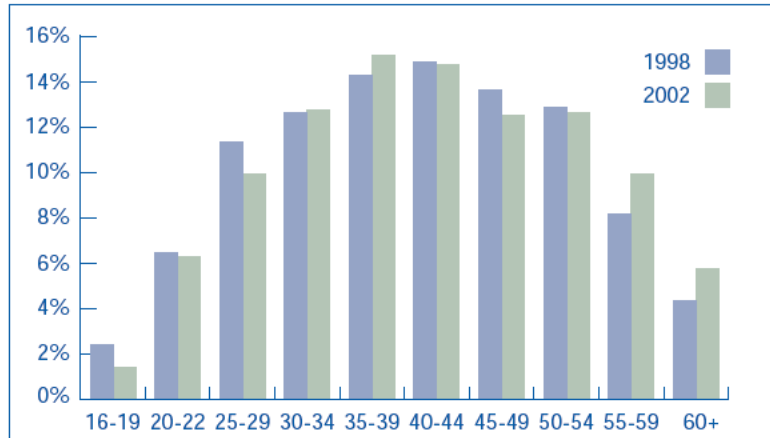
Chart 14
Age Profile of All Manuals in Construction, UK: 1998–2002



Source: Office for National Statistics: Labour Force Survey

For non-manuals the main changes have been a decline in the share of the 16–19 age group and an increase in the share of the older age groups, 55 plus.

Chart 15
Age Profile of All Non-manuals in Construction, UK: 1998–2002

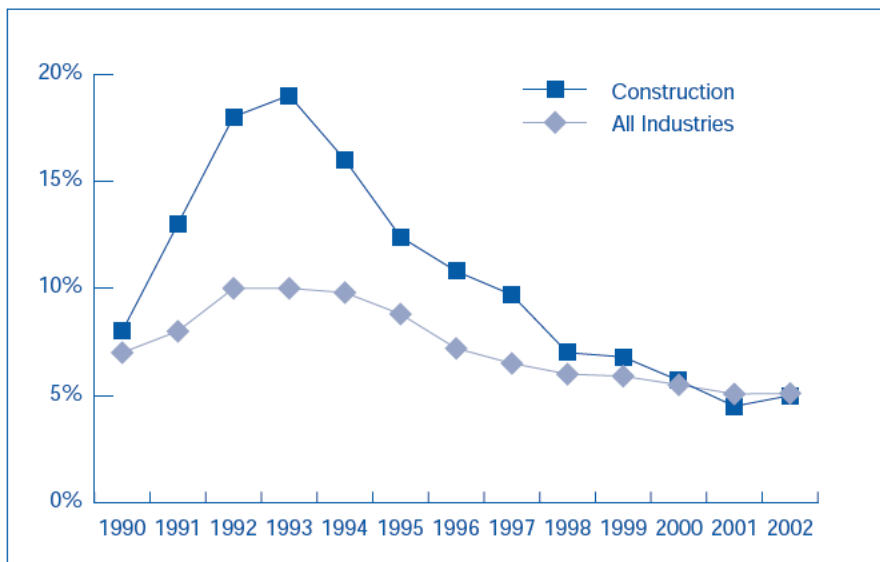


Source: Office for National Statistics: Labour Force Survey

The ageing of the workforce both for manuals and non-manuals can partly be attributed to the decline in recruitment during the early 1990s. However, demographic changes in terms of more young people staying on in full-time education after the age of 16 are also contributing causes. It is therefore unlikely that the age profile of the early 1990s will again be achieved and the industry will have to facilitate entry for older age groups.

Chart 16 shows that over the past ten years there have been considerable changes in the rate of construction unemployment. Following a rapid increase in the early 1990s, construction unemployment has declined over the past ten years and by 2002, the construction unemployment rate had decreased to 5%, the same as for the economy as a whole. Initially the decline was the result of an outflow from the construction industry to other sectors. More recently, the decline in unemployment can be attributed to increased demand for labour in the construction industry, with a moderate but steady rise in employment since 1997, as shown in Chart 4 on construction employment.

Chart 16
% Unemployment Rate in Construction and All Industries, UK: 1990-2002



Source: Office for National Statistics: Labour Force Survey

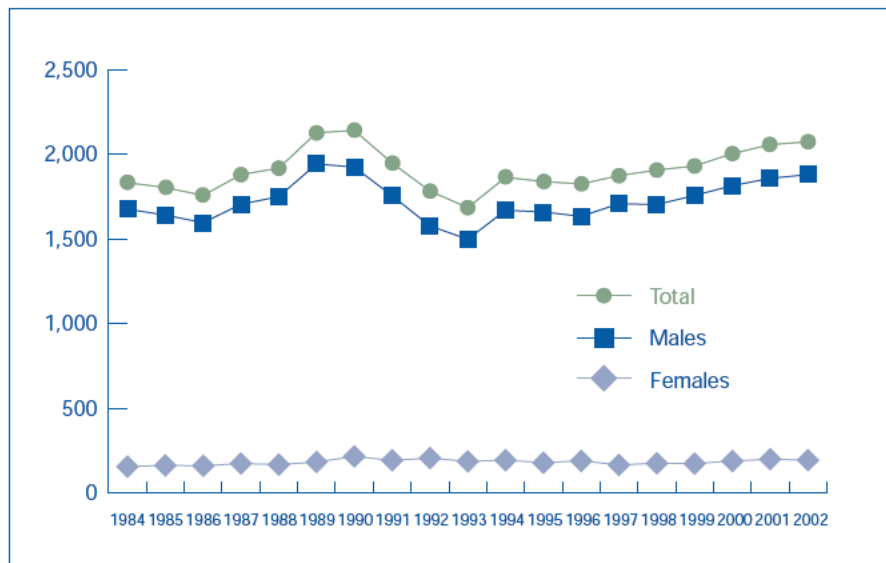
The persistence of some unemployment despite the high level of activity in the industry must be attributed to frictional and structural elements. Some frictional unemployment (individuals between jobs) is likely to be always present however tight the labour market. Moreover for construction the national figure for unemployment hides considerable regional differences, as shown in Section 4. Thus structural elements are primarily due to regional imbalances since the rate of unemployment is considerably higher in the northern than in the southern regions.

Diversity in the Labour Force

Construction has traditionally been seen as a white, male-dominated industry. Results from the Labour Force Survey confirm this image. During the 1990s, the ethnic composition of the construction workforce saw little change, with non-white employment in the industry barely rising from 1.5% in 1992 to 1.7% over the next eight years. By Spring 2002 there was a further increase to 2.4%. This resulted in a total employment of ethnic minorities in the industry of approximately 49,000 compared to 1.7 million in the economy as a whole.

As regards gender split, the proportion of women in the workforce has declined over the same period. In 1992, women accounted for 11.7% of total construction employment. By Spring 2002, this percentage had decreased to 9.3% (Chart 17). Looking at the split between non-manual and manual (not shown in the chart), women accounted for 36.5% of all non-manual in 1992 and 30% in 2002, and for 1.7% of all manuals in 1992 falling to 1% in 2002.

Chart 17
Total Construction Employment by Gender, UK: Spring 2002 (000s)



Source: Office for National Statistics: Labour Force Survey

As regards disability, while no information on numbers currently employed in the industry is available, CITB aims to provide the support services, equipment and physical adaptations which will remove barriers and obstacles and will enable apprentices to access its facilities and services. In this way the industry will be open to all categories of people in the UK.

Professionals

Construction professionals in the built environment include all working in the construction industry (SIC 45) and most of those working for professional services (SIC 74.20). However, construction professionals also work in other sectors. Table 2 shows the percentage working in the built environment varies from 35% for town planners to just over 70% for architects and 86% for quantity surveyors. For technical staff, approximately 70% of architectural and town planning technical staff work in the built environment. For draughtspersons, the percentage falls to just over 30%.

Table 2
All Professionals and Technical Staff in the Built Environment
UK Average Spring 2001–Winter 2002/03

	SIC 45	SIC 74.20	built environment' SIC45 and SIC 74.20	all industries including SIC45 & SIC74.20	built environment as % of all industries
Main professional occupations					
All professionals	117,451	118,970	236,421	(1683860)	*
Civil engineers	31,873	15,322	47,195	68,337	69%
Other engineers	28,647	35,285	63,932	(370,065)	*
Other professionals	16,157	8,456	24,613	(1,079,413)	*
Architects	3,624	32,894	36,518	49,770	73%
Town planners	2,322	3,128	5,450	15,658	35%
Quantity surveyors	24,608	9,338	33,946	39,421	86%
Chartrd surveyors	10,222	14,547	24,769	61,195	40%
Main technical occupations					
All technical staff	50,546	27,498	78,044	(760,420)	
Build & civil eng tech	12,687	3,576	16,263	26,271	62%
Architectural & town planning	2,195	8,692	10,887	15,446	70%
Draughtspersons	8,032	8,662	16,694	51,685	32%
Building inspectors	2,142	485	2,627	4,219	62%
Estimators, valuers, assessors	11,371	907	12,278	68,100	18%
Financial technicians	3,762	1,837	5,599	(280,311)	*
Other technicians, including IT	10,357	3,338	13,695	(314,388)	*

Source: Office for National Statistics: Labour Force Survey;
Construction Industry Council: Survey of UK Construction Professional Services
2001–2002

Please note that the total for combined professional and technical staff in SIC 74.20 has been deflated by 20% in accordance with the results from the CIC survey.

The occupational shares within the total are from the Labour Force Survey.

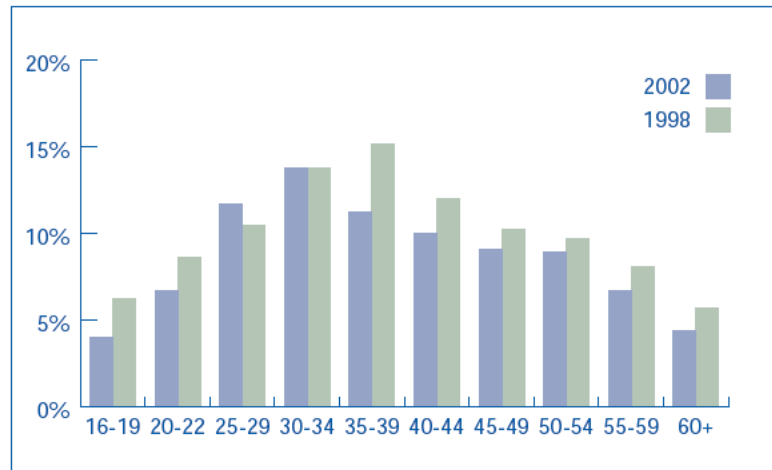
* Also, the figures in brackets show occupations that are not construction specific. It is therefore not appropriate to give the combined figure for SIC 45 and SIC 74.20 as a percentage of the total employment in these occupational categories.

The balance of construction professionals is working mostly in the real estate sector or for clients of the construction industry. Companies and professional partnerships in the built environment will therefore have to compete, when recruiting, with companies outside the built environment.

The age profiles of construction professionals are shown in Chart 18 (professionals in SIC 45) and Chart 19 (professionals in SIC 74.20). In terms of percentage shares, the main change for professionals in SIC 45 is the decrease in the 25–29 age group and the increase in the 40–44 age group.

It should be noted that for SIC 74.20 it is not possible to separate professionals working in partnerships in the built environment from professionals working in other areas within the same industrial classification. For professionals in SIC 74.20 the main feature is the decrease in the percentage share for most age groups 35 and above counterbalanced by increases in the shares of the younger age groups.

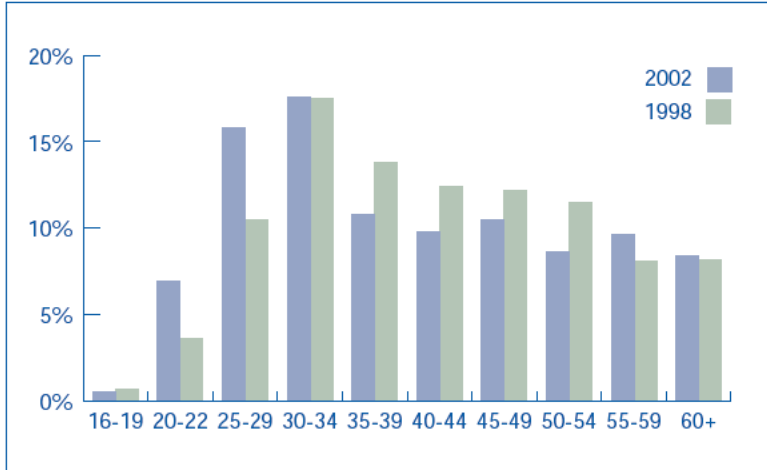
Chart 18
Age Profile of Professionals in Construction, SIC 45, UK: 1998–2002



Source: Office for National Statistics: Labour Force Survey

Chart 19

Age Profile of Professionals in Partnerships, SIC 74.20, UK: 1998–2002



Source: Office for National Statistics: Labour Force Survey

Construction Skills in Other Industries

For Building Services, Table 3 shows that 20% of plumbers (including heating and ventilating engineers) and approximately half of all electricians work outside the industry. Also 25% of those in wood trades work outside the industry, for example in manufacturing.

In practice, this means that the construction sector will need to compete with other sectors for three important skills in the industry. This needs to be taken into consideration when comparing the numbers required to join the industry with the numbers in training.

Table 3

Construction Skills in Other Industries, UK Average: 2000–2002

	In Construction	In Other Industries	Total	Percentage in Construction
Electricians ¹	141,130	117,530	258,660	55%
Plumbers, heating and ventilating engineers ¹	138,400	38,790	177,190	78%
Wood trades	186,880	63,940	250,820	75%

Source: Office for National Statistics: Labour Force Survey

¹ Not all within CITB footprint

Skill Levels in the Industry

The majority (up to 90%) of the future workforce over the next five years are already employed within the industry. It is necessary, therefore, to examine their skills and to assess any additional requirements particularly in view of the federations' targets for achieving a fully qualified workforce. See the subsection on Qualification Targets and OSAT (page 33).

In terms of general qualifications, construction is around the average when compared with other industries. Table 4 shows that the proportion of employees with NVQs or equivalent in construction was 46% in Spring 2002, compared to 61% for energy and water and 30% for agriculture and fishing. However, it should be noted that the qualifications shown at the various levels include those obtained at school, including GCSEs and A levels. Other qualifications are not specifically 'vocational', and therefore cannot strictly be taken into consideration in achieving the aim of a fully qualified workforce. On the other hand, as increasingly higher skills are demanded by the modern construction industry, it seems likely that higher levels of literacy, numeracy and general education will also be required as a base on which to increase productivity.

The proportion of employees holding actual NVQs is considerably lower in all industries. For construction, 7% of the total employed hold at least an NVQ Level 2 or above. This is the same as the average for all industries. Agriculture and fishing (5%), transport and communication (6%) and banking, finance and insurance (6%) are below construction while public administration, education and health (10%) and energy and water (9%) are above.

Table 4
Proportion of Construction Employees with NVQs or Equivalent by Sector, UK: 2002

	At least NVQ Level 3 or equivalent	NVQ Level 2
Energy and water	61%	9%
Public administration, education and health	60%	10%
Banking, finance and insurance	59%	6%
Other services	49%	9%
Construction	46%	7%
Manufacturing	44%	8%
Transport and communication	36%	6%
Distribution, hotels and restaurants	33%	7%
Agriculture and fishing	30%	5%

Source: Department for Education and Skills' estimates from the Labour Force Survey, Spring 2002

Table 5 shows the make-up of the current workforce in terms of their skill levels. Overall, around two-thirds have a qualification at NVQ Level 2 or equivalent, half are at NVQ Level 3 or equivalent, and just 13% are at NVQ Level 4 or equivalent, or above. As is to be expected, managers and professionals have the highest proportion of qualifications at NVQ Level 4 or equivalent, while for manual occupations less than 5% of construction employees reach a qualification at NVQ Level 4 or equivalent.

There has been some improvement in qualifications achieved in manual occupations over the past two years. Comparing Spring 2000 to Spring 2002, for construction trades a whole, 74% had reached NVQ Level 2 or equivalent in 2002 from 65% in 2000. For NVQ Level 3 or equivalent the corresponding proportions were 47% in 2002 and 39% in 2000. Over a two-year period increases of this magnitude are encouraging. However, the low proportions of employees with actual NVQs is a continuing cause of concern.

Table 5
Proportion of Construction Employees with NVQs or Equivalent by Occupation, UK: Spring 2002

	At least NVQ level 4	At least NVQ level 3	At least NVQ level 2
All occupations	13%	46%	70%
Managers and senior officials	35%	64%	84%
Professional and associate professional	56%	78%	91%
Administrative and secretarial	14%	32%	60%
Construction trades	3%	47%	74%
Electricians	4%	59%	88%
Plumbers, heating etc engineers	2%	55%	84%
Wood Trades	2%	54%	85%
Process, plant and machine operatives	3%	23%	48%
Labourers	2%	19%	39%
Other occupation	4%	37%	63%

Source: Department for Education and Skills' estimates from the Labour Force Survey, Spring 2002

Construction has one special feature in that it has high levels of 'trade apprenticeships'. Table 6 shows that, overall, 41% of the construction workforce has completed an apprenticeship. This figure is higher for craft occupations, rising to 73% for wood trades, and is significant even for managers and administrators.

The high figure of completed apprenticeships for managers and professionals suggests that there is progression from trade occupations into managerial and professional occupations. Unfortunately, for completed apprenticeships, results from the Labour Force Survey do not give the type of apprenticeships obtained. However, from data on people currently in apprenticeships, a small percentage of people in non-manual occupations are shown as following an apprenticeship in a main trade, such as carpentry and joinery.

Table 6
Proportion of Completed Apprenticeships by Construction Occupation,
UK: Spring 2002

	Number employed	Number completed	Proportion completed
All employed in the construction industry	2,074,000	856,000	41%
Major Occupation Group SOC 2000			
Managers and senior officials	242,000	97,000	40%
Professional occupations	114,000	26,000	22%
Associate professional & technical occupations	82,000	31,000	38%
Administrative & secretarial occupations	141,000	10,000	7%
Skilled trades occupations	1,100,000	621,000	56%
Personal service occupations	*	*	*
Sales & customer service occupations	17,000	4,000	21%
Process, plant & machine operatives	198,000	45,000	23%
Elementary occupations	179,000	24,000	13%
Minor Occupation Group SOC 2000			
Production managers	164,000	80,000	48%
Functional managers	43,000	10,000	24%
Engineering professionals	63,000	20,000	32%
Construction trades	663,000	381,000	57%
Building trades	210,000	94,000	45%
Metal machining, fitting & instrument making trades	24,000	13,000	55%
Electrical trades	162,000	108,000	67%
Metal forming, welding & related trades	27,000	17,000	64%
Construction operatives	114,000	31,000	27%
Mobile machine drivers & operatives	45,000	4,000	8%
Elementary construction occupations	145,000	20,000	14%
All other occupations in construction industry	413,000	78,000	19%

Source: Office for National Statistics: Labour Force Survey, Spring 2002

* Sample size too small for a reliable estimate.

From these figures, it would appear that the construction workforce has reasonable levels of skills and that, at least for the craft workforce, these are relevant vocational skills acquired through apprentice-type training.

It is suggested by a number of commentators (Clarke L, *Blueprint for Construction*, report for the Construction Industry Board, 2000) that, in general, skill levels in UK construction are significantly lower than those in our competitor countries (especially Germany), and that higher levels of skills are required to deliver higher productivity in the future. In particular, the UK lags behind in terms of qualifications at Level 2 (Germany has no workers below this level) and at Level 3.

This perception that the UK construction workforce is significantly deficient in skills does not appear to be shared by the industry itself. Recent surveys, including those by CITB, by the Department for Education and Skills and the Northern Ireland Skills Monitoring Survey, show employers to be reasonably satisfied with the level of skills in the workforce. For Great Britain, 85% of employers were satisfied that their existing employees were able to cope with current requirements including dealing with new technology and new materials (reported in the CITB Employers' Skill Needs Survey). Looking at the countries individually, the reported skill gaps were similar: 15% for Northern Ireland, 19% for England and 13% for Scotland. These percentages compare favourably with the figures for all industries in England (23%) and Scotland (16%).

However, a major area of concern is training at managerial level in the industry. Because of changes in technology, building materials and building methods, managerial skills have become increasingly important. Little formal training has traditionally been provided for managers in the construction industry. To help redress this shortcoming, in 2001 CITB approved a Special Measures Programme. The aim of the programme is to bring about an improvement in the quantity and quality of management and supervisory training.

Some 70 programmes for management training have so far been developed. Three main types can be distinguished: firstly, through direct involvement with the federations; secondly, through CITB area offices and finally, more generalised projects that are available to the whole industry.

Qualification Targets and OSAT

The drive towards a fully qualified workforce in the industry has gathered momentum and acquired wide support amongst the main federations:

- The Major Contractors Group (MCG): a fully qualified workforce on own construction sites by end of 2003.
- Civil Engineering Contractors Association (CECA): a fully qualified workforce on own sites by 2007.
- National Federation of Builders (NFB) and Construction Confederation: a fully qualified workforce by 2010.

For craft trades this drive towards a fully qualified workforce generally means qualification to NVQ/SVQ Level 2 or above, or its equivalent (City & Guild certificates), and ownership of a Construction Skills Certification Scheme (CSCS) card.

CSCS aims to register every competent construction employee within the UK not currently on a skills registration scheme or a skills registration scheme affiliated to the same quality standard. The scheme is designed to assure clients that operatives' skills have been validated against national standards and they have the required knowledge to operate safely on site. The CSCS card also provides evidence that the holder has undergone health and safety awareness training or testing.

Registration for an NVQ/SVQ together with a Health and Safety test pass is enough to gain an Experienced Worker card. This demonstrates an operative's experience and competency in a trade, but indicates that they have yet to achieve the NVQ/SVQ qualification.

To meet this challenge of qualifying every member of the workforce, CITB has developed the On-Site Assessment and Training (OSAT) programme. The aim of OSAT is to assess workers for NVQs/SVQs in the workplace, helping experienced workers get the qualifications to prove they can do the job.

With OSAT, workers can turn their existing skills and experience into a nationally recognised qualification such as an NVQ/SVQ. Having these qualifications also means that they will be eligible for a CSCS card.

The whole process is carried out whilst the workforce is on site so workers don't have to take time off to go to college. Typically, the whole process takes four or five visits over a period of less than six months, and is available for most occupations in construction.

Companies, their staff and individuals are already seeing the benefits of OSAT in their workplace. These include:

- Helping workers achieve vital skills so workers achieve CSCS cards quickly and easily.
- Taking account of existing skills so workers only train towards the things they do not know how to do.
- No downtime because assessment and training are carried out on site.
- Being easier for employees who have difficulties with the basic skills.
- Achieving qualifications to show to potential customers.

To date there have been 41,000 OSAT registrations, which have resulted in 11,000 NVQ/SVQ achievements.

The Learning and Skills Council (LSC) and CITB have also initiated the On-Site Assessment and Training pilot, which will assess and qualify 10,000 construction workers through OSAT by July 2004.

The project will focus specifically on the on-site assessment and training of experienced construction industry employees aged 25 and over to NVQ Level 2 or 3 and will also provide an extra 275 assessors. The £9m LSC budget will help establish ten regional networks comprised of local colleges, private training providers, LSCs and CITB OSAT co-ordinators. They are tasked with delivering OSAT quickly and effectively.

The networks cover every region of England and, by using a partnership approach that involves a wide range of training providers, they will be flexible and prompt in meeting the varied craft assessment and training needs of local employers. Each network will have a single point of contact for companies who require On-Site Assessment and Training to ensure that enquiries are dealt with efficiently. The pilot will be rolled out more extensively to train and assess much higher numbers over the next five years.

Section 2:

Short-term Skill Requirements

For the short-term, an assessment of the industry's prospects and skill needs is best obtained from employers' surveys.

Employers' skill needs have been monitored on a regular basis by organisations in the industry. Notably, four major employer federations in the industry report on skill shortages: the Federation of Master Builders (FMB), the Construction Confederation (CC), the Civil Engineering Contractors Association (CECA) and the National Specialist Contractors Council (NSCC). It should be noted that their reports refer to their own members rather than to the industry as a whole.

CITB has undertaken such a survey on an annual basis since 2000 and the Department for Education and Skills has been providing information on employers' skill needs since 1999. Information on skill gaps and skill shortages in Northern Ireland is collected in the Northern Ireland Skills Monitoring Survey.

The term 'skill shortages' can be interpreted in a number of ways. The Government's Skills Task Force report distinguished between 'skills shortages' – defined as an absolute absence of people with the required skills in the workforce and 'recruitment difficulties' where employers could not attract workers at certain terms and conditions. A further category was described as 'skills gaps' – this is where members of the existing workforce lack the necessary skills to do the job.

Industry Surveys

The Federation of Master Builders

Results from the Federation of Master Builders (FMB) Second Quarter 2003 State of Trade Survey indicate a further increase of the workload and workforce of small and medium-sized building firms, and of enquiries regarding possible future work. Both workload and employment are expected to continue to rise in the third quarter. The FMB survey has now been indicating an increase in activity for the past four years. Repair, maintenance and improvement of existing private housing continues to show relatively the strongest trend, but the indications are also positive for all other types of work for private sector clients except industrial building work. However, there is no increase in FMB survey respondents' work for public sector clients, but this is expected to show some growth in the third quarter.

Labour market conditions remain tight for building Small and Medium Enterprises, with 72% of respondents, compared with 69% in the first quarter, reporting difficulty either with recruitment of direct employees (51%) or with hiring trades as subcontractors (57%). The latest regional results from the labour market question are again somewhat surprising, with firms working principally in London showing one of the lowest proportions experiencing labour supply problems. However, the figure for firms working elsewhere in the South East has increased this time.

The Construction Confederation

The Construction Confederation Construction Trends Survey for Quarter 3 2003 reported that 70% of building contractors surveyed encountered difficulties in recruiting skilled craftsmen, particularly bricklayers, plasterers, carpenters & joiners and plumbers. However shortages appear to have eased since the last trends survey in the final quarter of 2002 and acute shortages were rare.

The Civil Engineering Contractors Association

Taking account of answers given to all questions, results of the Civil Engineering Contractors Association (CECA) July 2003 Survey of Civil Engineering Workload Trends are the weakest for four years. They show some reduction over the past year in total workload, and a weakening of order books. There is still a slightly positive trend in employment over the past year, however, and numbers of operatives, engineers and other staff are still expected to increase over the coming twelve months, although expectations regarding employment are the weakest since the second half of 1999. On balance, expectations of the trend in orders over the year ahead also remain slightly positive.

The weakening experience and falling optimism amongst civil engineering contractors that has been evident in all three CECA surveys in 2003 is most pronounced amongst the largest firms, and this may be linked to a gathering hiatus in construction of major road schemes.

With the trend in employment continuing to appear slightly stronger than the trend in workload, conditions in the market for civil engineering personnel remain difficult. Although CECA's April and July 2003 surveys have found a lower proportion of respondents describing as 'unsatisfactory' the supply of engineers and other staff, down to 35%, the latest survey finds 52% reporting problems recruiting skilled operatives, which is the highest figure in the six and a half year history of the CECA survey.

National Specialist Contractors Council

According to the State of Trade Survey Quarter 2, 2003, the balance of firms reporting difficulty in recruiting skilled labour has increased from 32% to 37% and is the highest balance reported since Quarter 2, 2001. Labour shortages remain the biggest issue of the day. The expanded section on skill shortages has identified scaffolding and carpentry as having the largest number of reported vacancies. The low number of skilled applicants is again cited as the major cause of recruitment difficulty (77%). In Quarter 2, however, 22% of respondents were unable to bid for work because of these shortages, a significant increase from the 14% reported in Quarter 1.

A balance of 18% expects employment to rise again compared with 16% in Quarter 1. At the same time the balance anticipating an increase in workload has risen from the Quarter 1 figure of 23% to 41%. All four quarters reporting since Quarter 3, 2002 (when there was a decrease of 3%) have shown positive balances.

Royal Institute of Chartered Surveyors

According to the Market Survey Quarter 2, 2003 from the Royal Institute of Chartered Surveyors, new construction workloads slowed for the second quarter in succession, with activity growing at a modest rate. Growth in workloads was below that of Quarter 1, and hovered around the long-run average for the survey. However, surveyors highlighted the expansion in health and education projects as underpinning continued growth in work, with strength in private housebuilding also sustained in Quarter 2.

Chartered surveyors reported the slowdown in activity as mostly centred in public housebuilding and infrastructure, the former posting a limited rise after two quarters of record increases in workloads. Private industrial building was the only area to see an actual contraction in work, completing two years of decline. Private construction activity continued to feel the effect of an uncertain economic environment and weak global economy. Though new private commercial building projects picked up, the rate of growth was comparatively low, as the sector has exhibited a subdued trend over the previous twelve months.

The outlook for construction workloads for three and twelve months ahead was slightly more positive, underpinned by expectations of further growth in public sector investment. Expectations for employment remained healthy. Confidence in profit margins, however, weakened following the sharp rise in Quarter 1.

The DfES Employers' Skill Survey

The DfES Employers' Skill Survey 2002 provides information on the extent, causes and implications of skill deficiencies reported by employers in England.

Within the report, analysis is undertaken by sector or by occupation. Construction is identified as a specific sector whereas information given by occupation, e.g. skilled trades, professionals, will include other sectors and may not represent a wholly accurate picture of the situation within construction.

In all, 4,054 companies were included in the survey, 365 of which were in construction (9% of the overall sample). However, it should be noted that companies with fewer than five employees (equating to a large proportion of employers in the construction sector) were excluded from the survey.

Vacancies currently represent a higher proportion in construction (3.9%) than is the case in the economy as a whole (3.1%). Vacancies can be distinguished between those that are 'hard-to-fill' and those that remain unfilled for skill related reasons, categorised as 'skill shortage vacancies'. The situation is significantly worse in construction for skill shortage vacancies (1.9% compared to 0.6% in the economy as a whole). At 1.9% of the employed workforce this would amount to 13,960 vacancies.

Across all sectors, skilled trades account for 8% of the overall total of unfilled vacancies but they represent 13% of hard-to-fill and 19% of skill shortage vacancies. Vacancies for skilled trades were heavily concentrated in construction with almost two-thirds of skill shortage vacancies and 60% of hard-to-fill vacancies.

Technical and practical skills (other than IT) were the most frequently quoted deficiencies within skilled trades, representing 57% of hard-to-fill vacancies and 58% of skill shortage vacancies (compared to 29% and 36% respectively across all occupations).

The main causes of hard-to-fill vacancies and skill shortage vacancies for skilled trades was the low number of applicants with skills.

The biggest impact overall of recruitment difficulties was in providing a service to customers. Skilled shortage vacancies among skilled trades were more likely to have a negative impact. Skill shortages in construction often led to a loss of business, in addition to – or perhaps because of – difficulties with customer service and increased operating costs.

Interestingly, employers' reports of skill gaps in their workforce are fewer in construction than in the rest of the economy. In the construction sector they would equate to 37,568 individuals being in some respect deficient in terms of skills.

Where skill gaps were reported by construction they were heavily concentrated in administrative, skilled trades and managers. Within skilled trades the most commonly quoted areas of skill gaps were technical/practical, problem solving and communication. In other words, a mix of vocational and generic skills.

Northern Ireland Skills Monitoring Survey

Information on skill gaps and shortages within construction firms in Northern Ireland is dealt with in the Northern Ireland Skills Monitoring Survey published in 2000. Key findings from the survey in relation to Northern Ireland's construction industry were:

- 21% of employers within construction reported that they had at least one current vacancy and 17% had at least one hard-to-fill vacancy.

- Craft and related occupations accounted for 67% of hard-to-fill vacancies.
- 60% of hard-to-fill vacancies were perceived to be due to external skill shortages, where the reasons given for difficulties included a lack of practical skills, technical skills, qualifications or work experience that the employer required.

The most frequent craft occupations that employers stated as being hard-to-fill were plasterers, wood trades, brickwork occupations and other labourers. It is unexpected to find that employers are experiencing difficulty in recruiting for wood trades when research shows an oversupply of new entrants to the sector. However, it is not surprising to find that employers have difficulty in recruiting for the bricklaying and plastering trades as these occupations have had a shortage of new entrants over the past number of years.

The main reasons given for hard-to-fill vacancies in construction firms in Northern Ireland were:

- not enough people interested in doing the job (18%)
- lack of practical skills (14%)
- wages offered are less than by other employers (13%).

Other reasons given for hard-to-fill vacancies in construction included a lack of the work experience required, impact of the benefits trap and too much competition from other employers.

15% of construction employers surveyed in the Northern Ireland Skills Monitoring Survey reported skill gaps in their existing workforce. Skill gaps limit employees' abilities to do their jobs effectively. The most frequent gaps reported within construction firms were:

- practical skills (59%)
- general communication skills (25%)
- computer literacy/IT knowledge (24%)
- management skills (23%).

Further reported skill gaps included problem solving, team working and customer handling skills. The high percentages of employers in construction who believe that there are a lack of external skills and practical skills, reinforces the general consensus that there are not enough sufficiently trained people to fill vacancies in construction occupations.

The CITB Employers' Skill Needs Survey

The main aim of CITB carrying out an Employers Skill Needs Survey is to provide information on skill shortages/gaps by occupation, sector and geographical area.

In 2002, the work on skill shortages was refined to distinguish between recruitment difficulties and skill shortages that result in employers being unable to recruit sufficient staff to satisfy their requirements.

In October 2002, the survey was carried out by CITB training advisers on behalf of the Research Department. The survey was structured to deliver 50 responses from each Regional Development Agency area plus Scotland and Wales, making 500 responses in total, covering small, medium and large companies. The final sample achieved was 470.

Overall, 79% of companies said they had experienced difficulties in recruiting skilled staff in the previous three months. However, only 63% of companies said they had had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 69% of them had managed to fill it. Consequently 20% of the overall number of companies were left with a long-term vacancy which they were unable to fill. This result is considerably less than the 79% of companies who reported experiencing recruitment difficulties.

Companies reporting difficulties were asked whether offering higher wages had helped them recruit skilled staff. For around a third of companies this had been a successful strategy. This could be interpreted as indicating some room for manoeuvre in an otherwise tight labour market. However, if companies are simply 'bidding-up' each other's workforces, wage inflation will occur which will add to the industry's costs. Although earnings in construction have risen by 6–7% in the last year – higher than in the rest of the economy – the situation is patchy and excessive increases have only been reported in some areas.

Occupations that were reported as presenting the most difficulty recruiting were wood trades, bricklayers, plasterers, professionals and managers. However, in terms of having long-term vacancies, the pattern is a little different, so that general labourers, plant mechanics, plant operatives, clerical staff and supervisor staff are highlighted, along with managers and professionals. These are all occupations which often form part of a company's permanent workforce, as opposed to those who may normally be hired on a project by project basis. Looking at occupations where vacancies are remaining unfilled (arguably the most acute areas), the picture changes again to highlight plant mechanics, plasterers and roofers.

A possible pattern emerges as follows. If companies are asked which occupations present most recruitment difficulties they will mention wood trades and bricklayers – who are most numerous in the workforce. However, when asked about vacancies (as opposed to normal project by project recruitment) they will refer to their core workforce members including clerical staff, supervisors, labourers and plant mechanics. These vacancies may not, however, be hardest to fill (for example clerical staff) whereas others including plasterers, roofers and plant mechanics are causing the most severe difficulties. Generally in thinking about skill shortages, it would be helpful to bear in mind differences between volume of shortages, as opposed to intensity of difficulty. Also for construction companies, how they recruit temporary as opposed to permanent staff.

Difficulties in recruiting by geographical area were highest (89%) in Yorkshire & Humber and lowest in London (64%). However, the highest percentage of employers reporting at least one unfilled long-term vacancy was in the South West.

In terms of difficulty in recruitment by companies' main activity or sector, there is a similar pattern across all the different sectors, with housing firms reporting the most difficulty. However, in terms of unfilled vacancies, firms in civil engineering were the most affected.

The results of the survey seem to indicate that as far as construction employers are concerned, skill gaps are not a particular problem for existing employees. The majority of employers (85%) were satisfied that their existing employees were able to cope with current requirements, including dealing with new technology, new construction methods and/or new materials.

However, approximately 50% of participating employers reported problems with new employees who, although trained and qualified for certain occupations, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified. This is probably more so in the construction industry than in other sectors. The most frequently cited skills in which new recruits are deficient are trade-specific skills, with Health and Safety being singled out by a minority of employers.

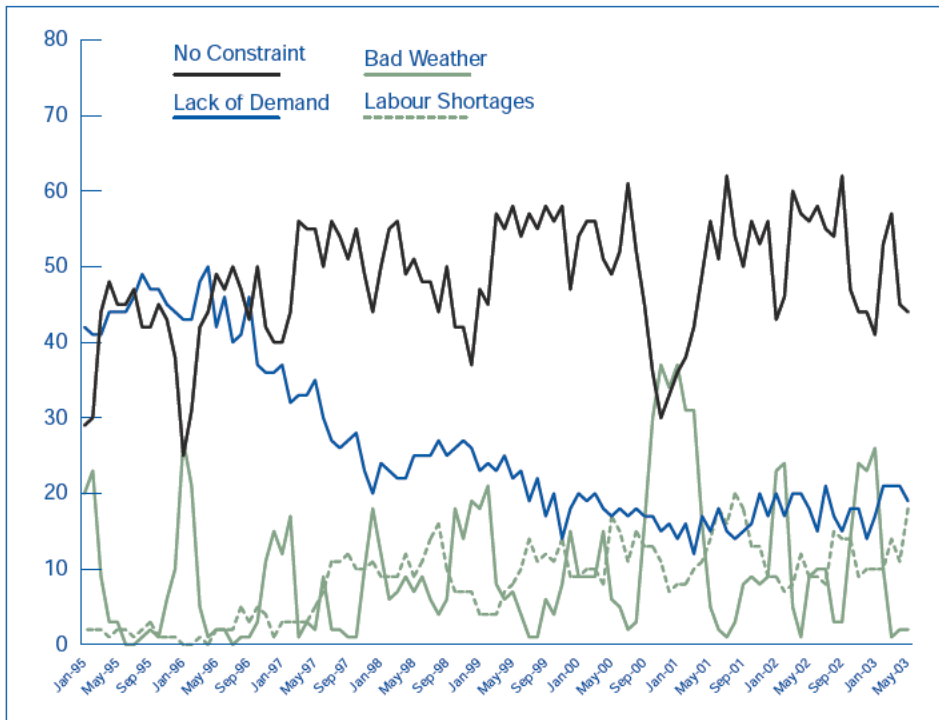
As regards future workload, approximately half the employers (54%) expected an increase, 43% expected their workload to remain the same and only 3% expected a decrease over the next six months. At a regional level, the percentage of employers expecting their workload to increase was lowest in the South East (36%) and highest in Scotland and the South West (both 65%).

Constraints on Construction Activity

Skill shortages are only one of a number of constraints faced by employers. Experian Business Strategies publishes a monthly survey of contractors' workloads entitled *Construction Industry Focus*, which is sponsored by the European Commission as a unit in their Business Surveys series. As part of the survey, each month firms across the UK are asked to specify which of a number of factors has been a constraint on activity. Chart 20 shows this information over an eight-year period (1995–2003).

In May 2003, the proportion of firms reporting constraints on activity rose marginally to 56%. While the problem of insufficient demand had eased to 19% of firms, the problem of labour shortages had increased to 18% of firms reporting it as a constraint on activity, the highest level since September 2001. As would be expected, bad weather has an adverse effect on activity during the winter months, most notably during the winter of 2000/01.

Chart 20
Constraints on Activity Reported by Firms, UK: 1995–2003



Source: Experian Business Strategies: Construction Industry Focus

Section 3:

Medium-term Skill Requirements

Medium-term skill requirements are based on the CITB Employment Model.

Methodology

For 2003, the CITB Employment Model has been updated to cover the wider definition of construction employment based on the Labour Force Survey.

Construction output is based on the measure established by the Department of Trade and Industry (DTI), as this is still the best measure in terms of its coverage and the detailed analysis by subsectors.

Two econometric relations have been estimated: one using DTI data for both output and employment and the other using Labour Force Survey employment data and DTI output data. As expected, the fit of the first equation was much better. It was therefore decided to use the level of employment from the Labour Force Survey but take the rate of increase from the equation estimated using DTI data.

The basic methodology has not, however, changed and the model is still based on a top-down approach. The analysis starts at the national level with total construction employment and is subsequently broken down by occupation and region. The variables used to explain construction employment are construction output together with the price of capital (real interest rate) and the price of labour (wage rate).

For the occupational shares, a historical series has been estimated back to 1980 and projected forward to the year 2007. The results have then been shared out among the nine Regional Development Agencies (RDAs) of England plus Scotland and Wales.

Labour demand is approximated by total employment plus 3% to take into account long run vacancies. This has been revised down from the 5% used in previous years in view of a recent study by the Department for Education and Skills reported in Labour Market Trends, October 2002.

On the supply side, a new model has been developed by Geoff Meen (Reading University). This substitutes the previous methodology that relied on an estimated average working life in the industry of some twenty years and a replacement ratio of approximately 5%.

Labour supply is defined as all in employment in construction plus the unemployed or people working in other industries with construction skills. Information from the Labour Force Survey allows us to estimate what proportions of people joining construction employment can be assumed to be part of the labour supply and therefore do not need training, although they are unlikely to be qualified.

The way the supply and demand sides of the model interact is shown in Figure 1.

Figure 1
Outline of the Construction Employment Model

LABOUR SUPPLY	LABOUR DEMAND
REVISED STOCK-FLOW METHOD	ECONOMETRIC METHOD
	Forecasts using:
SUPPLY AT BEGINNING OF YEAR T-1 (Construction employment and unemployment)	OUTPUT, REAL INTEREST RATES, REAL WAGE IN CONSTRUCTION
plus	generates forecast of
FORECASTED NET FLOWS T (May be either negative or positive and include retirements)	TOTAL EMPLOYMENT T
	plus
	VACANCIES
to obtain	to obtain
LABOUR SUPPLY T	LABOUR DEMAND T
DEMAND T – SUPPLY T	
gives	
ANNUAL RECRUITMENT NEEDS FOR THE YEAR	
split by	
CONSTRUCTION OCCUPATION SHARES AND REGIONS	
used to derive	
TRAINED REQUIREMENTS BY OCCUPATION AND REGION	

Note: Real interest rate is nominal rate minus construction prices rate of inflation.
 Subscript 'T' denotes time period.
 Further details on net flows are given in Section 6.

The annual trained requirement is the difference between demand and supply and consists of two elements:

1. The extra intake required due to the increase, if any, in total employment.
2. The number required due to supply side factors, i.e. outflows of workers and corresponding inflows into employment.

Table 7 shows labour demand and supply over the forecast period 2003–2007. It also gives cumulative and annual trained labour requirement. Approximately half of the annual requirement is due to increases in employment while the remainder is due to supply side factors.

Table 7
Labour Demand, Supply and Trained Requirement: 2003–2007

	2003	2004	2005	2006	2007
Labour Supply	1,928,615	1,887,015	1,843,343	1,801,036	1,759,653
Labour Demand	2,045,897	2,101,328	2,137,879	2,174,938	2,209,998
Cumulative Requirement	117,281	214,314	294,537	373,901	450,346
Annual Requirement	85,301	97,033	80,223	79,365	76,444
Requirement due to Expansion	43,458	55,432	36,551	37,058	35,061
Requirement due to Supply Side Factors	41,842	41,601	43,672	42,306	41,384

Source: CITB Employment Model, 2003

Numbers rounded to the nearest 100.

Total requirement includes non-construction operatives such as truck drivers, porters and cooks. Total requirement in Table 13 excludes non-construction operatives.

The annual figure for labour supply excludes annual recruitment.

A separate model has been developed for all professionals in the built environment including all professionals in SIC 45 and a proportion of the professionals in SIC 74.20. This model is based on the same methodology as the main model.

The previous version of the CITB Employment Model had separate sub-models for each country and RDA area. This methodology was found to have a number of drawbacks and it is therefore no longer used. The current model uses regional employment from the Labour Force Survey in the base year (2002) together with regional growth forecasts provided by Experian Business Strategies. We believe this is a more satisfactory way to share out total construction employment and the required intake resulting in less imbalance among the four countries and the nine RDA areas within England.

Trained supply is derived from CITB's measures of formal training in annual surveys. This includes Modern Apprenticeships and other formal, long duration training at craft and operative level leading to NVQ Level 2 or higher. Dropout from training is estimated from CITB and Learning and Skills Council data.

For professionals, information on entry and retention can be obtained from data published by the Universities and Colleges Admission Service (UCAS) and the Higher Education Statistical Agency (HESA).

The Forecast

In the medium term, the five-year period from 2003 to 2007, the crucial variable for forecasting changes in construction employment is construction output.

Below are the forecasts from four major organisations:

- Cambridge Econometrics (CE)
- Experian Business Strategies/Construction Forecasting and Research (EBS/CFR)
- Construction Products Association (CPA)
- Hewes & Associates (H&A).

CE and EBS publish long-term forecasts to 2010, while forecasts published by CPA and H&A only cover a three-year period. There are considerable differences in the forecasts of the four organisations, as can be seen in Table 8. There is, however, agreement that the main source of growth will be the planned increases in Government spending while some decline in the private sector is expected. To quote CPA: 'The delivery of planned increases in Government expenditure is central to forecast growth in construction activity over the next three years'.

Table 8
Construction Output in 1995 Prices, Great Britain: 1997–2007
Annual Growth Rate

Actual	%			
1997	3			
1998	1.6			
1999	1.5			
2000	1.5			
2001	3.5			
2002	8			
Forecast	CE Summer 2003 %	BSL/CFR Summer-2003 %	CPA Summer 2003 %	H&A Apr-03 %
2003	3.6 (2.6)	5	1.9 (4)	1
2004	1.8	2.3	1.0 (0.6)	-1
2005	2.1	2.8	1.1 (1.3)	3.2
2006	1.3	3.1	NA	NA
2007	0.7	2.1	NA	NA

Source: Actuals: Department of Trade and Industry

Figures in brackets refer to Winter 2002/03 forecasts which were used to forecast construction employment. It was not deemed necessary to change our basic case of a 2.1% average annual growth rate over the forecast period 2003–2007. The changes are minor, and moreover the more optimistic forecast by CE for 2003 is counterbalanced by a less optimistic forecast by CPA.

Expected Changes in Construction Output and Employment

Over the five year period 2003–2007, construction output in Great Britain is expected to increase at an average rate of 2.1% which is the average of the CE and EBS/CFR forecasts (calculated using the standard growth rate formula). A 2.1% growth rate is near the long run trend but slightly below the rate of 2.6% used in the previous *Skills Foresight Report*.

The jump in construction activity achieved in 2002, up by 8% year-on-year, surpassed even the most optimistic forecasts. However, over the medium term such a fast growth rate may not be sustained and a return to normality is more likely.

Table 9 shows that with an annual average growth rate of 2.1%, construction output is expected to reach £72,000m in 1995 prices by 2007. Over the same period construction employment should continue to increase at a steady rate, averaging 1.9% per year.

Table 9
Total Construction Output (in 1995 Prices) and Employment, Great Britain: 1995–2007

Year	Total Output Growth Rate %	Total Output £m 1995 prices	Employees	Self-employed	Total Employment
Actual					
1995	-0.1	52,643	999,000	782,000	1,781,000
1996	2.3	53,863	986,000	778,000	1,765,000
1997	3	55,468	1,083,000	732,000	1,815,000
1998	1.6	56,370	1,204,000	645,000	1,850,000
1999	1.5	57,190	1,217,000	651,000	1,868,000
2000	1.5	58,050	1,328,000	607,000	1,935,000
2001	3.5	60,100	1,342,000	641,000	1,983,000
2002	8	64,920	1,315,000	687,000	2,002,000
Forecast					
2003	2.1	66,866	1,343,901	702,099	2,046,000
2004	2.1	68,872	1,380,027	720,973	2,101,000
2005	2.1	70,270	1,404,331	733,669	2,138,000
2006	2.1	73,067	1,428,634	746,366	2,175,000
2007	2.1	75,259	1,451,623	758,377	2,210,000

Source: Actuals: Department of Trade and Industry for output;
Office for National Statistics: Labour Force Survey for employment;
Forecast: CITB Employment Model, 2003.
Employment in SIC 74.20 is not included in the table. Construction professionals in SIC 74.20 are dealt with separately.

To account for alternative scenarios, we have also run the model using a lower (1.1%) and a higher (3.1%) growth rate of construction output (Table 10).

Table 10
Alternative Scenarios for Output Growth Rate, Employment and Trained Requirement, Great Britain: 2003–2007

Growth Rate of Construction Output	Low Growth 1.1%	Base Case 2.1%	High Growth 3.1%
Total Employment in 2007	2,111,000	2,210,000	2,312,000
Annual Average Trained Requirement	64,000	83,160	103,000
Cumulative Trained Requirement	320,000	415,800	515,000

Source: CITB Employment Model, 2003

A 3.1% annual growth rate over the five-year period (which seems unlikely) would result in an annual average requirement of approximately 100,000, that is, some 25% higher than for the basic case. On the other hand, a 1.1% annual growth rate would result in an annual average requirement of approximately 64,000 which is some 35% below the base case. Changing the assumption regarding output growth has obviously a considerable effect on recruitment and training requirements.

As regards productivity growth, there are a number of conflicting views. On one hand, the recent developments in prefabrication should result in greater efficiency and some labour saving, as well as some change in the types of skills used and a possible decrease in numbers employed.

On the other hand, there is evidence that in some branches of the industry, the trends in employment have become relatively stronger than the trend in output. This is particularly noticeable in the results of the quarterly survey carried out by the Civil Engineering Contractors Association (CECA), which for the past three years has found the trend in employment, especially of engineers and other professionals but also of operatives, running ahead of the trend in civil engineering workload.

Closer investigation by CECA has found this to be attributable principally to new forms of procurement and contractual relationships, such as partnering and alliancing, and changes in legislation and regulations in such areas as construction design and management, health and safety, and the environment. Where civil engineering is concerned – which accounts for a fifth of all construction output but a slightly lower proportion of the workforce – it may therefore be advisable to assume no growth in productivity, or even a slight decline, in the short to medium term.

Given the current uncertainty as regards expected changes in productivity, we have decided to run three alternative scenarios for productivity keeping the assumptions about output growth unchanged (Table 11). Our base case of low growth in productivity results in moderate but steady increases in total employment in the industry. Because of our role as a training organisation, we consider it prudent to take the cautious view and our basic case remains unchanged, with increases in employment averaging 1.9% per annum.

As argued in the subsection on Technological Change and Innovation, while productivity is increasing in 'niche' areas, the size of these markets is such that the gains have little effect on the overall trend

However, productivity will be closely monitored using the CITB quarterly model of construction employment which is currently being developed. Any change in expectations regarding productivity will be used to inform the required intake into the construction labour force.

Table 11
Alternative Scenarios for Growth Rate in Labour Productivity, Great Britain: 2003–2007

Productivity changes	Zero growth	Low growth	High growth
Growth Rate of Output	2.10%	2.10%	2.10%
Total Employment in 2007	2,222,000	2,210,000	2,002,460
Annual Average Trained Requirement	86,000	83,800	40,840
Cumulative Trained Requirement	430,000	415,000	204,200

Source: CITB Employment Model, 2003

The high growth scenario has been run in the CITB Employment Model using the productivity growth forecast of the Institute of Employment Research. The zero growth scenario has been run in the CITB Employment Model in a similar way but constraining productivity to zero growth.

Changes in Occupational Shares

At any one time the relative importance of skills within the construction industry may be said to depend on the three factors examined below.

Changes in Output Mix

Available forecasts for construction output by subsector only cover the period 2003–2005. For housing, the expected increase depends crucially on the expected strength of the public sector. For the other sectors, the increase in public non-residential new work should compensate for the slack in private commercial and industrial new work. Infrastructure is also expected to increase resulting in a small increase in the demand for civil engineering skills (source: Construction Products Association). Otherwise, in terms of overall skill requirements, output mix over the next three years is expected to be largely neutral.

Changes in Technology

A period of sustained growth, underpinned by labour and skill shortages, has resulted in an increased need to improve the competitiveness and productivity of the construction industry.

Clients and specifiers demanding better value, more predictable costs, reliable quality, and fixed completion times have been instrumental in initiating change within the industry, but perhaps the biggest and most widely attributed catalyst for change has been the skills shortage.

As a consequence, sections of the industry, perhaps with the exception of repair and maintenance, have sought to change the whole construction process, its inputs and outputs, which inexorably involves technological change and innovation.

With the assistance of the designers and manufacturers of materials and components this change has been enabled through the development of products and processes designed for ease of installation, improved performance and improved cost. These are practical answers to the challenges posed.

Over the past decade the developments have principally, although not exclusively, occurred in the prefabrication of structures and components, the standardisation of production, the development and application of new (and out-of-sector materials) and the better integration of information technology in the business and construction process.

Initially it would appear that many of these technological changes and innovations have not had as large an impact on the repair and maintenance sector as that of new build. Indeed, it is true to say that repair and maintenance has not benefited, and probably will not benefit greatly from a volumetric¹ approach to construction. However, it has undoubtedly gained from the development of the 'kit of parts' approach², where innovations in the manufacture of component products to make them easier to fit, limits time spent on installations.

Whilst the rate of change has tended to be gradual, both over time and in scope, there is little doubt that it will, in due course, have significant implications for the composition and occupational mix of the industry. Moreover, as the rate of technological change and innovation increases, as is anticipated, its effects will similarly and increasingly be measured in the medium term.

Better performing products and processes will require the skills of the workforce to change. The development and adoption of new technologies will affect both manual and non-manual occupations.

For the manual worker this may mean new skills in production and quality control will be required, as construction becomes more mechanised and working tolerances greater. Handling skills and team working will become evermore crucial as time is compressed and individual operations become more critical.

1. Volumetric construction is the use of fully finished non-load bearing factory produced modules, such as bathroom pods, kitchens or plant rooms, which arrive on site ready for installation into independent frames.

2. The 'kit of parts' approach is the assembly of individual parts, but with the benefit that they are delivered together and ready to fit. Innovations in this area aim to reduce the build time and improve productivity.

For the non-manual worker this means architects and designers will need to work more closely with suppliers and contractors to integrate new technologies into the design. On site, construction managers will need to make more use of information communications technology (ICT) to schedule work, and will require organisational and interpersonal skills to enable collaborative working amongst multi-disciplinary teams.

Changes in Legislation or Government Regulation

For the construction industry, the Government is doubly important as both a legislator and as a major client. There is a balance to this relationship in the UK since, without a strong and effective construction industry, the Government would be unable to fulfil its electoral promises.

The modern construction industry receives governance from several bodies with varying degrees of interest and authority, including:

- European Government, particularly in employment legislation
- UK Government, particularly in the improvement of public services
- Devolved and regional governments in economic redevelopment
- Local government, particularly in planning.

The policy priorities that are likely to have the most impact on the construction industry are broadly summarised as:

- The focus on improving public services
- The introduction of procurement frameworks and measurement of best value
- Employment legislation such as the working time directive, health and safety law, and corporate manslaughter
- Procurement directives and laws relating to open tendering, planning regulations, sustainability and environmental impact
- Consultation with employees and works councils.

The construction industry has suffered from both a poor public image and a poor safety record. Provisional figures from the Health and Safety Executive show that there were 79 fatal injuries in the construction industry for the period 2001/02 (Statistics of Fatal Injuries, 2001/02). Whilst this represents a reduction of about 25% on the previous year, the construction industry still accounts for over a third of all worker fatalities. Consequently, health and safety remains a key theme for both the Government and the construction industry. However, it has been the industry that has been instrumental in taking the lead. In addressing the challenge of improving site safety, the industry has proactively developed and supported health and safety testing and skills registration schemes, including the implementation of the Construction Skills Certification Scheme (CSCS). This requires those entering construction sites to hold a card showing they have the skills to operate safely on site. Further health and safety legislation will lead to a greater demand for tactical skills to deal with site safety and strategic skills to design and operate safer sites. Site managers will increasingly require better skills in ensuring each operative is aware of the dangers and is capable of avoiding and minimising them. Professionals will need to gain a greater appreciation of health and safety issues to ensure that sites are designed to remove the risks.

With regards environmental issues, the introduction of the climate change levy in 2001 and associated changes to the building regulations to improve the environmental performance of materials and structures, has affected the nature of many construction products and processes. Regulatory drivers of change have played a central role in improving the energy efficiency of materials, increasing the elimination of waste from the construction process and estimating the 'whole-life' cost of structures. Also, the introduction of the landfill tax in 1996 and the aggregates levy in 2002 has placed particularly stringent requirements on the disposal and recycling of materials.

A principal skills change required in dealing with regulations will be the ability to predict, understand and interpret legislation. The construction industry and its constituent companies will need to be more aware of law, how to monitor it and when to act on it. It is likely that this will result in the companies having to gain skills in, and knowledge of, environmental and employment legislation.

The increased need for legal skills in the management of a construction business will also have to be filtered down to site level, through construction managers and site managers, to ensure the correct interpretation and practical implementation of more complex regulations.

Outcome of Changes in Occupational Shares

The combined effects of the above three factors on occupational shares are illustrated in Table 12. Over the period 2002–2007, the highest decreases in occupational shares are for clerical staff and plasterers while the highest increases are for professionals and steel erectors. It should be pointed out that, in terms of levels, a large percentage increase from a small base results in a small increase in actual numbers, and vice versa.

The forecast decrease in clerical staff represents the single largest percentage change in the occupational shares for the period 2003–2007. Over the past decade this occupational group has experienced marked fluctuations in the numbers in employment and, more generally, a long-term decline in the size of their occupational share. Whilst data from the Council for Administration (CfA) points towards more stability in the future proportions of clerical staff within construction, nevertheless it is crucial to understand why this previous downward trend occurred, how it has influenced the current position, and how it might shape future requirements. Changing working practices, new technology and the cultural climate have all played a major part in shaping the administrative occupations as they exist today, and it is expected that all will be equally influential in the future. However, it should also be stressed that patterns of employment within the administrative occupations have been as closely linked to the construction economic cycle as any manual occupations. Peaks in the numbers employed within administrative occupations have naturally tended to drop off as on-site construction activities pick up. Whilst there is no reason why this pattern should not continue in the future, it is worth noting that these peaks have been noticeably lower with each cycle suggesting other dynamics are at work within the mix.

The tendency for more and more office-based staff to undertake their own administrative tasks (primarily brought about by the IT revolution) is one area that has already influenced the current situation and could lead to further decreases in future requirements. However, the changing role of the administration, including specialisation towards human resources, finance or sales, also means that fewer people will be referred to and possibly categorised as administrators. Consequently, whilst the number of administrators employed within construction is more likely to decline than increase, due to fewer recognisable administration positions and more people referring to themselves as managers, it will probably be accompanied by a comparable rise in the numbers entering associate professional occupations or reporting that they have managerial duties.

Table 12
Occupational Shares in Construction, Great Britain: 2002–2007

Occupations	2002	2003	2004	2005	2006	2007	change 2002-2007
	%	%	%	%	%	%	
Managers	11.1	11.2	11.4	11.5	11.7	11.8	0.7
Office Staff	8.3	8.1	8	7.8	7.7	7.5	-0.8
Professionals	5.6	5.7	5.8	5.8	5.9	6	0.4
Technicians	2.5	2.5	2.6	2.6	2.7	2.7	0.2
Wood Trades	14	14	14	14.1	14.1	14.1	0.1
Bricklayers	7.2	7.1	7	6.8	6.7	6.6	-0.6
Painters	5.7	5.6	5.6	5.5	5.5	5.4	-0.3
Plasterers	2	1.9	1.8	1.7	1.6	1.5	-0.5
Roofers	2.8	2.8	2.8	2.8	2.8	2.8	0
Floorers	2	2	2	2	2	2	0
Glaziers	1.8	1.8	1.8	1.8	1.8	1.8	0
Other SB Operatives (1)	2.3	2.3	2.2	2.2	2.1	2.1	-0.2
Scaffolders	1.2	1.2	1.2	1.2	1.2	1.2	0
Plant Operatives	2.5	2.5	2.5	2.6	2.6	2.6	0.1
Plant Mechanics/Fitters	1.5	1.5	1.5	1.5	1.5	1.5	0
Steel Erectors/Structural	1	1	1.1	1.1	1.2	1.2	0.2
Other CE Operatives (2)	4.6	4.6	4.6	4.7	4.7	4.7	0.1
General Operatives	5	4.9	4.9	4.8	4.8	4.7	-0.3
Maintenance workers	1.1	1.1	1.2	1.2	1.3	1.3	0.2
Electricians	8.7	8.7	8.7	8.7	8.7	8.7	0
Plumbers	7	7.1	7.3	7.4	7.6	7.7	0.7
Non-construction operatives	2.1	2.1	2.1	2.1	2.1	2.1	0

Source: Office for National Statistics: Labour Force Survey; CITB Employment Model, 2003;
National Centre for Social Research: Survey of Employment by Occupation 2002

⁽¹⁾ Specialist Building ⁽²⁾ Civil Engineering

The strong growth in the share of managerial occupations forecast against a previous and almost entirely ascendant trend is due in part to the changing nature of roles and responsibilities within the workplace. It also reflects the shift in focus towards a process driven system that requires more control. Indeed, this increasingly process oriented view of construction is almost entirely responsible for the concurrent increase in professional and technical occupations. The move to integrate planning, design and procurement seamlessly into the construction process has necessarily placed more emphasis on the inputs as well as the outputs. The need for contractors to understand the concepts of value, quality and risk has required a greater ability to monitor, measure and analyse the construction process. This knowledge and experience can then be used to aid the allocation of resources more effectively, and to pre-empt and prevent problems. Consequently, this has resulted in an increased investment in the non-manual workforce both in terms of their level of involvement and the numbers employed.

Turning to the trades, the decreasing occupational share of plasterers has been strongly influenced by the increased use of dry lining, which is less labour intensive, and the more contentious suggestion that a degree of this work could be carried out by carpenters. Recruitment demand is likely to be sustained mainly by the replacement of staff rather than growth. However, anecdotal evidence suggests that the increasing application of dry lining methods and materials could lead to a shortage of plasterers with 'heritage' skills.

An increase in the share of both glaziers and maintenance workers is also forecast. Between 2001 and 2002 a modest increase in their shares resulted from the re-classification of the occupations. However, it is forecast that these shares will be maintained, and in the case of maintenance workers increase, over the period 2003–2007. The main drivers behind these increases include the growing use of structural glazing in buildings, and an increase in PFI and facilities management, respectively.

The forecast increase in the share of glazing largely depends upon the level of activity within the economy as a whole, and in particular the future investment in commercial and office buildings. Indeed, the use of glass cladding, in conjunction with a steel frame construction, is a recurrent feature of many modern commercial developments, and is also seen to be the driver of the forecast increase in steel erectors and structural steel fixers.

With reference to the forecast increase in maintenance workers it is also recognised that recent large housing stock transfers within some local authorities is likely to herald the emergence of specialist maintenance contractors employing more multi-skilled workers.

Construction Employment and Training Requirement by Occupation

Combining the employment forecast (using the 2.1% base case forecast of output) with the projected occupational shares yields employment by occupation over the forecast period 2003–2007. The first two columns in Table 13 show total construction employment analysed into 22 main occupational groups in 2003 and 2007, the last year in the current forecasting period. The third column shows the percentage change for each occupation and for total employment in the industry over the forecast period. Further breakdown of each group is given in the Appendix. The table also shows the average annual requirement over the period 2003–2007, as well as the cumulative requirement over the same period.

Over the forecast period, total employment is expected to increase at an annual average rate of 1.9%. This is higher than what we predicted last year (0.6%) and implies lower growth in labour productivity. The current forecast for productivity continues the historical trend based on the Labour Force Survey estimates of total construction employment.

Labour productivity based on DTI estimates of construction employment can be expected to differ. Employment not captured by DTI is more likely to be in smaller companies working in the more labour-intensive sectors of the industry. Moreover labour savings due to improvements in technology are likely to be partly offset by increased bureaucracy via legislation and Government regulations.

An average training requirement of approximately 83,000 is expected resulting in a cumulative requirement for the five-year period of 415,000. These results cannot be directly compared with the results from *Skills Foresight Report 2002* since the definition of construction employment used in the model has changed (see Methodology, page 44). Using the previous definition of construction employment would result in a similar or a lower required intake over the current forecast period.

To obtain the required intake which is the direct responsibility of ConstructionSkills we need to subtract the required intake for Building Services (13,670) and add the required intake for professionals working in partnerships (8,770). See Table 14. This results in an required intake of approximately 78,000 or a cumulative required intake over the five year period of 390,000.

Table 13
Construction Employment and Training Requirement by Occupation,
Great Britain: 2003–2007

	Total Employment		Average Annual % Change (2003-2007)	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
	2003	2007			
Managers	230,000	260,760	3.2	9,770	48,850
Office Staff	166,550	165,750	-0.1	6,670	33,350
Professionals	116,230	132,620	3.4	4,950	24,750
Technicians	51,970	59,660	3.5	2,230	11,150
Wood Trades	286,460	309,400	1.9	11,910	59,550
Bricklayers	145,280	148,080	0.5	5,880	29,400
Painters	115,410	119,350	0.8	4,680	23,400
Plasterers	38,400	33,150	-3.6	1,440	7,200
Roofers	57,280	61,870	1.9	2,380	11,900
Floorers	40,910	44,190	1.9	1,710	8,550
Glaziers	36,820	39,790	2.0	1,510	7,550
Other SB Operatives (1)	46,480	46,420	-0.0	1,850	9,250
Scaffolders	24,550	26,520	1.9	1,020	5,100
Plant Operatives	51,570	57,460	2.7	2,170	10,850
Plant Mechanics/Fitters	30,680	33,150	2.0	1,270	6,350
Steel Erectors/Structural	21,280	26,520	5.7	960	4,800
Other CE Operatives (2)	94,520	103,870	2.4	3,960	19,800
General Operatives	101,070	103,890	0.7	4,090	20,450
Maintenance workers	23,240	28,730	5.4	1,040	5,200
Electricians	178,030	192,250	1.9	7,390	36,950
Plumbers	146,090	170,170	3.9	6,280	31,400
Non-construction operatives	42,970	46,400	1.9		
Total	2,045,790	2,210,000	1.9	83,160	415,800

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

Please note that the average growth rate in employment is measured over a four-year period using the standard growth rate formula while the cumulative requirement, inclusive of 2003, is for five years.

It should be noted that managers is a widely defined occupational category covering site managers and working proprietors, as well as company managers. Wood trades is seen to be the single largest manual occupational category in the industry, followed by electricians, bricklayers and plumbers (including heating and ventilating engineers). The figures for plumbers and electricians only include operatives working in the construction industry (SIC 45). They do not include plumbing and electrical operatives working in manufacturing but do include operatives working in the electrical and wiring and plumbing sector (SIC 45.33) which are in the construction industry but outside scope and amount to approximately 60% (or 200,000 in 2003) of building services trades.

Professionals in the Built Environment

Table 14 shows the forecast for employment and required intake for professionals working for contractors and for those working in partnerships. Total employment by all professionals in the built environment is expected to increase at an annual average rate of 3% from 319,000 to 365,000 over the forecast period. Overall approximately 15,000 newly trained professional and technical recruits are required each year, resulting in a cumulative requirement over the forecast period of approximately 76,000.

Table 14
Employment and Training Requirement of Professionals in the Built Environment, Great Britain: 2003–2007

	Total Employment		Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
	2003	2007		
SIC45				
Professionals	116,230	132,620	4,660	23,300
Technical Staff	51,970	59,660	1,930	9,650
Part of SIC74.20				
Professionals	90,409	103,680	5,262	26,310
Technical Staff	60,273	69,120	3,508	17,540
Total in 'built environment'				
Professionals	206,639	236,300	9,922	49,610
Technical Staff	112,243	128,780	5,438	27,190
Total Professional & Technical Staff	318,881	365,080	15,360	76,800

Source: CITB Employment Model, 2003; Experian Business Strategies; Construction Industry Council: Survey of UK Construction Professional Services, 2001–2002
Please note that the forecast of employment and requirement for professionals in SIC 74.20 has been deflated by 20% to eliminate professionals in SIC 74.20 working outside the built environment, see Table 2. Professional and technical staff have been shared out using the figures from the CIC survey.

Technological Change and Innovation

When looking at technological change and innovation within the construction industry it is apparent that whilst some parts of the sector are highly responsive others demonstrate more caution. As a consequence its widespread uptake has been gradual, and despite a compelling case for industry-wide change, highlighted in part by the skills shortage, much of the construction industry uses building techniques that are based on traditional methods and materials that have remained fundamentally unchanged over the last 100 years. Indeed, this is reflected in the recent report *Innovation, Skills and Productivity* by MRM Solutions, commissioned by CITB. It is clear from this report that the rate and scope of change is very much structured by individual companies and their existing business strategies; an approach that whilst enabling these companies to operate in the short-term does not always address the long-term future of the industry as a whole.

The report suggests that industry needs to be innovative to deal with the changes demanded by clients and specifiers; take advantage of the opportunities presented by suppliers; and deal with external pressures such as demographics and legislation. The consultation identified four broad areas where innovation is required:

- To improve the performance of the industry
- To integrate the construction industry supply chain
- To address external pressures on the workforce skill shortages, demographics and legislation
- To introduce new management styles that deal with external pressures and accommodate the workforce of the future.

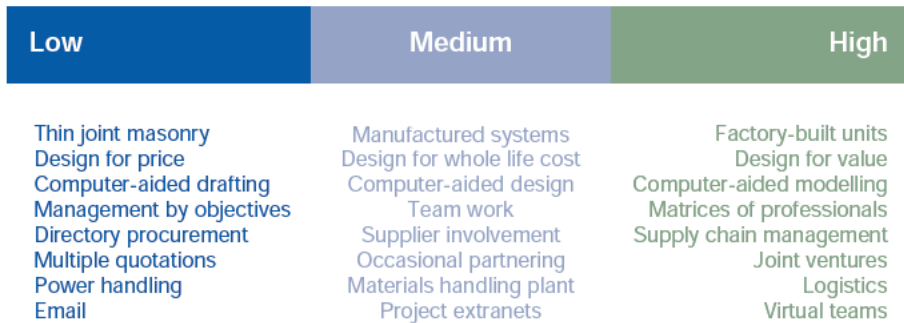
Having identified these areas of need, and in order to gain an understanding of the skills requirement, the consultation looked at areas where innovation, and technological change, is occurring.

The key areas were identified as:

- Design and build methods – the way people design and construct buildings
- Construction products – the products people use to fabricate buildings and equip them for use
- Business management – the way people run construction companies.

The spectrum of innovation available today is extremely broad. Figure 2 illustrates the range of innovation in methods, products and management. The extremes of this spectrum are in some respects wider than the diagram suggests and there are many firms that operate to the left of 'Low' and a few that operate to the right of 'High'.

Figure 2
The Spectrum of Innovation

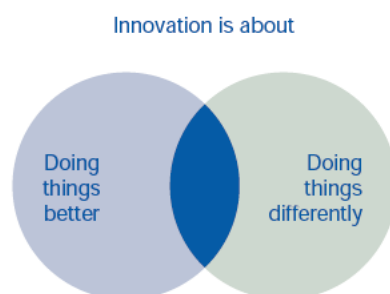


Much of the construction industry essentially falls into the 'low innovation' category, with building techniques based on traditional methods and materials. On balance, many constructors, particularly smaller companies operating locally on one-off projects, remain untouched by the innovations and changes described in Figure 2. However, what it clearly illustrates is how the different levels of innovation are manifested on an operational level, and what appears innovative to one can be perceived as conventional to another.

The Scope of Innovation

The accepted view that innovation is the successful commercial exploitation of new ideas translates into two strategies: doing things better and doing things differently (although, innovation often involves both). For the construction industry, innovation is in the approach to the job and the technology used. Consequently, both products and processes feature.

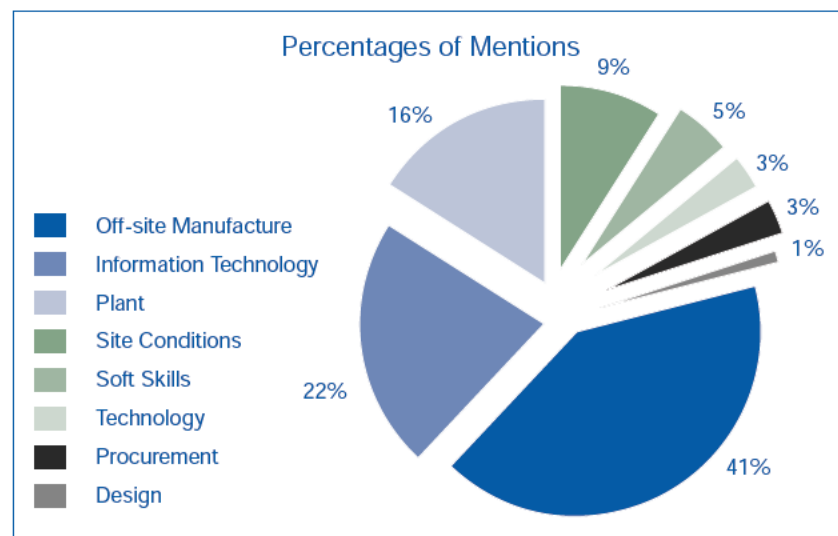
Figure 3
The Dynamics of Innovation



In the consultation *Innovation, Skills and Productivity*, a panel comprising construction companies and industry practitioners, selected at random and of various sizes, was consulted on the impact of innovation in construction methods and the skills required to deal with that innovation.

Chart 21 shows that the innovation that received the most mentions was off-site manufacture, or prefabrication, followed by IT and Plant. IT, the second most mentioned, was referred to only half as often.

Chart 21
Panellist Views on Innovation – Percentage of Mentions, Great Britain: 2003



Source: CITB: *Innovation, Skills and Productivity*, Spring 2003

The Off-site Opportunity

Whilst it is difficult to say that any one technology or innovation alone will have a greater impact on the industry than another (it is often easy to overestimate what can be done in five years time and underestimate what can be done in 50 years time), off-site manufacturing looks set to feature more heavily in the medium- to long-term plans of the industry. Largely this is because it is seen to bring the highest cost and quality benefits through economies of scale, increased productivity and improved consistency. Interestingly, half of the companies interviewed as part of the consultation panel felt that manufactured buildings will have widespread market acceptance in the next three to five years.

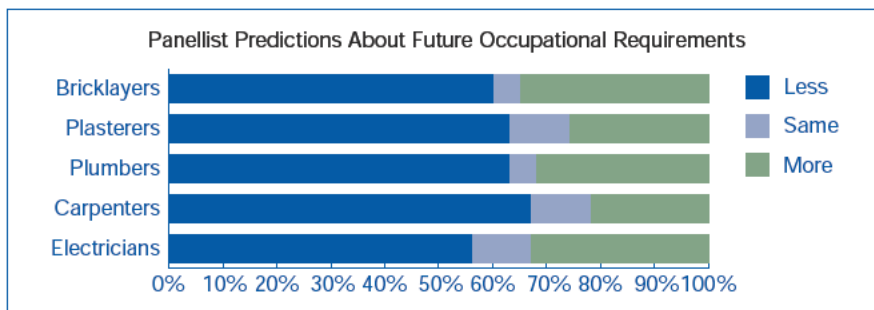
In 2002, the total market for UK prefabricated buildings was estimated to have grown by around 8% on the previous year. Increasing levels of investment and Government expenditure, together with a strong demand for affordable housing, constraints on building land (set out in the government’s planning guidance note PPG3), continued skill shortages and the call for sustainable solutions, are expected to maintain a similar level of growth in the medium term, and ensure that off-site manufacturing features prominently in future construction programmes.

Off-site manufacturing stands apart as being the one area of technological change and innovation that has the potential to involve and impact across many markets and occupations within the industry. The aim of off-site manufacturing has been to take out many of the uncertainties of construction and prepare as much as possible off site, in a controlled environment, to allow greater control of quality and cost, and to mitigate some of the problems of skill shortages and labour supply.

Any shift towards off-site manufacturing is likely to mean that on-site construction increasingly becomes more of an assembly process, suggesting that the industry will see a move from fabrication to fitting. New skills of production control, assembly and quality control will be required to handle a more mechanised approach to construction.

Prefabricated components and assemblies, designed for ease of installation as well as improved performance and cost, will enable greater output from a smaller workforce. This has a particular significance for both manual and non-manual occupations. Off-site manufacturing has further implications for manual occupations mainly because its size and scope encompasses such diverse occupations and, secondly, because skills and training are built around fervently demarcated craft traditions with a largely bespoke approach to construction.

Chart 22
Panellist Predictions about Future Occupational Requirements



Source: CITB: Innovation, Skills and Productivity, Spring 2003

The majority view of the panellists was that future numbers working on site will probably fall. This was often qualified by comments about national skill shortages and the adoption of new methods and techniques. It is not always clear what is cause and what is effect, that is whether new methods are reducing the demand for trade skills or whether lack of supply is increasing the use of new methods. Either way, the net effect is seen by the panel as fewer tradespeople working on site and within construction. The few companies that predict an increase in demand for trades comment that the trades will need to adapt to new working practices, be more flexible and be able to assemble different types of components to those they are used to.

The Implications for Skills

Assuming the future trend towards off-site manufacturing is fully realised, it will increasingly see trades move to a factory environment; a move that will ultimately bring with it better and safer working conditions. This signals a debate on where the workforce to create prefabricated units will come from – the construction sector or the manufacturing sector – and what skills they will need.

If it is the construction sector, as anticipated/proposed, this will inevitably result in the erosion and revision of some traditional trade boundaries and the introduction of a more generalist or multi-skilled approach to the construction process. Whilst current off-site technology certainly draws upon traditional craft skills, a factory-based approach, as employed in the manufacturing sector, will probably result in operatives performing tasks that would traditionally be associated with other trades. In this respect, technological change will offer the opportunity to redefine a number of existing roles within the industry, as well as offering opportunities in new areas. Already as the use and benefits of off-site manufacture have become more widespread, developers are showing a growing interest in combining technologies to get the best possible solution. As a consequence this has precipitated an emerging trend of mixing technologies, known as composite or hybrid construction. This fits with the need to make industry employees more multi-skilled, since working as part of an integrated team requires an understanding of areas outside traditional demarcations.

The trades will need multiple skills centred on a core of reading drawings, understanding the principles of construction, health and safety, and basic organisation and supervision. To this core of building skills they will add erection skills, site preparation, fitting (as opposed to fabricating) and how to better integrate with other trades. However, in addition to good practical skills and the ability to work accurately, carefully and methodically, there is a need for increasingly better levels of literacy, numeracy and communication on site. The proliferation of information technology in construction products and processes also suggests that IT and communication skills will be essential.

Growth in off-site manufacturing also has particular consequences for the non-manuals as the supply chain broadens and integration between design and production increases. Architects and designers will need to work more closely with suppliers and contractors to include new materials in the design. The integration of the team will also encourage architects to build the practical experience of site managers and tradespeople into their designs, which will themselves have to be more complete as the scope for site-based variations reduces.

Construction and site managers will need to make more use of information technology to schedule work, and will require the necessary interpersonal, communication and business skills to enable collaborative working amongst multi-disciplinary teams. It is also reasonable to assume that a need for quality control and planning skills will almost certainly become apparent as more and more manufactured components are delivered to site in the exact quantities and to more exacting timescales.

To achieve faster construction times, process mapping and risk analysis will supplement established project management skills. Traditional cost and accounting skills will need enhancing with value engineering. New estimating skills are required that encompass risk management evaluation and whole life costs.

The site assembly of prefabricated elements will generally require a more stringent approach to quality and a greater understanding of the construction process as a whole. Logistics and planning will become more crucial as time is compressed and individual operations become more critical. Reliable logistics, enabled by new materials-tracking technologies and integration between contractor and supplier systems will improve the industry's ability to deliver on time, to specification, as well as avoiding the scheduling mistakes that cause the industry to call upon the containment and recovery skills associated with crisis management. Transport and handling will need higher skills.

Similarly, for managers, increasingly complex supply chains and site processes will require improved organisational, communication and IT skills. Dealing with the issues of collaborative partnership and multi-disciplinary approaches throughout the supply chain will demand greater use of interpersonal and business skills associated with team building and management. IT will be more pervasive and site managers will have to incorporate computers more into the day-to-day running of projects and sites. This is likely to involve more mobile IT.

Advances in information communications technology (ICT) represent a major opportunity for the construction industry. Wireless application protocol (WAP) technology, palm pilots, personal digital assistants (PDAs), video systems and more compact laptops are enabling technologies to deliver knowledge and information to the user in the exact location of use. The resulting flow of information will be faster and more effective, enabling design, planning and procurement to contribute towards better quality, higher productivity and reduced costs. Computer simulation and 3-D modelling will also enable the further integration of design into the supply chain and will increasingly play a role in predicting the whole life use of buildings. A wider understanding of client needs will call for more research and analytical skills.

The increasing prevalence of IT and electronics in products and processes has led to an explosion in the volume of data generated. Consequently, all involved in the construction industry will need to increase their capacity to collect and assimilate data and, given the increasingly international nature of the industry, there will also be a greater need for cultural awareness and language skills.

The current and continued development of plant and power tools follows the established trend to limit the manpower or number of operatives required to perform traditionally labour-intensive tasks, whilst increasing potential output. The majority of innovation occurring within manufacture and application of plant is primarily focused on powered access, lifting, trenching, cladding and tunnelling. The development of specialist powered aerial work platforms and telehandlers has enabled safer working at height. Technical innovation in excavation plant means that machines are now available to excavate in restricted areas and to very accurate specifications, including 'no-dig' or 'trenchless' technologies which rely on boring rather than open excavation methods. Recent developments have increasingly included partnerships between contractors and plant suppliers to produce site-specific solutions to plant requirements. The increased use of plant has the potential to increase productivity across the whole build process, and is vital in improving the competitiveness of prefabricated buildings against traditional masonry and timber frame constructions.

The further development of power tools, through mechanisation, is similarly intended to increase operative output. Now commonplace, both inside and outside construction, the development of more compact and mobile tools has enabled considerable performance gains. Drills, saws, sanders and nailguns have been manufactured for ease of use and durability, ensuring widespread and repeated application. This has also led to the development of much more specialist variants, including diamond drills, saws and wall chasers. Indeed, the development of diamond cutting technology has in itself opened a whole specialist market.

The principles of off-site manufacture, utilising economies of scale, increasing productivity, improving consistency and waste reduction, have also been instrumental in the development of more conventional materials, resulting in products that essentially simplify existing methods. The use and further development of thin joint masonry using aircrete, machine applied renders and mortars and brick slip construction represent innovations that improve the efficiency of build, but still revolves around traditional construction skills. Reducing the skill in blocklaying does not remove the need for a bricklayer to build to line and level. The skill of building to line and level, following a plan and reading drawings apply equally to new products and techniques as they do to the conventional.

The use of materials and products from other industries may see a crossover of employees bringing a new range of skills and knowledge into construction. As some systems become more complex (or include new non-construction materials and technologies), there will almost certainly be a move towards some ultra-specialisation in niche markets. Indeed, accompanying the more generalist approach to construction is another more specialist approach, which sees the consolidation of specific skills into relatively small occupations. Both approaches represent the industry's need to increase productivity, but have very different implications for the workforce. Whilst on-site construction has, in some sectors, become a low skill/high labour process, in others it is the opposite, a high skill/low labour process.

There is also the particular emphasis on health and safety. The continued high level of fatalities and injuries in construction is being addressed by the introduction of the Construction Skills Certification Scheme (CSCS) and more stringent legislation. However, the call to reduce the accident rate will drive technology and processes in the sector. For example, materials that enable construction with a shorter time spent at height, or are lighter and impose less lifting stress, are likely to increase in popularity.

Significant technological developments have also seen the adoption of new materials, including composites and plastics such as fibre reinforced polymers (FRPs), specialist adhesives, resin-based cements, self-compacting concretes (SCCs), solar glazing in heating, self-cleaning glass, fibre optics and white light emitting diodes (LEDs) in lighting.

The development and growth of biotechnology, especially in land remediation (on brownfield sites), is a prime example of how the construction industry has looked out of sector for solutions to the new challenges it faces. Similarly, the introduction of sensing and monitoring technology, not only within the construction process but also within actual buildings, has represented a significant crossover into science and engineering sectors. The continued development of wire-free electrical installations and nanotechnology will further sustain this interface, and more generally characterise the increasingly multi-disciplinary approach to technological development.

The move to a more sustainable approach to construction will also require operatives to have an increased understanding and appreciation of energy efficiency, waste management and recycling issues. This will manifest itself in the 'greening' of site practices with the sorting of waste materials.

Distinguishing the Possible from the Probable

If industry has a collective view of innovation at this moment, it would probably be one of healthy scepticism. However, evidence from the *Innovation, Skills and Productivity* report indicates that this scepticism appears to decrease as the size of the company increases – suggesting that the large companies that will bring innovation into the industry and then take their suppliers and others with them.

Having identified that a great deal of innovation, including new technology, is available, the same report sought to describe why the rate of innovation is perhaps less than it could be.

There are arguments for and against changing construction methods and adopting innovative approaches.

<p>The arguments FOR change are:</p> <ul style="list-style-type: none">• The demographics of the workforce and particularly the people to train that workforce (e.g. ageing workforce, recruitment and retention issues).• The need for greater output from a smaller workforce.• The need to improve standards and build quality.• The time to train the increased workforce is longer than the time that the industry has to deliver the increased outputs.	<p>The arguments AGAINST change are:</p> <ul style="list-style-type: none">• Labour is always accessible, whether through retraining, migrant labour or simply by paying more than the competition. Although, not immediately cost-effective, there are long- and short-term benefits if demand can be sustained.• Alternative methods are too expensive and often perceived as high risk.• Construction companies are still able to compete and profit using traditional methods and materials, thus reducing the need to change (e.g. the repair and maintenance sector).• In parts of the UK, land is the restricting factor, not labour.
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Each argument has its own validity and the case for change is finely balanced. If the arguments **for** change are proved correct, then the industry will probably experience a large-scale move towards volumetric methods. However, if the case **against** change prevails, then innovation is more likely to involve making it easier to build using a kit of parts.

The arguments for change hold true at an industry level and, if addressed, are good for the long-term future of the sector. However, the case for change is perhaps not as compelling for the individual company, where the perceived risks to revenue, profit and cost associated with innovation outweigh the longer-term benefits.

Whatever route the construction industry takes, one certainty is that to continue to succeed economically, there remains a fundamental need to maintain, and wherever possible, maximise revenue and profit and minimise cost. The revenue will flow to the companies that have methods that meet the client demands for quality buildings. Profits will be made on sites that run to time and get the output right first time. Costs will be lowest in those construction companies that operate lean principles and use their labour, plant and materials to the greatest effect. In an increasingly risk-averse society, construction companies will, in the short and medium term, strive to retain their existing business models, workforce and building methods. Only when it becomes impossible to achieve revenue, profit and cost targets with the current model will the majority seriously consider adopting a more innovative approach to their business management, design and products.

Indeed, perhaps the biggest barrier to innovation within the construction industry is the struggle to accept the notion that it can, and perhaps should, occur not only out of necessity but as an integrated part of a business process.

In the medium term, it appears that many of the likely changes can be handled with the same core skills that are applied today. Indeed, it is clear from the *Innovation, Skills and Productivity* report that employer skills requirements are structured by their existing business strategies; this approach will equip the sector with the workforce for today but does not address the future.

As the need to improve the performance of the industry, its productivity and competitiveness increases, there will emerge a mounting need to innovate.

Equipping the managers (from site manager through to director) with a number of new skills necessary to deal with change and innovation will provide a better climate for innovation in both what the sector builds and how it builds. Increasing the volumes of well skilled tradespeople available to the industry will help construction managers achieve greater productivity and quality.

The challenge for ConstructionSkills, together with its partners and industry, is to ensure that there is a programme for upskilling the existing workforce, and a strategy for attracting and training these new recruits.

A fuller account of these issues is contained in the report *Innovation, Skills and Productivity*, available from ConstructionSkills.

Section 4: The UK and the Regional Dimension

There are considerable differences both in terms of construction output and construction employment among the four countries within the UK and among the nine Regional Development Agency (RDA) areas within England. Construction output, in current prices, varies from £13,524m in London to £2,397m in Northern Ireland.

The differences in construction output are reflected in construction employment that varies from over 300,000 in the South East to 51,000 in Northern Ireland.

Comparing London and the South East, output was higher in London (£13,524m compared to £12,032m) while total employment was lower (238,290 compared to 304,370). However, the relatively low employment figure in London is misleading since a substantial amount of new construction work in London is carried out by firms and workers resident outside London.

Table 15
Total Construction Output in Current Prices and Total Employment, UK: 2002

	Output in current prices £million	Total Employment Number
United Kingdom	83,471	2,053,660
Northern Ireland	2,397	51,230
Scotland	6,682	168,200
Wales	2,915	92,110
England	71,477	1,742,120
England by RDA areas		
North East	2,811	72,090
East Midlands	5,382	154,190
Yorkshire & Humberside	6,380	164,200
South West	7,280	198,240
West Midlands	7,633	176,210
North West	8,189	224,270
Eastern	8,245	210,260
South East	12,032	304,370
London	13,524	238,290

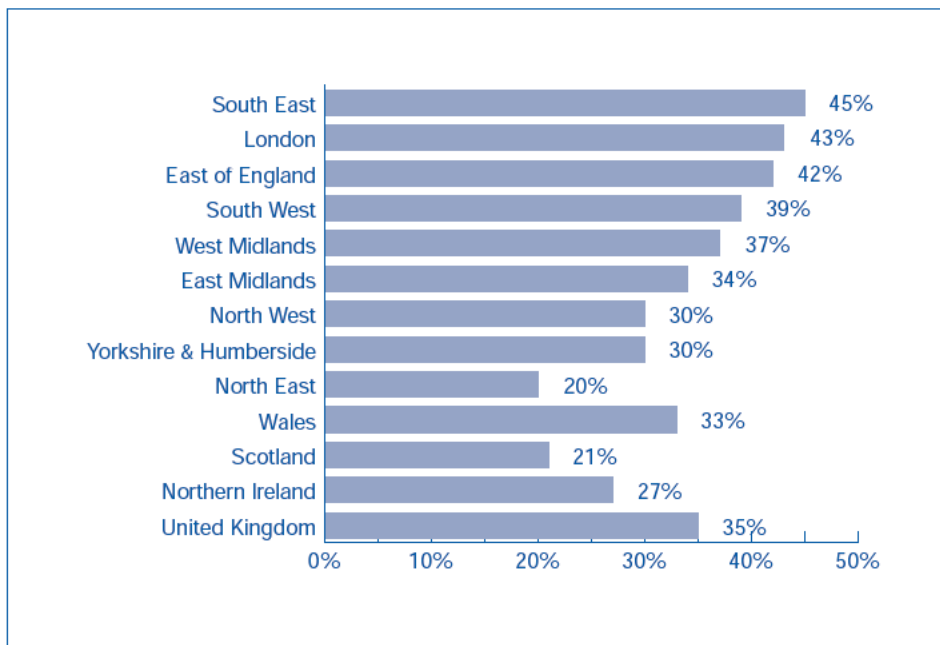
Source: Department of Trade and Industry; CITB Northern Ireland; Office for National Statistics: Labour Force Survey

Regional Labour Markets

The individual labour markets within the UK show considerable differences regarding the share of the self-employed, the male/female ratio and the rate of unemployment.

The share of self-employment has increased in the UK and in all areas from the level in 2000. The regional distribution has, however, remained unchanged. Chart 23 shows that the share of self-employment tends to decrease as we move away from the South. It is highest in the South East (45%) and London (43%), declining to 20% in the North East.

Chart 23
Construction Self-employment by Country and Region, UK: 2002



Source: Office for National Statistics: Labour Force Survey

As regards the share of women in the workforce there are, perhaps surprisingly, considerable differences within the UK, as can be seen in Table 16. By country, it is highest in England (9.8% for all occupations) and lowest in Wales (3.4% for all occupations). Within England, there are also some differences ranging from 6.3% in the North East to 11.8% in the Eastern region. Women's share in total employment is much higher for non-manual occupations, averaging 30% for the UK, falling to 1% for manual occupations. This could account for the regional differences.

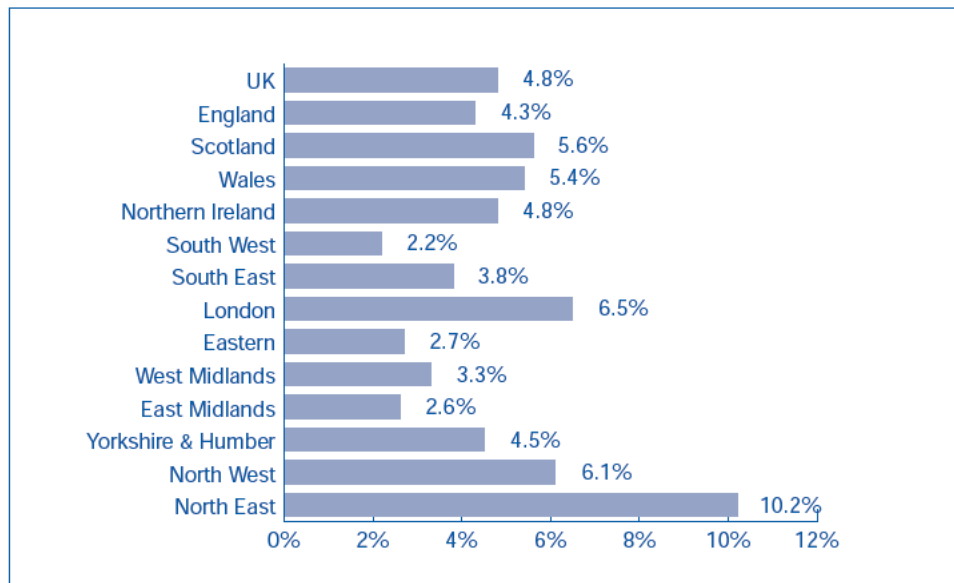
Table 16
Percentage of Females in the Construction Workforce, UK: 2002

	All Occupations	Non-manual Occupations	Manual Occupations
United Kingdom	9.3%	30.0%	1.0%
Northern Ireland	7.1%	26.6%	0.9%
Scotland	9.0%	29.9%	1.0%
Wales	3.4%	14.4%	0.6%
England	9.8%	30.8%	1.1%
England by RDA areas			
North East	6.3%	22.1%	0.6%
Yorkshire & Humberside	8.1%	33.3%	1.2%
North West	8.8%	26.4%	1.7%
West Midlands	10.8%	33.6%	1.1%
East Midlands	9.8%	34.3%	1.7%
South West	8.4%	26.2%	0.9%
Eastern	11.8%	35.6%	0.9%
South East	10.4%	29.6%	0.4%
London	11.2%	33.3%	1.1%

Source: Office for National Statistics: Labour Force Survey

As regards unemployment, there has been further decline in the last two years. For the UK, the unemployment rate in 2002 decreased to 4.8% from 6% in 2000. For the regional pattern the situation is the reverse of self-employment. It is highest in the North East and lowest in the South West. For London it continues to be surprisingly high although it decreased to 6.5% from 8% in 2000 (Chart 24).

Chart 24
Percentage Unemployment in Construction by Country and Region, UK: 2002



Source: Office for National Statistics: Labour Force Survey

Country and Regional Forecasts

For each country or RDA area forecast, we have included a brief commentary outlining key factors in the construction sector for each region. As far as possible, we have kept the information uniform across regions and each section includes information on:

- Activity – this includes current and expected activity, of which only the top projects are listed based on information available up to Spring 2002
- Reported skill shortages and skill gaps
- Provision of training.

For each commentary, the approach is short-term in reporting the current situation and that over the next six to twelve months. This is in contrast to the forecast tables that are based on a medium-term perspective.

The forecasts are given in Tables 17 to 29. For each region, the tables include:

- Total employment by occupation in 2003 and 2007
- The average annual required intake over the forecasting period 2003–2007
- The cumulative required intake over the period as a whole.

As for the Great Britain table (Table 13), the annual trained requirement is the difference between demand and supply and consists of two elements:

1. The extra intake required due to the increase, if any, in total employment
2. The number required due to supply side factors, i.e. outflows of workers and corresponding inflows into employment.

For the labour supply, improved data from the Labour Force Survey allow us to take into account migration. This is an important refinement on previous models used by CITB since construction is a relatively mobile industry. However, in practice it does not have a major impact on the required intake.

The country and regional forecasts for 2003 are in some instances considerably different from the forecasts published in the *Skills Foresight Report 2002* which was largely based on data for 2001.

This is not surprising since the views regarding country and regional growth patterns have changed considerably over the past two years and it is the expected growth in each country and RDA area that determines the required intake, although assumptions about migration also play a minor role.



In Northern Ireland, construction output in 1995 prices is forecast to increase by an average yearly rate of 3.6% over the forecast period 2003–2007, as a result of increased Government procurement and productivity improvements. This compares with the 2.1% growth rate forecasted for Great Britain.

Current major projects

- **Commercial:** There is strong activity in this area including three developments at a total of £42m; a retail development in Antrim, an office building in Belfast and a distribution depot in Crumlin.
- **Infrastructure:** A £4.9m flyover on the A1 in Banbridge as well as three sewer systems/treatment works projects totalling £10.85m in Craigavon and Belfast.
- **Housing:** Two developments in Newry and Cookstown at a total of £15.5m.

Proposed major projects

- **Infrastructure:** A £500m open-cast coal mining and power station in Ballymoney; two projects at a total of £190m to install gas pipelines in Belfast and Londonderry; a £40m wind farm at Drumquin, a £23m upgrade of a carriageway at Newry and a £14m sewage treatment project in Larne. In December 2002, the Northern Ireland Office announced its largest ever spend on infrastructure, equating to almost £2 billion over the next five years.
- **Commercial:** Includes a £13.2m retail outlet, offices and apartment development at Royal Avenue in Belfast and an £8m extension to the Quay Shopping Centre in Newry, including associated infrastructure.

Reported skill shortages and skill gaps

According to the Northern Ireland Skills Monitoring Survey 2000, 21% of employers in the province reported at least one current vacancy and 17% of employers reported at least one difficult to fill vacancy, of which the majority (67%) were accounted for by craft and related occupations. The recruitment of plasterers, wood trades and brickwork occupations were worse affected.

Provision of training

36 external training providers are accredited by CITB Northern Ireland to provide Health and Safety training and occupational assessment for the Construction Skills Register (CSR) scheme that is affiliated to the CSCS scheme in Great Britain. In total 1,400 organisations are accredited to meet industry's needs. CITB Northern Ireland's Direct Training and Assessment Unit (DTAU) provides specialist training, not widely available elsewhere.

The Qualifying the Workforce (QW) pilot scheme that began in 2001 provides opportunities for On-Site Training and Assessment, enabling employees who have practical skills and experience to gain NVQs. To help expand the scheme employers are being encouraged to nominate supervisors and managers to qualify as assessors.

Apprenticeship training is delivered by the sixteen colleges of further education and a number of independent training providers, and is funded through the Department for Employment and Learning Jobskills programme.

Table 17
Northern Ireland

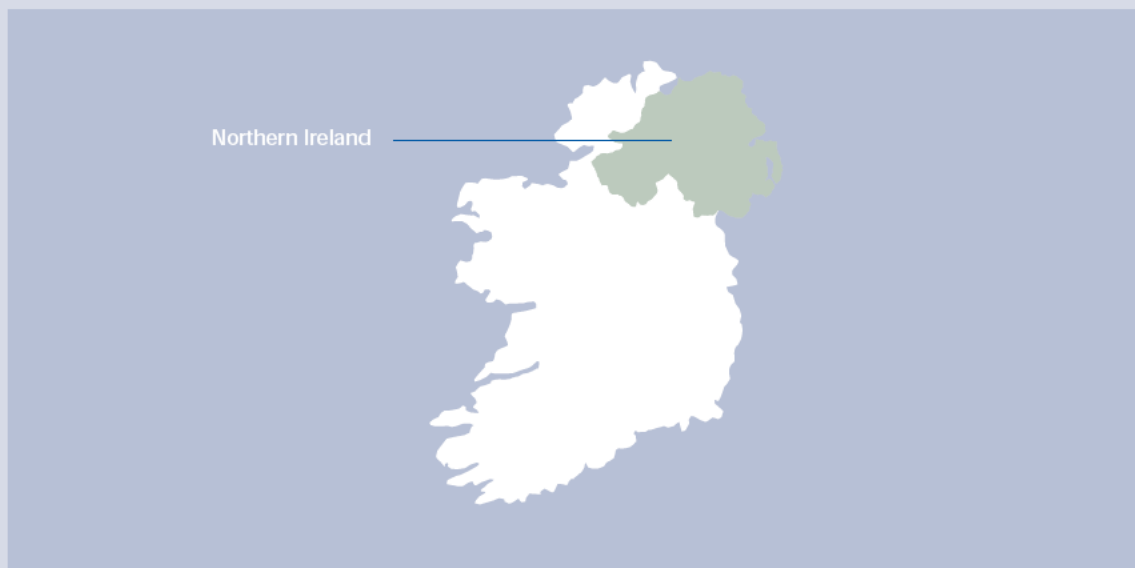
	2002	Total Employment 2007	Average Annual Requirement (2002-2007)	Cumulative Requirement (2002-2007)
Managers	3,980	4,570	250	1,470
Clerical	4,320	4,610	240	1,470
Professionals	1,040	940	60	340
Technicians	120	120	10	40
Carpenters & Joiners	9,050	9,710	550	3,320
Bricklayers	2,020	2,160	120	740
Painters and decorators	2,130	2,200	120	730
Plasterers	3,050	3,160	170	1,040
Roofers	1,730	1,860	110	630
Floorers	350	360	20	120
Glaziers	920	990	60	340
Other SB Operatives	1,790	1,920	110	660
Scaffolders	520	490	30	180
Plant Operatives	4,320	4,630	260	1,580
Plant Mechanics/Fitters	430	410	20	140
Steel Erectors/Structural	170	150	10	50
Other CE Operatives	1,210	1,460	80	490
General Operatives	9,680	9,310	530	3,160
Maintenance workers	20	20	0	10
Plumbers	4,380	4,010	240	1,450
Total	51,230	53,080	2,990	17,940

Source: CITB Northern Ireland Employment Model, 2003; Experian Business Strategies

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Figures of zero indicate a number less than five.

Please note that the coverage of construction employment used in the above table differs from the coverage of the Labour Force Survey. The results cannot therefore be added to Great Britain to obtain the total for the United Kingdom.





In Scotland, construction output in 1995 prices is forecast to increase by an average yearly rate of 1% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in Scotland is expected to increase by an average yearly rate of 0.8% over the forecast period, below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** There is strong activity in this area including a £296m rebuilding of a fused catalytic cracking unit at the BP Complex, Grangemouth; a £100m project comprising the construction of 9 km section of dual carriageway to be known as the Glasgow Southern Relief Road and a 15 km dual two-lane motorway parallel to the existing A77.

Proposed major projects

- **Commercial:** There is strong activity in this area including a £500m regeneration of Polkemmet Colliery site, Bathgate to include residential and leisure facilities with associated infrastructure; a £250m mixed development North East of Aberuthven.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 81% of employers in Scotland experienced difficulties in recruiting skilled staff in the preceding three months. However, only 67% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 71% of them had managed to fill it. Consequently only 19% of companies in the Scotland sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by bricklayers.

Recruitment difficulties are unlikely to ease in Scotland since approximately 65% of employers expect their workload to increase over the next six months and 33% expect their workload to stay the same.

The results of the survey seem to indicate that as far as construction employers are concerned, skill gaps are not a particular problem for **existing** employees. The majority of employers (85%) were satisfied that their existing employees were able to cope with current requirements. However, approximately half (52%) of participating employers reported problems with **new** employees who, although trained and qualified for certain occupations, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified. This is probably more so in the construction industry than in other sectors.

Provision of training

Since its official start in February 1999, On-Site Assessment and Training (OSAT) has been expanding rapidly in Great Britain as a whole. 50 candidates took part in the pilot scheme at the end of 1998 and by the beginning of 2003 this had increased to approximately 41,000 candidates. Scotland accounted for 2,518 of these registrations.

Table 18
Scotland

	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	16,160	17,450	520	2,600
Clerical	14,070	13,290	410	2,050
Professionals	9,460	10,300	310	1,550
Technical Staff	4,270	4,670	140	700
Wood Trades	30,170	31,100	950	4,750
Bricklayers	6,760	6,550	200	1,000
Painters and decorators	10,550	10,400	320	1,600
Plasterers	1,590	1,310	40	200
Roofers	5,220	5,360	160	800
Floorers	2,440	2,520	80	400
Glaziers	1,860	1,910	60	300
Other SB Operatives (1)	2,140	2,040	60	300
Scaffolders	2,920	3,030	100	500
Plant Operatives	6,710	7,150	210	1,050
Plant Mechanics/Fitters	1,910	1,970	60	300
Steel Erectors/Structural	1,820	2,160	60	300
Other CE Operatives (2)	7,320	7,660	230	1,150
General Operatives	9,740	9,540	300	1,500
Maintenance workers	1,920	2,260	60	300
Electricians	16,020	16,560	510	2,550
Plumbers	11,170	12,400	360	1,800
Non-construction operatives	3,350	3,440		
Total	167,570	173,070	5,140	25,700

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In Wales, construction output in 1995 prices is forecast to increase by an average yearly rate of 1% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in Wales is expected to increase by an average yearly rate of 1% over the forecast period, below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** The construction of a £60m offshore wind farm situated on the North Hoyle site.
- **Commercial:** A £30m scheme comprising the construction of a two-storey museum building in Swansea with associated infrastructure.

Proposed major projects

- **Infrastructure:** There is very strong activity proposed in this area including three offshore tidal power stations: a £500m 450 mega-watt at Rhyl; a £150m 30 mega-watt at Swansea; a £300m 1,500 mega-watt at Bala, North Wales and the construction of a £375m 460 mega-watt power station near Onllwyn in the Durais Valley, South Wales.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 69% of employers in Wales experienced difficulties in recruiting skilled staff in the preceding three months. However, only 44% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 75% of them had managed to fill it. Consequently only 11% of companies in the Wales sample were left with a long-term vacancy.

The recruitment of bricklayers was worst affected, followed by wood trade occupations.

Recruitment difficulties are unlikely to ease in Wales since approximately 38% of employers expect their workload to increase over the next six months and 60% expect their workload to stay the same.

The results of the survey seem to indicate that as far as construction employers are concerned, skill gaps are not a particular problem for **existing** employees. The majority of employers in Wales (84%) were satisfied that their existing employees were able to cope with current requirements. However, 36% of participating employers reported problems with **new** employees who, although trained and qualified for certain occupations, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified. This is probably more so in the construction industry than in other sectors.

Provision of training

Since its official start in February 1999, On-Site Assessment and Training (OSAT) has been expanding rapidly in Great Britain as a whole. 50 candidates took part in the pilot scheme at the end of 1998 and by the beginning of 2003 this had increased to approximately 41,000 candidates. Wales accounted for 2,501 of these registrations.

Table 19
Wales

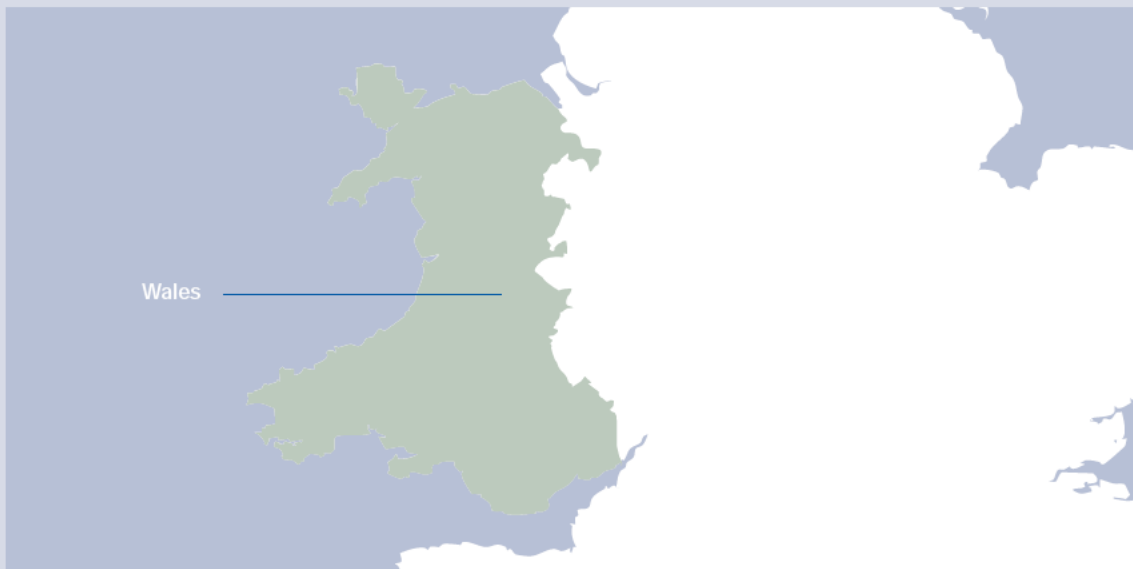
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	6,640	7,250	280	1,400
Clerical	5,780	5,520	230	1,150
Professionals	5,550	6,110	240	1,200
Technical Staff	1,910	2,110	80	400
Wood Trades	13,260	13,830	560	2,800
Bricklayers	9,070	8,880	360	1,800
Painters and decorators	5,770	5,750	240	1,200
Plasterers	1,650	1,380	60	300
Roofers	2,930	3,040	120	600
Floorers	1,210	1,260	50	250
Glaziers	2,900	3,010	120	600
Other SB Operatives (1)	2,650	2,560	110	550
Scaffolders	900	940	40	200
Plant Operatives	4,310	4,650	180	900
Plant Mechanics/Fitters	990	1,040	40	200
Steel Erectors/Structural	1,180	1,420	50	250
Other CE Operatives (2)	4,830	5,110	200	1,000
General Operatives	4,440	4,400	180	900
Maintenance workers	690	820	30	150
Electricians	8,490	8,870	360	1,800
Plumbers	6,210	6,970	270	1,350
Non-construction operatives	1,410	1,460		
Total	92,770	96,380	3,800	19,000

Source: CITB Employment Model, 2003

(¹) Specialist Building, (²) Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





Regional Development Agency Areas

North East:	Durham, Tyne and Wear, Northumberland, Tees Valley
Yorkshire & Humber:	North Yorkshire, Humberside, West Yorkshire, South Yorkshire
North West:	Lancashire, Greater Manchester, Cheshire, Merseyside, Cumbria
West Midlands:	Hereford and Worcester, Warwickshire, West Midlands, Staffordshire, Shropshire
East Midlands:	Northamptonshire, Leicestershire, Nottinghamshire, Derbyshire, Lincolnshire
South West:	Cornwall, Devon, Somerset, Dorset, Wiltshire, Gloucestershire, West of England
Eastern:	Cambridgeshire, Norfolk, Suffolk, Essex, Hertfordshire, Bedfordshire
South East:	Hampshire, West Sussex, East Sussex, Kent, Surrey, Berkshire, Oxfordshire, Buckinghamshire, Isle of Wight
London:	All boroughs

Table 20
England

	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	207,200	236,070	8,970	44,850
Clerical	146,720	146,950	6,000	30,000
Professionals	101,220	116,200	4,420	22,100
Technicians	45,800	52,880	2,010	10,050
Wood Trades	243,030	264,470	10,390	51,950
Bricklayers	129,460	132,640	5,300	26,500
Painters and decorators	99,080	103,190	4,150	20,750
Plasterers	35,160	30,470	1,330	6,650
Roofers	49,170	53,480	2,100	10,500
Floorers	37,270	40,430	1,560	7,800
Glaziers	32,070	34,870	1,350	6,750
Other SB Operatives (1)	41,680	41,810	1,690	8,450
Scaffolders	20,740	22,540	870	4,350
Plant Operatives	40,560	45,660	1,770	8,850
Plant Mechanics/Fitters	27,790	30,140	1,170	5,850
Steel Erectors/Structural	18,280	22,970	830	4,150
Other CE Operatives (2)	82,380	91,100	3,540	17,700
General Operatives	86,900	89,920	3,630	18,150
Maintenance workers	20,630	25,640	930	4,650
Electricians	153,500	166,840	6,510	32,550
Plumbers	128,720	150,810	5,650	28,250
Non-construction operatives	38,210	41,510		
Total	1,785,570	1,940,590	74,170	370,850

Source: CITB Employment Model, 2003

(¹) Specialist Building, (²) Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the North East, construction output in 1995 prices is forecast to increase by an average yearly rate of 1.3% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the North East is expected to increase by an average yearly rate of 1.8% over the forecast period, just below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £112m highway maintenance project in Highways Agency Area 14 (Newcastle-upon-Tyne).
- **Commercial:** A £45m office development in Newcastle-upon-Tyne with associated infrastructure.

Proposed major projects

- **Public housing:** A £100m refurbishment of 14,000 houses over seven years at various sites throughout Stockton-on-Tees.
- **Public:** £35m relocation of existing primary school and formation of new education village in Darlington with all local infrastructures.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 71% of employers in the North experienced difficulties in recruiting skilled staff in the preceding three months. However, only 59% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 59% of them had managed to fill it. Consequently 24% of companies in the North sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by bricklayers.

Recruitment difficulties are unlikely to ease in the North area since approximately 56% of employers expect their workload to increase over the next six months and 40% expect their workload to stay the same.

The majority of employers in the North (91%) were satisfied that their **existing** employees were able to cope with current requirements. However, 43% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

N.B. Results for the North East and the North West have been combined.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The North East accounted for 2,186 of these registrations.

Table 21
North East

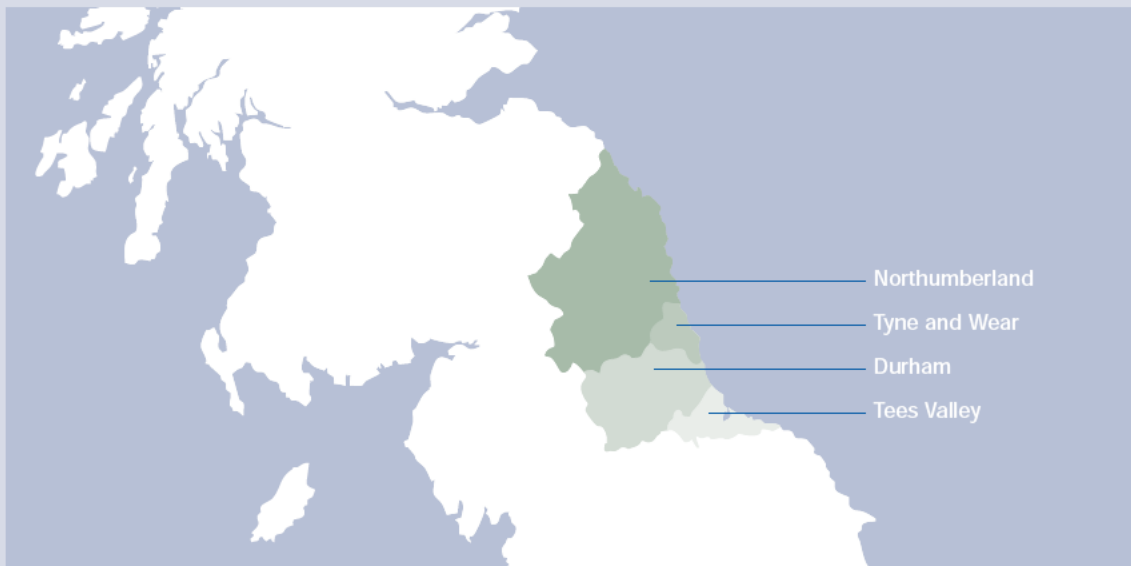
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	7,300	8,210	380	1,900
Clerical	5,080	5,000	250	1,250
Professionals	3,190	3,610	170	850
Technicians	2,170	2,470	110	550
Wood Trades	9,550	10,260	500	2,500
Bricklayers	4,560	4,600	220	1,100
Painters and decorators	3,620	3,720	180	900
Plasterers	1,040	890	50	250
Roofers	2,640	2,820	130	650
Floorers	1,620	1,740	80	400
Glaziers	1,020	1,090	50	250
Other SB Operatives (1)	2,140	2,120	110	550
Scaffolders	940	1,020	50	250
Plant Operatives	2,250	2,490	120	600
Plant Mechanics/Fitters	1,420	1,520	70	350
Steel Erectors/Structural	1,400	1,730	80	400
Other CE Operatives (2)	3,840	4,180	200	1,000
General Operatives	4,300	4,390	220	1,100
Maintenance workers	820	1,000	40	200
Electricians	5,770	6,210	300	1,500
Plumbers	4,290	4,960	230	1,150
Non-construction operatives	1,770	1,900		
Total	70,730	75,930	3,540	17,700

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In Yorkshire & Humber, construction output in 1995 prices is forecast to increase by an average yearly rate of 2.3% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in Yorkshire & Humber is expected to increase by an average yearly rate of 2.9% over the forecast period, well above the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £245m programme of improvements to the A1 from Darrington to Dishforth; A £231m project comprising trunk road/motorway network and maintenance within Highways Agency Area 12.
- **Commercial:** A £100m redevelopment of RAF Finningley, Doncaster to provide a commercial airport with airport related business, leisure and associated facilities.

Proposed major projects

- **Commercial:** Strong activity is proposed in this area including a £150m regeneration of industrial wasteland with around 700 residential, retail and business units in York; £75m second phase of the Advanced Manufacturing Park in Rotherham including office buildings and a hotel with associated infrastructure.
- **Public:** £35m to rebuild and refurbish healthcare facilities throughout Sheffield.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 89% of employers in Yorkshire & Humber experienced difficulties in recruiting skilled staff in the preceding three months. However, only 80% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 69% of them had managed to fill it. Consequently 24% of companies in the Yorkshire & Humber sample were left with a long-term vacancy.

The recruitment of wood trade occupations and bricklayers was worst affected.

Recruitment difficulties are unlikely to ease in Yorkshire & Humber since approximately 62% of employers expect their workload to increase over the next six months and 34% expect their workload to stay the same.

The majority of employers in Yorkshire & Humber (87%) were satisfied that their **existing** employees were able to cope with current requirements. However, 72% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. Yorkshire & Humber accounted for 3,427 of these registrations.

Table 22
Yorkshire & Humber

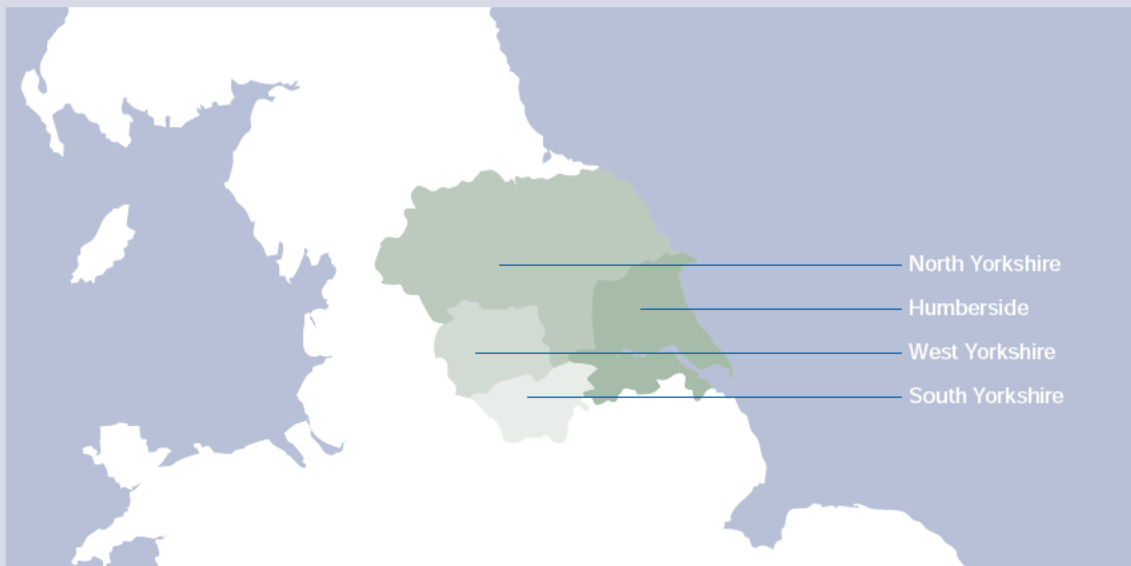
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	14,820	17,430	660	3,300
Clerical	13,170	13,540	530	2,650
Professionals	7,260	8,600	330	1,650
Technicians	3,930	4,680	180	900
Wood Trades	24,300	27,270	1,060	5,300
Bricklayers	12,120	12,770	500	2,500
Painters and decorators	9,590	10,300	410	2,050
Plasterers	3,060	2,750	120	600
Roofers	4,910	5,490	210	1,050
Floorers	3,980	4,460	170	850
Glaziers	2,550	2,850	110	550
Other SB Operatives (1)	2,400	2,490	100	500
Scaffolders	2,250	2,550	100	500
Plant Operatives	4,440	5,150	200	1,000
Plant Mechanics/Fitters	3,280	3,670	140	700
Steel Erectors/Structural	3,120	4,030	140	700
Other CE Operatives (2)	8,500	9,690	370	1,850
General Operatives	8,180	8,730	340	1,700
Maintenance workers	2,330	2,980	110	550
Electricians	14,610	16,440	650	3,250
Plumbers	11,450	13,820	510	2,550
Non-construction operatives	2,940	3,290		
Total	163,190	182,980	6,940	34,700

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the North West, construction output in 1995 prices is forecast to increase by an average yearly rate of 1.6% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the North West is expected to increase by an average yearly rate of 1.4% over the forecast period, below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £150m highway maintenance project in Highways Agency Area 13 (Carlisle); a £103m project for improvements to M60 between junctions 5 and 8.
- **Public:** A £99m scheme for the construction and 25 year maintenance of 17 new police stations at various sites in Greater Manchester.

Proposed major projects

- **Infrastructure:** A £100m project for the construction and supply of infrastructure for Line 2 of a proposed rapid transit system for Merseyside; £144m scheme in Preston to design, build, finance and operate a waste management facility capable of processing 50,000 tonnes of municipal solid waste per year.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 71% of employers in the North experienced difficulties in recruiting skilled staff in the preceding three months. However, only 59% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 59% of them had managed to fill it. Consequently 24% of companies in the North sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by bricklayers.

Recruitment difficulties are unlikely to ease in the North area since approximately 56% of employers expect their workload to increase over the next six months and 40% expect their workload to stay the same.

The majority of employers in the North (91%) were satisfied that their **existing** employees were able to cope with current requirements. However, 43% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

N.B. Results for the North East and North West have been combined.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The North West accounted for 7,605 of these registrations.

Table 23
North West

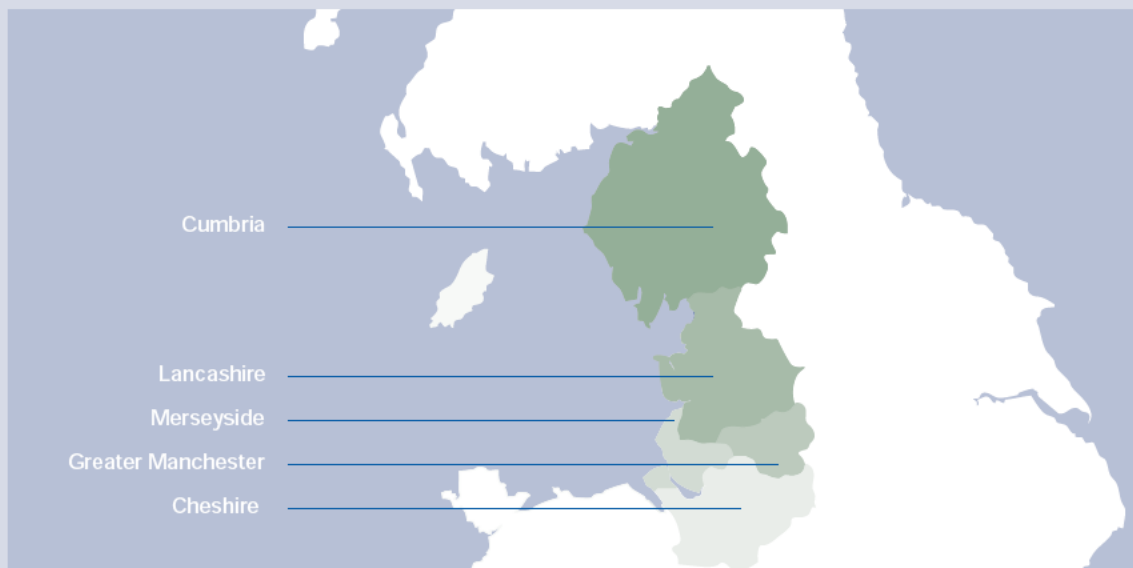
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	23,780	26,310	830	4,150
Clerical	18,700	18,100	610	3,050
Professionals	16,690	18,610	590	2,950
Technicians	5,000	5,610	180	900
Wood Trades	36,260	38,300	1,260	6,300
Bricklayers	14,950	14,830	490	2,450
Painters and decorators	10,850	10,970	370	1,850
Plasterers	5,290	4,470	170	850
Roofers	5,100	5,360	170	850
Floorers	5,850	6,170	200	1,000
Glaziers	4,810	5,060	160	800
Other SB Operatives (1)	5,000	4,890	160	800
Scaffolders	3,490	3,710	120	600
Plant Operatives	4,680	5,110	160	800
Plant Mechanics/Fitters	2,210	2,330	80	400
Steel Erectors/Structural	3,130	3,810	120	600
Other CE Operatives (2)	11,840	12,690	410	2,050
General Operatives	10,300	10,340	350	1,750
Maintenance workers	2,360	2,840	90	450
Electricians	20,110	21,300	700	3,500
Plumbers	14,760	16,780	520	2,600
Non-construction operatives	4,920	5,190		
Total	230,080	242,780	7,740	38,700

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

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In the West Midlands, construction output in 1995 prices is forecast to increase by an average yearly rate of 2.1% over the forecast period 2003–2007, the same as that forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the West Midlands is expected to increase by an average yearly rate of 2% over the forecast period, just above the average for Great Britain of 1.9%.

Current major projects

- **Housing:** A £50m residential development in Birmingham with associated infrastructure.
- **Infrastructure:** A £40m Midlands Omnibus contract covering 22 canals and waterways in the Midlands, South West and Wales.

Proposed major projects

- **Commercial:** A £100m expansion of Aston Business Park, Birmingham with local infrastructure.
- **Infrastructure:** A £70m motorway improvements project to junction 19 of the M1.
- **Public:** A £50m new inner city education village in Coventry.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 83% of employers in the Midlands experienced difficulties in recruiting skilled staff in the preceding three months. However, only 66% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 79% of them had managed to fill it. Consequently only 14% of companies in the Midlands sample were left with a long-term vacancy.

The recruitment of bricklayers was worst affected, followed by wood trade occupations.

Recruitment difficulties are unlikely to ease in the Midlands area since approximately 57% of employers expect their workload to increase over the next six months and 38% expect their workload to stay the same.

The majority of employers in the Midlands (81%) were satisfied that their **existing** employees were able to cope with current requirements. However, 58% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

N.B. Results for the East Midlands and West Midlands have been combined.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The Midlands (East and West) accounted for 4,711 of these registrations.

Table 24
West Midlands

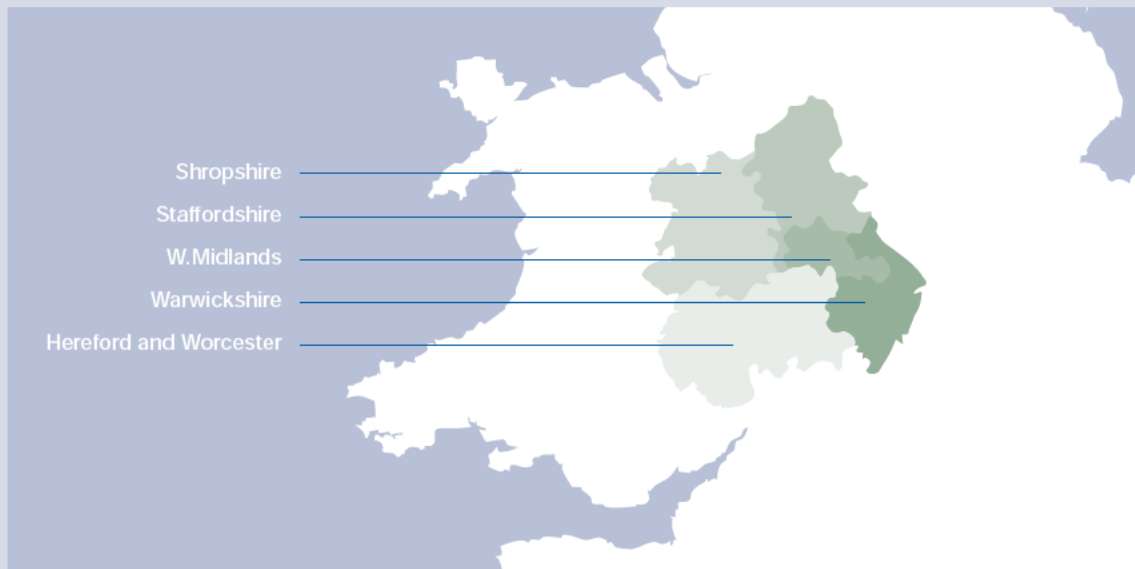
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	22,040	25,010	900	4,500
Clerical	14,730	14,620	550	2,750
Professionals	8,760	10,020	360	1,800
Technicians	4,600	5,290	190	950
Wood Trades	24,990	27,070	1,010	5,050
Bricklayers	11,570	11,770	440	2,200
Painters and decorators	9,090	9,420	360	1,800
Plasterers	3,620	3,140	130	650
Roofers	6,060	6,540	240	1,200
Floorers	3,630	3,930	150	750
Glaziers	3,630	3,910	140	700
Other SB Operatives (1)	3,280	3,290	130	650
Scaffolders	1,390	1,520	60	300
Plant Operatives	4,200	4,700	170	850
Plant Mechanics/Fitters	2,430	2,630	100	500
Steel Erectors/Structural	1,910	2,390	80	400
Other CE Operatives (2)	10,120	11,120	400	2,000
General Operatives	8,080	8,320	310	1,550
Maintenance workers	1,990	2,450	80	400
Electricians	13,300	14,440	540	2,700
Plumbers	14,590	17,000	600	3,000
Non-construction operatives	3,640	3,940		700
Total	177,650	192,520	6,940	34,700

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the East Midlands, construction output in 1995 prices is forecast to increase by an average yearly rate of 2.1% over the forecast period 2003–2007, the same as that forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the East Midlands is expected to increase by an average yearly rate of 1.5% over the forecast period, below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £70m desulphurisation plant at Cottam Power Station, Retford.
- **Public:** A £38m project comprising the demolition and construction of a Ministry of Defence sixth form college at Loughborough with associated infrastructure.

Proposed major projects

- **Infrastructure:** Two projects are proposed for the light rail scheme entitled Nottingham Express Transit (NET) at a total cost of £224m – linking with the city centre will be line 2 at 7.6km to Clifton and line 3 at 9.8 km to Chilwell.
- **Commercial:** A £80m redevelopment of Trinity Square, Nottingham.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 83% of employers in the Midlands experienced difficulties in recruiting skilled staff in the preceding three months. However, only 66% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 79% of them had managed to fill it. Consequently only 14% of companies in the Midlands sample were left with a long-term vacancy.

The recruitment of bricklayers was worst affected, followed by wood trade occupations.

Recruitment difficulties are unlikely to ease in the Midlands area since approximately 57% of employers expect their workload to increase over the next six months and 38% expect their workload to stay the same.

The majority of employers in the Midlands (81%) were satisfied that their **existing** employees were able to cope with current requirements. However, 58% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

N.B. Results for the East Midlands and West Midlands have been combined.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The Midlands (East and West) accounted for 4,711 of these registrations.

Table 25
East Midlands

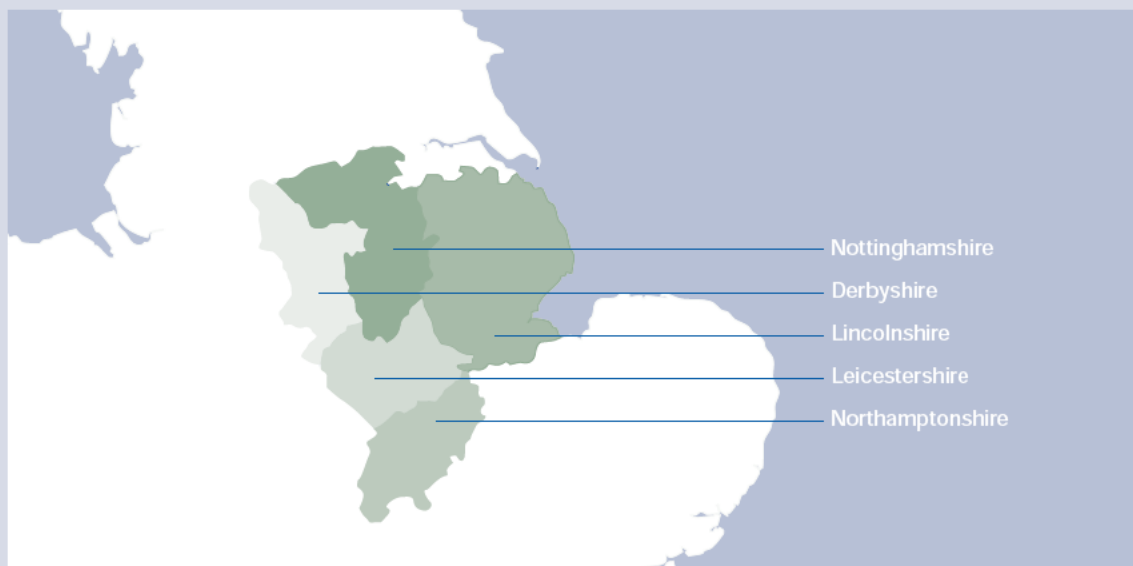
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	13,410	15,010	540	2,700
Clerical	14,750	14,450	560	2,800
Professionals	8,070	9,100	330	1,650
Technicians	3,510	3,980	140	700
Wood Trades	21,940	23,450	880	4,400
Bricklayers	14,150	14,200	540	2,700
Painters and decorators	11,910	12,170	460	2,300
Plasterers	3,860	3,300	140	700
Roofers	3,770	4,010	150	750
Floorers	2,560	2,730	100	500
Glaziers	2,580	2,750	100	500
Other SB Operatives (1)	4,060	4,010	150	750
Scaffolders	1,080	1,160	40	200
Plant Operatives	3,610	3,990	150	750
Plant Mechanics/Fitters	3,870	4,130	150	750
Steel Erectors/Structural	3,550	4,380	150	750
Other CE Operatives (2)	6,860	7,440	280	1,400
General Operatives	8,940	9,080	350	1,750
Maintenance workers	1,910	2,330	80	400
Electricians	12,130	12,990	480	2,400
Plumbers	11,750	13,510	480	2,400
Non-construction operatives	4,010	4,270		
Total	162,280	172,440	6,250	31,250

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the South West, construction output in 1995 prices is forecast to increase by an average yearly rate of 2% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the South West is expected to increase by an average yearly rate of 1.6% over the forecast period, below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £52m general highway maintenance contract for improvement works and network management (four roads altogether) at various sites within Somerset.
- **Commercial:** A £50m urban village at St Austell, Cornwall with associated infrastructure.

Proposed major projects

- **Infrastructure:** The construction of a £500m 4,500 mega-watt offshore tidal power station at the Severn Estuary, Bristol.
- **Public:** A £500m scheme comprising the provision of capital works and property maintenance at Ministry of Defence sites across the South West of England.
- **Commercial:** A £500m retail, leisure and residential development in Bristol with associated infrastructure.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 86% of employers in the South West experienced difficulties in recruiting skilled staff in the preceding three months. However, only 69% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 51% of them had managed to fill it. Consequently 33% of companies in the South West sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by bricklayers.

Recruitment difficulties are unlikely to ease in the South West area since approximately 65% of employers expect their workload to increase over the next six months and 33% expect their workload to stay the same.

The majority of employers in the South West (88%) were satisfied that their **existing** employees were able to cope with current requirements. However, 36% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The South West accounted for 3,012 of these registrations.

Table 26
South West

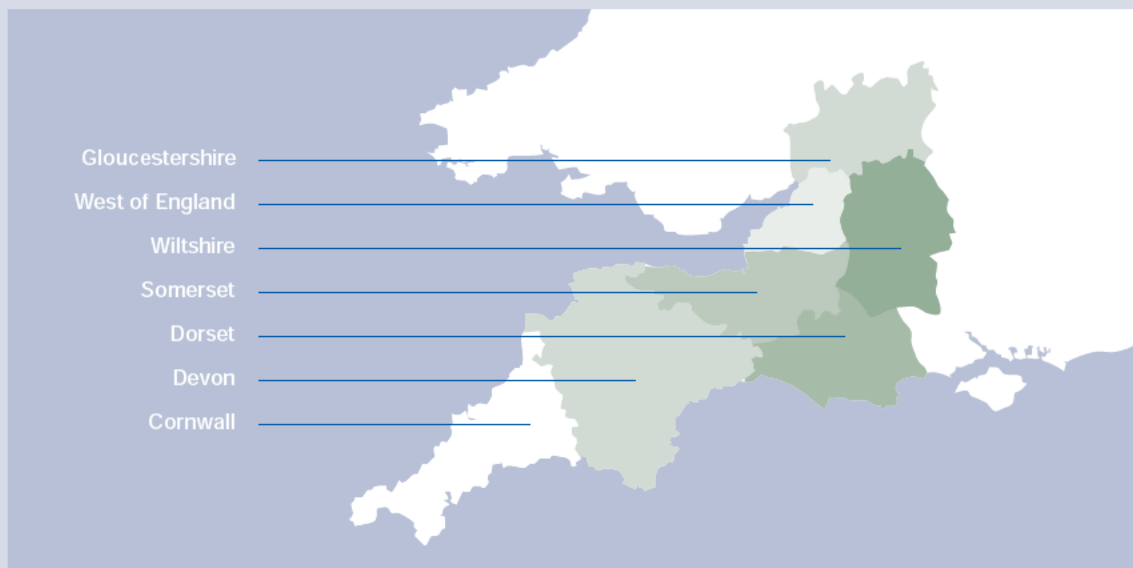
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	20,990	23,580	840	4,200
Clerical	16,100	15,820	600	3,000
Professionals	9,190	10,400	370	1,850
Technicians	5,340	6,070	220	1,100
Wood Trades	28,190	30,220	1,120	5,600
Bricklayers	19,460	19,590	730	3,650
Painters and decorators	11,530	11,820	450	2,250
Plasterers	4,340	3,720	160	800
Roofers	8,860	9,460	350	1,750
Floorers	4,370	4,680	170	850
Glaziers	3,920	4,180	150	750
Other SB Operatives (1)	3,930	3,900	150	750
Scaffolders	2,430	2,620	100	500
Plant Operatives	5,730	6,350	230	1,150
Plant Mechanics/Fitters	2,380	2,550	90	450
Steel Erectors/Structural	1,020	1,270	40	200
Other CE Operatives (2)	8,590	9,350	340	1,700
General Operatives	11,350	11,560	440	2,200
Maintenance workers	3,220	3,930	130	650
Electricians	16,560	17,800	660	3,300
Plumbers	13,630	15,720	550	2,750
Non-construction operatives	3,540	3,780		
Total	204,670	218,370	7,890	39,450

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the Eastern area, construction output in 1995 prices is forecast to increase by an average yearly rate of 2.6% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the Eastern area is expected to increase by an average yearly rate of 3.8% over the forecast period, double the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £75m wind farm situated offshore from Great Yarmouth; a £28m extension of existing container terminal at Felixstowe Docks – project entitled The Trinity Terminal III Extension.
- **Commercial:** A £45m pharmaceutical research building at Hoddesdon; a £40m mixed development at Letchworth – both projects with all associated infrastructures.

Proposed major projects

- **Infrastructure:** There is strong activity proposed in this area including two airport projects – a £6 billion new airport off the coast of Essex and a £483m redevelopment of Alconbury Airport, Huntingdon.
- **Commercial:** £150m residential development in Peterborough for 1,700 houses together with community, educational, leisure, industrial and commercial areas.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 80% of employers in the Eastern area experienced difficulties in recruiting skilled staff in the preceding three months. However, only 73% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 67% of them had managed to fill it. Consequently 24% of companies in the Eastern sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by professionals.

Recruitment difficulties are unlikely to ease in the Eastern area since approximately 56% of employers expect their workload to increase over the next six months and 39% expect their workload to stay the same.

The majority of employers in the Eastern area (80%) were satisfied that their **existing** employees were able to cope with current requirements. However, 72% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The Eastern area accounted for 2,448 of these registrations.

Table 27
Eastern

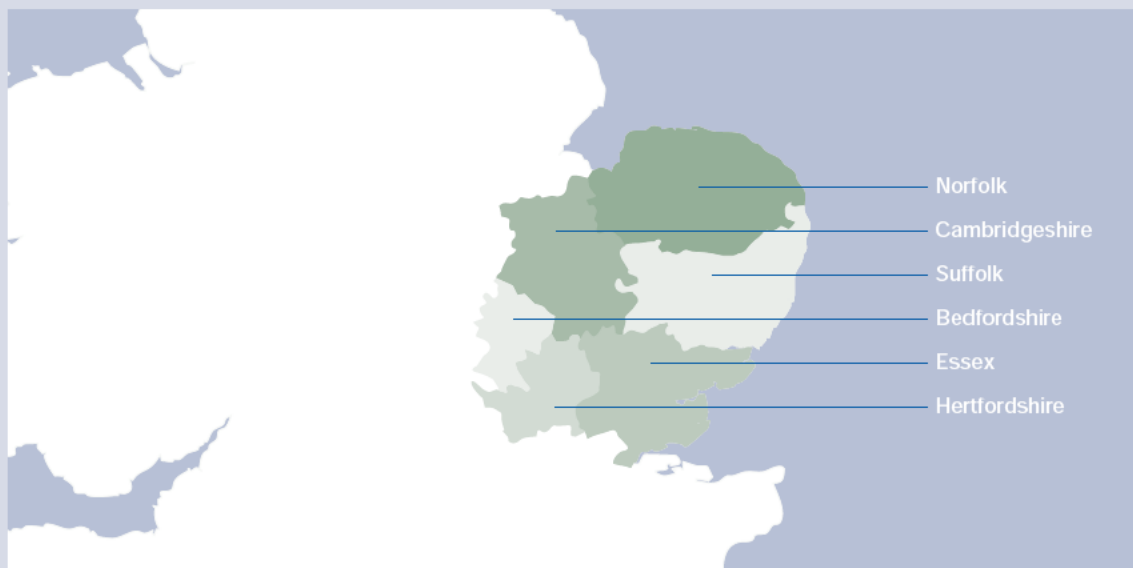
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	26,110	30,300	1,240	6,200
Clerical	17,450	17,720	770	3,850
Professionals	11,750	13,730	560	2,800
Technicians	5,470	6,430	260	1,300
Wood Trades	25,690	28,450	1,210	6,050
Bricklayers	19,600	20,380	870	4,350
Painters and decorators	10,730	11,370	490	2,450
Plasterers	4,330	3,840	180	900
Roofers	5,840	6,440	270	1,350
Floorers	3,940	4,360	180	900
Glaziers	5,140	5,670	230	1,150
Other SB Operatives (1)	4,950	5,070	220	1,100
Scaffolders	2,250	2,510	110	550
Plant Operatives	5,040	5,770	240	1,200
Plant Mechanics/Fitters	3,210	3,550	150	750
Steel Erectors/Structural	1,810	2,310	90	450
Other CE Operatives (2)	9,970	11,200	470	2,350
General Operatives	9,450	9,950	430	2,150
Maintenance workers	2,870	3,630	140	700
Electricians	18,030	20,010	850	4,250
Plumbers	17,760	21,170	860	4,300
Non-construction operatives	4,030	4,450		
Total	215,420	238,310	9,820	49,100

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the South East, construction output in 1995 prices is forecast to increase by an average yearly rate of 3.2% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in the South East is expected to increase by an average yearly rate of 3.5% over the forecast period, nearly double the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £289m steel footbridge in Portsmouth; a £140m road maintenance contract on the A27 between Brighton and Lewes.
- **Commercial:** A £60m scheme known as the Synchrotron Project comprising the demolition of laboratory and office buildings and construction of research facilities, office and laboratory in Didcot.

Proposed major projects

- **Infrastructure:** There is strong activity proposed in this area, including the construction of two new airports in Kent – a £9 billion new purpose-built hub airport at Cliffe and a £3 billion new international airport at Sheerness.
- **Public:** A £500m scheme comprising the provision of capital works and property maintenance at over 150 Ministry of Defence sites across the South Eastern region; a £110m project to construct a District General Hospital of between 71,500 and 76,750 square metres in Tunbridge Wells.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 82% of employers in the South East experienced difficulties in recruiting skilled staff in the preceding three months. However, only 59% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 73% of them had managed to fill it. Consequently only 16% of the companies in the South East sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by bricklayers and plasterers.

Recruitment difficulties are likely to worsen in the South East area since approximately 36% of employers expect their workload to increase over the next six months and 60% expect their workload to stay the same.

The majority of employers in the South East area (84%) were satisfied that their **existing** employees were able to cope with current requirements. However, just under half (45%) reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. The South East accounted for 3,970 of these registrations.

Table 28
South East

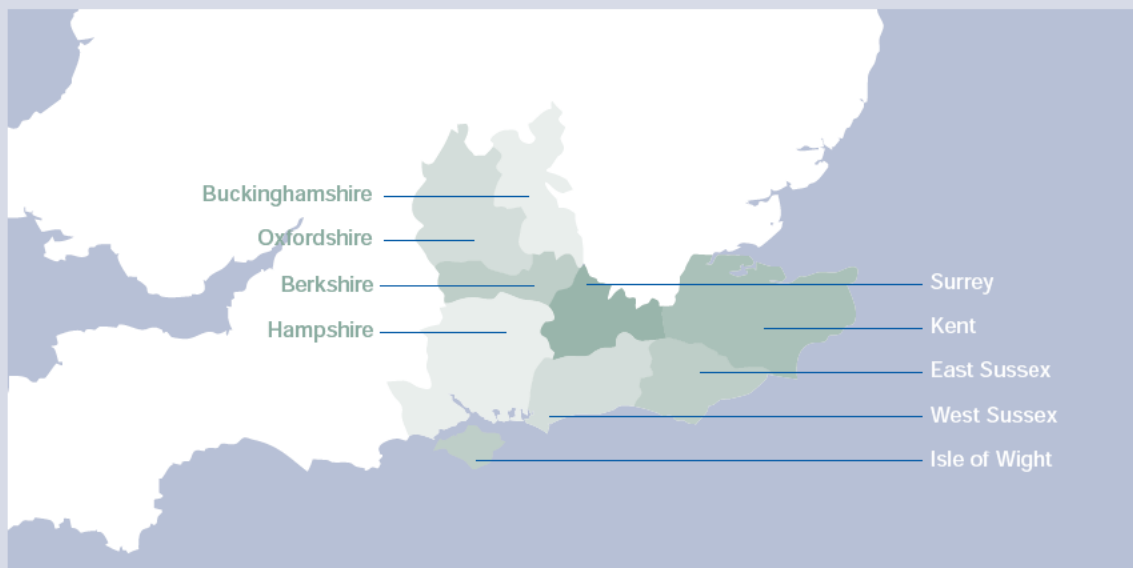
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	39,140	47,130	2,160	10,800
Clerical	31,670	33,360	1,610	8,050
Professionals	19,860	24,100	1,110	5,550
Technicians	8,120	9,900	450	2,250
Wood Trades	41,210	47,360	2,240	11,200
Bricklayers	21,820	23,550	1,120	5,600
Painters and decorators	17,600	19,350	930	4,650
Plasterers	4,090	3,760	200	1,000
Roofers	8,660	9,910	460	2,300
Floorers	5,650	6,480	310	1,550
Glaziers	5,960	6,820	320	1,600
Other SB Operatives (1)	7,280	7,740	380	1,900
Scaffolders	1,970	2,280	110	550
Plant Operatives	6,170	7,330	340	1,700
Plant Mechanics/Fitters	3,900	4,480	210	1,050
Steel Erectors/Structural	1,930	2,560	110	550
Other CE Operatives (2)	13,650	15,930	740	3,700
General Operatives	15,270	16,670	800	4,000
Maintenance workers	3,290	4,300	190	950
Electricians	22,500	25,910	1,240	6,200
Plumbers	21,830	27,000	1,220	6,100
Non-construction operatives	7,620	8,740		
Total	309,190	354,660	16,250	81,250

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.





In the London area, construction output in 1995 prices is forecast to increase by an average yearly rate of 1.3% over the forecast period 2003–2007. This compares with the 2.1% growth rate forecasted for Great Britain as a whole. In terms of construction employment, the requirement in London is expected to increase by an average yearly rate of 1% over the forecast period, below the average for Great Britain of 1.9%.

Current major projects

- **Infrastructure:** A £300m 4.4 km extension to Docklands Light Railway between Canning Town and London City Airport; construction of a £200m underground baggage system at Terminal 5, Heathrow.
- **Commercial:** A £170m retail and office development in Central London, a £150m mixed development at Bishops Square with associated infrastructure.

Proposed major projects

- **Infrastructure:** There is strong activity proposed in this area including a £2 billion upgrade to the West Coast Mainline from London Euston to Glasgow and Edinburgh; two projects for tram routes in the city – a £300m route from King's Cross to Camden and a £200m route from Uxbridge to Shepherds Bush.
- **Commercial:** A £270m project to construct retail and office accommodation at North Quay with local infrastructure.

Reported skill shortages and skill gaps

According to the Employers' Skill Needs Survey Autumn 2002, 64% of employers in London experienced difficulties in recruiting skilled staff in the preceding three months. However, only 53% had a long-term vacancy (i.e. in addition to normal recruitment for contracts). Furthermore, of these companies with a long-term vacancy, 83% of them had managed to fill it. Consequently only 9% of the companies in the London sample were left with a long-term vacancy.

The recruitment of wood trade occupations was worst affected, followed by bricklayers and plasterers.

Recruitment difficulties are unlikely to ease in the London area since approximately 56% of employers expect their workload to increase over the next six months and 42% expect their workload to stay the same.

The majority of employers in London (80%) were satisfied that their **existing** employees were able to cope with current requirements. However, 36% reported problems with **new** employees who, although trained and qualified, still lacked a variety of skills required. This response is possibly not surprising since new trainees will need to do some on-the-job training even if formally qualified.

Provision of training

For Great Britain as a whole there were approximately 41,000 candidates on the On-Site Assessment and Training scheme in 2003. London accounted for 8,367 of these registrations.

Table 29
London

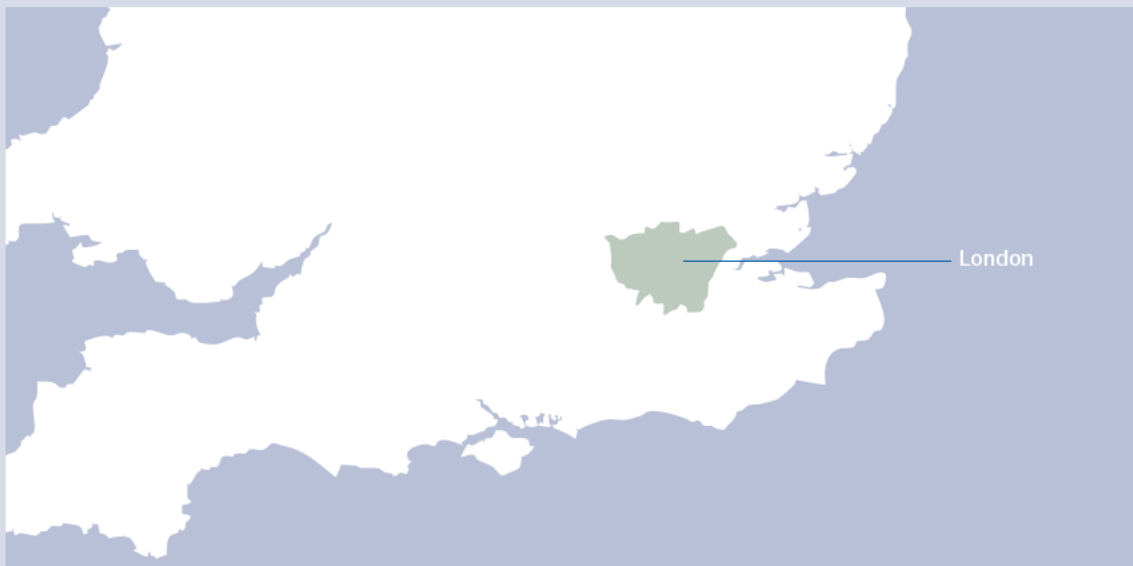
	2003	Total Employment 2007	Average Annual Requirement (2003-2007)	Cumulative Requirement (2003-2007)
Managers	39,610	43,090	1,420	7,100
Clerical	15,070	14,340	520	2,600
Professionals	16,450	18,030	600	3,000
Technicians	7,660	8,450	280	1,400
Wood Trades	30,900	32,090	1,110	5,550
Bricklayers	11,230	10,950	390	1,950
Painters and decorators	14,160	14,070	500	2,500
Plasterers	5,530	4,600	180	900
Roofers	3,330	3,450	120	600
Floorers	5,670	5,880	200	1,000
Glaziers	2,460	2,540	90	450
Other SB Operatives (1)	8,640	8,300	290	1,450
Scaffolders	4,940	5,170	180	900
Plant Operatives	4,440	4,770	160	800
Plant Mechanics/Fitters	5,090	5,280	180	900
Steel Erectors/Structural	410	490	20	100
Other CE Operatives (2)	9,010	9,500	330	1,650
General Operatives	11,030	10,880	390	1,950
Maintenance workers	1,840	2,180	70	350
Electricians	30,490	31,740	1,090	5,450
Plumbers	18,660	20,850	680	3,400
Non-construction operatives	5,740	5,950		
Total	252,360	262,600	8,800	44,000

Source: CITB Employment Model, 2003

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Numbers rounded to the nearest ten. Total requirement does not include non-construction operatives.

For more comprehensive data on the region, CITB also produces separate regional Skills Foresight Reports. To request a copy, please see contact details at end of document.



Section 5: Training Supply

Craft and Technical Training

So far, this report has looked at the likely skill demands for the construction industry between 2003 and 2007, and put this in the context of current training levels. This section looks more closely at training and how it is measured, as well as some of the detail behind the headline numbers.

Each academic year CITB conducts a survey to measure the numbers of people entering construction training: The Trainee Numbers Survey. Data is collected from colleges, private training providers and construction industry training centres across Great Britain. These include those coming through CITB's own Managing Agency and those entering other formal certificated training at craft and technical level. In all, training for seventeen different occupations is covered. The results are used to project the number of skilled workers who will enter the industry.

There are several advantages in using this method to gauge training levels over other sources of information. Primarily, it is used because the information is available quickly – if numbers are to be used for forecasting purposes, then a key requirement has to be that they are up to date. With the Trainee Numbers Survey, initial results are available within a matter of weeks. The survey also allows information to be analysed at local and regional levels, pinpointing potential skill shortage hot spots, as well as areas of possible oversupply of training.

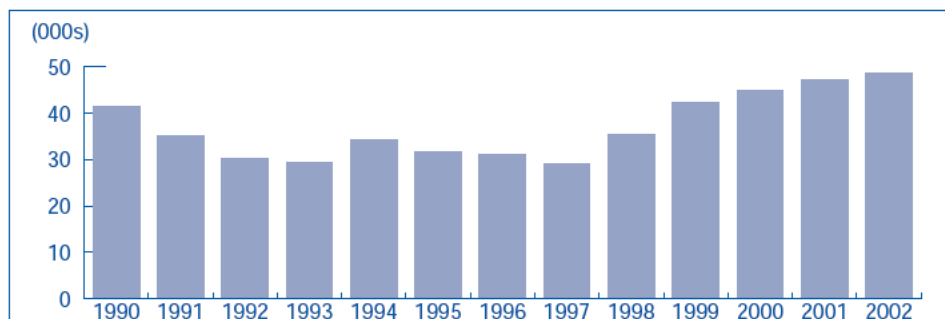
Numbers in Training

The number of first-year construction trainees increased for the fifth year running in 2002/03. This is highlighted in Chart 25, illustrating the trend in levels of training across all craft and technical occupations over the past thirteen years.

Throughout the early 1990s, the number of first-year construction trainees fluctuated between 30,000 and 35,000. After reaching a low point of just over 29,000 in 1997, numbers have since increased strongly, with 1999 seeing numbers climb above 40,000 for the first time since the late eighties. Growth has continued into 2002, though at a reduced rate of increase.

Chart 25

First-year Trainees on Construction Courses, Great Britain: 1990–2002



Source: CITB Trainee Numbers Survey, 2002/03

Table 30 shows the overall first-year intake for the seventeen occupations covered by the survey. This covers a slightly broader range of occupations than analysed so far in this report by looking beyond the building craft trades. It shows the breakdown of trainees by both age and gender.

As with previous years, wood trades and bricklaying dominate the first-year training figures. Together they account for just under half of all construction training, although this year has witnessed a growth in training outside the main building trades.

Table 30

First-year Trainees on Construction Courses at Further Education Colleges and Training Centres, Great Britain: 2002/03

	Trainees Under 18		Trainees 18 and Over		Total
	Male	Female	Male	Female	
Technical	1880	149	4927	514	7470
Carpenters & Joiners	9123	54	5337	176	14690
Bricklayers	5004	25	3337	33	8399
Painters	1993	150	1541	357	4041
Plasterers	805	8	802	11	1626
Roofers	247	1	107	1	356
Floorers	119	0	254	6	379
Glaziers	54	0	34	4	92
Other SB Operatives	26	0	164	0	190
Scaffolders	189	0	446	1	636
Plant Operatives	51	0	2042	4	2097
Plant Mechanics	154	0	59	1	214
Steel Erectors/Structural	0	0	42	0	42
Other CE Operatives	0	0	274	0	274
General Operatives	516	5	1901	7	2429
Maintenance Workers	34	1	19	1	55
Mechanical Engineering	2742	9	2966	37	5754
Total	22,937	402	24,252	1,153	48,744

Source: CITB Trainee Numbers Survey, 2002/03

⁽¹⁾ Specialist Building, ⁽²⁾ Civil Engineering

Table 30 shows that of the 48,744 first-year trainees, around 3% were female (1,555) which is the same proportion as in 2001/02. Whereas male trainees are fairly evenly divided between those aged 18 and over and those aged under 18, there are by far more female adult trainees than under 18s (1,153 compared to 402).

Further equal opportunities data that is not shown in Table 30, but is provided by the Trainee Numbers Survey, is the numbers of ethnic minority trainees. This year (2002/03), 4% of first-year trainees are from an ethnic minority (2,068) which is a rise of 1% on the previous academic year. The collection of equal opportunities data shows strong regional variations, with London having the highest proportion of both female trainees (7%) and ethnic minority trainees (32%).

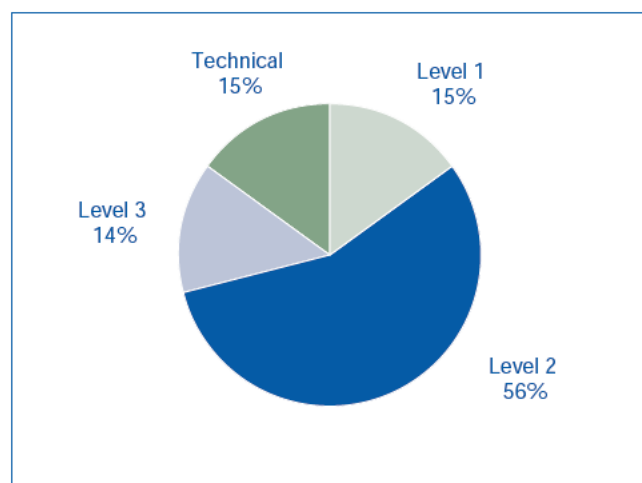
Training by Qualification

Data is collected on trainees starting construction qualifications at each of the following levels:

- NVQ/SVQ Level 1 or Foundation Construction Award
- NVQ/SVQ Level 2 or Intermediate Construction Award
- NVQ/SVQ Level 3 or Advanced Construction Award
- Technical Courses
(National Certificate/Diploma and Higher National Certificate/
Diploma).

Chart 26 shows the percentage of first-year trainees on a qualification within each of these levels for the whole of Great Britain.

Chart 26
First-year Trainees Undertaking a Construction Qualification at Each Level, Great Britain: 2002/03



Source: CITB Trainee Numbers Survey, 2002/03

Within Great Britain, just over half (56%) of the first-year trainees are undertaking a qualification at NVQ/SVQ Level 2 or an Intermediate Construction Award, with the remaining 44% spread between the other three levels.

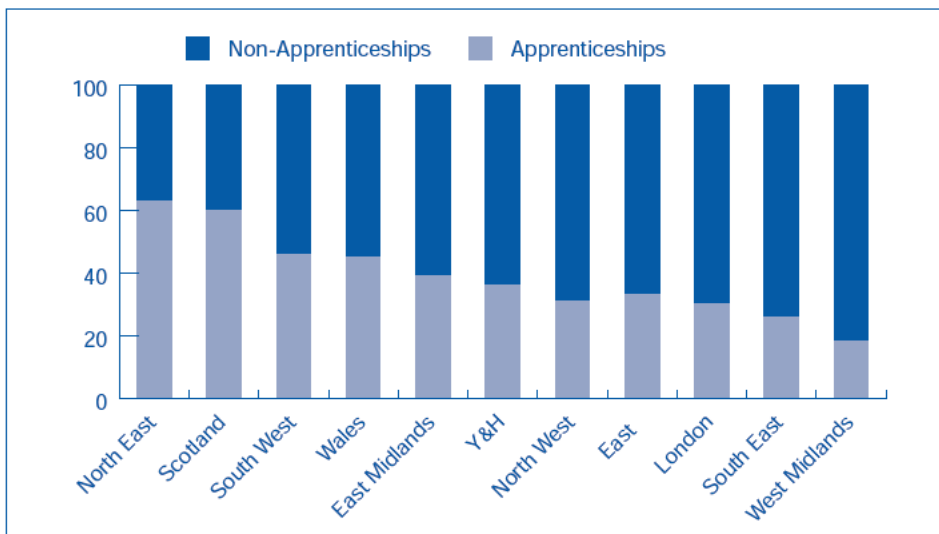
This pattern is consistent across all the regional development areas of England and Wales, with the highest proportion of first-year trainees undertaking a Level 2 or equivalent qualification. However, the exception to this is Scotland, where the majority of trainees are on an SVQ Level 3 as opposed to a Level 2.

An explanation for this lies in the fact that in England and Wales, an NVQ Level 2 is regarded as the normal skill level for craftspeople. In Scotland, an SVQ Level 3 is the expected level of skill requirement.

Apprentices

The Trainee Numbers Survey also asked training providers to identify the proportion of their first-year trainees who are on Modern Apprenticeship training. The results show wide variations between one training provider and another, and between one area and another. Areas where Modern Apprenticeship training predominates are the North East and Scotland, where over half of all trainees fit into this category. Overall the proportion of first-year trainees in Great Britain on an NVQ/SVQ Level 2 course or higher and pursuing some form of apprenticeship is 38%, or 16,000 individuals.

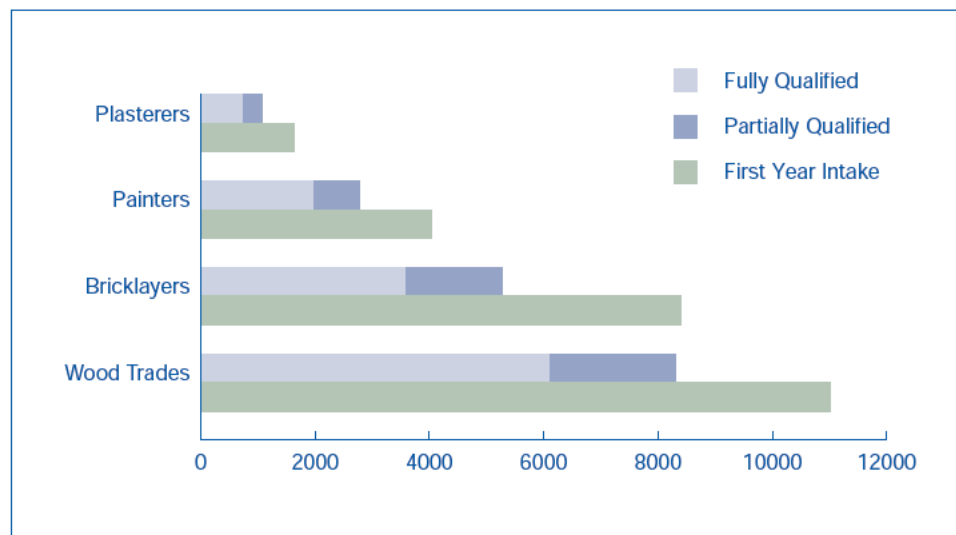
Chart 27
Proportion of First-year Trainees who are Undertaking a Modern Apprenticeship in Construction by Country and Region, Great Britain: 2002/03



Source: CITB Trainee Numbers Survey, 2002/03

Chart 28 illustrates the difference between the total first-year intake and the proportion of the first-year intake that is estimated will be trained or partially trained construction workers. For the main building trades, around 40% of trainees will leave the course before finishing it. Around half of these will leave the construction industry entirely; the remainder, along with many of those who complete an NVQ/SVQ Level 1, will continue to work in construction as partially trained workers. Wood trades is reduced further to reflect the fact that only just over 75% will work in the construction industry.

Chart 28
Comparison of First-year Intake and Trained Output to the Construction Industry by Trade, Great Britain: 2002/03



Source: CITB Trainee Numbers Survey, 2002/03

School Leavers

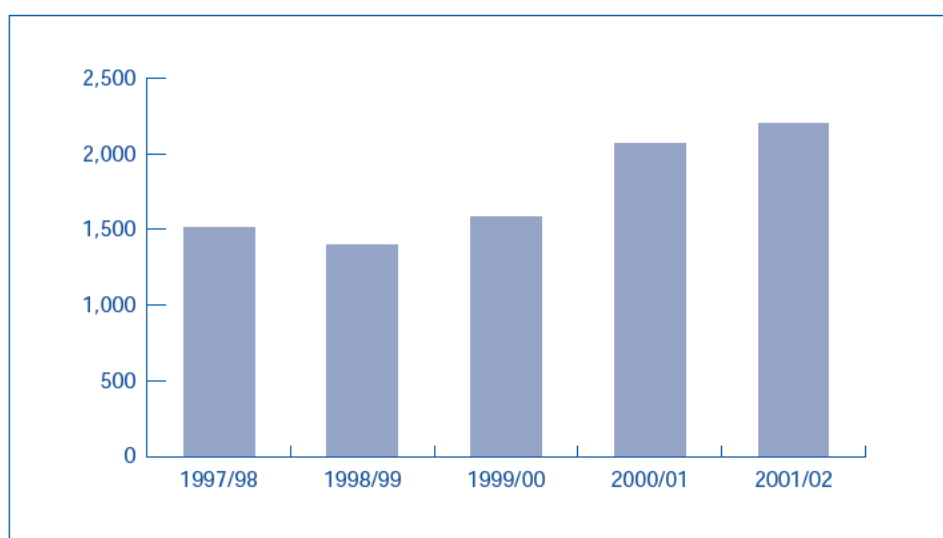
One of the main areas of supply for construction training courses is Year 11 school leavers. The 2002 Annual Activity Survey undertaken by Connexions Partnerships and Careers Services publishes figures for England on the destination of young people engaged in employment or training following Year 11. The data shows that 11.5% of young people in this age group entered training or work in 'skilled construction' occupations. The gender breakdown of these reveals that 18% of males went into 'skilled construction' jobs or training, compared with 0.3% of females. A further 3% of all school leavers entered 'plant or machine operatives' jobs or training with around 16% entering 'labouring or other elementary occupations' (although clearly not all in construction). The results from the survey show that the numbers entering 'skilled construction' jobs or training has risen for the second year running.

Northern Ireland

Chart 29 shows that in 2001/02 there were 2,199 first-year enrolments on construction courses at further education colleges in Northern Ireland, a 6% increase from the previous year and an increase of 45% since 1997/98. It should be noted that the increase in enrolments in 1999/2000 is likely to be a result of the merger of Government training centres with the further education sector.

Chart 29

First-year Enrolments on Construction Courses at Further Education Colleges, Northern Ireland: 1997/98–2001/02



Source: CITB Northern Ireland: Workforce Development Plan for the Construction Industry in Northern Ireland 2003–2007

A detailed look at total enrolments by specific subject areas in Table 31 shows that carpentry and joinery, plumbing, brickwork and plant mechanic courses have had the highest increase in enrolments between 1996 and 2002. The bricklaying and plastering trades have suffered severe shortages of new entrants over the past number of years, so it is encouraging to see that there has been an increase in the current intake figures for these sectors.

A number of training initiatives has been developed by CITB Northern Ireland to address the need to recruit into the wet trades and other occupations experiencing difficulties in attracting new entrants (such as roofing and wall & floor tiling). These initiatives include running Introductory Training Programmes for adult entrants and facilitating Employer-Led Modern Apprenticeships (ELMAs).

In 2002, there were approximately 2,076 new entrants through apprenticeships, compared to 2,214 new entrants in 2001. The greatest demand for apprenticeship training in 2002 was in carpentry and joinery, trowel occupations and plumbing, with no demand in building services, general construction, scaffolding, roofing, road surfacing or mechanical and thermal insulation occupations.

Table 31
Total Enrolments on Construction Courses at Further Education Colleges,
Northern Ireland: 1996/97–2001/02

	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Carpentry and joinery	908	1,241	1,121	1,331	1,617	1,696
Brickwork	271	338	339	386	565	593
Plumbing	237	231	192	259	418	586
Painting and decorating	182	202	151	147	172	204
Plant mechanic	43	80	79	90	79	88
Plastering	49	49	48	49	58	69
Others in building	57	33	25	11	26	22
Roof slating and tiling	25	37	14	22	21	23
Heating, ventilation and air-conditioning	18	47	24	15	10	0
Yearly intake total	1,791	2,258	1,981	2,310	2,966	3,281
Percentage increase	–	26%	-12%	17%	28%	11%

Source: CITB Northern Ireland: Workforce Development Plan for the Construction Industry in Northern Ireland 2003–2007

Table 32 shows that the numbers actually achieving awards in construction-related NVQs in Northern Ireland has remained relatively constant over the past five years, with less than a 1% increase in those achieving NVQs between 1997/98 and 2000/01. The numbers achieving at Level 2 have actually declined by approximately 10%.

Table 32
NVQ Awards in Construction and Property (Built Environment) Courses,
Northern Ireland: 1997/98–2000/01

	1997/98	1998/99	1999/00	2000/01
Level 1	138	159	254	274
Level 2	1,593	1,605	1,425	1,442
Level 3	770	639	861	800
Level 4 & 5	2	0	10	9
All courses and levels	2,503	2,403	2,550	2,525

Source: CITB Northern Ireland: Workforce Development Plan for the Construction Industry in Northern Ireland 2003–2007

Destinations of Early Leavers and Completers

The CITB Trainee Exit survey provides some idea of the initial destinations of those who leave their courses, either after completion or after having left early.

Looking at both early leavers and completers together, just over 60% either go on, or continue, to work in construction, with 40% leaving the industry altogether. It should be noted that this is probably the upper end for such estimates, with an actual figure of between 20% to 40% leaving the industry, dependent upon the course.

It must also be remembered that these figures refer to immediate destinations only; there will be considerable churn amongst the workforce, with people moving into or dropping out of construction over time.

Table 33
Immediate Destinations of those Leaving Construction Training, Great Britain
(CITB Managing Agency Trainees 2001)

Destination	Early Leavers	Completers	Weighted Average
Unemployed	18.10%	1.70%	8.30%
Staying with Current Employer	11.60%	60.50%	41.00%
Starting a New Job in Construction	13.30%	10.50%	11.60%
Starting a New Job in Another Industry	24.60%	1.70%	10.90%
Starting Another Training Course	11.90%	6.30%	8.60%
Starting a Further Education Course	10.20%	7.80%	8.80%
Self-employed in Construction	7.20%	9.50%	8.60%
Self-employed in Another Industry	<1%	<1%	<1%
Looking to Finish Course	2.00%	0.00%	<1%
Armed Forces	<1%	<1%	<1%
Working Abroad	<1%	<1%	<1%
Other	2.00%	1.30%	1.60%

Source: CITB Trainee Exit Questionnaire, 2001
 The weighted average assumes 60% of starters will complete their course.

Training Capacity

Anecdotal evidence continues to suggest that the education and training system is struggling to meet the demand for training from the construction industry. In 2003, CITB undertook research designed to measure the difference between the demand for college places and their availability, in order to argue the case more strongly for increased funding for construction training. The results of the research confirm that shortage of capacity is already a serious problem for plumbing and related trades, and is also a significant and growing restraint on the amount of training in construction craft occupations.

Around 75% of colleges expected their construction craft courses to be oversubscribed in the 2003/04 academic year. Of these, nearly a quarter said that they would probably have to turn away between 10 and 20% of applicants due to a lack of facilities or a shortage of instructors. More worryingly, 12% of oversubscribed colleges said that they would have to turn away over half of all applicants for construction courses as a result of limited capacity.

Many colleges have been able to respond to this increase in applicants by providing more training places but, as shown by the research, this will not be sufficient to keep pace with the demand. Collectively colleges reported that they would provide around 18% more places on construction courses in 2003/04 compared with the previous year. However, they expected applications to increase by around 22%. Applications from 16–18 year olds are expected to rise by nearly 20% for 2003/04, with the rise among those aged 19 years and over being 25%.

The problem is not simply one of lack of space. Many colleges reported difficulties in retaining staff, particularly when instructors' pay is low in comparison with rates in the industry. The problem is further compounded by the relative expense of running construction courses in comparison with other further education courses, particularly given the large numbers of adults wishing to retrain who do not receive Modern Apprenticeship funding.

Nor is it only colleges that are struggling to find places for potential trainees. There is a lack of understanding amongst employers of the contribution they have to make to vocational training. In order to qualify for an NVQ or SVQ, the students need to have gained work experience in the industry, which for many will mean finding an employer willing to offer them a work placement. Around three-quarters of colleges stated that some of their trainees will face difficulties in achieving this. The scale of the problem varies, but around two-thirds of colleges expected that 10% or more of their students will not find a work placement during their training, with around 15% of colleges saying that over half their students will fail in this.

Looked at nationally, only half the colleges in Wales expected to turn away applicants for construction courses due to lack of capacity. By comparison, with around 80% of colleges saying that they expect to be oversubscribed, England faces the most severe problems meeting demand. Scotland on the other hand comes out worst in terms of shortage of work placements with colleges there stating that around 30% of trainees will fail to find suitable work experience.

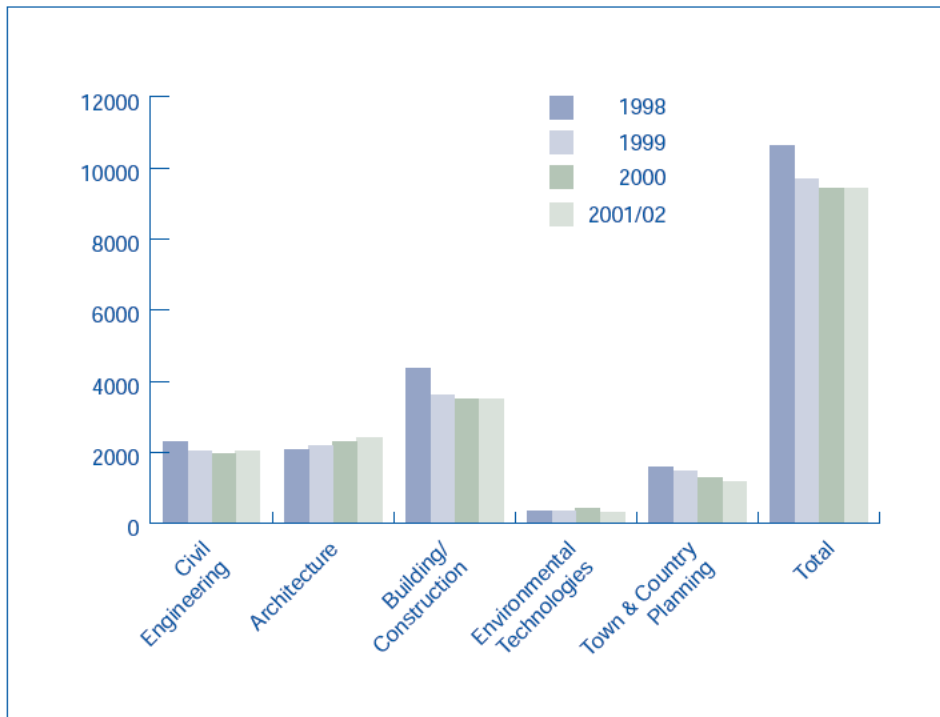
There is clearly scope to make better use of the space and resources that are currently available in the present system. Around 15% of all trainees are currently studying for an NVQ Level 1 – a qualification that is not generally recognised by the industry as representing sufficient competence. Directing available resources towards Level 2 and 3 courses, as is common in Scotland, would free up in excess of 7,000 extra places nationally.

Given the high level of dropout on some courses, it is also clear that places are currently being offered to those who are not interested or able enough to complete the course. Scarcity of places means that colleges are in the fortunate position to be more selective in offering those places to the most able and committed candidates.

Professional Training

The Higher Education Statistics Agency (HESA) collects figures for people attending construction-related courses at degree level. Chart 30 shows that, after declining for three consecutive years, the number of first-year undergraduates on construction-related courses remained stable around the 9,400 mark in 2001/02. There was some increase in architecture and civil engineering matched by decreases in environmental technologies and town & country planning.

Chart 30
Comparison of First-year Intake onto Construction-related Degree Courses: 1998/99–2001/02 (UK-based Students)



Source: Higher Education Statistics Agency

There has been little real change in the number of women entering construction training at degree level – down from 2,160 in 1998/99 to 2,103 in 2001/02. However, when set against the decline in total numbers, the proportion of women entering training compared with the proportion of men has actually increased from 20% in 1998/99 to 22% in 2001/02.

There has been no change in the numbers of first-year students from non-white ethnic minorities (1,100 in 1998/99 to 1,106 in 2001/02). This group accounts for around 12% of all first-year construction undergraduates, a proportion that has increased over this time given the overall fall in student numbers.

Company Training Activity

People Skills Scoreboard

CITB's *People Skills Scoreboard 2002* project aim was to discover how much training is going on in companies and how much they spend on it. Information on individual companies is set out in a scoreboard report that shows how they compare with each other, and how the sector fares as a whole.

Unlike most surveys, results were not confidential; instead individual companies were able to show in public the extent of their training activity. Naturally not all companies feel able to share this information. In particular very small companies, of which there are many in construction, are on the whole less likely to have significant training activity to report than their medium and large counterparts. However, for those small companies who are involved in training, it can represent a more significant proportion of their time and costs, as is shown below. So, although the Scoreboard should provide a reasonably fair benchmark of training in typical medium and large firms (a view confirmed by CITB Training Advisers), it cannot claim to be representative of the whole industry.

On average the construction companies who took part in the survey spend three days and £219 per employee per year (directly employed only) on **off-the-job**¹ training, plus 1.71% of payroll and 0.20% of turnover. The proportion this represents in terms of turnover varies from a low of zero to a high of 12%; which may indicate use of part-time employees and trainees.

On average companies with a Modern Apprentice spend an extra day per employee on off-the-job training, but in pounds per person they actually spend significantly less than companies with no Modern Apprentices. One explanation for this maybe due to the provision of funding and/or grants towards the cost of training a Modern Apprentice.

In regard to **on-the-job**² training, the construction companies within this survey spend on average six days and £415 per employee per year (directly employed only). As with off-the-job training, the highest levels of training on-the-job and expenditure per employee were found in very small companies who had one or more apprentices.

Given the nature of the construction sector, there is a steady requirement for training across all subsectors and companies of various sizes. Amongst the companies included in the Scoreboard, the following numbers of new trainees were taken on over the year: 59 graduates, 27 national trainees and 384 Modern Apprentices.

Approximately a third of companies taking part in the survey had a separate training budget. It tended to be smaller sized companies that did not have a budget.

The Effect of Employment Status on Investment in Training

Commissioned by CITB and the Department for Education and Skills and conducted by IFF Research, *The Effect of Employment Status on Investment in Training 2003* study aimed to examine the validity of the differential industry training levy. This is currently 0.5% of annual wage bill for direct employees and 1.5% of the net value of payments to labour-only sub-contractors [LOSCs] based on the industry assumption that those who rely on LOSCs are less likely to invest in staff training

The results summarise the 864 interviews with construction employers, site-based manual workers and recruitment agencies.

Use of labour-only sub-contracting

- Almost three in four (73%) employers had used LOSCs over the last 12 months.

Employers use labour-only sub-contracting to undertake a wide range of occupational roles. Most (76%) indicate they use LOSCs for skilled trades where they do not employ people in those trades, and very few use labour-only sub-contracting mainly for relatively low skilled, general labourer positions.

Apprentice training

- Overall two in five companies (42%) had apprentices or trainees at the time of interview. The likelihood of having any apprentices or trainees does not differ markedly simply by whether a company uses LOSCs or not.

¹ Off-the-job training includes all training away from the immediate work position. It can be given at the employers' premises or elsewhere. It includes all sorts of courses – full or part time; correspondence or distance learning, Health and Safety and so on – as long as it is funded or arranged by the employer.

² On-the-job training is undertaken at the desk or place where the person usually works.

Employer training activity

- The majority of employers (58%) had provided training to (non-apprentice) staff over the last 12 months. All the large firms (with 250 plus staff) had done so, as had nearly all (98%) the medium sized firms (with 50–249 staff). Simply whether or not a firm makes use of LOSCs has little effect on whether they undertake any training or not.

However, there is strong evidence that training is less likely to be provided to LOSCs.

Off-the-job training

- Most telling, overall a much higher proportion of directly employed staff received off-the-job training. For example, 17% of employers indicated that all their directly employed manual staff had received training over the last 12 months compared with 8% who employed LOSCs saying they had provided off-the-job training to all their LOSCs.

On the job training (employers)

- Overall, a greater proportion of directly employed staff receive on-the-job training than do LOSCs. For example, 17% of those with directly employed staff said all or nearly all these workers were given on-the-job training. This is twice the level found among employers with LOSCs in terms of the proportion of this type of staff given on-the-job training (9%).

Skill levels among LOSCs and directly employed staff

- Part of the explanation for less training being provided to LOSCs is that some employers see these staff as more highly skilled. Overall half the employers (49%) agreed that LOSCs are generally more skilled and do not need as much training (38% disagreed).

Site workers

- The picture on people currently working towards any qualifications confirms this. Overall, 17% of workers indicated they were working towards a formal qualification, and this was much higher among those directly employed (22%) than those in self-employment (10%).

In conclusion, there is strong evidence from both employers and construction workers that less is invested in the training of staff who are employed on an LOSC basis. It is also the case that LOSC workers tend to receive their training and qualifications while directly employed.

Learning and Training at Work

The Department for Education and Skills *Learning and Training at Work 2002* survey presents figures on key indicators of employers' commitment to training, including the management and delivery of training, the levels of provision of both off-the-job and on-the-job training, and also awareness of, and involvement with, various training initiatives.

The following data is from unpublished statistics obtained from the Department for Education and Skills by CITB, which identifies the construction sector separate from the other industry sectors.

Just under half of construction employers (46%) had provided any job-related training to their employees in the 12 months prior to the interview. The type of training which construction was more likely to provide was on-the-job training (21%) compared to off-the-job training (18%). Actually, construction has the highest proportion of employers providing off-the-job training, this equates to an average of 6.8 days per employee trained and 2.2 days per employee.

Employers who had provided off-the-job training in the last 12 months were asked about the existence of resources for training within their organisation. They were asked specifically whether the organisation had:

- someone at senior management level responsible for training
- members of staff to design and teach training courses
- a separate training facility such as a training school or centre.

Approximately three-quarters of employers in the construction sector (78%) had a member of senior management with responsibility for training within their organisation. However, construction companies did not perform well against the other industry sectors for having either training staff and/or training facilities (both 12%). Employers in the construction sector are more likely to have a business plan (65%) than a human resources plan (25%). This pattern is consistent with the other industry sectors.

Employers were also asked about the types of off-the-job training they had provided over the past 12 months. In the construction sector, Health and Safety was the most frequently provided off-the-job training (89%) while foreign languages training was the least likely to be provided (31%). Of those construction employers who provided off-the-job training, over half (56%) reported that at least some of this training was leading to a formal qualification.

In order to ascertain employers' involvement with a number of training initiatives, a series of questions was put to all employers covering:

- awareness of, and involvement with, training initiatives
- involvement and satisfaction with NVQs/SVQs.

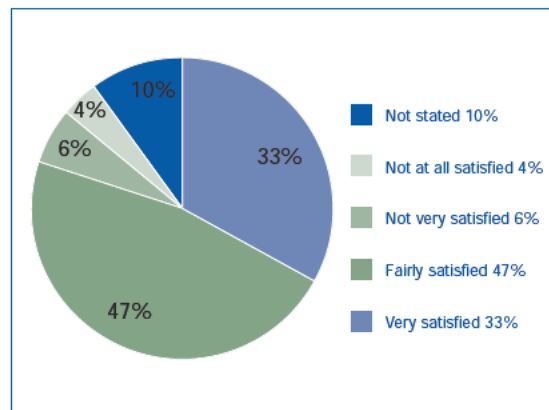
Across all industry sectors NVQs/SVQs are the initiative with the highest level of awareness, with over nine out of ten employers in each sector having heard of them.

Within the construction sector, 95% of employers had a high awareness of NVQs/SVQs but only a limited amount of knowledge of the Union Learning Fund (7%).

Relative to the level of awareness, NVQs/SVQs was also the initiative that the highest proportion of construction employers had been involved with (43%). Likewise the Union Learning Fund (along with the New Deal for Young People and the New Deal for Long Term Unemployed) have the lowest proportion of involvement in the construction sector. Just under half of construction employers (again 43%) offered NVQs/SVQs, and estimated that on average 46% of employees were offered them.

Employers were also asked to state how satisfied they were with the NVQs/SVQs on offer. Chart 31 shows the level of satisfaction reported by construction employers.

Chart 31
Construction Employers' Level of Satisfaction with NVQs/SVQs: 2002



Source: Department for Education and Skills: Learning and Training at Work Survey, 2002

As Chart 31 shows, construction employers are for the most part content with NVQs/SVQs.

Just over half of employers (57%) who had recruited 16–24 year-olds in the previous twelve months reported that some of their young recruits were on a training initiative. The company's internal training scheme was by far the most commonly used.

As was the case across all industry sectors, construction employers reported that the use of the company's training scheme was the most commonly used training initiative for 16–24 year-olds. However, in comparison with the other industry sectors, construction companies had a higher proportion using other Government supported training for young people, Foundation Modern Apprenticeships and Advanced Modern Apprenticeships, but were less likely to use the New Deal Initiative. Overall, construction was more likely than all other industry sectors to use any of the training initiatives.

Employers who had recruited 16–24 year-olds were asked what factors they took into account when so doing. A wide variety of factors were mentioned, with personality, attitude, flexibility and reliability being the most generally mentioned across all industry sectors. However, the most commonly mentioned factors in the construction sector were interest, enthusiasm and willingness to learn. The least mentioned factor for all industry sectors and construction was references.

Advertising in the local or regional press and word of mouth (both 38%) were the methods most widely used by construction employers to recruit 16–24 year-olds. The total for all industry sectors shows that as well as advertising in the local/regional press (43%), the Employment Service/Job Centres (34%) were also a favoured method. No construction companies reported that they had used either in store/window advertising or internet websites.

Table 34 reveals how construction employers perceived the impact of training on four factors. The majority of employers did not rate training as having any impact on turnover, employment or profit margins. However, when asked about labour productivity, a slightly higher percentage said it produced a small increase as opposed to making no difference. Overall, only a very small proportion felt that training had any negative effect on any of these four factors.

Table 34
The Perceived Impact of Training Amongst Construction Employers, England: 2002

	Large Increase	Small Increase	No Difference	Small Decrease	Large Decrease	Do Not Know
Turnover	7%	27%	56%	2%	1%	8%
Employment	6%	22%	65%	3%	<0.5%	4%
Labour productivity	13%	43%	37%	3%	–	3%
Profit margin on sales or services	6%	29%	53%	5%	–	7%

Source: Department for Education and Skills: Learning and Training at Work Survey, 2002

Northern Ireland

In research conducted by CITB Northern Ireland, levy payers were asked to provide occupational breakdown data for all employees. The data was extrapolated to provide information for the entire Northern Ireland construction industry and findings indicated that in 2001 there were 1,859 trainees in the Northern Ireland construction industry, accounting for 4% of the workforce. This includes trainees attached to formal training programmes as well as those who are undergoing work-based training. Those occupations with a higher than average percentage of trainees as part of their workforce are in the building engineering services sectors – plumbing, refrigeration/air-conditioning and thermal insulation occupations. The lowest levels of trainees as a percentage of the workforce are in wall and floor tiling, plant and roofing, or are labourers.

Table 35
Construction Trainees by Occupational Category, Northern Ireland: 2001

	Number of Trainees	Trainees as a Percentage of Total Occupation Employment	Percentage of All Trainees in Construction Employment
Brickwork	174	11%	9.4%
Wood trades	624	9%	33.6%
Wood machining	22	8%	1.1%
Painting and decorating	79	5%	1.1%
Plastering	67	3%	3.6%
Wall and floor tiling	0	0%	0%
Plant	71	2%	3.8%
Plumbing (including gas)	364	14%	19.6%
Heating/ventilating	72	11%	3.9%
Refrigeration/air-conditioning	17	14%	0.9%
Thermal insulation	10	12%	0.5%
Labourers	93	1%	5%
Roofing	24	2%	1.3%
Specialist operations	121	3%	6.5%
Total manual occupations	1,738	5%	93.5%
Supervisory, clerical, sales	40	1%	2.1%
Technical/professional	81	2%	4.4%
Total non-manual occupations	121	2%	6.5%
Total	1,859	4%	100%

Source: CITB Northern Ireland: Workforce Development Plan for the Construction Industry in Northern Ireland 2003–2007

One of the major issues facing the Northern Ireland construction industry is to increase participation in training and learning throughout the industry, in particular for both adults and smaller construction organisations. Adult participation in training is needed to upskill the current workforce, of which a significant proportion fall into the older/adult age categories and many of whom have not participated in formal training programmes since leaving school. Small organisations often discard the idea of training due to issues such as costs, location and time involved.

At present one of the mechanisms CITB Northern Ireland is using to encourage employer participation in training is the development of Skills Development Programmes (SDPs) with levy payers. SDPs examine the current qualifications of all employees and labour-only sub-contractors within the organisation, and recommend the training to be undertaken so that individuals can carry out their job roles more effectively and efficiently, with particular emphasis on health and safety training. The Skills Development Programme started in 1997 and a review in 1999 showed that 71% of companies contacted had taken part in training since participating in the initiative.

Section 6:

Recruitment and Training

Dynamics of the Construction Labour Supply

Labour mobility for the construction industry is high. Results from the Labour Force Survey show that, in recent years, the annual turnover in construction employment has been approximately 10% of the total: the annual outflow has to be balanced by a corresponding inflow. This factor has to be taken into account when calculating the required annual intake. Given that employment has been increasing steadily over the past six years, inflows have been higher than outflows.

The dynamics of the construction labour market are best explained with a flowchart and in Figure 4 a number of different flow types are identified.

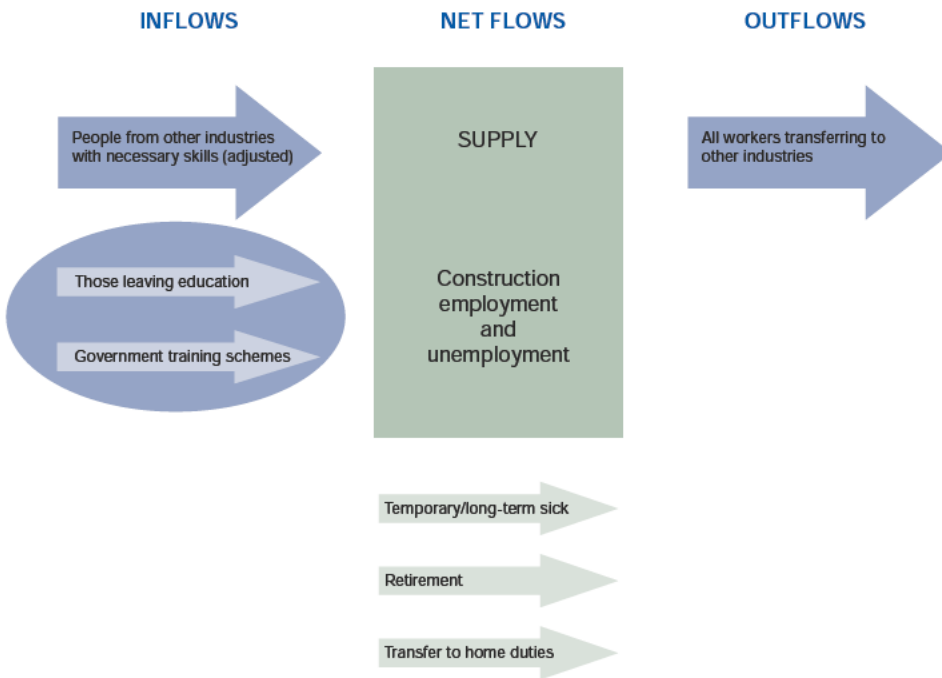
Net flows are defined as inflows less outflows. Specific bi-directional flows are not modelled, rather the total flow (or net flow) is modelled. This can be positive or negative indicating an overall inflow of workers or outflow of workers respectively, dependent on economic conditions.

For the purpose of this model, inflows are set equal to zero. The final supply estimate (and hence the requirement estimate) given by the model does not include flows from these sources, namely schools, universities, and Government training schemes. The upshot of this is that the model gives an indication of the number of persons who will need to be sourced from these areas and who therefore need training.

The only variable in the stock-flow methodology taking into account specific directional flows is that of inter-industry change or occupational mobility. This variable takes the inflow of workers from other industries and applies a percentage to account for the number of people who are likely to have the necessary training (that is, those who may have worked in the construction industry before). This is used with the outflow of construction workers to other industries to obtain the 'real' flow adjusted for trained individuals. The rationale behind this assumption is that at any moment in time, people with the relevant skills are part of the labour supply to the construction industry, even if not working in the industry at that time.

Once all flows have been calculated for a given year as a percentage of supply, they are summed up and the resultant percentage value is taken away from supply (in the flowchart this is synonymous with summing up the value of each arrow). This methodology continues each year to give the annual trained labour supply over the forecast period.

Figure 4
Flowchart of the Construction Labour Supply



Required Intake, Training and Qualifications

At the Operative Level

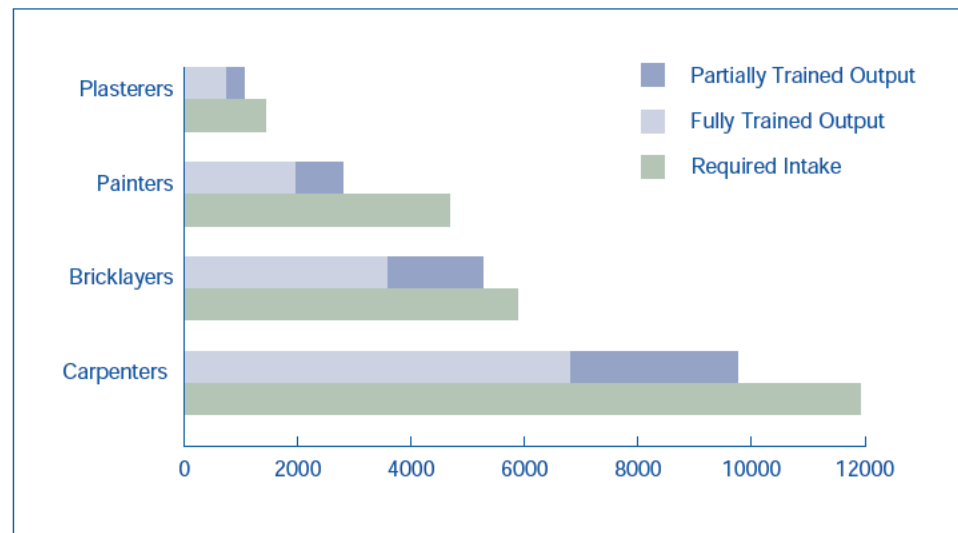
In this subsection we compare the required intake as forecast by the CITB Employment Model with the numbers achieving formal qualifications. Training in the industry was covered in Section 5.

When considering the trained intake, the traditional approach has been to allow for the fact that skills in the construction industry are acquired in a variety of ways, such as on-the-job training and conversion training of operatives transferring from other industries. However, with the current drive towards achieving a fully qualified workforce as outlined in Section 1, we need to compare the required intake with the estimated number of formally trained workers joining the industry.

The following charts show the comparison between the number of trainees obtaining a qualification and the required intake for the main occupational groups in construction.

The building trades are the largest group of operatives in the industry. At the beginning of the forecast period (2003), total employment in the building trades at approximately 586,000 represents 30% of total employment in the industry and 40% of all operatives. In building trades a combination of fully and partially trained output covers most of the required intake: 90% for bricklayers, 70% for wood trades, 75% for plasterers and 60% for painters and decorators. It should be pointed out that the share of plasterers, bricklayers and painters and decorators is projected to decrease over the forecast period while the share of wood trades is projected to remain unchanged.

Chart 32
The Building Trades, Great Britain: 2003–2007
Annual Average Required Intake Compared with Trained Output

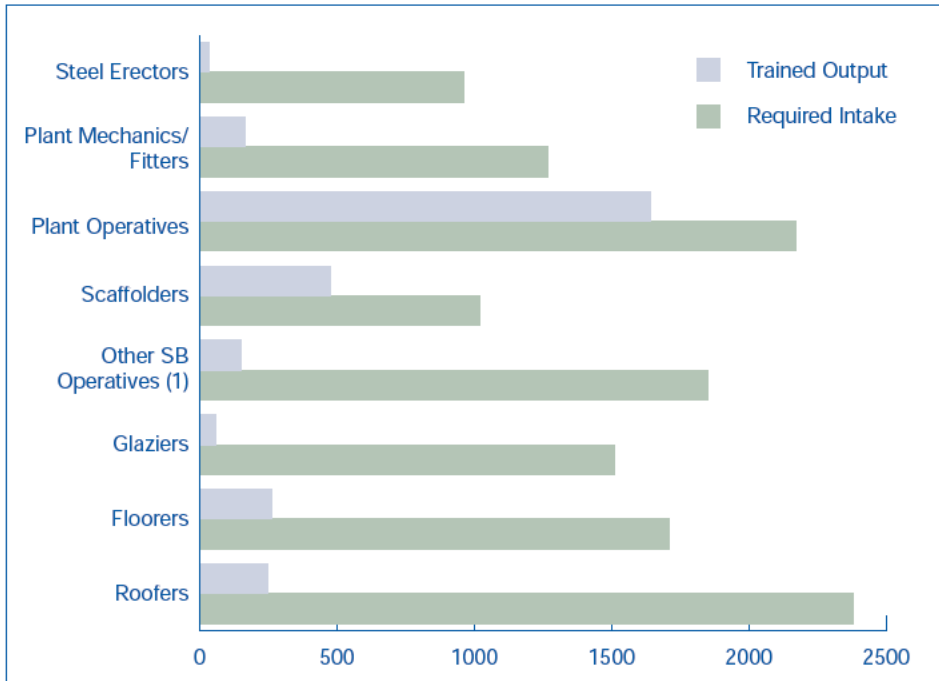


Source: CITB Employment Model, 2003; CITB Trainee Numbers Survey, 2002/03
Please note that the fully trained output includes only those with a minimum of NVQ Level 2 (the industry's required standard). Also, it assumes that only 60% of those beginning training will achieve a qualification. The partially trained output includes those at Level 1 and assumes that a further 20% of those beginning training will join the industry. Wood trades is reduced further to reflect the fact that only just over 75% will work in the construction industry.

Chart 33 shows that for civil engineering and specialist building trades less than 20% of the required intake is met by formally trained craftspeople. For glaziers and steel erectors the percentage falls to less than 5%. There are, however, two exceptions, namely plant operatives (almost 90% covered) and scaffolders (nearly 60% covered).

Overall approximately 12,000 operatives in this group are required to join the industry each year. Of these approximately 3000 enter the industry with formal qualifications leaving a balance of 9,000 receiving only short-duration, informal or on-the-job training.

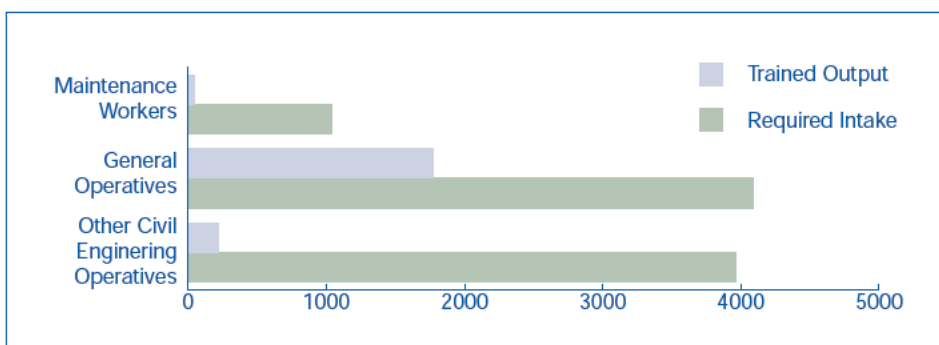
Chart 33
Civil Engineering and Specialist Building Trades, Great Britain: 2003–2007
Annual Average Required Intake Compared with Trained Output



Source: CITB Employment Model, 2003; CITB Trainee Numbers Survey, 2002/03
⁽¹⁾ SB = Specialist Building
 For steel erectors, only 34 are in training.

Looking at other trades, the average annual required intake is approximately 8,000. Of these, approximately a quarter have some form of formal training. General operatives fare best with half of the required intake covered by formal training (Chart 34).

Chart 34
General, Civil Engineering and Maintenance Operatives, Great Britain: 2003–2007



Annual Average Required Intake Compared with Trained Output

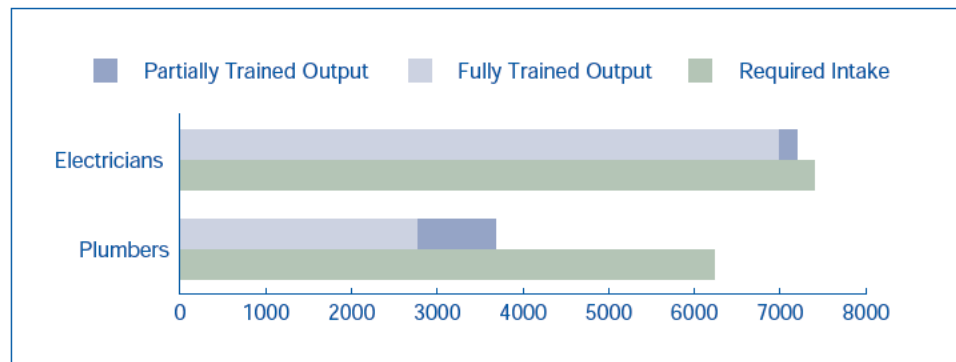
Source: CITB Employment Model, 2003; CITB Trainee Numbers Survey, 2002/03

Chart 35 for building services presents a mixed picture. For plumbers, including heating and ventilating engineers, approximately 45% of the required intake is met by formally trained craftspeople, increasing to 60% if partially trained craftspeople are added.

For electricians, only the fully trained output has been included and this covers approximately 95% of the required intake.

The trained output has been deflated by 50% for electricians (from 14,000 to 7,000) and by 20% for plumbers (from 4,600 to 3,700) to take into account operatives in these trades working outside the construction industry.

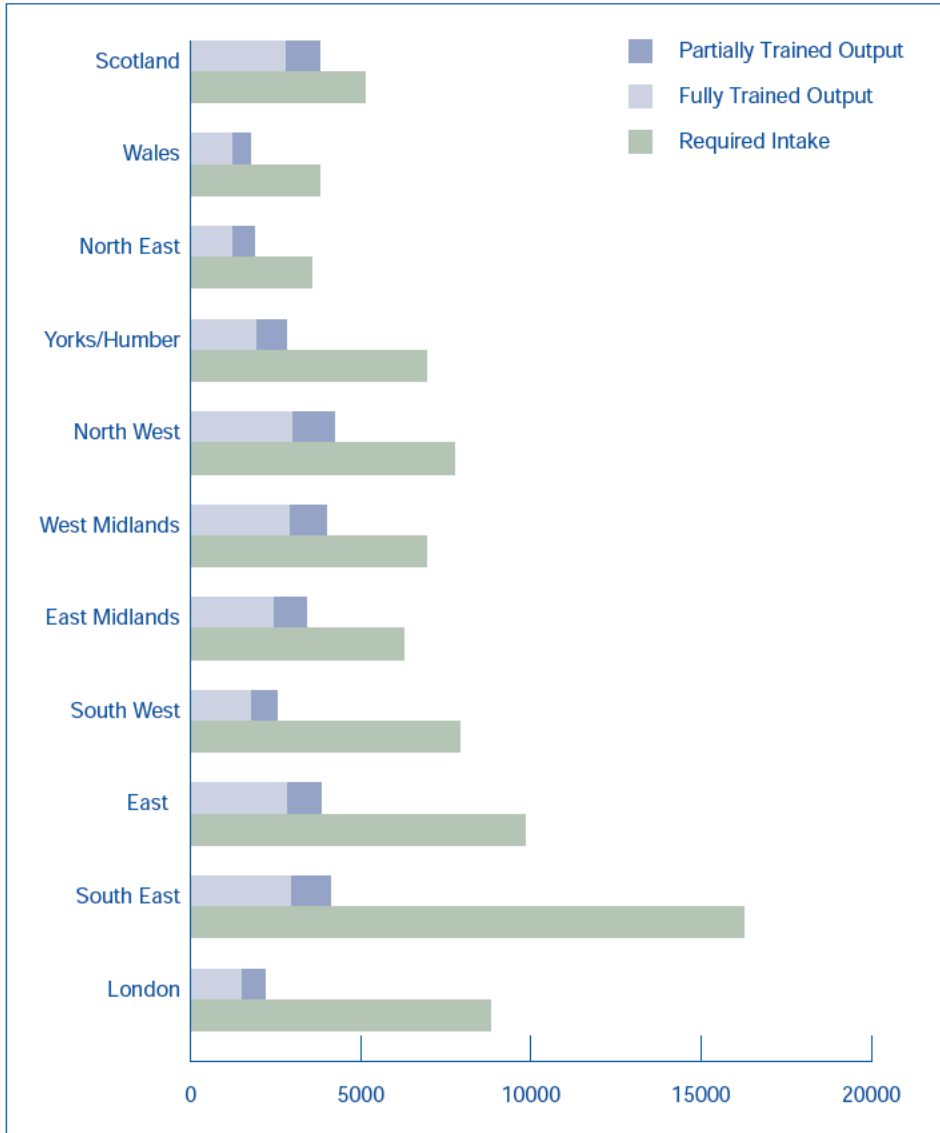
Chart 35
Building Services, Great Britain: 2003–2007
Annual Average Required Intake Compared with Trained Output



Source: CITB Employment Model, 2003; CITB Trainee Numbers Survey, 2002/03
Measuring the Supply of New Entrants to the Construction Industry, Consultation Paper by ECOTEC, 2001

There are also considerable regional differences in the proportion of the required intake into the industry that is covered by fully or partially trained output. Thus for the South East and London, only a quarter of required intake is covered by some form of training compared to Scotland, two thirds, and just over a half for the northern regions, except Yorkshire and Humber, and the Midlands (Chart 36).

Chart 36
Regional Comparison of Annual Average Required Intake Compared with Trained Output, All Trades, Great Britain: 2003–2007



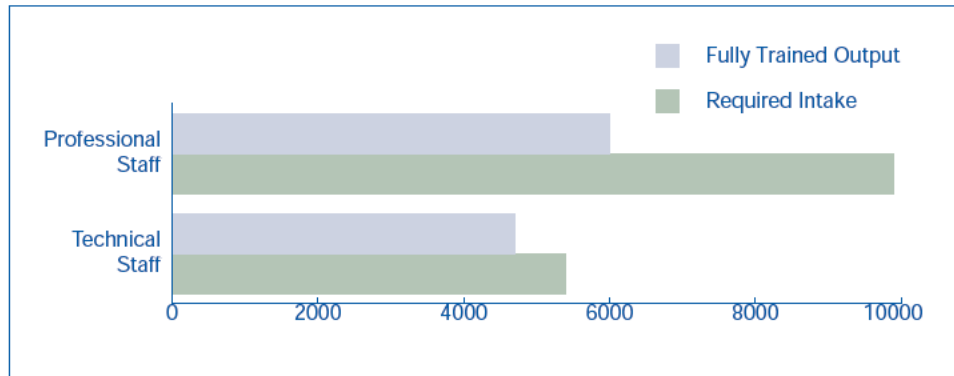
Source: CITB Employment Model, 2003; CITB Trainee Numbers Survey, 2002/03

Broadly speaking the further north one goes in Britain, the better the level of training is, relative to the numbers of skilled workers required. Significantly this is the same regional pattern that occurs with respect to the level of self-employment in the workforce.

At the Professional Level

Over the forecast period 2003–2007, professional and technical occupations in the industry are projected to increase at a faster rate than construction employment as a whole. On the other hand, the recent trend in undergraduate recruitment onto construction courses has been downward, although the numbers have remained stable between 2001 and 2002. The combination of these two factors could lead to serious shortages over the next five years, as shown by Chart 37.

Chart 37
Professionals and Technical Staff, Great Britain: 2003–2007
Annual Average Required Intake Compared with Trained Output



Source: CITB Employment Model, 2003; CIC Survey of Professional Services, 2001–2002; CITB Trainee Numbers Survey, 2002/03

On the supply side, HESA/UCAS figures show a dropout of approximately 10%, yielding a trained output of approximately 8,500. Dropout figures have increased over the period 1999–2001 and we have taken the average over the three-year period. Trained output has been further deflated by 20% to take into account construction professionals working outside the built environment. Numbers for technical staff have been deflated in the same way.

The Way Forward

At the operative level, the figures in this section continue to show a substantial gap in the provision of formal training if the aim is to achieve a fully qualified workforce.

The initial loss in training numbers plays a major role: a 40% drop-out rate implies a considerable waste of resources. Improved retention at this initial stage would greatly benefit the industry.

Although in recent years the outflow to other industries has declined, it is still a major cause of loss. Further improvements in working conditions and a more stable working environment might help decrease this major source of loss of skills.

At the same time as more young people tend to continue in full time education after the school leaving age, more needs to be done to attract adult trainees into the industry.

Further moves towards diversification of the workforce by attracting and retaining women and members of ethnic groups would also be helpful.

At the professional level, there also appears to be a large gap between the required intake and the trained output. We will need to attract and retain more young people into construction related degree courses.

A shortfall in formal training at the operative level has been reported in previous years (*Construction Employment and Training Forecast 1997, 1998, 1999, 2000* and *Skills Foresight Report 2002*). This is concerning as it implies a gradual erosion of the industry's skill base. An important measure to fill the gap has been the development of OSAT (see Section 1). In the longer term, we need to both increase the intake into formal training and improve the retention rate if we are to achieve the aim of a fully qualified workforce.

Appendix: Detailed Occupational Break- down

The following gives a further occupational breakdown of the numbers employed in Great Britain for most groups in Chart 11. The more detailed occupation categories given here mirror, as far as possible, NVQ categories. These figures are based on the forecast for 2003.

NON-MANUAL OCCUPATIONS	
Site supervisors	40,878
Administration staff	108,697
Sales and customer services staff	16,176
Total office staff	166,550
Contracts managers	79,420
Site managers	102,576
General managers	78,764
Total managers	230,000
Legal/business associates	16,386
Engineering technicians	10,017
Architectural support	4,467
Surveyors estimating support	27,057
Building inspectors	1,733
Total technical staff	51,970
Legal/business professionals	12,200
Engineering professionals	39,887
Architects	5,752
Surveyors	57,311
Town planners	1,080
Total professionals	116,230

MANUAL OCCUPATIONS	
Carpenters and joiners (sitework)	212,612
Carpenters and joiners (benchwork)	44,252
Shopfitters	7,774
Formworkers	4,809
Wood machinists	7,995
Domestic fit-out contractors	3,883
Demountable partition erectors	5,135
Total wood trades	286,460
Bricklayers	136,610
Cavity wall tie installers	1,215
Facade maintenance/cleaning	1,179
Stonemasons	6,276
Total masonry trades	145,280
Plasterers (fibrous)	10,613
Plasterers (solid)	19,598
Dry liners (fixers)	6,328
Dry liners (finishers)	1,862
Total plasterers	38,400
Thatchers	200
Slaters and tilers	29,139
Built-up felt roofers	9,382
Sheeters and cladders	7,731
Single ply roofers	955
Liquid applied roofers	1,760
Mastic asphalters	8,314
Total roofers	57,480
Painters and decorators	96,444
Commercial painters	18,966
Total painters and decorators	115,410
Wall and floor tilers	11,840
Floorcoverers, including carpet fitters	29,052
Access flooring installers	18
Total floorers	40,910

Ceiling fixers	26,210
Demolition operatives	12,710
Steeplejacks/lightning conductor engineers	4,582
Chimney engineers	2,978
Total other specialist building operatives	46,480
Steel erectors/riggers	11,472
Structural steel workers	9,808
Total steel workers	21,280
Refractory engineers	1,484
Plant mechanics	29,196
Total plant mechanics	30,680
Crane operators	4,939
Plant operators	46,631
Total plant operating trades	51,570
Asphalters	6,249
Mason paviors	19,028
Drilling, tunnelling and piling operatives	12,047
Other road construction operatives	32,956
Public utilities distribution operatives	12,148
Track/railway workers	12,091
Total other civil engineering operatives	94,520
Plumbers	120,902
Heating and ventilating engineers	14,962
Refrigeration and air-conditioning engineers	4,226
Total plumbing trades	140,090
Thermal insulation engineers	3,912
Maintenance operatives	19,328
Total maintenance operatives	23,240

Source: Office for National Statistics: Labour Force Survey
National Centre for Social Research: Survey of Employment by Occupation, 2002
CITB Employment Model, 2003

CITB-ConstructionSkills Research Department Publications

CITB-ConstructionSkills is responsible for helping the construction industry meet its skill requirements. In order to do this, CITB-ConstructionSkills aims to develop a comprehensive understanding of the industry and its future prospects, as well as an analysis of its skill needs and how those needs are to be met. To inform this, CITB-ConstructionSkills maintains a programme of research and labour market information comprising a range of qualitative and quantitative projects. These include surveys of employers, training establishments and trainees as well as evaluations of particular activities in which CITB-ConstructionSkills is involved.

This report, setting out the industry's future skill needs, is a key part of CITB-ConstructionSkills research and labour market information work. The forecasts contained in it are used as a basis for planning training provision, the allocation of resources and the development of new qualifications and other training products. CITB-ConstructionSkills has a policy of publishing its work in this area, to share the information with those partners in training who might benefit from it.

CITB-ConstructionSkills research and labour market information can be found at: www.citb.co.uk

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Details of other CITB-ConstructionSkills research and labour market information are available from:

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