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An Assessment of Skill Needs in Construction and Related Industries

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Skills Dialogue

A comprehensive summary from employers of skills requirements
in construction & related industries.

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Contents

Introduction 1
The Skills Dialogues 1
Executive Summary 2
Key features of the industries 6
1.1 The scope of the Construction Dialogue 6
1.2 The sectors overall 9
Changing skills demands 12
2.1 Current employment patterns 12
2.2 Drivers of occupational shifts 14
2.3 Employment trends 18
2.4 Confirming the trends - other forecasts 21
2.5 Replacement demand - construction and specialist contracting and extraction 22
2.6 Occupational change and skills requirements 24
Skills supply 28
3.1 Stocks of qualified people 28
3.2 Trends in qualifications 31
3.3 Further education and other colleges 32
3.4 Higher education and professional bodies 37
3.5 Training Programmes 39
Skills mismatches 46
4.1 Recruitment problems 46
4.2 Causes of recruitment problems - skill shortages and other reasons 50
4.3 The skills that applicants lack 52
4.4 The impact of, and responses to, hard-to-fill vacancies 54
4.5 Skills gaps 58
4.6 The skills that existing employees lack 61
4.7 Impact of, and responses to, skill gaps 63
4.8 Regional variations in construction and contracting 68
4.9 Tackling imbalances in skills supply and demand: future prospects 70
Conclusions 75
Annex (Further Tables) 78

Foreword

The representative National Training Organisations for the construction and related industries welcomed the recommendations from the National Skills Task Force to set up a programme of skills dialogues across the major industrial and business sectors, provided the reports reflected the views of those in the sector. It was felt that the skills dialogues could bring valuable information and new insights on skills to those planning education and training provision.

This report has been developed as a partnership between NTOs, their employers, and Government, but has involved discussion with a wide range of partners, including some of the funding and planning bodies who will benefit from this information. It has brought together a wide range of information, including the research that we as NTOs have carried out along with new data on current and future skills needs in the sector. The result is a detailed and thorough assessment of the current and projected skill needs in construction, which will be a valuable source of information for both planners and careers and information services.

With changes underway in post-16 education and training, it is important that NTOs and our employers work closely and effectively with both the Learning and Skills Council, once it starts work in April 2001, and with the Regional Development Agencies.

It is hoped that the Dialogue report, together with the NTOs own Skills Foresight reports will provide a valuable tool for all those involved in planning education and training provision to meet current and future skill needs in vital construction occupations.

BPEC CITB Construction Industry Training Board EPIC ESTTL Engineering Services Training Trust Limited ginto TV NET

Skills Dialogues – General Introduction

Skills Dialogues constitute a series of consultations with all major industrial and business sectors, leading to the production of high quality authoritative skills assessments for each of these broad sectors. Dialogues developed from recommendations in the 2nd Report of the Skills Task Force, *Delivering skills for all*, as a means of providing better quality information on changes in skills supply and demand at a sectoral level. They draw on research undertaken by National Training Organisations (NTOs) through Skills Foresight and other projects as well as a wide range of national research on current and future skills needs. Recognising the UK remit of NTOs the dialogue reports reflect the UK perspective as far as possible, although not all the available evidence which underpins the Dialogues is UK wide. Typically, the reports do not provide a region by region analysis but they do attempt to illustrate any major regional differences. The Skills Dialogues operate as a rolling biennial programme with the first full series of reports due to appear between Autumn 2000 and the end of 2001.

The purpose of the dialogues is to improve the quality of skills information available at a sector level, and to provide an effective voice for NTOs and employers in their sectors in the planning and implementation of education and training provision and in informing careers advice and guidance. They will ensure that industry sector views are well articulated and represented to major stakeholders, such as the new Learning and Skills Council (LSC) and its local arms, Regional Development Agencies (RDAs) and careers services. The dialogues are designed to draw on the work of individual NTOs but to cover broader industrial groupings, so as to aid strategic planning and make the information base more manageable.

The assessments produced through the dialogues will also directly contribute to Sector Workforce Development Plans, as the evidence on skill needs will underpin proposed action and influence the nature of relationships with key partners. These plans will form a strategic statement of NTOs' proposed activities, relationships with partners and stakeholders and targets for achievement.

Each report results from a process of consultation with the main organisations in the sector to identify the key issues, and a wide ranging analysis of existing material on skills supply and demand, and factors influencing skill trends. The evidence includes sector specific analysis from the recent national research conducted on behalf of the National Skills Task Force including the Employer Skills Survey (ESS) and Projections of Employment and Qualifications by the Institute for Employment Research as well as the NTOs' own Skills Foresight research. The material is brought together into a draft discussion document for a national seminar, which involves all the key interests in the sector, such as employers, NTOs, Further and Higher Education planning, funding and qualifications' bodies, trade unions, professional associations and government departments.

The final report takes on board the comments from all those involved in the Dialogue and provides a comprehensive analysis of the skill needs and an authoritative statement about skill trends in the sector. We hope they will be useful to policy makers and planners in other parts of the United Kingdom. For example, a series of skills monitoring and forecasting exercises are being undertaken in Northern Ireland and the work on this and other Dialogues will inform the Northern Ireland research.

List of Tables

1.1 Employees in the sector based on broadly equivalent SIC codes 9

2.1 (SEE ANNEX) Employment including self-employment, by occupation, 1998 78

2.2 (SEE ANNEX) Changing employment, including self-employment by occupation - construction and specialist contractors 79

2.3 (SEE ANNEX) Projected skilled craft employment in construction and specialist contracting 80

2.4 (SEE ANNEX) Projections of replacement demand for construction, specialist contracting and extractive industries combined 1998 - 2009 81

2.5 (SEE ANNEX) CITB projections of net requirements for new entrants in construction and specialist contracting sectors, 2000 - 04 82

2.6 Estimates relative importance of different skills to different skilled craft occupations 26

3.1 (SEE ANNEX) Construction qualifications by NVQ equivalent levels 83

3.2 Qualifications held in the electrotechnical industry 29

3.3 Qualifications needed to work in the plumbing industry: survey responses 30

3.4 Most important qualifications in professional services: survey response 30

3.5 (SEE ANNEX) Extractive and mineral processing qualifications by NVQ Levels 84

3.6 (SEE ANNEX) Numbers awarded constructing NVQ 85

3.7 Share of FE colleges in training in three main building trades, 1997 32

3.8 First-year construction trainees: who they are 1998/9 CITB estimates 33

3.9 Students on FE courses by gender and ethnicity 1996/7 34

3.10 Construction and specialist contracting enrolments (ISR database) by trade 36

3.11 Applications to built environment courses 37

3.12 Students graduating from construction-related courses 38

3.13 Graduate destinations, 1997 39

3.14 Most important subjects of external training for professionals 41

3.15 Construction trainees by occupation 42

3.16 Training initiatives used in electrotechnical firms 43

3.17 Training programmes taken by trainees 44

4.1 Evidence on sector construction recruitment problems 47

4.2 Occupations in which hard-to-fill vacancies reported - construction sector 49
4.3 Causes of hard-to-fill vacancies: craft and skilled occupations 50
4.4 Skills difficult to obtain from applicants for hard-to-fill vacancies in craft and skilled workers 53
4.5 Impact of hard-to-fill vacancies in craft and skilled occupations 55
4.6 Results of recruitment over past five years 56
4.7 Response to hard-to-fill vacancies in craft and skilled occupations 57
4.8 Expected results of recruitment problems over the next 2 - 3 years 57
4.9 Causes of skills gaps in top five occupations in the construction and specialist contracting sector 59
4.10 Proficiency of existing staff in current job 60
4.11 Skills lacking in non-proficient staff in top 5 occupations in construction and specialist contracting 62
4.12 Expected results of skills gaps over next 2 - 3 years 64
4.13 Impact on business of skills gaps in staff in top 5 occupations in construction and contracting sector 65
4.14 Action to overcome skills gaps in top 5 occupations in the construction and contracting sector 66
4.15 Market conditions 67

List of Figures

1.1	Contractors' output, Great Britain	7
2.1	Productivity	15
2.2	Total employment in construction and specialist contracting, UK	18
2.3	Percentage change in key occupations, 1998-2009 (i)	19
2.4	Percentage change in key occupations, 1998-2009 (ii)	20
2.5	Evidence on construction recruitment needs in 2000	23

Introduction

The Skills Dialogues

This report, prepared by consultants Business Strategies, is the result of the Construction, Professional Services, and Extractive Mineral Processing Sector Skills Dialogue. The Skills Dialogues are a new rolling programme of biennial skills assessments across all sectors of the economy, which are intended to provide planning and strategic bodies and careers services with detailed information about skills supply and demand trends in each one of 15 broad sectors. The Dialogues were recommended in the Skills Task Force Second Report *Delivering Skills for All* which identified a gap in the availability of sectoral information on skills. It recommended a programme of Skills Dialogues to bring together all the information that National Training Organisations (NTOs) collected through their Skills Foresight and other research on skills, with national research commissioned by DfEE and other national bodies. Dialogue is between industry and its NTOs on the one hand, and Government and planning and funding bodies on the other. The resulting reports are intended to provide comprehensive, high quality skills assessments for use by planning bodies such as the new Learning and Skills Council (LSC) and Regional Development Agencies (RDAs), as well as informing careers guidance and advice. This report therefore provides an assessment of trends in employment and skill needs, and associated issues in the sector and is the first of a series of reports that will be published up to the end of 2001.

The report should not be regarded as a definitive statement on the construction, professional services, and extractive and mineral processing industries. More detailed information on the sectors that make up these industries will be found in the Skills Foresight reports and Workforce Development Plans of the NTOs that have contributed to this dialogue.

Executive Summary

Key features of Construction, Professional Services, Extractive and Mineral Processing Industries

- The scope of this Skills Dialogue is broad, including all those industries that contribute to the development of the nation's built environment (i.e. its buildings and infrastructure).
- It includes the extraction and processing of raw materials; construction, including the installation of gas, electrical and plumbing appliances; together with the design, management and maintenance of the properties and infrastructure built, which incorporate services such as architecture, civil engineering, and project management.
- Collectively these industries represent a significant share of the UK economy.
- However, because of the broad range of activities it is difficult to generalise trends.

Changing skills demand

The employment situation today

- Construction and contracting relies heavily on craft skills and technicians and is not highly dependent on low-skilled workers.
- Extractive and mineral processing are mainly reliant on less-skilled workers and also rely on skilled technicians and engineering professionals.

Drivers of skills change

- The Egan Agenda promotes modern supply chain principles and integrated project management techniques in the construction and specialist contracting sector to meet more stringent customer demands and quality control. The principles apply to new build; but repair and maintenance; and the emphasis on old building renovation in the UK, mean uptake has been limited in comparison with the rest of Europe.
- Extractive and mineral processing are driven by the need to keep costs competitive and by increasing mechanisation.
- Information and communications technology is a key driver across all sectors, but particularly in professional services.

Future skills needs

- In construction and specialist contracting, managers will account for an increasing share of employment, and skilled crafts a declining share. Professional services are also likely to experience significant employment growth due to the rising share of services in the economy.

- There will be a growing need for customer-focused staff and a possible increase in less-skilled manual workers if prefabrication techniques become more widespread.
- Although projections suggest a decline in overall numbers of skilled craft workers in construction, specialist contracting and extractives, there is still a need to recruit new workers to replace those who leave the industry.

Changing skills supply

Current skills supply

- In construction and specialist contracting over half of all workers hold National Vocational Qualification (NVQ) Level 3 or above; a quarter hold NVQ Level 1 or below; while a modest number hold NVQ Level 4 or 5.
- Extractive and mineral processing, by comparison, have a greater number of workers holding NVQ Levels 4 and 5.
- Membership of a professional body is the most important qualification to employees in professional services.

Trends in skills supply

- Qualifications projections by the Institute for Employment Research (IER) show an increase in the proportion of those in work holding NVQ Levels 4 and 5, and a decline in those holding NVQ Level 3 or lower.
- However, the numbers of NVQs awarded at all levels in the construction-related subjects have remained fairly flat, suggesting that the trend towards up-skilling in the broader economy is less apparent in construction.

Training provision

- Further education is vital in providing training for the construction and specialist contracting sectors. It also provides off-the-job training for the extractive and mineral processing sector.
- There has been an increase in adults without employer sponsorship enrolling on construction and related courses, reflecting both government policies to encourage people into education and training and the shift towards formal recognition of site skills in construction, and competency re-assessment in specialist contracting.
- On-the-job training is of considerable importance to the industry but although employers demand site-proven skills some are reluctant to provide work experience for trainees.
- Higher education is an important source of supply for professional services. However, there is a mismatch between how professionals perceive their skills and the way in which their role is perceived by clients.
- In professional services, training is geared to obtaining professional qualifications. Moreover, continuous professional development is obligatory for membership of professional bodies.

- There is high awareness, and relatively high take-up, of the Foundation and Modern Apprenticeship schemes in construction and specialist contracting.

Skills mismatches

Recruitment difficulties

- In construction and specialist contracting there is a shortage of suitable younger workers to replace mature workers who are retiring.
- Young people, the traditional recruitment pool for construction, are choosing to stay in continuous academic study. A further disincentive is the perception of the industry as one of hard working conditions and low pay.
- Shortages arise from a general lack of applicants and employer dissatisfaction with the skills of those who come forward.
- Skills lacking amongst applicants for skilled craft jobs are technical and practical skills (other than IT) and customer service skills.
- Skills shortages may mean businesses are making do with inferior labour.
- Cost competition has held back wage inflation and in the face of skills shortages businesses are making do with inadequately skilled labour.
- However, this is having an adverse effect on customer service, increasing operating costs, and resulting in a loss of business to competitors.

Skills gaps

- Long-lasting recruitment problems and new working practices are the most likely causes of skills gaps.
- However, employers in construction and specialist contracting see suspiciously few problems with the skills of existing workers. By contrast, firms in the extractives sector seem more critical of their workers' skills.
- Construction, because of its cyclical nature, is used to adapting to skills shortages and skills gaps in the short term.
- Skilled craft workers are most likely to lack technical and practical skills; while managers, administrators and professionals mostly lack management and team working skills.
- In extractive and mineral processing, technical, practical, managerial, IT, communications, multi-skilling, customer care and problem-solving skills were all reported as deficient.
- Despite the high mobility of the construction workforce there is some evidence of regional variations in skills shortages and gaps. These variations differ according to occupations.

Tackling imbalances

- One challenge is to encourage more young people to enter the construction industry, and to attract women and ethnic minorities who traditionally have not been well represented.

- Also there is the need to address criticisms that current training programmes do not entirely meet the needs of the industry, although employers in the construction sector have been encouraged to 'take ownership' of training to overcome this problem.

- In particular, there is a worry that training pays insufficient attention to the growing demand for a multi-skilled workforce.

Chapter 1
Key features of the industries

- The industries are heterogeneous in their products, processes and needs
- They have all undergone large changes in circumstances
- Construction employment in particular is much smaller than it once was
- But collectively the industries still represent a major part of the UK economy
- Their employment practices partly reflect their business and market structures
- For example, small firms provide much of the training in construction and contracting
- That in turn influences the roles that NTOs and others need to play in the industries

The scope of the Construction Dialogue

1.1 The Construction Skills Dialogue includes those industries that contribute to the development of the nation's built environment, that is, its buildings and infrastructure. The Dialogue therefore includes the following sectoral activities:

- the inception of a property or infrastructure development
- the extraction and processing of many of the raw materials to be used in the project
- the construction stage, which includes the installation of services and utilities (gas, electrical and plumbing appliances for industrial and domestic usage)
- the design, maintenance, and management of the property and assets that have been built (services such as architecture, civil engineering and project management).

1.2 The sectoral interests of these industries are looked after by a wide number of NTOs, trade bodies and professional associations, which have contributed information and feedback on this report. The Skills Dialogue has been guided by a steering committee, comprised of representatives from the following organisations:

- BPEC (British Plumbing Employers' Council)
- CITB (Construction Industry Training Board)
- EPIC (Extractive and Mineral Processing NTO)
- ESTT (Engineering Services Training Trust)
- GINTO (Gas Industry NTO)
- NET (National Electrotechnical Training)
- TOPIC (Training Organisation for Professionals In Construction).

1.3 This report brings together research and evidence from a wide range of institutions involved in construction. It also draws on national data, including the new Skills Task Force Employers Skills Survey (ESS), Business Strategies' Forecasts of Employment and the Institute of Employment Research (IER) Projections of Occupations and Qualifications. The dialogue has built on these sources of information rather than undertaking any new research.

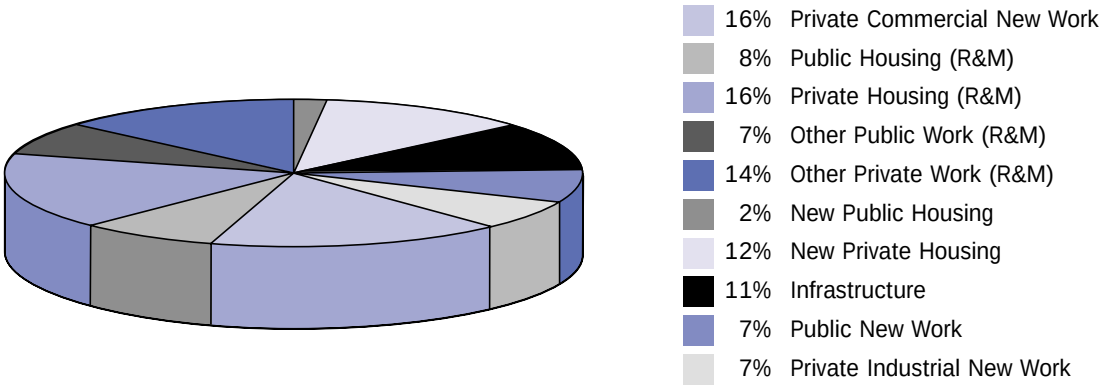
1.4 A working version of the report was discussed at a national seminar held on 3rd May 2000, which involved the relevant NTOs, employers, professional bodies, funding agencies, RDAs, representatives of further and higher education and government departments. This final version of the report incorporates comments from the seminar and has been ratified by representatives from the relevant sectors through the steering committee.

1.5 Given the broad scope of the Construction Skills Dialogue, this report, for ease of reference, splits the industries as follows:[1]

Construction and specialist contractors

1.6 Construction, as it is defined in the Standard Industrial Classification (SIC) produced by the Office for National Statistics (ONS), is a very broad sector. It includes site preparation, the creation and completion of buildings and infrastructure such as houses, offices, roads and bridges; and the installation of services and utilities. It also includes all repair and maintenance work, as well as new build. In 1998, repair and maintenance and new build each accounted for around 45 per cent of total construction output, while infrastructure accounted for the remaining 11 per cent (figures do not sum to 100 due to rounding). Infrastructure work has become more prevalent since 1990, when it accounted for eight per cent of total construction output, to the detriment of repair and maintenance.

Figure 1.1: Contractors' Output, Great Britain 1998



Source: Housing & Construction Statistics, 1988 - 1998, DETR, 1995 prices

Note: R&M stands for Repair & Maintenance

1 Although most of the industries covered by this report benefit from individual research conducted by NTOs and others, there is no comprehensive and consistent dataset on skills and their drivers that identifies separately all the industries covered by this report, and allows cross-industry comparisons to be drawn. This necessarily places limits on the kind of analysis that it has been possible to do for this report.

1.7 On that broad definition, the construction sector includes the large proportion of work done by plumbers, electricians, and those who install and service gas equipment, heating, ventilation, air conditioning or refrigeration systems, and many other building or infrastructure services (although not of course the basic generation and network supply of such utilities as gas, electricity, water or telecommunications).

1.8 However, this official terminology does not accord with common usage, which often confines 'construction' to activities that relate to the fabric of a building or infrastructure project, while work to do with services such as plumbing or lighting is variously described as 'building services' or 'specialist contracting'. Furthermore, the specialist contracting services are themselves highly diverse, not just in the obvious sense that working (for example) with gas equipment is different from working with electrical equipment, but because the work varies from the installation of very large and complex industrial facilities, to routine maintenance of domestic systems.

1.9 Significantly, a report for the Strategic Forum of Construction NTOs commented:

'The Strategic Forum of Construction NTOs should seek to define the construction sector and set the boundaries that the industry covers under its remit...In this context NTOs will also have to resolve issues of overlap and authority between them...The challenge for the Strategic Forum of Construction NTOs is to provide a definition, which meets the needs of its members but is still acceptable to government and the requirements of the official industry classification.[2]

1.10 New build construction activity and a lot of specialist contracting are peripatetic, with activity shifting in response to changing demand conditions. As a result, employers engage many of their workers on short-term contracts, either directly or via subcontracting companies. There are some extremely large construction companies, but their payrolls tend not to be commensurate with their turnover.

Extractive and mineral processing

1.11 The extractive and mineral processing industry contributes a major part, but not all, of the raw materials supplied to the construction industry, plus raw materials produced for use in many other industries. These are essentially quarry products (mainly stone, limestone, sand and other aggregates, gypsum and clay - the last of these mainly for export), and the manufacture of cement, ready-mixed concrete and mortars.

1.12 Neither building products and processing, nor the extraction of energy sources such as coal, oil and gas, is covered in this report. They will, however, be discussed in other Skills Dialogue reports.

1.13 The extractive and mineral processing industry is geographically tied to where its raw materials are available, and the sector is dominated by large companies employing their own workforces. Total skills needs and skills supply issues are correspondingly dominated by a small number of companies; imbalances between labour supply and demand will often reflect particular local circumstances.

Professional services

1.14 Professional services, such as architecture, civil engineering, project management, building surveying and quantity surveying, are essential to the work of the construction sector and to the concerns of this report. Indeed, many people providing those services work directly for construction companies and so are unambiguously part of the construction sector. Most, however, work in consultancies and partnerships. These people are treated by the official statisticians as part of the business services sector, alongside accountants, lawyers, management consultants and others.

2 Developing and Implementing a Skills Foresight Strategy for the Strategic Forum of Construction NTOs, (December 1999) p.4.

1.15 To minimise double counting, in this report we generally understand the property services and professional services sector to include only those working in consultancy or private practice, although often the issues addressed relate also to those who work in the construction sector itself.

The sectors overall

1.16 With such a wide range of activities, it is difficult to make useful generalisations that link the sectors together, while distinguishing them from other sectors. Not only is mineral processing different from specialist contracting but, as noted already, the latter covers a wide diversity of activities. The same is true for professional services and for construction itself.[3] Within the professional services sector, for example, there are large numbers of people who conduct surveys of the kind with which we are all familiar, but there are also many specialists in diverse tasks such as aerial surveying, computer modelling, analysing fluvial systems and land drainage issues, and a host of others. Within construction, repair and maintenance work is different from new build; within new build, building houses is different from constructing a large infrastructure project.

1.17 But one generalisation that it is important to make is that these sectors collectively represent a significant share of the UK economy. To get a sense of the overall scale of employment involved, and the relative magnitude of the sectors, we can look at the 1997 data from the Government's Annual Employment Survey. This shows the pattern in Table 1.1. While some of the categories do not correspond exactly to the sectors as defined by, for example, the relevant NTOs, the table does give an indication of the relative magnitudes involved - at least for employees. Taking into account self-employed people boosts the figures, although not by much in the case of extractives and mineral processing.[4]

Table 1.1 Employees in the sectors based on broadly equivalent SIC Codes: 1997

Extractive and mineral processing	
14.1 Quarrying of stone	6,400
14.2 Quarrying of sand and clay	20,100
14.5 Other mining and quarrying	1,300
Construction and specialist contractors	
45.1 Site preparation	18,700
45.2 Building of complete constructions etc	608,500
45.3 Building installation	215,800
45.4 Building completion	128,100
Professional services	
70.3 Real estate activities	124,600
74.2 Architectural/engineering activities etc	285,100
Total of above	**1,410,500***

Source: Business Strategies based on 1997 Annual Employment Survey
**Figures here and in some following tables may not sum exactly due to rounding*

3 The largest group of professionals are engineers, who account for about two-fifths of the total. Surveying and architecture account for about a fifth each, while a range of other professionals make up the remainder.

4 Data including self-employment is provided in Annex Table 2.1 but not for all the categories in Table 1.1

1.18 This employment total is not, however, comparable with what it once was, because of large declines in construction and extractive sector employment, not fully offset by increases in specialist contracting and professional services. Between the mid-1970s and the early 1980s, construction activity fell heavily, and almost half a million jobs were lost. In the mid-1980s the industry bounced back, and skill shortages emerged, but that did not alter the fact that employment's long-term trend was downwards.

1.19 Yet even within construction there were differences in trends. In the 1980s there was, for example, declining demand for construction craft workers in the so-called 'wet' trades, and declining demand for labourers. But these trends were partly offset by increased demand for those who worked with concrete, steel, dry lining, prefabricated components, mechanical and electrical work, and specialist assembly. Work associated with positioning and alignment, measurement, fitting, assembly and calculation, was also rising.[5] The drivers behind such trends - and, more particularly, the drivers behind the trends of today and tomorrow - are explored in Chapter 2 of this report.

Contract and self-employment on the increase

1.20 The use of subcontractors has always been common for specialist crafts such as carpentry, plumbing or electrical work. However, it is now widespread amongst other occupations across all stages of construction, from site preparation onwards. Self-employment is also widespread (although the Inland Revenue has tightened up the rules on who can be registered as self-employed, and that has exerted some downward pressure on the numbers). As a result, it is a key feature of the modern construction sector that, with projects of any significant scale, contractors often make heavy use of subcontractors, who can be engaged to carry out virtually every stage of the actual building process. One-time large employers have shifted towards being contract managers, operating via layers of subcontractors of differing sizes - especially when they work away from their core geographic markets. At some stages of a project, the site manager may be almost the only employee of the client's primary contractor present on site.

1.21 Partly as a result, many construction companies would say that their key skills - the ones that determine success or failure in the market place - are to do with conceiving, scheduling and managing projects, and that operational site-based skills are important, but do not really vary much from company to company, and so are not the real drivers of competitive success or failure. These latter skills can, therefore, simply be bought in when needed. Partly as a result, the industry is heavily dependent on organisations such as the CITB and others to address skills issues on behalf of a range of employers.

5 IPRA Ltd (1991) Future skill needs of the construction industries.

Training in small firms

1.22 In repair and maintenance work, in a lot of specialist contracting, and in professional activities such as estate agency, the mobility of work is not such an issue, since demand is fairly evenly spread around the country, according to the patterns of existing property location and emerging economic prosperity. Again, however, companies tend to be small - often very small - and a large proportion of apprentices and trainees work in micro-sized companies (the electrotechnical industry, plumbing, gas installation and heating, ventilating, air conditioning and refrigeration, are all characterised by large numbers of very small companies). This has significant implications. Whereas a firm with 100 staff may be able to devise its own training regime, for a firm with only a few employees to take on an apprentice is a large commitment, and for a sole trader it is often impossible. Yet training in the construction sector, and in some specialist contracting, occurs heavily within small firms, which provide the majority of apprenticeships, but who are faced with the threat of losing trained workers to other employers. This too means that the support provided by NTOs and others is of high strategic importance.

Chapter 2
Changing skills demands

- Construction and contracting rely heavily on craft skills and technicians
- Craft employment is projected to fall rapidly between 1998 and 2009
- This accords with pressure to streamline processes in new build construction
- But craft workers who leave create heavy recruitment demand
- Projected employment of specialist contracting technicians holds up rather better
- Managerial, professional and customer care jobs are generally projected to rise
- In professional services, prospects vary markedly by type of job
- The extractive sector probably faces downwards pressure on jobs
- These trends tell us something about evolving skill needs
- A proper database on skills within occupations, though, does not currently exist
- It appears that skilled construction workers rely heavily on their manual skills
- They are not particularly focused on problem-solving
- Construction is seeking to become an all-qualified sector
- Project management skills are rising in significance in construction and contracting
- One likely area of rising skill needs, almost across the board, is ICT skills

Current employment patterns

2.1 In this chapter we review the evidence and discuss issues relating to the demand side. We review the current employment pattern for construction and specialist contracting, extractives and mineral processing, and professional services. We examine the drivers that are impacting on the employment pattern of the sectors and which feed into the employment and occupational projections for the Construction Dialogue sectors that are also reviewed in this chapter. Finally, we review the impact that the occupational projections have for skills needs in the industries.

2.2 The information on employment trends and skills deficiencies is mainly derived from the IER Occupational Projections and Trends data, the Employer Skills Survey, 1999 and various surveys and information provided by the NTOs that represent the sectors covered in this dialogue. A considerably greater amount of data is available for the construction and specialist contracting sectors than for extractive and mineral processing and professional services, although we have made every effort to incorporate the information where it exists.

Construction and specialist contracting

The sector relies heavily on skilled craft workers and technicians

2.3 Construction and specialist contracting is distinctive from most other industries, in its high reliance on people with well developed manual skills, for example, painting skills, bricklaying, electrical engineering skills and plumbing. The possession of these skills has traditionally been the preserve of people in clearly defined technical occupations, and in the various craft 'trades' for which construction is well known.

Skilled craft workers account for nearly half the workforce of the combined construction and specialist contracting sectors. This can be compared to around one in ten for the economy as a whole. (The concentration of skilled craft workers is shown in Annex Table 2.1, on page 78)

The sector is not highly dependent on low-skilled workers

2.4 Although construction and specialist contracting firms are large users of skilled manual workers, they are not large users of semi-skilled or unskilled manual workers. (The concentration of skilled manual workers is shown in Annex Table 2.1, on page 78)

2.5 They differ in that respect from extractive and mineral processing firms, and they also differ from large parts of manufacturing. Construction and contracting, for example, has a similar sized workforce to the engineering sector within manufacturing. However, in engineering less than one third of workers are skilled manual workers, while it employs twice the number of unskilled manual workers as the combined construction and specialist contracting sectors.

There are significant levels of white-collar employment in construction and specialist contracting

2.6 With so many skilled manual workers employed by construction and specialist contracting firms, it is not surprising that employment in these industries is less concentrated in white-collar jobs than in the majority of other sectors. Nevertheless, employment in managerial, administrative, sales and other non-manual occupations is still high in absolute terms within the construction and specialist contracting industries, and it is of considerable strategic importance.

Employment in extractive and mineral processing

2.7 Estimates provided to DfEE by the Institute of Employment Research (IER) do not allow us to pick out the extractive and mineral processing sector. However, industry sources suggest that:

- the sector makes less use of skilled craft workers than does construction
- it is more reliant on less-skilled labourers and machine operators (the sector is highly mechanised)
- it does rely, though, on some very highly-skilled technicians and engineering professionals.

2.8 The sector also relies on managers and other white-collar staff in much the same way as any other sector.

Employment in professional services

2.9 As with extraction and mineral processing, the IER dataset does not allow us to pick out professional services employment.

Nevertheless, the key characteristics are clear:

- companies and partnerships make little use of manual workers, skilled or otherwise
- employers are highly reliant on professional and technical staff
- the occupations clearly vary, but engineers are the largest professional category, followed by surveyors and architects.

2.10 Again, there are also many people working in managerial and other white-collar jobs.

Drivers of occupational shifts

The Latham and Egan Reports relating to construction and specialist contracting

2.11 Some drivers of change that are probably already picked up, at least partly, by the projections include the construction industry's efforts in the 1990s to respond to mounting criticisms about customer care, quality, productivity and costs, such as those identified in the Latham Report, *Constructing the Team* (DoE, 1994). The Egan Report, *Rethinking Construction* (DETR, 1998), returned to the same themes.

2.12 *Rethinking Construction* was prepared on behalf of a government-sponsored Task Force predominantly comprising large clients in the construction sector. The report:

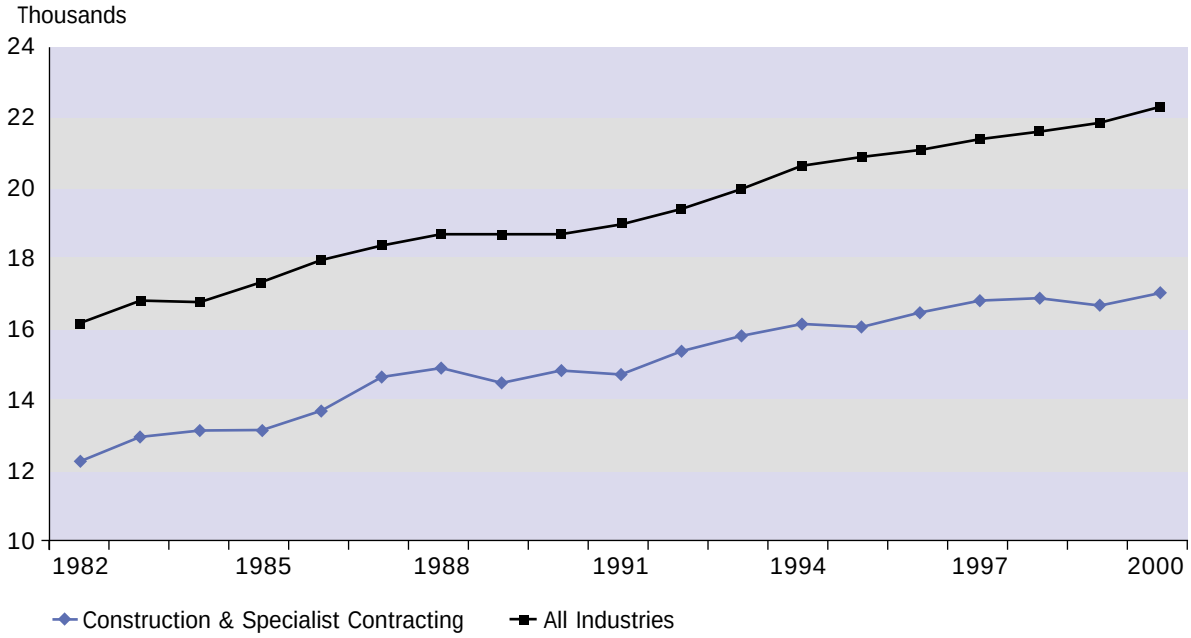
- set an agenda for radical change in the construction sector's working methods by advocating modern supply chain management principles, lean production and an integration of the design and production processes
- argued that an increase in the use of prefabrication (which is far less widespread in the UK than in other European countries) could have a major impact on the construction industry's productivity, construction costs and project times
- argued that the industry should restructure around the *processes* needed to deliver clients' requirements rather than around definitions of craft trades that are becoming obsolete. This would give clients a clearer view of where responsibilities lie, how long tasks would take, and of how costs had been calculated
- suggested that major construction sector clients such as big retailers should provide best-practice advice from their own experience on how to implement such changes, in return for commitments from contractors to achieving the targets set.

2.13 Other programmes have extended the recommendations of the Egan Report - for example, the *Construction Best Practice Programme*, which focuses on the transformation of management and business practices, and the *Movement for Innovation* (M4I), which concentrates on key performance indicators relating to project management and company safety, productivity and profitability.

The complexity of raising productivity performance

2.14 Over the past twenty years, productivity in construction has been rising but at a slower rate than productivity in the whole economy. As a result, the productivity gap has widened, raising concerns that there are deeper problems bedevilling the UK construction sector.

Figure 2.1 Productivity



Source: Business Strategies

2.15 There are also concerns (although little hard evidence) that differences in skills and in work management help to explain differences in productivity between the UK and the rest of Europe. There is much emphasis in the Egan Report, and elsewhere, on the need to raise skill levels in the UK construction industry, alongside the need to change the underlying construction processes.

2.16 In this regard, some important changes are underway. For example, industry leaders aspire to a fully-qualified workforce, based on:

- better recognising the skills that many site workers already have
- encouraging workers to gain qualifications through training.

2.17 The demand for this shift comes from a variety of sources:

- a need for multi-skilled or cross-craft workers below the level of craft skilled workers, able to complete a variety of moderately complex assembly tasks
- a need to retain workers, by offering them qualifications, increased job satisfaction and, indeed, career prospects
- perhaps most important in the long term, customers who want some assurance that they are getting good quality work, and thus who care about the qualifications of those who do the work.

2.18 But progress towards increased efficiency and a higher-skilled workforce may be much more possible for large companies than for small ones which lack the time to develop new ways of working, and whose owners and managers may be unwilling to challenge their own attitudes and working methods.

2.19 Part of the problem is that the transformation process itself involves *increases* in white-collar employment (marketing, project management, etc), as part of the process whereby the sector improves its non-price competitiveness. These have to be more than offset by higher manual productivity, if overall productivity is to improve. But if it is not as easy to improve manual productivity as it is in the manufacturing sector, then it follows that the overall pace of change may look disappointing in comparison.

2.20 Another possible explanation of the poor past productivity performance is that UK construction sector firms felt able to persist with labour-intensive methods, because, by the standards of the more advanced European economies, they enjoyed both a reasonably abundant supply of workers, and relatively few regulations on wages and working conditions. However, these conditions are now changing.

Technological developments

2.21 Information and Communication Technology (ICT) has also been a particularly important driver of change in the professional services sector, jobs such as surveying, engineering, architecture and project management. In the more technical areas, equipment is becoming ever more sophisticated, especially Geographical Information Systems (GIS) and a vast potential is opening up for transactions to be conducted on-line.

2.22 In the extractives and mineral processing sector there is a pressure to introduce more modern technology to meet stricter environmental standards and to achieve greater efficiency, replacing workers by automation.

Economy of maintenance

2.23 Another driver of change is that customers want high-quality infrastructures and buildings that will be economic to run and not just cheap to build. The Public Finance Initiative (PFI), which involves contractors bidding to manage as well as build projects, has focused attention on this issue of 'total value'. Specialist contractors, together with construction companies and their professional advisers, are increasingly incorporating low long-term maintenance costs into the initial design and construction of the facility. This emphasis on 'total value' alters the kind of design that constructors opt for, and hence changes the portfolio of skills that they will need in the construction process.

Competitive pricing

2.24 In the extractive and mineral processing sector, pressure comes very much from the sheer need to keep squeezing costs in the face of intensifying competitive pressures, including international competition. As in the construction sector, competition tends to be highly dependent on price because the materials that are supplied by any one firm are frequently indistinguishable from those that their rivals offer. Customers can easily compare prices and go for the cheapest deal.

2.25 At the extreme, the construction sector suffers from the problem of 'cowboy builders', who operate at or beyond the fringe of what is legal, who frequently lack skills, and who colour attitudes to the sector more generally.

2.26 As a result of competitive pricing, companies in the sector may feel forced to under-invest in people or to use less-skilled labour than they would ideally like to employ in order to keep costs low. Indeed a key feature of the sector is that it employs large numbers of poorly qualified manual workers, some of whom take on work that an outsider might expect to be done by properly qualified people. However, that said, many workers in the construction, contracting services, extraction, and the professional services sectors adhere to stringent competency standards while those working with gas and electricity, some mining and quarry workers, and many engineering, surveying and architecture professionals, operate to rigorous standards, tough entry requirements and, in some cases, continuous accreditation.

Internationalisation

2.27 All sectors are also experiencing the impact of growing internationalisation. Many of the outputs of the extractive and mineral processing sector are traded internationally (notably clay, which is primarily an exporting business). Construction firms compete abroad for business. Large professional consultancies and partnerships compete extensively in a global market.

Changing regulations

2.28 Similarly, all sectors have experienced a changing regulatory environment, with concerns over safety and equity creating pressure on the ways in which firms conduct their business - though also sometimes creating new market opportunities (such as the joint Government/Transco *Affordable Warmth Scheme*, and the new Seller Surveys in the home conveyancing market, to name but two examples).

Sustainability

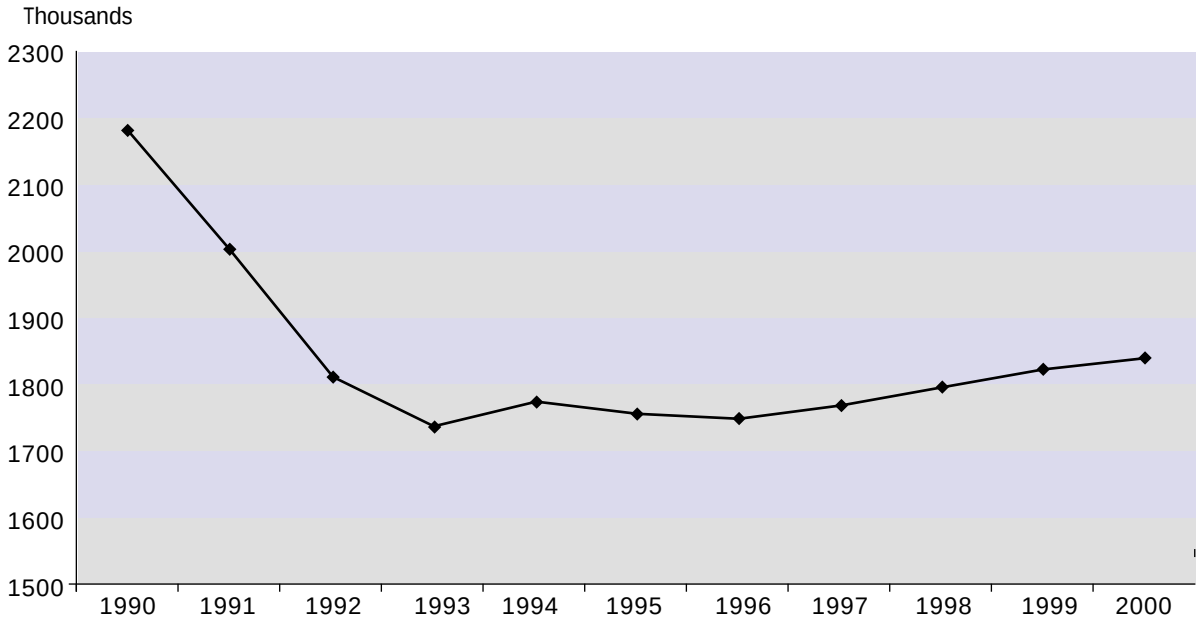
2.29 All the sectors covered by this report are under pressure to shift towards more environmentally-sustainable practices. The Government is promoting the use of recycled aggregates, and is introducing an 'aggregates tax'; planning permissions are often hard to obtain; and the Government is encouraging the balance of construction activity to shift towards refurbishment and regeneration and away from new build. As noted above, the last of these certainly cuts across the Egan ambitions of a major shift towards prefabrication.

Employment trends

Construction and specialist contracting

2.30 Employment in construction and contracting declined dramatically between 1990 and 1993. Around 450,000 jobs were lost over these three years and, although employment growth resumed in 1994, the overall level of employment is still much below its 1990 peak. Business Strategies estimate that in 2000, there are around 1,837,000 people employed in construction and contracting compared to 2,184,000 in 1990.

Figure 2.2

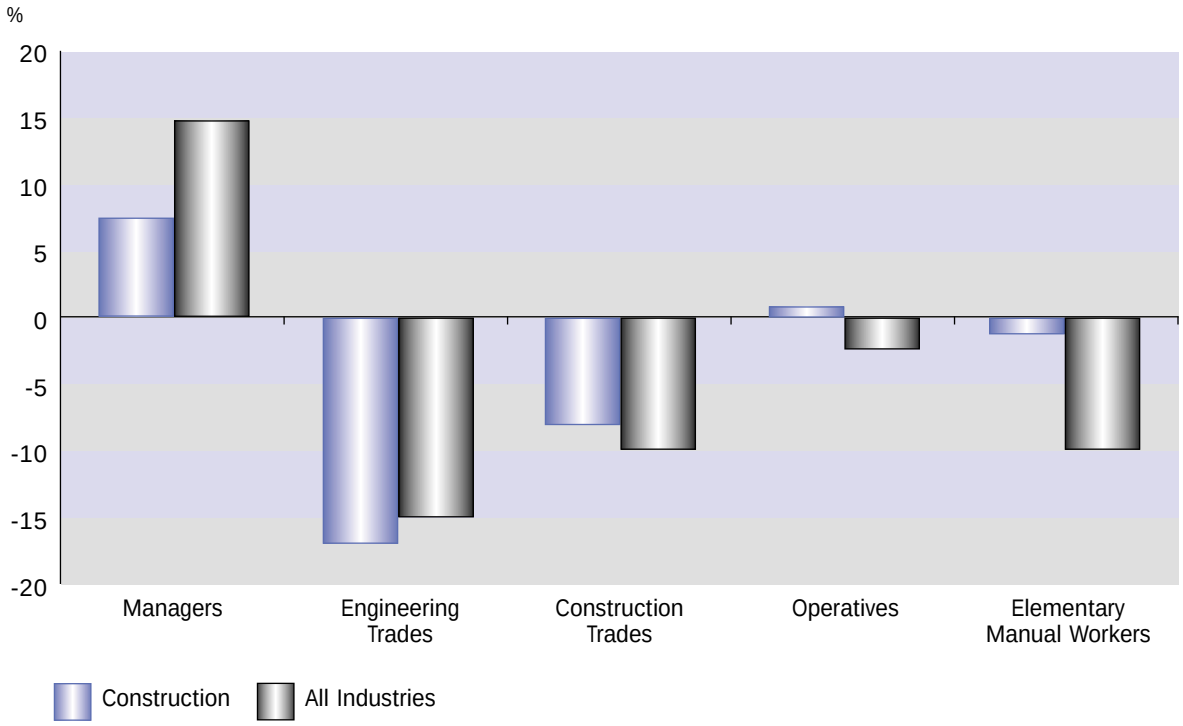


Source: Business Strategies

2.31 The IER projections point to little overall change in construction and specialist contracting employment through to 2009 but to an on-going shift in occupational patterns, away from manual workers and towards white-collar workers. (The figures from which these graphs are derived are found in Annex Table 2.2 on page 79).[6] As can be seen in the following graph, managers will account for an increasing share of employment in construction and specialist contracting, while skilled trades will take a decreasing share.

6 These projections are from the Institute of Employment Research at the University of Warwick. They are part of a set covering all sectors of the economy, thus allowing comparisons to be drawn across different Skills Dialogue reports.

Figure 2.3 Percentage Change in Key Occupations, 1998-2009

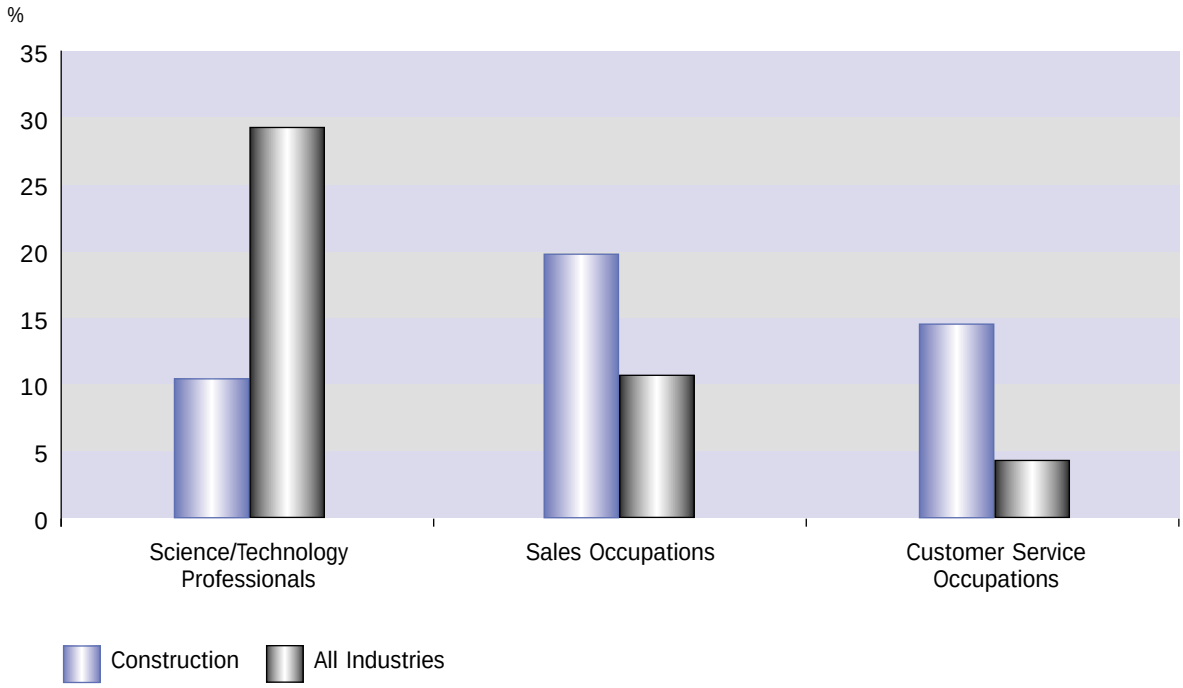


Source: IER

2.32 This shift has some important features, when compared with the similar transition occurring in the economy as a whole:

- the rate at which employment rises in managerial, professional and technical occupations is generally lower in the construction sector than in the economy at large
- the projected speed of job losses among the most skilled manual trades is greater in the construction and specialist contracting sector than the average for all industries
- there are rapid increases in the employment of sales and customer services workers in the construction and specialist contracting sector - occupations in which the sector has traditionally been weak
- in contrast to the economy as a whole, employment in process plant and machinery operatives and elementary non-manual operatives is projected to rise

Figure 2.4 Percentage Change in Key Occupations, 1998-2009



Source: IER

The extent of the changing demand for skills

2.33 Some of the occupational changes that have been identified in the previous section (some of which are shown in greater detail in Annex Table 2.3 on page 80) are consistent with at least some degree of adoption of the Egan agenda by the construction industry. These are:

- the increases in managerial and professional staff
- the increases in customer-focused staff
- the decline in skilled manual workers
- possibly, the increase in less-skilled manual workers (a trend that might well be associated with a shift towards increased prefabrication methods).

2.34 Nevertheless, the scale of transformation that IER project for the future is not particularly large in comparison with, for example, the kind of reconstruction that much of the manufacturing sector has undergone and continues to undergo.

2.35 The same story emerges if we look at productivity trends. Within construction, for example, the Egan Report argued that opportunities existed to increase sharply the productivity of labour used in the industry. But although the projections do indeed show that construction sector productivity will increase over the period 1998 to 2009, the rate of change is not especially dramatic by the standards of what manufacturing has achieved in the past.

2.36 There are several possible explanations for what, on the surface, appears to be a rather disappointing performance:

- part of the explanation may be that it is too soon to expect to see much transformation. If so, then it is conceivable that the pace of change will accelerate, and indeed the scale of change in the future may prove to be rather greater than that suggested by the projections
- in some parts of the industry, radical change was already in place before the Latham and Egan Reports were produced, so a 'before and after' comparison may be a little unfair
- most importantly, while in some parts of construction there may be considerable opportunity for productivity gains, in many other parts of construction and in many specialist contracting activities, there really is not much scope for very large improvements in productivity performance, and not much likelihood of substantial transformations in occupational structures. For example, the desire in the UK to renovate old buildings makes it hard to pursue prefabrication methods. Similarly, the ad hoc repair and maintenance work on properties that are old and idiosyncratic means it is difficult to introduce new working methods.

Extractive and mineral processes

2.37 In the extractive and mineral processing industry, there is downwards pressure on prices and hence on employment. The industry's products are essentially commodities, and companies cannot generally differentiate the quality of their products from those of their competitors, so there is a never-ending search for lower costs. That tends to involve increasing mechanisation and lower employment, although this may create some vacancies for people with specialist technical qualifications.

2.38 In professional services the situation is very different. The share of services in the economy has been rising and in line with this professional services are also likely to experience significant growth.

- One complication arises because, for large projects, services such as engineering and architecture are internationally traded; UK firms have strong reputations, but factors such as the exchange rate and the growing sophistication of international rivals can nevertheless impede employment growth.

Confirming the trends - other forecasts

2.39 The underlying projections of rising output in the construction and specialist contracting sector that underpin the IER employment projections are broadly comparable with projections from other sources such as Business Strategies and Construction Forecasting and Research. Most forecasters anticipate a rising trend in construction output, as well as in total output in the economy as a whole, but little growth or some decline in employment over the longer term.

2.40 Since these forecasts were generated the government has announced, in its Comprehensive Spending Review, that an additional £43bn will be spent over the next ten years. The CITB has estimated that around £4bn of this will feed into the

construction industry in the form of building and repair and maintenance work on schools, transport and social housing projects. This expenditure will raise construction output above the levels forecast, and this is likely to have a concomitant effect on employment demand in the industry. The IER employment projections indicating little overall change in construction and specialist contracting employment through to 2009, may therefore underestimate the demand for skilled workers in the construction industry.

Replacement demand - construction and specialist contracting and extraction

2.41 While the absolute numbers of skilled manual workers are projected to decline in construction, the growing need to recruit entrants to the sectors, to replace those who are retiring or otherwise quitting their occupations, suggests that recruitment difficulties and skill shortages may get worse rather than better. The numbers involved are large and the need for new entrants to receive training correspondingly so.

Older workers retiring, too few recruits, skill shortages

2.42 The construction, specialist contracting and extractive and mineral processing sectors are all increasingly affected by the need to replace large numbers of older workers, approaching their effective retirement ages. At least in construction and specialist contracting, there is a shortage of suitable younger workers coming through to take the places of these mature workers (in the extractive and mineral processing sector recruitment needs are currently quite low).

2.43 These shortages arise partly from an absolute absence of would-be recruits (the construction sector has high rates of recruitment difficulties, compared with the average for all industries) and partly from employers' dissatisfaction with the skills of many of those who do come forward (although that is true in most industries). Indeed, employers in the two sectors are more likely to identify skill deficiencies in those whom they are seeking to recruit, than in those whom they already employ. These skill shortages are generally of a technical, practical or vocational nature - although poor customer care skills are also a problem. Within professional services, the numbers of people enrolling on many degree courses is in decline, and employers increasingly find it difficult to recruit people of the calibre they feel they want.

2.44 IER projections for the net requirement for new entrants by occupation, split between the impact of overall contraction or expansion in employment, and the impact of replacing those who leave, show:[7]

- a projected need for 720,000 people overall to enter the industries in the period 1998 to 2009, despite a 33,000 decline in the overall level of employment
- a need, within skilled manual occupations, for 173,000 people with construction craft skills and 86,000 people with engineering craft skills to enter the industries, despite declining employment levels

7 The IER figures make no allowance for international migration.

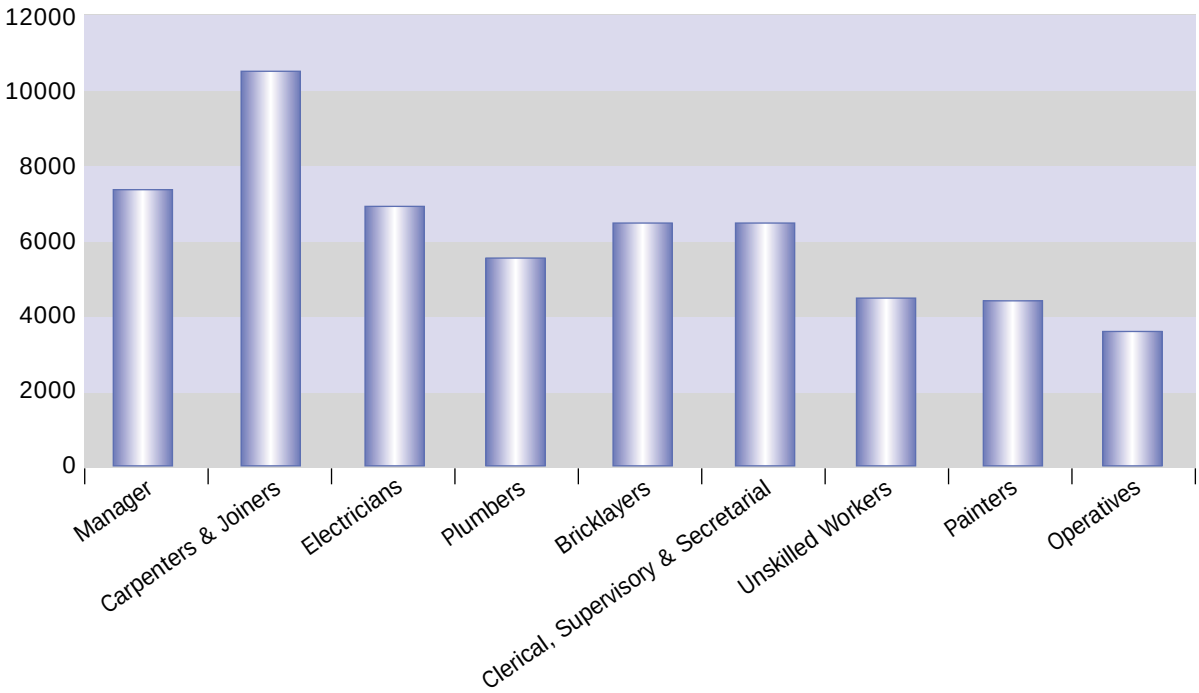
- a need for 96,000 managers to enter the industries, mostly accounted for by replacement demand but with some of the increase attributable to increases in overall employment levels.

(In this case the data, from IER, refer to the construction, specialist contracting and extraction/mineral processing sectors, but do not include professional service companies and partnerships. The projections can be found in Annex Table 2.4 on page 81)

2.45 Estimates for construction produced by CITB suggest slightly stronger rates of replacement demand for workers in the construction sector and specialist contracting sector.[8] They also indicate a slightly higher overall annual requirement of 75,000, compared to the IER estimate of around 65,000. In the CITB projection the largest needs are accounted for by carpenters and joiners (10,500); managers (7,300); electricians (7,100); bricklayers and clerical, supervisory and sales workers (both 6,500).

2.46 The recruitment needs of the construction industry are illustrated below (and in detail in Annex Table 2.5 on page 82):

Figure 2.5 Evidence of Annual Construction Recruitment Needs in 2000 - 04



Source: CITB

8 CITB and IERs projections use different methodologies and are for different time periods. The CITB estimates do not include extractives.

2.47 Clearly, the issue of workers approaching retirement and needing to be replaced is very significant in large parts of the construction, specialist contractors and extractive sectors, and also has some importance to the professional services sectors.

- Compared with sectors in which employment expanded rapidly in the 1980s and 1990s (for example, many service sectors), many parts of these sectors have relatively mature workforces, and hence large numbers coming up for retirement.

- Furthermore, the manual occupations within these sectors have high rates of early retirement, because much of the work is physically demanding and even dangerous, and working conditions are often poor.

- In some sub-sectors, the impact of an ageing workforce may also be compounded by the recent introduction of regulations requiring workers to re-submit themselves regularly for accreditation. In order to install gas systems and carry out maintenance work, for example, gas installers now have to be assessed in a far more rigorous manner than the previous ACOPS standard required. Engineers have to be assessed every five years, and the cost as well as the rigour of the assessment is relatively high.[9] The age profile of CORGI registered gas installers is biased towards the upper end, with more than a quarter aged over 49, and it is possible that the new arrangements may have the effect of bringing down the retirement age to 50-55, as older engineers decide not to put themselves through such a stringent assessment. Many can compensate for their loss of earnings by doing other plumbing jobs or kitchen-fitting - particularly while the economy is buoyant - while others may decide to operate outside the regulated market.

- The problem is compounded if there are low numbers of people applying to enter the occupations - a point addressed in later chapters. But even if there are plenty of new entrants to the occupations, the departure of older workers may result in a loss of skills that have been acquired over years, on the job.

Occupational change and skills requirements

2.48 Trends in occupations tell us a lot about skill needs, but not everything. For that we need to dig a little deeper. Unfortunately, sources of information prove to be rather rare, and represent a major research gap waiting to be filled.

2.49 The National Occupational Standards provide one approach to defining the skill needs of people within occupations, as do the occupational descriptions that underlie the Standard Occupational Classification itself. Similarly, the rubrics for the craft training received by skilled manual workers, and the qualifications that such people are expected to have in order to describe themselves as 'qualified', provide direct definitions of the vocational or job-specific skills of such people. The same is true for most professional workers.

2.50 Occupational standards are perhaps central here:

- they are intended in part to provide a common language to define what a competent person should be able to achieve at work

9 One company interviewed said that it was spending its entire training budget on ACS assessment.

- the standards are intended to cover not just the ability to perform specific tasks, but wider skills such as managing unexpected contingencies or being effective within the job environment
- they provide the basis for NVQs, but they can also be applied to other purposes, such as recruitment and appraisals.

2.51 However, such systems do not yet provide us with any data on which skills employers value most for people doing different jobs, or how those values are changing through time:

- for a plasterer, an electrician or a quantity surveyor, there is no clear basis on which to say whether someone needs to be more skilled or less skilled to do their job today, than twenty years ago
- nor do we have information on whether, for example, problem-solving skills are more important to plumbers than to carpenters, or whether numeracy is more important to quantity surveyors than to architects.

Construction craft workers

2.52 For construction craft workers we have some limited, but nevertheless revealing, evidence that suggests that:

- skilled construction craft workers are more reliant on manual skills than are skilled engineering or other skilled workers[10]
- indeed, the importance of manual skills to skilled construction workers is very marked - in no other occupation are any of the generic skills on which workers were asked to report as important as manual skills are to skilled construction craft workers
- rather disturbingly, skilled construction craft workers ascribe much less importance to problem-solving skills than do non-construction craft skilled workers - something that may be indicative of different working cultures between the construction sector on the one hand, and the manufacturing and service sectors on the other
- numerical skills are much less important than among skilled engineering workers
- and verbal skills and professional communication skills matter less to skilled construction craft workers than to other skilled workers
- on the positive side, the research suggests that skilled construction craft workers make more use of the ability to plan work than skilled engineering or other skilled workers
- and the ability to communicate with immediate fellow workers is of similar importance in the different skilled occupations - as one might expect.

10 Although note that the construction sector is an important employer of those with engineering craft skills.

2.53 Table 2.6 provides the relevant data. It indicates the relative importance of a range of skills for different types of skilled manual workers - those working in construction, in engineering and in other sectors. The evidence shows workers' assessments of their own skills, expressed on a consistent basis. From this we can see, for example, that manual skills are considered most important across all skilled craft occupations.

Table 2.6 Estimates, derived from surveys of the relative importance of different skills to different skilled craft occupations

	Skilled construction workers	Skilled engineering workers	Other skilled workers
Verbal	-0.61	0.10	-0.36
Manual	1.19	0.97	1.02
Problem-solving	0.15	0.68	fd0.39
Numerical	-0.04	0.18	-0.16
Planning	0.24	-0.27	-0.33
Client communication	-0.18	-0.40	-0.21
Horizontal communication	-0.35	-0.30	-0.35
Professional communication	-0.14	0.16	0.05

Source: Institute of Employment Research
Footnote: This data is derived from a broader analysis. In the original sample these scores average out to zero across the whole sample. A positive number indicates essential skills and a negative number that these skills are unimportant.

2.54 It is also striking that skilled construction craft workers share other characteristics with people who work in different industries at the *semi-skilled or operative level.* In terms of generic skills, other than manual skills and problem-solving skills, there were in 1997 no consistent gaps between *skilled* construction workers and those who worked in various other industries at the *operative* level.

2.55 Effectively this suggests that skilled construction workers describe themselves in much the same way as operatives in other industries do - and less favourably than the descriptions that other skilled workers apply to themselves.

2.56 These research results do not match with perceptions that many construction crafts demand high and diverse skills that place their owners on a par with skilled workers in other industries. This is a subject that would benefit considerably from more research.

2.57 The same research also offers some possible insight into changing skill needs in construction. Analysis of similar surveys conducted in 1986 and 1997 provides some limited evidence that the skill needs of skilled construction craft workers increased between those years. For the period since 1997, however, we can only speculate.

Managerial, ICT and other higher-level skills

2.58 There are strong perceptions among the leaders of all the industries covered in this report that professional and managerial skill needs are of central importance. There is little hard data, but some suggestion that:

- as professional institutions have raised standards within their own fields, so it has become increasingly hard for professionals from different disciplines to understand one another
- yet the need for coordinated processes and seamless project management, and above all the need to be client-focused, suggests that cross-disciplinary and project management skills are likely to be in rising demand too
- an important and growing area of skill needs is information and communications technology (ICT). This need is becoming more widespread throughout all of the industries covered by this review
- on construction sites, mobile phones are now ubiquitous, while many sites are linked via video cameras to the offices of project managers, architects and other consultants, who can thus involve themselves remotely in the work of a construction site without always having to pay a visit[11]
- computerised project management, integrated into web-based purchasing, and computerised facilities management based on 'smart' buildings, are also of increasing importance
- smart buildings themselves are essentially a continuation of a long established trend for building services such as heating and ventilation to be computer-driven. Accordingly, ICT skills are now increasingly important to heating engineers and many other specialist contractors
- perhaps the biggest impact is in professional services, with the emergence of computer-aided processes for mapping, drawing, design and analysis, and also with the arrival of web-based marketing and transactions.

11 Regional LMI Group (October 1997) Skills issues in the Construction Industry in the North East of England p.28 suggests that on some sites PCs are taking over the role of supervisors.

Chapter 3
Skills supply

- City and Guilds qualifications dominate in the electrical and electrotechnical sector
- In plumbing, City and Guilds and ACOP are the most popular qualifications
- Membership of a professional body is most important in professional services
- Around half of all construction workers are qualified to NVQ Level 3 or above
- Large numbers of workers hold NVQ Level 4 and 5 in the extractives sector
- In future years qualification levels will generally rise
- But the sectors already experience problems recruiting the best people
- This problem may be exacerbated if the sector does not raise investment in training
- FE is a vital provider of training for construction and specialist contracting sectors
- Trade Associations also have their own training companies or subcontract training
- Multi-skilling has contributed to an increase in the demand for short courses
- HE is particularly important for the professional services sector
- However, there is a lack of support for graduates entering small organisations
- On-the-job training is a key source of skills development
- And there has been a move to try and formalise this type of training
- Awareness of Modern Apprenticeships is high

Stocks of qualified people

3.1 In this chapter we look at the supply side issues facing the construction industry i.e. the labour force skills available to the industry. The main source of information is education and qualifications data. Also reviewed here is training activity within companies, together with the Foundation and Modern Apprenticeship training programmes.

Qualifications Today - the importance of Level 3 in construction

3.2 Skills are commonly, but not entirely, recognised through the award of qualifications. Estimates of the qualifications possessed by workers in the combined construction and specialist contracting sector are shown in Annex Table 3.1 on page 83. They indicate that about half of the workers hold NVQ Level 3 qualifications or their equivalents. There are only modest numbers at Levels 4 and 5, and over a quarter of workers were only at Level 1 or below. Over time, the proportion of people working in construction that have no qualifications has been falling. Correspondingly, the proportion of people with NVQ Levels 1, 2, and 3 has increased.[12] This reflects the fact that older workers,

12 Labour Force Survey, 1996 to 1999.

who are more likely to have no qualifications, are retiring and also reflects occupational changes. However, there remains plenty of scope for improving the numbers of workers who hold NVQ Level 3 and above. The CBI has estimated that at least half the jobs in the economy require Level 3 or higher and the demand for this level of skill is likely to increase in future, in construction and in the wider economy.[13] Provision for this level of training should be a priority for the industry.

The specialist contracting sectors

3.3 Table 3.2 provides more information for those in electrical trades and the electrotechnical sector more generally. The evidence suggests that, as one would expect, City and Guilds dominate in terms of the qualifications that employers say their people already have, and Modern Apprenticeships dominate in terms of the qualifications they are working towards.[14]

Table 3.2 Qualifications held in the electrotechnical industry - share of workforce holding or working towards the qualification

	Holding the qualification (%)	Working towards qualification (%)
Professional	2.1	<1
Degree	1.3	<1
Modern apprenticeship	8.0	15.5
NVQ/SVQ	2.2	3.5
City and Guilds 236 Part 1	19.2	5.1
City and Guilds 236 Part 2	26.8	5.0
City and Guilds - other`	7.5	2.1
BTEC/Edexel	1.4	<1
SCOTVEC/SQA	1.6	<1
Other	<1	<1

Source: Postal survey for NET LMA 1998

3.4 The ESTTL labour market survey did not collect equivalent information for those working in the heating, ventilation and air conditioning sector, but Table 3.3 provides corresponding information with respect to plumbers. The qualification that employers in early 1999 were most likely to say was needed in order to work in the industry was ACOP, followed by City and Guilds - the former is essentially a measure of competence, however, rather than a broad measure of skills.

13 DfEE (1999) Delivering Skills for All: Second Report of the National Skills Task Force.

14 Before the introduction of S/NVQs, City and Guilds qualifications were the usual standards for many craft trades. Today, many people still use 'City and Guilds' to refer to standard qualifications - partly because CGLI are an awarding body for many qualifications.

Table 3.3 Qualifications needed to work in the plumbing industry: Survey responses

	%
City and Guilds	57
ACOP	53
S/NVQ	19
JIB registration/grade card	16
SCOTVEC	4
Other	19

BPEC, 1999

The professional sector

3.5 Amongst professional service companies the pattern is different, with three-quarters of employers in the TOPIC survey reporting that membership of a professional body was the most important qualification for employees to hold.

Table 3.4 Most important qualifications in professional services: Survey responses

	%
Membership of professional institutions	72
First degrees	11
HNC/HND	9
Masters degrees	3
S/NVQ	2
Other	3

TOPIC, 1999

The extractives sector

3.6 In the extractive and mineral processing industries, the situation is again rather different as the 1999 EPIC employer survey indicates. The highest levels of qualifications are amongst senior management and professionals. But the pattern differs markedly from construction, with rather larger numbers of workers with NVQ Level 4 or 5. (Although less than one-third of respondents to the survey actually provided information on the qualifications held by their employees and therefore the results should be treated cautiously).

3.7 The survey also suggests that large numbers of operatives either hold, or are working towards, NVQ Level 2.[15] This may reflect at least some commitment to the pursuit of a

15 See Annex Table 3.5 for detailed results on p.84.

qualified workforce, even if not at an especially high level so far. (Although there is a risk that some employers may have classified 'certificates of competence' held by drivers/operators of mobile plant as NVQs).

Trends in qualifications

3.8 In future years these qualifications patterns will alter, and qualification levels will generally rise. More formally-qualified people will enter the workforce and many of those that remain will improve their own qualifications while some of the least qualified currently in work will leave.

3.9 The changing qualifications structure will be driven by both demand and supply side factors. Projections of qualifications to 2007 are similar to the level of qualifications in the industry today and suggest that occupational change is not an important driver of changing qualification patterns.

3.10 Nevertheless, qualification patterns are likely to change much more than this, because the training and educational systems are geared up to supply more qualified people into the labour market. Projections for the whole economy, produced by IER, show an increase in the percentage of those in work holding NVQ Levels 4 and 5 and a decline in those holding NVQ Level 3 or lower; indeed that the supply of people educated to NVQ Levels 4 and 5 may rise even faster than demand. This is unlikely to translate into graduate unemployment and instead it is likely that those with higher qualifications will take up jobs currently done by those with NVQ Level 3 or below. In other words, there will be a ripple effect down the qualifications hierarchy.[16]

3.11 Such patterns will vary by industry. The construction, specialist contracting, professional services and extractive and mineral processing sectors already experience problems recruiting the best people (see subsequent chapters), and show little evidence of participating in the rising demand for more highly-qualified people. Consequently, there is a risk that these sectors will find it more difficult than others to attract graduates and the relative qualifications levels in these industries will fall behind other parts of the economy.

3.12 There is also the possibility that the industries covered by this report will fail to raise their own investment in training. For much of the 1990s this was certainly a common source of anxiety with respect to much of the construction sector, reflecting an apparent sharp falling away in the number of construction apprenticeships. Calculations by Hilary Steedman suggested, for example, that the number of people under 25 years, qualifying at craft level in construction, fell from 24,000 in 1991 to just 8,700 by 1996.[17] However, the DfEE statistics on NVQs awarded suggest a much flatter trend through much of the 1990s, and the industry's main concern at present is to find people to take up the training that it can offer.[18]

16 One consequence may be that the availability of more qualified people causes the lower-level jobs to be effectively upgraded, with employers taking advantage of the more academic skills of their recruits. There is reason to believe that such an effect has happened in recent years, since the wages premium paid to graduates has not fallen, despite the trading down in entry jobs that graduates obtain.

17 Steedman, H. (1998) A Decade of Skill Formation in Britain and Germany, Journal of Education and Work, Vol 11, No 1, 1998. Craft level in this context was taken to be the old City and Guilds Part II qualification, or the new NVQ 2.

18 See Annex Table 3.6 for detailed numbers of NVQ awarded (see p.85).

Further Education and other colleges

Overall numbers

3.13 Further Education (FE) is vital in providing training for the construction and specialist contracting sectors. The FE sector also plays a small role in providing trained recruits or off-the-job training for the extractive and mineral processing sector. It is less important for the property services sector, which needs more highly-qualified people.

3.14 In 1996/7 about three per cent of all FE students were on construction or construction-related courses. Of almost 150,000 construction-related enrolments on the Further Education Funding Council's (FEFC) Individual Students Registrations (ISR) database in 1996/7, nearly 46,000 were from just 20 colleges. Manchester College of Arts and Technology, trains the largest number of construction students with over 6,800 enrolments.[19]

3.15 Students at FE colleges typically account for only a third to a half of those gaining qualifications in the three main building skills, according to the Qualifications and Curriculum Authority (QCA) (see Table 3.7). FE colleges are supplemented by private training providers (often specialising in construction or specialist contract crafts) and many larger employers have their own training centres. The remainder obtain accreditation via their place of work, although private sector colleges are also important.

Table 3.7 Share of FE colleges in training in the three main building trades, 1996/7

	Total NVQ achievements in each trade	Of which students at FE colleges
Level 2		
Carpentry joinery	3,000	51
Bricklaying	2,400	34
Painting and decorating	1,600	35
Level 3		
Carpentry joinery	1,800	53
Bricklaying	1,100	34
Painting and decorating	500	51
Total of the above	**10,400**	—

Source: FEFC Table 3.5 p17 - see source for notes on definitions and methods

19 FEFC (1999) Program Area Review - Construction p.13. The 150,000 figure for enrolments exceeds that for students (126,000) because some enrol on more than one course.

3.16 Many trade associations also have either their own training companies or they subcontract training to independent firms. The courses are usually short, ranging from one to five days, and often do not lead to formal qualifications. Course completion may be necessary for membership of the association, and may be a precursor to promotion within a member firm.

3.17 The ISR database, discussed above, covers all students on construction-related courses in the FE sector. Alternatively, the CITB survey of colleges looks at students taking NVQ courses (up to Level 3) in construction and construction-related subjects, but extends beyond FE into private providers. The subjects covered include plumbing, but exclude electrical occupations.

3.18 The CITB evidence shows that 35,800 people enrolled on these courses in 1998/9.[20] This is a rise of about a fifth compared with the previous year, although because the scope of the survey was extended during the period the level of genuine increase is unclear. (Figures are shown in Table 3.8).

Table 3.8 First-year construction trainees: who they are 1998/9 CITB estimates

NVQ Level 1		8,190
Adult 'improvers' (mostly in the industry, up-skilling on their own account)		6,190
'Out of scope' - e.g. local authorities and public utilities		1,100
Plumbing		4,230
Full time students under 18		4,350
Adult new entrants to (includes New Deal and others)		1,250
New entrant trainees with construction managing agents		10,480
Of which	CITB	7,070
	CITCs	1,590
	Other	1,820
Total		35,790

Source: CITB College Survey, 1998/9

Who enrols, and who enters the industries?

3.19 The CITB survey shows about a fifth - just over 8,000 students - were studying for basic courses leading to a Level 1 qualification. However, there is no information on how many move directly into employment in the construction and related industries. There were over 6,000 adults seeking to improve their skills on their own account, typically by studying at night school. These people tend to be working already in the construction industry or related sectors. About 1,000 worked in different industries such as the public sector or public utilities, while there were over 4,000 people studying plumbing.

20 The figures exclude Northern Ireland.

3.20 There were 4,000 students under the age of 18, and about 1,000 adults on schemes such as New Deal. Some of these people might move into construction and related sectors, but their careers paths would be much less closely managed than the remaining roughly 10,500 people registered with managing agents. These agents recruit trainees, place them with appropriate employers and monitor and supervise their training. The 10,000 thus represent the core of recruitment of qualified people at intermediate skill levels into the construction industry itself.

3.21 In recent years there has been an increase in the number of students under 18 undertaking FE courses, and also an increase in adults without employer sponsorship enrolling on construction and related courses. These partly reflect government policies encouraging people into education, training and work. The rise in adult enrolment may also have much to do with a shift towards more formal recognition of site skills within construction, and towards regular re-assessment of competency in specialist contracting. In addition, the motivation of individuals may have changed, with more young people wanting to gain decent qualifications before leaving the education system, and older workers coming to value the benefits qualifications can bring them.

3.22 However, the drive towards training and qualifications may cause problems for the industry. Some of those who are studying construction or construction related courses at college might not intend to enter the construction and contracting industries. More significantly the emphasis on qualifications has led to more youngsters staying on in education, reducing the pool of school leavers from which the industry used to recruit workers.

3.23 Another problem for the construction and contracting industry is the low number of ethnic minorities and women entering it. While the proportion of students from ethnic minority groups is well in excess of their share of the total population, the proportion of ethnic minority members who actually enter construction and contracting is not very high. And there is significant under-representation of women, both in the student population and in the industry (see Table 3.9).

Table 3.9 Students on FE construction courses, by gender and ethnicity 1996/7

	Number	%
Male	97,453	93.7
Female	6,607	6.3
White	82,198	79.0
Non-white	21,862	21.0
Total	104,060	100.0

Source: FEFC, 1999

The types of courses on offer

3.24 The courses that students take at college range widely, from one-off short courses and NVQ entry and Level 1 courses, to three-year programmes, generally at NVQ Levels 3 and even 4 (for example, the HNC in Building Studies, which is one of the most popular courses offered in FE colleges). As well as programmes based on NVQs, colleges also typically offer courses geared towards other recognised qualifications and competencies, notably the competency requirements for gas installers and electricians. The courses may be of the colleges' own design, or designed in collaboration with other organisations, and can be full-time, part-time (in construction this is marginally less common than for courses at large), block release, day release or one or more evenings a week.

3.25 There are literally thousands of such courses on offer, and thousands of qualifications that people can seek to gain. For example, roughly half of all qualifications within the construction sector attract fewer than 100 students across the entire country. As a result there are concerns that the variety of courses make it hard for applicants to know what to study and what qualifications to pursue. Having said that, a small minority of courses account for a large share of enrolments - in 1996/7 the ten most common FE construction courses accounted for a third of all such enrolments.[21]

The subjects that people study

3.26 The rise of multi-skilling in the workplace has contributed to an increase in the demand for short courses, so that people can extend, or update, their skills. There is some disagreement over the value of such courses, which do not lead to accreditation - both the FEFC and the CIB have expressed concern - but there is little doubt that the industry's need for this type of multi-skilling will rise, and that this will be a growth area.[22]

3.27 More positively, the emergence of college courses, mostly at NVQ Level 2, in 'construction site work' is helping to address a long standing criticism of construction sector training provision, which is that many supposedly unskilled labourers receive little formal training, yet exercise genuine skills that are simply not formally recognised.[23] Table 3.10 suggests that in 1996/7 there were about 56,000 people enrolled on FE courses on general construction and site work courses, and people on general construction courses now account for about a third of enrolments reported on the ISR database, although about half of these are on short courses.

21 FEFC p.18.
22 See FEFC (1999) p. 5 and CIB (1998) p.5.
23 NFER (1999); FEFC (1999) p.9.

Table 3.10 Construction and specialist contracting enrolments recorded in the ISR database by trade (superclass definition) 1996/7

	Enrolments	% of total
General construction, built environment, property, other	47,900	34.8
Construction site work	8,300	5.8
Construction carpentry/woodworking	20,300	14.3
Brickwork/masonry	10,900	7.7
Painting and decorating	6,800	4.8
Plastering	1,300	0.9
Other building/construction operations	1,100	0.8
Civil and structural engineering	1,900	1.3
Electrical work	10,000	7.1
Plumbing	9,700	6.8
Gas supply installation1	18,800	13.3
Heating and ventilation	800	0.6
Other building services	3,900	2.8

[1] (Reflects existing workers taking courses to satisfy CORGI competency standards, and is not an indication of recruitment of new gas installers).

Source: FEFC ISR database, July 1997, as quoted in FEFC (1999)

3.28 Where construction trades are concerned, the four building trades of carpentry, bricklaying, painting and plastering dominate the numbers as far as the ISR database is concerned, and about a quarter of all enrolments reported on the database are for people in these trades.24 Indeed FE colleges have more students studying these subjects than any other.25

3.29 Training for specialist contracting occupations occurs through established training courses, and as Table 3.10 shows, large numbers are reported on the ISR database. The figures reflect in part the requirement for many workers to attain certification of competence, and do not necessarily reflect the extent to which *new skills* are currently being acquired by such people, let alone by new entrants. In the gas industry, for example, installers need to meet competency standards set by CORGI if they are to carry out work on their own. Electricians similarly need to meet standards set down in Institute of Electrical Engineers (IEE) regulations.

24 More recent CITB data give a similar picture. Of 10,000 trainees starting in 1999, 3,700 were carpenters and joiners, 2,100 were bricklayers and 1,300 were painters and decorators. The wood occupations are subdivided, but collectively represent the fourth largest category.

25 FEFC (1999) Programme Area Review: Construction, p.8.

3.30 Other key points include:

- for the building trades, enrolments are much more likely to be at NVQ Level 2 than at either Level 1 or Level 3 and above. In contrast, although FE courses for the specialist trades (roofers, floorers, glaziers and others) are growing in importance, numbers enrolled on training courses are still modest as a share of the total, and very few are above NVQ Level 2
- gas enrolments are overwhelmingly Level 2 and are probably dominated by people studying towards CORGI competency. Plumbing and heating/ventilation are also skewed towards Level 2, whereas electrical enrolments are slightly more likely to be Level 3, as are other specialist contracting courses
- although fewer people work in civil engineering occupations than in the building trades, their skills are of great importance to the construction industry as a whole, and indeed, the overwhelming majority of such courses are at Level 3 or above
- even when the skills are at lower levels they can still have strategic importance. For example, scaffolders may only work for a few days on a site, but without them little else can happen. Yet low numbers make it uneconomic for large numbers of different training courses to be run. The CITB and the FEFC have both noted that only four colleges in England provide courses in scaffolding.[26] As with other subjects in limited demand, the priority is to ensure that the courses are genuine centres of excellence, and that there is access to them even for people from elsewhere in the country

Higher education and professional bodies

3.31 Graduate entry

The higher education system also supplies new entrants to the various sectors covered in this report. It is a particularly important source of supply for the professional services sector. Yet, despite the increasing demand for graduates, applications for places on related courses have been declining in recent years (see Table 3.11). It has also been suggested that universities are accepting lower-calibre applicants onto courses.[27]

Table 3.11 Applications to built environment courses

	1994	1995	1996	1997
Civil engineering	5,100	4,500	4,200	3,800
Architecture	3,300	3,200	3,100	3,200
Building/construction	4,000	3,900	3,200	2,800
Total of above	12,400	11,600	10,500	9,800

Source: UCAS Annual Report

26 FEFC, p.9; CITB (1997).

27 The issue is discussed in Ove Arup Foundation (1999) Interdisciplinary Skills for Built Environment Professionals.

3.32 A similar picture emerges if we look at those graduating from construction related degree courses (see Table 3.12).

Table 3.12 Students graduating from construction-related courses

	1996	1997
Civil engineering	2,550	2,250
Architecture	1,580	1,310
Building	2,840	2,500
Environmental technology	280	260
Town and country planning	1,300	1,170
Other architectural	30	80
Total of above	8,580	7,570

Source: National Construction Careers Group Labour Market Information Updates

3.33 Of course, the sectors covered by this report also recruit general graduates to enter managerial and administrative jobs, covering project management, procurement, marketing, finance and a range of other specialisms.

3.34 The dialogue consultation process provided anecdotal evidence that employers find it hard to recruit the best graduates. A key issue is the image of the construction and extractive sectors as having unenlightened social attitudes and difficult working conditions.

Professionals

3.35 One consequence of the decline in applicants for vocational degree courses seems to have been that larger percentages have been accepted onto courses (larger increases than in other disciplines), thus preventing a large decline in the flow of specialised graduates for the professions. This may place increasing pressure on employers and professional bodies to ensure that students, once they graduate, are properly supported in the progression towards full qualification. Professionals such as architects, engineers or surveyors mostly study for, and obtain, qualifications set by their own professional bodies. For example, 29 per cent of architecture graduates in 1997 and 26 per cent of those with town and country planning degrees went on to further education/training. Those who go straight into work typically take on professional or associate professional jobs, rather than managerial or administrative ones; if it is the latter, it may well be in companies working in markets completely unrelated to the subject of study.

Table 3.13 Graduate destinations, 1997 (1996 in brackets), per cent of total

	Employed	Education/training	Seeking work
Architecture	61 (54)	29 (36)	6 (7)
Building	85 (80)	4 (6)	9 (12)
Environmental technologies	77 (60)	13 (23)	8 (12)
Town and country planning	62 (60)	26 (28)	7 (8)
Civil engineering	77 (73)	13 (15)	6 (9)
Land and property management	79 (81)	4 (3)	12 (14)

Source: National Construction Careers Group

3.36 Unfortunately, research on behalf of TOPIC suggests there is a lack of support for graduates entering employment with small organisations. This is not so much the case in professional practices, which normally have explicit policies of helping recruits to work towards their professional qualifications, but applies in small construction firms and specialist contractors, which seldom have such policies, lack systematic training plans, and rarely have any interest in their recruits attaining professional status.[28]

3.37 The skills that professionals acquire through their formal education and qualifications tend to be highly focused, especially in the case of architects, and the traditional demarcations associated with skilled craft workers are no less apparent amongst professionals. Significantly, while 32 per cent of such professionals describe themselves as 'solution providers' and 51 per cent described themselves as 'professional/technical advisors', their clients thought differently; only 17 per cent said the professionals were 'solution providers' and 68 per cent described them as 'professional/technical advisors'. It appears that there is a mismatch between how professionals view themselves and how they are perceived by their clients.[29]

Training Programmes

Training while in employment

3.38 In almost all sectors in the economy, most investment in training comes from employers. Some of this takes place off the job, and the point has already been made that large numbers of those studying in colleges are employer-funded. Similarly, many graduates have an employer sponsor, normally one of the handful of very large contracting companies.

3.39 However, on-the-job training is also of considerable importance, and in all the sectors under consideration, larger and better employers (the two are not necessarily the same) provide explicit training towards NVQs and other qualifications. The extent of this remains poorly documented, however, as it is in most sectors; and even information on whether firms have training plans and training budgets is not

28 TOPIC Briefing Paper 1/99.
29 TOPIC (November 1998) Training Survey Report.

comprehensive. It also seems that employers want site-proven skills, yet are reluctant to provide work experience to trainees, and that subcontractors are becoming very specialised, yet want employees who are increasingly multi-skilled.

3.40 Of course, qualifications provide only a partial measure of how much investment has been made in skills development. There are two main reasons, which tend to reinforce one another:

- first, many workers' qualifications will have been acquired years ago, and will not be an accurate indication of how skilled such people now are. The formal value of their qualifications may have been diminished through time, but against that, the individuals are likely to have learnt new things, not encoded in any qualifications

- second, comparisons between industries can be heavily influenced by the age structures of the different workforces. The qualifications attained by young people tend to rise through time, so that an industry with a young workforce is likely to exhibit higher average qualification levels than either the extractive and mineral processing industry or the construction industry, both of which have older workforces. It is possible - indeed likely - that age and experience themselves act as sources of skills for workers.

3.41 Work experience is a key source of skills development for all the sectors under scrutiny. Few FE or HE courses offer work experience. However, the critical skills that courses offer include not just the practical and vocational elements, but also softer, more generic, skills such as the ability to diagnose problems.

3.42 Indeed, much effort in recent years has been directed at capturing some of these qualities in formal qualifications systems. Modern Apprenticeships, and the membership requirements of many professional organisations, have introduced such concepts into the qualifications system, and there has been a lot of radical change in the way in which assessment is taking place, with a move away from testing rote-learning and towards testing more conceptual skills.

3.43 In another development, ESTTL, NET, BPEC, HVCA (the Heating and Ventilating Contractors Association) and ECA (the Electrical Contractors Association) have been seeking to develop a common approach to defining and promoting multi-skilling. The aim is to extend multi-skilling from the managerial and supervisory level downwards, pulling together workers from the mechanical and electrical craft heritages. As a result, a modern apprenticeship for building service engineering technicians is now available, covering a range of disciplines within a common framework. It is aimed at those in the industrial and commercial sectors rather than the domestic sector, where traditional skill boundaries are thought to still be appropriate.

Professional services

3.44 For professionals, training tends to be geared towards obtaining professional qualifications but, partly because of the requirement of the professional organisations and partly because of barriers such as lack of time, the training itself is mostly on the job.[30]

30 TOPIC (November 1998) Training Survey Report, p.7.

3.45 Evidence on training provision for professionals is provided by TOPIC's 1998 Training Survey.[31] The survey covers firms mainly engaged in architecture (almost half the total), building surveying, quantity surveying, project management and engineering, or in many cases a combination of such disciplines. Although some such firms are large with hundreds or even thousands of employees, the majority are micro-businesses, and both the survey coverage and some of its key results reflect that.

3.46 Amongst professional firms surveyed in 1998 by TOPIC, over half said that they spent less than 1 per cent of their revenue on training, but 11 per cent claimed to be spending over 5 per cent. This is high by the standards of many businesses, but not implausible in a sector that relies heavily on its professional knowledge and workers keeping abreast of the latest ideas and techniques - hence the fact that nearly two-thirds of companies said that the main aim of training was to increase or improve the skills of professionals. Very few firms (3 per cent) said that either their training expenditure or the number of people being trained would fall in the next 12 months.

3.47 Where off-the-job professional training is provided, it tends to come from professional institutions and universities, with firms choosing providers mainly on the basis of course content rather than cost, reputation or location (although poor value for money is most commonly cited as a criticism of the training bought). Table 3.14 shows the main topics on which training is obtained.

Table 3.14 Most important subjects of external training for professionals, per cent

Health and safety	42
CAD/engineering drawing	40
IT/computing	35
CPD requirements	34
Architecture	34
Management/project management	28
Law and contracts	25

Source: TOPIC (1998)

Continuous professional development

3.48 Continuous professional development (CPD) is obligatory, at least in principle, for membership of most professional bodies.[32] For example, the Institution of Civil Engineers requires members to engage in five days of CPD a year, while the Institute of Clerks of Works requires 40 hours over two years. Most professional bodies provide guidance on what counts as CPD, and many run or provide information on courses.

3.49 In most professions, the emphasis of CPD is on keeping in touch with new technical developments. But there may also be a need to help professionals understand, and

31 TOPIC (November 1998) Training Survey Report.

32 A summary of requirements is provided in Construction Industry Council (September 1999) CPD Information Sheets of the professional institution members of the CPD in construction group.

respond to, changes in business circumstances and in business strategies.[33] Part of the function of TOPIC - an organisation funded by the Construction Industry Council (CIC) - is to encourage individuals and organisations to address such issues within CPD. Anecdotal evidence from within the sector suggests that more progress may be needed.

3.50 There are also suspicions that the arrangements for monitoring and verifying CPD are not always as rigorous as they should be, and some professional bodies may sometimes be reluctant to impose sanctions on their own members for failing to meet fully their CPD obligations, and may allow activities to count towards CPD that perhaps should not (such as attending a conference). Such concerns may persist at least until professionals are required to re-submit themselves periodically to be re-examined and re-registered - although there is little reason to suppose that any change of that nature is imminent.

Foundation and Modern Apprenticeships

3.51 Foundation Apprenticeships, formerly known as National Traineeships, and Modern Apprenticeships (MA) are important elements in the infrastructure whereby vocational and craft level skills are obtained by those working in, or seeking to work in, the construction, specialist contracting and extractive and mineral processing sectors. They are less important for the professional service sector, for obvious reasons.

3.52 Table 3.15 provides an assessment of which parts of the construction sector make particular use of trainees. Manual trades dominate over non-manual workers, and within manual trades there is a strong bias towards woodworking trades. (The numbers do not include subcontracted companies or sole traders, accounting for the fact that electricians, for example, are under-represented).

Table 3.15 Construction trainees by occupation*

	No. of trainees	Trainees as % of workforce in occupation	% of all construction trainees
Wood Trades	8486	9.2	30.3
Bricklayers	3980	4.2	14.2
Plasterers	827	4.1	3.0
Roofers	1747	6.4	6.2
Painters and Decorators	2652	6.1	9.5
Tilers and Floor-coverers	354	4.2	1.3
Scaffolders	628	5.5	2.2
Plumbers	774	5.6	2.8
Heating and Ventilation	2862	8.2	10.2
Total manual occupations	**25224**	**5.0**	**90.0**
Office Services	780	9.7	2.8
Professional services and property services	2022	2.6	7.2
Total non-manual occupations	**2802**	**1.8**	**10.0**
Total all occupations	**28026**	**4.2**	**100.0**

Source: 1998 Survey of Employees in Construction

*significant numbers only - total will not sum

33 Health and safety issues get little place in either continuous professional development or graduate training, despite the need for improvements to occur. This may be indicative of a broader failure to identify improvements to the working environment as a key issue for the industry.

3.53 Awareness of Modern Apprenticeships is high. The scheme is well established in the construction industry as a means for delivering skills development.

3.54 For example, NET reported that 87 per cent of their new entrant trainees were working towards Modern Apprenticeships, and that 59 per cent of those who replied to the NET survey felt they were well informed about Modern Apprenticeships and only 6 per cent said they had no idea what they were.[34] Half the respondents to the NET survey had arranged some form of training in the previous year, and the most frequently used scheme was Modern Apprenticeships.[35] Around half the firms in the industry are 'training firms' which make a commitment to training whereas the rest have little or no interest in training.

Similarly, some 90 per cent of firms responding to the ESTTL (2000) survey were aware of NVQs and 78 per cent were aware of Modern Apprenticeships/National Traineeships.

Table 3.16 Training initiatives used in electrotechnical firms

Initiative	Fully used	Used in selected departments	Occasionally used per cent	Has not been used per cent
Modern Apprenticeship	34	8	23	36
NVQs/SVQs	15	8	23	54
National Traineeships	2	1	6	92
National Standards	2	<1	3	95
Graduate Traineeships	<1	1	2	96
New Deal	<1	<1	3	96

Source: NET (1999)

3.55 The need to meet increasingly high standards in order to achieve registration - and therefore to be able to work - has always driven training in the *plumbing* sector. Although City and Guilds have historically been the preferred options for firms, Modern Apprenticeships are now a major channel of investment in the skills of new entrants. According to BPEC, 'around two-fifths' of plumbers surveyed employed trainees or apprentices, with larger firms (not surprisingly) being more likely to do so than smaller ones.

3.56 In the gas installation sector there is a serious shortage of apprentices. Most installers are sole traders and cannot afford to take on an apprentice unless he or she is able to generate revenue fairly quickly. However, the need to meet competency standards set by CORGI before a person can work on their own makes it difficult for apprentices to jump that hurdle. In any case there are few applicants.

34 NET (1999) Skills and Labour Market Survey of the Electrotechnical Industry, p.38.
35 NET (1999) Skills and Labour Market Survey of the Electrotechnical Industry.

The CITB levy scheme

3.57 The construction sector is unusual in the UK in that firms pay a levy to the CITB, which is used to fund training of new entrants and existing workers. The scheme is intended to address the problem whereby individual firms are reluctant to fund training for staff, who are quite likely to leave the firm fairly quickly. The training can be college-based or in-house, provided it is in some way accredited (normally, within the NVQ framework). Typically, firms that plan to provide training, or other forms of investment in people, approach CITB for a grant to cover most of the direct cost (e.g. course fees), although not normally the value of working time lost.

3.58 The levy is voted on annually by Parliament, and all but the smallest firms in the industry are legally obliged to pay. The scope covers mainstream construction, civil engineering and specialist contractors, but not principally those in the electrical, plumbing or heating, ventilation and air conditioning sectors. Traditionally the focus has been on vocational craft skills, and although there has been a shift towards funding managerial training, reflecting agreement over the importance of managerial skills, there are also arguments about whether it is appropriate for the levy to fund investment in generic skills that can be poached by employers in other industries.

3.59 Survey evidence suggests that there are many differences between CITB and non-CITB trainees.[36] For example, nearly twice as many CITB trainees (60 per cent) were taking block release courses as non-CITB (33 per cent), and just over half (52 per cent) of the CITB respondents had done a construction project at school but only 37 per cent of non-CITB trainees had done so.

3.60 However, the most important difference between the two groups was in the type of course followed. Table 3.17 shows that three-quarters of CITB trainees were working towards Modern Apprenticeships, compared with only 28 per cent of non-CITB trainees. The levy scheme thus seems to be particularly appropriate with respect to support for the MA scheme, and hence with respect to substantial training activity.

Table 3.17 Training programmes taken by trainees per cent

Programme	CITB	Non-CITB
Modern Apprenticeship	75	28
National Traineeship	8	7
Other Youth Training	13	30
Don't Know	3	20
No Response	2	14
Total	101	99

Source: NFER Construction Apprenticeship Survey 1998

36 Questionnaires were sent to new trainees in the construction industry in the autumn of 1998. Just over 3,000 CITB trainees and 247 non-CITB trainees responded.

OSAT and other initiatives

3.61 The Construction Skills Certification Scheme (CSCS) and the Link Card are initiatives from the construction industry, intended to produce a shift towards properly trained and certified site-workers. The expectation is that clients will increasingly want contractors to offer them workforces who all possess cards showing their qualifications. The scheme is still in its infancy, however, and it has yet to make a large impact. Often, clients have to waive their demands in the face of current labour shortages, and many contractors and individuals are as yet reluctant to embrace the scheme. Thus a programme to recruit individuals onto the scheme in late 1999 produced about 90,000 requests for application forms, but it is likely that only a minority (perhaps one in five) have led to registrations.

3.62 The Onsite Assessment and Training (OSAT) programme involves assessing the competence of existing workers, and either awarding them the appropriate qualifications, or putting in place the appropriate grant-aided training (currently £350 grants for assessment and further grants for the training itself). CITB estimates that take-up in 2000 may be of the order of 25,000 people.

Chapter 4
Skills mismatches

- Recruitment problems in construction and contracting are currently very bad
- Problems are also bad compared with other industries, as they are in extraction
- Professional services struggle to recruit good people
- Applicants' poor technical, customer care and other skills are a major explanation
- But often, so too is a sheer lack of applicants
- Employers see suspiciously few problems with the skills of existing workers
- And construction usually gets round its skills problems, at least in the short term
- But skill deficiencies affect quality and customer care and jeopardise work timetables
- These need to be addressed if the construction industry is to reposition itself
- Big need for problem-solving, team working and project management skills

Recruitment problems

Construction and specialist contracting

4.1 There is no doubt that in the last couple of years, many parts of the construction industry and of specialist contracting have experienced historically high recruitment problems.

4.2 In part this reflects cyclical patterns. During the late 1980s, the Construction Confederation's quarterly survey typically showed that four out of five construction employers had difficulty recruiting skilled workers such as bricklayers or carpenters. In the recession of the early 1990s this fell to almost zero. The next few years then saw a sharp hike in recruitment difficulties, followed by an equally sharp falling-away as the economy slowed down in the mid-1990s. In 1996, the economy became more buoyant and problems re-emerged, and they have remained widespread ever since.

- There has been an upward trend in the number of unfilled vacancies since 1995. While it is widely recognised that the number of vacancies notified to jobcentres do not reflect the full extent of demand on the job market, this is nevertheless one of the best available pointers to existing trends.
- In the fourth quarter of 1999 (the latest available at the time of writing), the most extreme shortages were for bricklayers, with 79 per cent of firms saying that it was difficult, very difficult or virtually impossible to recruit; followed by plasterers and carpenters and joiners (see Table 4.1)[37]

37 Construction Confederation (February 2000) Construction Trends Survey.

Table 4.1 Evidence on construction sector recruitment problems
Firms experiencing difficulty securing labour
1999 fourth quarter, by type of person, per cent of firms

Bricklayers	79
Plasterers	72
Carpenters and joiners	69
Plumbers	61
Electricians	55
Skilled civil engineering	49
Scaffolders	42
Plant operators	38
Roofers	36
Painters and decorators	32
Steel benders and fixers	29
General building	21
General civil engineering	17

Source: Construction Trends Survey February 2000

4.3 The shortage of bricklayers was just below the previous peaks of 87 per cent at the end of 1988 and 83 per cent in mid-1998, while the shortages for plasterers and carpenters were at their mid-1998 levels.

Comparisons between industries

4.4 There is plenty of evidence that the scale of problems in construction and specialist contracting, and possibly in extractive and mineral processing, is higher than the all-industry average. Although the percentages of firms reporting that they have vacancies tends to be quite low in these industries, a different pattern emerges from a focus on just *hard-to-fill* vacancies:

- according to the Employer Skills Survey, 20 per cent of all construction companies had some hard-to-fill vacancies in 1999, slightly above the 16 per cent for all companies
- since only 28 per cent of firms were recruiting at the time, this implies that of recruiters, 71 per cent had hard-to-fill vacancies.

4.5 And of all hard-to-fill vacancies in the economy, 13 per cent were attributable to the construction sector - roughly three times greater than the sector's share of total employment.

4.6 So these are clear indications of a labour market problem. Indeed, the Employer Skills Survey evidence suggests that both mining and quarrying and construction and specialist contracting have more serious recruitment problems than *any other* sector.

4.7 For professional services, there is little data to suggest how recruitment problems compare with other sectors. However, the points made in Chapter 3 about problems with the supply of future professionals indicate the nature of at least some of the recruitment difficulties that the sector faces.

Recruitment problems by type of jobs

4.8 Evidence on different occupations reinforces the story:

- for example, within plumbing, the BPEC survey reported a very similar pattern to that shown in the Employer Skills Survey for construction and specialist contracting as a whole, with a fifth of companies having hard-to-fill vacancies
- and although for mining and quarrying the Employer Skills Survey figure for hard-to-fill vacancies was only 6 per cent, almost half (48 per cent) of firms surveyed in the 1999 EPIC survey reported that they had hard-to-fill vacancies.[38]

4.9 Within construction and contracting, the Employer Skills Survey evidence suggests that in 1999:

- hard-to-fill vacancies were particularly prominent in craft and skilled occupations, which accounted for 70 per cent of all reported hard-to-fill vacancies, reflecting high levels of recruitment activity in this area
- sales occupations accounted for the next greatest proportion, at nine per cent
- the remaining hard-to-fill vacancies were distributed fairly evenly among other occupations (with the exception of personal service occupations, for which there were none).

38 The Employer Skills Survey also has information on total vacancies. Among the construction companies recruiting, the average number of vacancies was one, similar to the all-industry average. The greatest proportion of construction firms (17 per cent) had vacancies in Craft and Skilled occupations. Clerical and Secretarial vacancies were the next most cited, by 4 per cent of firms. Across all industries, the greatest proportions of firms reported Clerical and Secretarial, Sales and Personal Services vacancies.

Table 4.2 Occupations in which hard-to-fill vacancies reported - construction sector

	Construction and contracting		All Industries	
	Firms with hard-to-fill vacancies* %	No. of hard-to-fill vacancies** %	Firms with hard-to-fill vacancies* %	No. of hard-to-fill vacancies** %
Managers/Administrators	1	3	1	5
Professionals	1	3	1	5
Technical/Scientific	1	4	2	12
Clerical and Secretarial	1	2	2	9
Craft and Skilled	14	70	2	14
Personal Service	-	-	3	17
Sales	1	9	3	16
Operative and Assembly	2	4	2	13
Other Manual	1	5	1	7

*Base = all firms **Base = all hard-to-fill vacancies

Source: Employer Skills Survey 1999

4.10 For extractive and mineral processing, the vacancies appear to be more evenly spread, a picture reinforced by the EPIC survey. This survey suggests that smaller companies in the sector tend to have difficulties filling vacancies for operatives, whereas for larger companies (200 plus employees) difficulties (where they occurred) were mostly among non-operatives, including associate professional, technical, clerical, secretarial and sales occupations.[39]

4.11 As we noted in Chapter 3, a particular problem is arising in gas installation. Before the break-up of the gas industry, much of the industry's training was provided by British Gas. A reduction in the number of specialist gas training places offered by colleges means that fewer gas installers are being trained. As we noted earlier, the age profile of CORGI-registered gas installers is biased towards the upper end, and the effect of an ageing workforce may be compounded by the ACS arrangements that are replacing the ACOP standard. Currently, around 8 per cent of those taking the ACS assessment fail and survey results show that, on average, 13 per cent of those who know about ACS do not intend to acquire certification of competency. The consequent likelihood of large skill shortages is discussed in the GINTO Skills Foresight Report (1999).

4.12 There also appear to be problems with recruitment of managers and professionals into the construction industry, and also into specialist contracting and professional services. The problem is partly a matter of image and working conditions. If the industry's managers and professionals are not of the highest calibre, then it is correspondingly hard to break away from poor business strategies, and that can make the problem self-reinforcing.

39 Of the 54 companies reporting hard-to-fill vacancies, 22 had fewer than 50 employees and found that the main hard-to-fill vacancies were for plant and machine operatives. Among companies with 50-99 employees all 10 with hard-to-fill vacancies also said they were for operatives.

Causes of recruitment problems - skill shortages and other reasons

4.13 Recruitment problems can be caused by a number of factors, including poor working conditions, low pay, lack of public transport and so on. Skills shortages, i.e. the lack of job applicants with the required skills, qualifications or work experience, are also an important cause of such problems.

Construction and specialist contracting

- Certainly the Employer Skills Survey evidence suggests that within construction and contracting, a large number of the hard-to-fill vacancies for craft and skilled workers were the result of skill shortages - see Table 4.3.
- Fifty-four per cent of construction and contracting firms said their hard-to-fill vacancies in craft and skilled occupations were a result of a lack of applicants with the right skills.
- Only 21 per cent found applicants lacked the right work experience, and only 12 per cent said applicants lacked the right qualifications.

Table 4.3 Causes of hard-to-fill vacancies: craft and skilled occupations

	Construction and contracting	All Industries
Few applicants with required skills	54	49
Not enough people interested in job	32	27
Low number of applicants overall	31	25
Lack of work experience	21	20
Few applicants with right attitude/ motivation/personality	16	17
Lack of qualifications	12	14
Competition from other employers	11	9
Company does not pay enough	8	10
Irregular/antisocial hours	7	8
Don't know	6	6
Company location	2	1
Unattractive conditions of work	2	2

Base = all firms reporting hard-to-fill vacancies in occupation

Source: Employer Skills Survey 1999

4.14 Information from the various construction NTO surveys paints a similar picture:

- for example, the NET survey of the electrical sector suggests that there are real skill shortages of qualified/approved electricians, which employers attribute to a general shortage of 'appropriately qualified people'.[40] Technician and management posts were also reported to attract inadequately-qualified applicants

- in the plumbing industry, a third of employers surveyed on behalf of BPEC in 1999 had vacancies for plumbers, two-thirds of which were hard-to-fill, and 53 per cent of respondents said there were skill shortages in their area (although since most were not themselves recruiting, this needs to be taken with a degree of caution).[41] Perhaps significantly, more respondents expected more skills shortages in the future than observed them at the time - possibly reflecting awareness of the impact of demographics on the sector.

But recruitment problems are not only due to skills shortages

4.15 Such patterns are not unusual, however, where hard-to-fill vacancies in craft and skilled occupations are concerned:

- the evidence from the Employer Skills Survey suggests that hard-to-fill vacancies are no more likely to be due to skills shortages in the construction and specialist contracting sector than in many other sectors

- furthermore, while skills shortages were the main cause of recruitment problems at this level within construction, many construction and contracting firms also found that a general lack of applicants, or people interested in the job, was causing hard-to-fill vacancies. Indeed if anything, this problem was somewhat larger in the construction and contracting industry than in most other industries (see Table 4.3).

Key problem: getting harder to recruit the young

4.16 There is an issue whether skill shortages are caused by there being nobody at all available in the nation's workforce with the necessary skills, or whether the skilled people exist but are unable or unwilling to access the available vacancies. The fact that in July 1999 there were 46,000 unemployed skilled construction workers, suggests that the market failure is not just caused by an absolute lack of qualified people. (We return to this topic in section 4.7).

4.17 There is a particular problem with recruiting young people. The construction and contracting industry faces a strategic difficulty because its traditional recruitment ground - young males aged 16-19 - is becoming increasingly hard to access.

- The number of people in the age group is declining.

- Many more of them continue with academic study.

- Others are put off by their perception of the industry as one that offers poor working conditions, unexciting work, and what they perceive to be questionable career prospects.

40 NET (1999) Skills and Labour Market Survey of the Electrotechnical Industry.

41 BPEC (March 1999) Skill shortages in the plumbing Industry.

4.18 As a result, the industry is probably now more dependent for recruits from among the less able members of the age group than was once the case. This threatens to create problems in later years, with too few workers being able to take on more highly skilled and supervisory work.

4.19 It is unlikely that the way to address this recruitment problem is via a sharp increase in college provision - it is a people problem more than a provision problem. Instead, the industry needs to do a better job of retaining existing workers, needs to win back its traditional recruits, and it needs to attract more people from outside of that group - more women, more members of ethnic minorities, more older people.

4.20 Improving recruitment probably requires changes in, for example, the way in which college courses are offered to people, but it also requires clear efforts to sell the attractions of the industry to potential recruits, and to address the reservations that those people have about the industry and its working culture.

Similarly mixed picture for extractive industries

4.21 For the extractives sector, the EPIC survey suggested that a lack of applicants with the required skills was the main cause of hard-to-fill vacancies with respect to skilled craft workers and operatives. But lack of experience and poor motivation were more important for clerical and secretarial workers, and for managerial and professional workers, the inability to compete with the pay offered by other employers was a more important problem.

The skills that applicants lack

Construction and specialist contracting

4.22 In construction and contracting there are two very different types of skills on which applicants are most likely to fall down:

- by far the most common skill deficiencies that employers report among applicants for craft and skilled jobs are technical and practical skills (other than IT) (see Table 4.4)
- nearly a quarter of construction firms cited customer-handing skills as a deficiency for such applicants, compared to just 15 per cent of firms across all industries.

Table 4.4 Skills difficult to obtain from applicants for hard-to-fill vacancies in craft and skilled workers

	Construction and contracting	All Industries
Other technical and practical skills	70	63
Customer-handling skills	23	15
Team working skills	23	22
Problem-solving skills	19	18
Communication skills	16	15
Literacy skills	10	10
Numeracy skills	9	9
Management skills	4	7
Basic computer	1	4
Foreign language skills	1	1
Advanced IT or software	-	5
Other	19	12
None	2	3

Base = all firms reporting hard-to-fill vacancies by occupation

Source: Employer Skills Survey 1999

4.23 Although the overall scale of vacancies may be small, there is nevertheless some evidence that there are more serious recruitment problems with respect to skilled workers. In terms of the types of problems:

- research on the electrotechnical sector in 1999 suggested that applicants for apprenticeships sometimes proved to be lacking in key literacy and numeracy skills[42]
- lack of IT, marketing, financial and general management skills were identified in all categories. A significant percentage (12 per cent) of the respondents to the NET survey felt that recruits to the electrotechnical sector industry were of a generally low quality
- young recruits were found to lack interest and have a 'bad attitude' by five per cent of employers
- in engineering services, the most important skills that employers say are missing in school leavers are communications skills, problem-solving and customer service. The last of these is also the most serious deficiency among graduate recruits, followed by lack of both managerial and job-specific skills

42 NET (1999) Skills and Labour Market Survey of the Electrotechnical Industry.

- in the plumbing industry, the 1999 BPEC survey similarly suggested that a lack of success in recruiting apprentices and other trainees into the plumbing industry was attributable to lack of commitment by the potential trainees, with responses such as 'lack of interest in gaining skills', 'trainee got bored', and 'inappropriate attitude'[43]

- the same research suggested that the shortage of experienced skilled workers was because of a lack of 'good' plumbers, a lack of those with 'plumbing and heating skills' and a lack of those with 'CORGI/appropriate' qualifications

- respondents thought that the cost of training was the main explanation, followed by problems getting apprentices to fill the jobs and a lack of labour, to the right standard.

4.24 Such patterns are likely to be affected in part by the type of people whom the industries tend to recruit, with different 'target groups' having differing strengths and weaknesses. For example, although young people in the electrotechnical industry are felt by employers to be weak in terms of problem-solving, numeracy and communications, they are also perceived to have strengths in computing and in IT.

Extraction and Professional services

4.25 There is a need for more information on the skills that recruits into the extractive and mineral processing, and professional services sectors may lack.

The impact of, and responses to, hard-to-fill vacancies

Impact of hard-to-fill vacancies in construction and specialist contracting

4.26 Traditionally, skill shortages, although often large, have not been unduly problematic for the construction industry, partly because their severity has been only temporary, and partly because in practice the industry has struggled through its problems, and found ways to cope.

4.27 On the surface the same is true today, implying that the current scale of investment in skills - by employers, individuals and government - is probably about right overall, even if the balance may need adjustment in some instances, and if some relief for particular problems might be advantageous.

4.28 But in the past five years, the industry has got around skills shortages and skills gaps by sacrificing quality, and by allowing projects to run late and over budget. Generally, recruitment problems in the construction sector do not manifest themselves in substantial upward pressure on wages - although of course some upward movement does occur. The main reason is simple: companies cannot achieve the price rises necessary to finance higher pay rates, and instead make do with inferior or inadequate labour.

- The Department of Environment, Trade and the Regions (DETR) evidence suggest that average earnings in the construction and contracting sector went up by just over six per cent in 1998, while construction sector output prices went up by just

43 BPEC (March 1999) Skill Shortages in the Plumbing Industry.

under five per cent (although the same source suggests that construction material costs went up even more slowly, by less than one per cent).

- And between April 1998 and April 1999, the wages of male manual construction and contracting workers rose by an average 4.5 per cent, only slightly above the 3.9 per cent average for the economy as a whole.

4.29 Survey evidence shows that, compared with other sectors, firms in the construction and specialist contracting industries have a particularly strong sense of competing with one another in terms of prices, and have rather less sense than firms in other sectors of competing in terms of quality and customer satisfaction. Faced with downward pressure on prices combined with problems recruiting labour, there is inevitable pressure on contractors to delay work completion or skimp on quality, rather than allow wages to ratchet upwards.

4.30 Of course, skill shortages among recruits imply that firms must either employ people they believe to be sub-standard, or in some way do without. While there may often be creative and positive responses to such problems (for example, up-skilling existing employees), there are also likely to be unfavourable consequences. Nevertheless, employer evidence is that the greatest effect of hard-to-fill vacancies among craft and skilled occupations in construction and contracting is on customer service:

- in the Employer Skills Survey, over three-quarters of construction and contracting firms reported that they have difficulties in meeting their customer service standards as a result of recruitment problems, compared to two-thirds across all industries

- hard-to-fill vacancies in craft and skilled occupations in construction and contracting firms were also more likely to have led to a loss of business to competitors, delays in product development, increased operating costs and the withdrawal of products compared to the average for all industries.

Table 4.5 Impact of hard-to-fill vacancies in craft and skilled occupations per cent firms

	Construction and contracting	All Industries
Difficulties in meeting customer service objectives	76	67
Loss of business/orders to competitors	55	45
Delays in developing new products	48	45
Increased operating costs	44	43
Withdrew product/services	38	26
Difficulties in meeting required quality standards	27	27
Difficulties in introducing new working practices	24	25
Difficulties in introducing technological change	11	17

Base = all firms reporting hard-to-fill vacancies

Source: Employer Skills Survey 1999

4.31 Nor do such concerns over customer service standards appear to be purely temporary phenomena. It would appear that construction and contracting firms may be less able than most to absorb the effects of recruitment difficulties without incurring direct problems of a strategic nature. The Employer Skills Survey asked firms about the impact of recruitment difficulties (across all occupations) over the past:

- of those construction and contracting firms that had experienced such problems, the main problems were difficulties in meeting customer service standards, and increased operating costs (Table 4.5)
- more construction and contracting firms than average cited these problems, and more cited other factors such as a loss of business to competitors (21 per cent compared to 13 per cent)
- construction and contracting firms were also more likely than average to have had to withdraw a product from the market as a result of recruitment difficulties (14 per cent compared to the average of 8 per cent).

Table 4.6 Results of recruitment problems over the past five years per cent firms

	Construction and specialist contracting	All Industries
Difficulties meeting customer service objectives	31	26
Increased operating costs	29	22
Loss of business to competitors	21	13
Delays in developing new products/services	18	15
Difficulties in meeting quality standards	15	19
Withdraw products/services	14	8
Difficulties in introducing new working practices	13	14
Difficulties introducing technological change	9	11
No recruitment problems	41	46

Base = all firms

Source: Employer Skills Survey 1999

Responses to hard-to-fill vacancies in construction and specialist contracting

4.32 Encouragingly, however, employers in the construction industry appear more likely than most others to take action in response to hard-to-fill vacancies in their most dominant occupation. Survey evidence suggests that:

- in all industries, most companies increase the pay on offer in response to the hard-to-fill vacancies in craft and skilled occupations
- this response is more likely in the construction and contracting industry than in most other industries (although that does not seem to be leading to rampant pay escalation, because of the downwards pressure on prices)

- construction firms then look to their existing workforce to deal with the problem - either through training their workforce to fill the vacancies, or by redefining their jobs.

Table 4.7 Response to hard-to-fill vacancies in craft and skilled occupations per cent firms

	Construction and specialist contracting	All Industries
Increase pay on offer	61	54
Increase training of existing workforce in order to fill vacancies	40	39
Redefine existing jobs	30	28
Use technology as a substitute for labour	7	11
None	17	25

Base = all firms reporting hard-to-fill vacancies

Source: Employer Skills Survey 1999

4.33 Looking ahead, although only a minority of construction and contracting firms expect that recruitment difficulties will cause them problems, the numbers are higher than in industry as a whole (see Table 4.8). Firms fear

- adverse effects on customer service
- increased operating costs
- loss of business to competitors.

Table 4.8 Expected results of recruitment problems over the next 2-3 years per cent firms

	Construction and specialist contracting	All Industries
Difficulties meeting customer service objectives	32	23
Increased operating costs	27	20
Loss of business to competitors	27	15
Delays in developing new products/services	20	15
Difficulties in meeting quality standards	19	16
Withdraw products/services	17	9
Difficulties in introducing new working practices	14	12
Difficulties introducing technological change	10	10
Do not anticipate recruitment problems	50	59

Base = all firms

Source: Employer Skills Survey 1999

Impacts and responses in extractive and professional services firms

4.34 Once again, there is a need for more information on the impact of skill shortages, and how employers respond, in the extractive and mineral processing, and professional services sectors.

Skills gaps

4.35 The National Skills Task Force defined an internal skill gap as existing where lack of full proficiency, as perceived by employers, typically involved a third or more of staff in at least one occupational area.

Construction and specialist contracting

4.36 Long-lasting recruitment problems are one possible cause of firms feeling that their existing workforce lacks the skills required to do their jobs properly.

4.37 Thus as Table 4.9 illustrates, recruitment problems appear to be a major cause of skills gaps among craft and skilled workers in the construction and specialist contracting sector, with two-thirds of employers citing them as a reason.

4.38 However, as Table 4.9 also illustrates, increasing skill requirements resulting from the introduction of new working practices are almost as important in explaining the skill deficiencies of existing staff. This is a key result, throwing light on the issues raised in Chapter 2 of this report with regard to the extent to which the construction sector is undergoing a transformation in its processes and hence its skill needs.

Table 4.9 Causes of skills gaps in top five occupations in the construction and specialist contracting sector

	Craft and skilled	Managers/ admin	Clerical and secretarial	Professional	Other manual
Recruitment problems	66	40	2	3	43
New skills needed for introduction of new working practices	62	54	90	92	23
Inability of workforce to keep up with change	50	38	89	89	21
Poor labour retention	45	3	-	-	31
Failure to train/develop staff	38	70	88	14	14
Inability of older staff to acquire new skills/knowledge	31	47	8	86	9
Introduction of new technology	23	38	90	5	11
New skills needed for development of new products/services	18	45	4	3	8

Base = all firms where staff in occupation are not fully proficient

Source: Employer Skills Survey 1999

4.39 The evidence seems to point to at least some significant change being underway, but paradoxically, during the transition process, skills deficiencies have worsened as firms struggle to improve the adaptability of the employees or subcontractors.

4.40 A significant number of skill gaps in the construction and contracting sector also seem to arise from a broad range of human resource and management factors:

- half the firms blame the inability of the workforce to keep pace with change for lack of skills proficiency
- nearly as many blame high staff turnover rates
- over a third - 38 per cent - of construction sector employers admit a failure to train staff to meet the skill needs of their company (This particularly explains gaps between the skills that managers and administrators need, and those that they possess.)
- the introduction of new technology is also an important factor for clerical and secretarial staff, while the inability of older staff to acquire new skills is mentioned by many employers with regard to the deficiencies in their professional staff.

No significant skills gaps in construction and specialist contracting

4.41 It should also be recognised, however, that the majority of employers say that most of their staff are proficient and that, as Table 4.10 shows, in construction and contracting the situation appears to be similar to, or slightly better than, the overall picture for the economy as a whole.

4.42 In part, that may be because the construction and contracting sectors employ relatively few people in sales and personal service/care occupations - both of which tend to be 'black spots' in terms of skill deficiencies. But even in occupations such as craft and skilled workers, construction sector employers are slightly more likely than the average to express themselves satisfied with the quality of the people they employ.

Table 4.10 Proficiency Of Existing Staff In Current Job per cent firms

	Construction and specialist contracting	All Industries
Managers/administrators	85	80
Professionals	80	82
Technical/scientific	84	81
Clerical and secretarial	83	78
Craft and skilled	84	79
Personal service	92	82
Sales	77	70
Operative and assembly	79	78
Other manual	82	77

Base = all firms with employees in each occupation

Source: Employer Skills Survey 1999

4.43 NTO evidence supports this conclusion:

- for example, only a small minority of heating, ventilation and air conditioning engineers (11 per cent on average) who responded to the ESTTL survey reported skills gaps[44]
- although 63 per cent of gas installers reported to GINTO that they have recruitment difficulties, only 11 per cent reported skills gaps. The reason for this no doubt lies partly in the ACS requirements that ensure that those working on gas installation meet the required standards on competence and safety, and employers feel that such verification ensures that there are no skills gaps. However, registration does not cover softer skills such as customer care or business skills, and it is possible that there is a failure to appreciate the importance of these skills - particularly since most installers are self-employed, and hence are assessing their own skills

44 But 27 per cent in the East Midlands.

- evidence from the *plumbing* industry also points to skills gaps, arising from too few operatives updating or developing their skills. Lack of suitable off-the-job training opportunities appears not be the reason: survey evidence indicates that only 17 per cent of respondents mentioned this as a problem.[45]

Extractive firms seem more critical of workers' skills

4.44 Significantly, the position in the extractives and mineral processing sector seems to be different. Although only a third of smaller firms said that there were gaps between the skills their existing workers had and those that they needed to do their jobs, for larger firms the figure was closer to a half, and for firms with over 200 employers, the majority were concerned with skills gaps.

4.45 This difference with the construction sector is unlikely to reflect purely differences in survey wording and methodology.

4.46 The Employer Skills Survey suggests that in mining and quarrying, skill shortfalls are fairly evenly spread across occupations, although with those engaged in selling standing out a little as being particularly likely to be deficient in skills.

Professional services

4.47 We have no direct evidence of how highly or otherwise employers in professional services rate the skills of employees.

The skills that existing employees lack

4.48 There is a strong perception, stimulated by the issues discussed in Chapter 2, of a need to review the skills of construction workers at craft level, and to promote a shift towards multi-skilling.

4.49 This argument needs to be handled with care and we should not underestimate the quality of what is there already:

- most craft occupations have always required workers to be multi-skilled
- many workers have always had skills lying outside their own craft boundaries.

4.50 However, further improvements for craft workers, in terms of flexibility and problem-solving, team working and customer care, are probably necessary if the industry is to change its working practices, secure better prices, increase its efficiency and hence increase its rate of return. The same may also be true for many specialist contracting workers.

4.51 The construction industry is also having to address problems with the quality of some people in front line supervisory and perhaps technician posts. This particularly involves increased emphasis on project management skills. Tackling these skill deficiencies is critical to the industry's ability to deliver improved performance over the longer term.

4.52 Part of the problem is that there are fewer bright manual skilled workers coming through, able to take on work with wide-ranging responsibilities. At the same time, the industry does not find it easy to recruit good graduates, and particularly not for site management work.

45 BPEC (March 1999) Skill Shortages in the Plumbing Industry.

4.53 However, in many cases failure may lie, not with the individuals themselves, or with recruitment problems, but with the corporate cultures within which the people work - cultures that tolerate poor performance and that expect customers to do the same. So this may be as much a top management issue as a line training issue.

4.54 Employer Skills Survey evidence tends to back up these judgements:

- in construction and specialist contracting, skilled craft workers and managers are particularly likely to be deficient in their skills
- within that, firms report that their skilled craft workers are most likely to lack technical and practical skills, while managers/administrators and professionals mostly lack management and team working skills
- large proportions of construction sector employers think clerical and secretarial workers had a wide range of skills lacking (including basic computer skills)
- for manual workers the most commonly cited skill deficiency was in team working skills.

Table 4.11 Skills lacking in non-proficient staff in top five occupations in construction and specialist contracting

	Craft and skilled	Managers/ admin	Clerical and secretarial	Professional	Other manual
Other technical and practical skills	59	48	10	5	28
Team working skills	27	72	89	92	41
Problem-solving skills	26	38	90	5	24
Communication skills	20	64	85	92	26
Customer handling skills	20	35	85	5	28
Management skills	15	74	86	89	2
Basic Computer	13	44	87	14	2
Literacy skills	9	6	4	-	7
Advanced IT or software	8	33	10	5	1
Numeracy skills	6	4	5	-	8
Foreign Language skills	-	6	-	-	1
Don't know	32	-	-	-	37

Base = all firms where staff in occupation are not fully proficient in current occupation

Source: Employer Skills Survey 1999

4.55 In Chapter 2 we noted evidence that construction craft workers do not rate problem solving skills as being very important to them, and a common criticism of the British NVQ system is that its purpose is to produce 'job-ready' workers as rapidly as possible, and that it places too little emphasis on broader reasoning and problem-solving skills than, for example, the German apprenticeship system.[46] The fact that employers do not generally complain that craft workers are deficient in that regard, might imply that the criticism is irrelevant. Alternatively, this evidence may say more about the limited horizons of the employers themselves, and the narrow expectations that they place on skilled workers.

Extraction and mineral processing

4.56 The EPIC research suggests a wide range of skills deficiencies in the extractive industries. Technical, practical, managerial, IT, communication, multi-skilling, customer care and problem-solving skills were all reported as deficient. The Health and Safety Executive has also identified a need to improve health and safety training in the industry, including training related to safety management, and the Quarries National Joint Advisory Committee has offered a similar view.

4.57 The wide range may reflect a need for broad improvements in the quality of people, rather than problems that can be addressed via any quick fix approach.

Professional services

4.58 We have no direct evidence of which skills employees in professional services are particularly likely to lack.

Impact of, and responses to, skill gaps

4.59 Skill deficiencies, where they exist, inevitably impact on a business, its employees and probably its customers. An especially disturbing result of the Employers Skills Survey, and a clear indicator of the need for investment in skills development, is the evidence that more than half of construction and specialist contracting firms and a substantial proportion of mining and quarrying firms expect skill gaps to affect their business over the next two to three years.

4.60 Surprisingly, however, many firms seem to have difficulty pinning down what the impact of skills gaps is likely to be (their responses are shown in Table 4.12). The most common effects that employers mentioned in the Employer Skills Survey were that skills gaps would:

- damage customer service (both in mining and quarrying and in the construction and contracting sectors)
- raise operating costs (in the construction sector).

4.61 Nevertheless, only a minority of firms said that they anticipated such problems, while three-quarters of mining and quarrying firms, and nearly half of all construction sector firms, cited no specific problems that would arise because of skill deficiencies amongst existing employees.

46 Steedman, H. (1998) A Decade of Skill Formation in Britain and Germany, Journal of Education and Work, Vol 11, No 1.

4.62 The latter is the highest response for any sector, while the former is one of the lowest.

Part of the explanation for this pattern may be that:

- employers in the construction sector are looking to new building methods to reduce their dependency on craft and skilled construction workers
- so, although the Employer Skills Survey results suggest that construction employers *are* conscious of the risks to customer satisfaction, quality standards and operating costs of skill deficiencies amongst their craft and skilled staff, the results also suggest that employers do *not* think that such deficiencies will lead to problems introducing new working practices (see Table 4.13).

4.63 Only amongst managerial/administrative, clerical/secretarial and professional staff are skill deficiencies expected to impede the introduction of new working processes. That combination makes sense, if the introduction of new working practices is expected to *lower* the demand for skilled craft workers, while making the contribution of 'white-collar' workers relatively *more* important to businesses.

Table 4.12 Expected results of skill gaps over next 2-3 years per cent firms

	Mining and quarrying	Construction and specialist contracting	All industries
Difficulties in meeting customer service objectives	21	40	33
Increased operating costs	6	38	32
Delays in developing new products or services	4	25	20
Loss of business or orders to competitors	5	24	19
Withdraw certain products or services altogether	-	22	12
Difficulties introducing technological change	10	21	18
Difficulties in meeting required quality standards	10	20	27
Difficulties introducing new working practices	5	16	21
None of the above	73	46	47

Base = all firms

Source: Employer Skills Survey 1999

Table 4.13 Impact on business of skills gaps in staff in top five occupations in the construction and contracting sector

	Craft and skilled	Managers/ admin	Clerical and secretarial	Professional	Other manual
Difficulties in meeting customer objectives	70	52	1	100	46
Difficulties in meeting quality standards	68	31	88	5	48
Increased operating costs	58	49	89	92	46
Difficulties introducing new working practices	24	57	91	92	14
Loss of business to competitors	23	10	-	5	8
Difficulties introducing technological change	18	14	5	5	10
Withdraw from certain products	13	1	-	3	9
Delays in developing new products	7	17	2	5	12
No particular problems	16	23	5	-	32

Base = all establishments where all/nearly all are not proficient in current occupation

Source: Employer Skills Survey 1999

Responses to skill gaps - construction and contracting

4.64 Faced with skills gaps, firms in the construction and contracting industry offer a variety of responses:

- by far the most widespread response of employers in companies where the majority of staff are not proficient is to provide more training
- firms also tend to change working practices in response to skill gaps in clerical and secretarial and professional occupations
- for professional occupations, firms also increase their recruitment.

Table 4.14 Action to overcome skills gaps in top five occupations in the construction and contracting sector

	Craft and skilled	Managers/ admin	Clerical and secretarial	Professional	Other manual
Provided more training	93	86	94	92	75
Increased recruitment	59	25	3	89	49
Changed working practices	32	54	92	100	40
Other	7	9	2	3	8
No particular action being taken	6	13	-	-	11
Relocating work within company	3	-	4	-	-

Base = all establishments where all/nearly all are not proficient in current occupation

Source: Employer Skills Survey 1999

4.65 NTO survey evidence shows similar results:

- of the heating, ventilation and air conditioning engineers in the ESTTL survey who reported skills gaps, 46 per cent of firms said they were enhancing in-house training to try to address the problems they had identified and 31 per cent were buying in training from external providers. Only 14 per cent of smaller companies and 4 per cent of larger ones are taking no action[47]

- the survey of plumbing employers did not cover responses to skills gaps but this area clearly gave the researchers cause for concern.[48]

Training priorities in the extractive and professional services industries

4.66 The EPIC survey of extractive and mineral processing companies asked firms to rate (on a scale of one to five) 31 factors that might impact on their training needs. There were significant differences in the responses from small and medium-sized companies and from those given by the largest employers:

- the key reasons for training given by smaller employers were the need to improve management /administration (which could be the need to implement organisational change), health and safety, environmental legislation, planning regulations and customer care

- larger employers rated customer care the most important, followed by information and communications technology, environmental legislation, environmental management, managing people and then health and safety

- all employers rated customer care at more than four of a possible top score of five but, while smaller companies also rated health and safety above four, the larger employers did not. For them, environmental considerations were more important.

47 ESTTL (2000) p.34.
48 BPEC (March 1999) Skill Shortages in the Plumbing Industry, p.51.

4.67 In the TOPIC survey of professional firms (engineers, surveyors, architects and others), almost no respondents said that an aim of the training that they provided was to help expand the company, implement organisational change or enter new markets. Instead, increasing or improving professional skills was the dominant reason for training (although the scale of spending on training was not very high anyway).[49]

Deeper consequences of skill gaps for company strategies and performance

4.68 Deeper problems may occur when firms revise down their own strategic ambitions to suit the circumstances in which they feel themselves trapped. The Employer Skills Survey results offer some pointers here:

- although construction sector firms are more likely than others to say that they offer a 'high-quality service/product tailored to individual customer, they are also more likely than other firms to say that they produce a 'standard quality product/service that competes mainly on price requirements' (see Table 4.15)[50]

- they are also less likely than most firms to say that they plan to significantly improve the quality of their existing range of products/services. Instead, a larger than average proportion of construction firms say that they have plans to achieve higher efficiency with existing products/services.[51]

Table 4.15 Market conditions: per cent of firms for whom the following is very applicable

	Mining and quarrying	Construction and specialist contracting	All industries
Produce high quality product/service tailored to individual customer requirements	54	59	46
Standard quality product/service competing mainly on price	26	37	21
Implementing or about to implement plans to significantly improve quality of existing range of products/services	NA	23	36
No plans to move to higher quality product/services but plans to achieve higher efficiency with existing products/services	NA	34	25
Would like to move into higher quality markets but lack the skills	-	7	4

Source: Employer Skills Survey, 1999

49 TOPIC (1998) Training Survey Report, p.5.

50 At the all industry level, such a response is also more prevalent amongst small companies than large companies.

51 The survey comprised 23,000 telephone and 4,000 face-to-face interviews with employers, conducted across England between August and November 1999. All industries other than agriculture and households with domestic staff were included, but the survey was confined to firms with a minimum of five employees.

4.69 As we have already noted, the construction industry competes more in terms of price and less in terms of quality than most industries. However, that does not necessarily mean that quality is poor, or that skills are unimportant to competitiveness:

- in many instances quality is set by clear industry standards (often backed by safety legislation) and firms may feel that since standards are externally set, the price factor is particularly important for them in competing[52]

- at a more basic level, it is usual practice in many parts of the industry for clients to obtain competitive tenders, and pricing clearly plays a large part in the purchasing decisions that get made.

4.70 But what the survey results may imply is that the risk of being trapped by intense price competition in a low-quality, low-skills equilibrium is higher in the construction sector (broadly defined) than in many other industries.

4.71 In these circumstances it would not be surprising if many firms seemed reluctant to commit to using innovation and skills to bring about a step improvement in market success. The types of changes that are underway in the best firms are all the more commendable for that.

Regional variations in construction and contracting

4.72 Concern is often expressed about the tendency for construction and contracting training to be determined more by where entrants live than by where jobs are likely to be, and for there to be large skill deficiencies in some areas and surplus labour in others. While this is a large subject worthy of a report in its own right, a few comments do need to be made here:

- first, regional imbalances are bound to occur to some extent. General economic conditions within regions fluctuate more markedly than do underlying regional demographics; and regions experience temporary phases of peak activity reflecting individual large projects (thus the North West has recently experienced the construction of the Trafford Centre, the reconstruction of Central Manchester and the construction of the second runway at Manchester Airport, while London has experienced major infrastructure, arts and Millennium projects, lots of office building for the financial sector, and a lot of new build housing)

- second, by the standards of most industries, the construction sector labour force is very mobile - a reflection of its highly flexible employment structure. Indeed, the industry with perhaps greater problems is extraction and mineral processing, where quarries and mines are often in remote rural areas, with only limited local labour forces.

4.73 However, there is a systematic tendency for construction training to be skewed towards certain regions. Of the UK's top twenty construction sector colleges, only one is in the South East. And although three are in London, provision in the capital is still lower

52 It is worth remarking that industries in which basic product standards are regulated may either display strong competition in terms of price or strong competition via reputation and brands, and that elements of the latter are also important in the construction industry. Builders with good local reputations, and architects with good international reputations, are both examples.

than London typically needs. Furthermore, although demand is rising in London, some colleges in the region have apparently stopped offering construction courses.[53] The balance of training provision can often be seen to be driven as much by patterns of demand that prevailed decades ago as by patterns of demand that prevail today, let alone those likely to prevail in the future.

4.74 In terms of recent evidence on skill deficiencies of the current workforce, there is bound to be a diversity of experiences and issues, and a need for local and regional focus on these.[54] For example:

- in the electrotechnical industry in 1999, the NET survey found a wider range of skills shortages and skills gaps in London than in the country as a whole. And although there was greater awareness in the capital of training provision, participation in Modern Apprenticeship schemes was lower in London than the national average. This does not augur well for the narrowing of skills gaps in the electrotechnical industry in London

- CITB research suggests that in 1999, employers in the construction sector in the South East were experiencing difficulties in recruiting staff with the required level of skill in all trades, but that colleges reported that they were unable to increase the supply of construction courses, owing to funding problems, despite an all-time high demand. In the rest of the South East high growth in electrotechnical businesses and an apparent lack of interest in Modern Apprenticeships may account for concern about technical competence

- there were similar construction sector problems in the Eastern Region (excluding Suffolk) and in the South West. Separate 1999 research by the East of England Prosperity Group also found recruitment problems with respect to several building trades

- on the other hand, in Wales few recruitment problems were reported, but there was concern over the low number of trainees. Demand for on-site training was expected to increase, which may have reflected problems encountered by trainees in travelling long distances to colleges (a particular problem in Wales, revealed in the 1999 BPEC survey of plumbers, as well as in the broader 1998 Future Skills Wales survey)

- no especially significant skills shortages were reported in 1999 by CITB in the East and West Midlands, or the North West, but Yorkshire and Humber, the North East and Scotland all reported difficulties in recruiting skilled operatives in bricklaying and in carpentry and joinery. However, the West Midlands had similar problems in the electrotechnical industry to those of London. In heating, ventilation and air conditioning, ESTTL research found the highest skills gaps to be in the East Midlands and in the Eastern Region, while employers in the West Midlands often had difficulty in finding training courses for their specialisms in the vicinity

53 CITB (1999).

54 A number of local and regional agencies have produced comprehensive reviews of skills needs in their areas. These include Regional LMI Group (October 1997) Skills Issues in the Construction Industry in the North East; East of England prosperity Group and partners (December 1999) Bridging the Gap - an analysis of construction training and skill needs in East of England; and Thames Valley Enterprise (March 1998) Skills and Training Issues in the Construction Industry.

- colleges in the North East were considering reducing construction training provisions because of perceived high costs, and CITB also reported that college funding was inadequate to meet demand in Scotland, where there were specific construction sector shortages in bricklaying, plastering, scaffolding, roof slating and tiling

- although some electrotechnical skill shortages appeared in the North West in 1999, they seemed less severe than elsewhere. Skill shortages in that sector were least severe in the North East, where a higher proportion of electricians completed Modern Apprenticeships

- the problems that employers in the West Midlands found, locating courses in specific subjects in the heating, ventilation and air conditioning sector were also apparent in Yorkshire and Humber and Wales, the North East and the Eastern Region employers have difficulty in finding training courses in the vicinity

- paradoxically the BPEC survey found that the regions with relatively low levels of demand for experienced plumbers were the most likely to have employers committed to training (South West, Yorkshire and Humber, Wales and Highlands and Islands) and those in areas with recruitment problems were least likely to train (London, and the Eastern Region).[55]

4.75 But it is also the case that not every region can conceivably have courses run in every area of skill. In 1999, CITB provided training grants for only 357 new scaffolding trainees throughout Britain, but even that small number dwarfs the figures for stone masonry (59), roof sheeting and cladding (23), or cabinet making (1). Although other people will have been funded via different routes, the fact remains that many crafts (the ones quoted here are just examples) simply will not support college provision across every local area or even region of the country.

Tackling imbalances in skills supply and demand: future prospects

Individuals' perceptions

4.76 Construction, specialist contracting, property services and other professional services have, in the past, been popular sectors for people to work in.[56] Survey evidence from 1998 clearly suggests that, at least at that time, those young people who had gone onto construction courses generally did so because they wanted to work in construction, and not because they had no other choice (although policy changes since then - notably the New Deal - may have altered this somewhat).[57] Such reasons as 'I like working with my hands', 'I aim to start my own business', 'I always wanted to do it', 'good pay' and 'someone in my family works in construction' dominated the reasons for choosing construction as a career. Furthermore, a high proportion - 84 per cent - of interviewees said they would recommend their course to a friend.

55 BPEC (1999) Skill Shortages in the Plumbing Industry, p.48.

56 The same is perhaps less true for extraction and mineral processing.

57 Half of the trainees were studying carpentry and joinery, with bricklaying and painting and decorating dominating the remainder.

4.77 Unfortunately, young people with strong positive desires to enter the construction and related industries seem to be becoming less common. There is evidence of declining numbers of people coming forward wanting to enter the construction sector, and similar problems in many specialist services and many professional occupations. And that is despite the fact that in many respects, these sectors offer good long-term career prospects.

Employer concerns, and responses

4.78 In 1998 the Construction Industry Board published its *Strategic Review of Construction Skills Training*, which, together with an influential monograph by Clarke and Wall published in the same year, made a number of criticisms:

- training numbers were declining, and the quality of training was too variable
- many skills were insufficiently recognised, and training not therefore provided
- in particular, there was little response to the growing need for multi-skilling
- there was little clarity over who was responsible for training, and little strategic planning for the industry.

4.79 During the 1990s construction employers also began to complain that they had lost control over the content and organisation of training, which as a result was becoming increasingly divorced from their business needs. In 1997 the Construction Confederation said that employers should 'take ownership' of training by taking initiatives in five areas:

- increasing understanding of the need for a competent workforce
- improving the sector's image, to attract better entrants
- committing themselves to a 'whole industry training culture'
- developing a common understanding of construction training issues
- providing an adequately funded construction training system with clear career progression.

4.80 Since then, the new system of NTOs has come into being. The NTOs are specifically charged with identifying skill needs and recommending responses to those needs. The Government has taken various steps to improve the delivery and design of training, and to improve access to training. And all public sector funding of post-16 provision is about to be centralised under the new Learning and Skills Council and its local arms, ending the old divide between the 'education' and 'training' systems.

4.81 Nevertheless, detailed evidence suggests that concerns are not disappearing quickly. As noted above, for example, the 1999 BPEC survey suggests that 'just under a third' of plumbers had in the past tried unsuccessfully to take on trainees or apprentices, and CITB has had similar problems filling places.

Attitudes towards the current training system

4.82 It is also clear that the different systems of qualifications are not universally liked. Perhaps it would be surprising if they were, but in some cases feelings clearly run high:

- in particular, research suggests that, while many plumbers engaged in gas-related work accepted without much complaint the ACOP qualifications introduced under the CORGI banner, they have been much less happy with the tougher ACS scheme that has since been introduced. The ACS scheme is widely regarded as excessively tight, impractical and ruinously expensive, especially for those for whom gas-related work is not their main business.[58] There is a concern that the effect of too tight regulation may be to increase the opportunities for cut-price, unqualified and hence illegal operators, thereby undermining the rationale of the controls themselves. The need to participate in regular post-experience training in order to remain qualified is clearly disliked by some older workers who question its relevance and the costs involved

- the BPEC research suggested a belief among private sector plumbing businesses that NVQs produce more narrowly-focused, more academic and less rounded workers than the old City and Guild system - a belief driven by the view that plumbing is essentially a practical activity needing little theoretical prowess. Public sector employers of plumbers do not, however, subscribe to such criticisms

- some but not all of the BPEC seminar participants expressed concern over the quality of the learning experience offered by colleges and other training institutions - suggestions that often, teachers were only one step ahead of students. Colleges were also criticised for being too concerned with throughput rather than nurturing and mentoring, and there were suggestions that profit margins on statutory courses are excessively high. Some plumbers spoke highly of the BPEC literacy/numeracy test

- although several employers in the plumbing sector reported good contacts with colleges, most employers had given up using schools as a source of potential trainees, saying that teachers and careers advisors regarded plumbing as a poor career option. Trainees and apprentices themselves were criticised for lacking motivation, partly reflecting a limited pool of applicants from which to choose. Employers who dismissed apprentices mostly did so because of failure to cope with or attend their courses

- the plumbing industry feels that the pressures being placed upon it are rising (more demand from customers for multi-skilling, more demand from regulators for regular assessments of competency) while at the same time the quality and value for money of training provision are declining *because of rather than in spite of* the introduction of reforms such as S/NVQs. It would appear that in the plumbing sector overall, more firms would take on trainees or apprentices if people with the right attitudes and attributes were available

58 See BPEC (1999) Skills Shortages in the Plumbing Industry, p.42.

- In the extraction and mineral processing sectors, notable minorities of employers have said that the new training arrangements are not particularly helpful to their industry.[59] Reasons included a view that compliance was bureaucratic and unwieldy, and many comments that the industry is not very suitable to young people, because the work is dangerous and requires workers to take responsibility for expensive and advanced equipment

- within professional service companies, employers said that the best thing that could be done to improve the quality of training would be to provide independent evaluation/assessment of providers/courses, and that the best vehicles for presenting information about courses are technical journals/periodicals and mailshots/leaflets.

4.83 Although these criticisms of modern training arrangements deserve to be taken seriously, in most sectors they are probably minority views. For example, in the electrotechnical sector it was a minority - 30 per cent - who said that the current schemes are not as good as their predecessors, and 75 per cent of firms said that the quality of apprentices is high.[60]

4.84 Similarly, the FEFC has argued that colleges are generally maintaining a good standard of provision, and often offer flexible study patterns to suit students' needs. And FEFC says that the teaching of practical subjects is generally of a high quality.

General recognition that softer skills matter

4.85 Many of the critical skills that Modern Apprenticeships offer are not just the practical and vocational elements, but are softer, more generic skills such as the ability to diagnose problems. Modern Apprenticeships have sought to test more conceptual skills, because they may provide workers with a stronger basis with which to deal with a shift towards more multi-skilling and flexibility, and with change more generally. On balance this seems to be well supported by employers, and the introduction of a common approach to defining and promoting multi-skilling across a range of plumbing, electrical and heating and ventilation occupations continues this approach.

4.86 The Employer Skills Survey results provide evidence that construction and contracting firms are today very conscious, at least in principle, of the importance of softer skills. Although firms give high importance to job-specific, technical or vocational skills, they also stress the value to them of softer, more generic, skills. Furthermore, this is broadly reinforced by survey evidence collected by the NTOs at their more detailed sectoral levels. For example, heating and ventilation employers say that they are placing increasing importance on certain key skills, in particular literacy, numeracy, negotiation, verbal communication, customer service, flexibility and IT.[61]

4.87 In the extractives sector, large employers value, in addition to job-specific skills, high level of skills in customer care, information and communications technology, environmental legislation, environmental management, managing people, health and safety and the image of the industry.

59 EPIC (1999) Report on the Labour Market Assessment of the Extractive and Mineral Processing Industries, p.26.

60 NET (1999) Skills and Labour Market survey of the Electrotechnical Industry, p.38.

61 See ESTTL (2000) Table 11, p.29-31 for a detailed breakdown of skills by occupation.

What does the future hold?

4.88 In the last couple of years, construction sector companies have been experiencing significant skill shortages. If these problems persist, let alone worsen, then it must be likely that the industry's performance will increasingly suffer, in one way or another.

4.89 To some degree these shortages probably reflect a cyclical peak that will tend to ease with time. However, the severity of the construction cycle is probably lower than it once was, both absolutely and relative to other sectors. Compared with many, construction is probably now a relatively stable sector, and one that is likely to see persistent growth in output over the long term. So it may be misleading to assume there will be an automatic downswing of the construction cycle that will lead to a decline in skill shortages in the sector.

4.90 Furthermore, the overall level of future training provision for new entrants needs to be similar to, if not higher than, today's levels, simply to avoid worsening problems of skill shortages. While the projections in Chapter 2 show declining employment levels in construction and specialist contracting in the next decade, they also show a strong need to recruit new entrants to replace those who leave the industries. The average annual need for new entrants projected by IER for the period 1998-2009 is 65,000 people, compared with 46,000 in the period 1989-98.

4.91 The judgement does not really alter once allowance is made for changing mixes of skill needs. While it is possible that a shift in demand towards more people with cross-craft skills will reduce the demand for pure craft skilled workers, the pace of change is likely to be slow at best, for the reasons discussed elsewhere in this report. And with large numbers of mature craft workers leaving the industries, the most likely outcome is for continuing strong demand for new entrants. Indeed, the real challenge is probably to find enough people to enter construction and contracting services.

4.92 To that end, one of the more acute areas of prospective shortage, already referred to in this report, is with regard to gas fitters. The government has said that there is an urgent need to address the possible integration of the ACS requirements into the NVQ structure, to help reduce skill shortages, and has said that it will facilitate discussions on these issues between the competent authorities. The Health and Safety Executive (HSE) and CORGI are working with GINTO on the issue.

4.93 But in specialist contracting, in some areas of professional services, and perhaps especially in construction, there is clearly a larger recruitment problem to address. The construction industry's traditional recruitment ground - young males aged 16-19 - is becoming increasingly hard to access, with young people put off by their perceptions of poor working conditions, unexciting work, and questionable career prospects.

4.94 Altering these perceptions requires better dialogue between the construction sector, those who might enter it, and those who advise potential recruits, but it also requires that the industry itself continues to change, making itself more attractive by shifting towards a business ethos that gives appropriate value to customer satisfaction, quality, innovation and, hence, skills.

Chapter 5
Conclusions

5.1 The construction industry is experiencing today, as it has in the past, high levels of skill shortages, in the sense that employers cannot recruit the workers that they need, because potential recruits are unavailable or lack the skills to do the work. And although employers express few worries about the skills of those who currently work for them, there is a serious possibility that this represents complacency on the part of employers, who do not realise the business opportunities that they are missing by not having more highly-skilled workers or contractors.

5.2 Traditionally, skill shortages have not been unduly problematic for the construction industry, partly because their severity has been only temporary, and partly because in practice the industry has struggled through its problems, and found ways to cope. The same *could* be true today, implying that the current scale of investment in skills - by employers, individuals and government - is probably about right overall, even if the balance may need adjustment in some instances, and if some relief for particular problems might be advantageous.

5.3 But that conclusion is probably much too complacent. In the past, the industry has too often got round skill shortages and skills gaps by sacrificing quality, and by allowing projects to run late and over budget. Many construction companies compete heavily in terms of price rather than quality, lock themselves into low rates of return, deny themselves the opportunity to invest in skills, and hence commit themselves to strategies that disappoint their customers and that make individuals increasingly sceptical about seeking work in the sector.

5.4 Professional services are experiencing skills shortages and there are moves afoot to create a skilled 'technician' role that can be performed by non-graduates. This may help to alleviate skills shortages whilst enabling the industry to meet new government standards. However, one cannot escape the fact that the industry faces problems attracting graduates and numbers applying for related courses are down. The poor image of the related construction sectors seems to be a major factor.

5.5 Fortunately the situation is starting to change, and many organisations - NTOs and their partners - and especially employers themselves, are taking steps to change the nature of the broadly defined construction sector.[62] In that regard, there is a reasonable consensus that change needs to proceed with respect to five areas.

62 The Industry Targets contained in CITB Business Plan 2000-24 illustrate some of the areas where initiatives are occurring or planned.

- *First*, there is a recruitment problem to solve. The construction industry faces a strategic difficulty because its traditional recruitment ground - young males aged 16-19 - is becoming increasingly hard to access. The number of people in the age group is declining, many more of them continue with academic study, and others are put off by their perception of the industry as one that offers poor working conditions, unexciting work, and questionable career prospects. Part of the consequence is that the industry is probably now more reliant than it used to be on the less able members of the age group for its recruits. This threatens to create problems in later years, when too few workers show themselves able to take on higher-skilled and supervisory work.

    - It is unlikely that the way to address this recruitment problem is via a sharp increase in college provision. Instead, the industry needs to do a better job of retaining existing workers, needs to win back its traditional recruits, and it needs to attract more people from outside of that group - more women, more members of ethnic minorities, more older people.

    - The way to retain workers is partly to invest in their skills, thereby raising their value to the construction industry and hence the wages they can command from within their sector. (Such investment would probably increase their job satisfaction too.) Improving recruitment probably requires changes in, for example, the way in which college courses are offered to people, but it also requires clear efforts to sell the attractions of the industry to potential recruits, and to address the reservations that those people have about the industry and its working culture.

- *Second*, the construction industry is seeking to reduce its reliance on unqualified site workers, both by better recognising the skills that many site workers already have, and by encouraging workers to gain qualifications through training. The demand for this shift comes partly from the already-mentioned need to retain workers, and partly from a need for multi-skilled or cross-craft workers below the level of craft skilled workers, able to complete a variety of moderately complex assembly tasks. But it is also being driven by customers who want some assurance that they are getting good quality work, and who thus care about the qualifications of those who do the work.

    - The implications of this trend could be substantial. For example, estimates by CITB suggest that if the Cowboy Builders initiative and the Clients Charter both succeed in their aims, then by 2003, four times as many people (80,000) will be seeking grants to support OSAT training from the NTO than would otherwise be the case.[63] Under such circumstances, the industry would be well on the road towards an all-qualified workforce.

63 CITB (May 2000) Levy Assessment Consultation Brief.

- *Third*, there is a need to review the skills of workers at craft level. Most craft occupations have always required workers to be multi-skilled, and many workers have always had skills lying outside their own craft boundaries, so we should not underestimate the quality of what is there already. However, further improvements for craft workers in terms of flexibility and problem solving, team working and customer care, are probably necessary if the industry is to change its working practices, secure better prices, increase its efficiency and hence increase its rate of return.

- *Fourth*, the industry is having to address problems with the quality of some people in front-line supervisory and perhaps technician posts. This particularly involves increased emphasis on project management skills. However, in many cases failure may lie, not with the individuals themselves, but with the corporate cultures within which they work - cultures that tolerate poor performance and that expect customers to do the same. So this may be as much a top management issue as a line training issue.

- *Finally*, there appear to be problems with recruitment into the industry of managers and professionals. Again, the problem is partly a matter of image and working conditions. However, the industry's ability to offer competitive financial and career packages may be hampered by its excessive reliance on a strategy of competing primarily via low prices rather than through quality, innovation and customer satisfaction. But if the industry's managers and professionals are not of the highest calibre, then it is correspondingly hard to break away from such a strategy. The problem is thus self-reinforcing.

Annex
Chapter 2: tables

Table 2.1 Employment, including self-employment, by occupation, 1998

	Construction and specialist contracting	%	All Industries	%
11 Managers	189,300	10.7	2,640,600	9.7
12 Proprietors	11,600	0.7	979,400	3.6
21 Science/technology professionals	62,800	3.6	851,700	3.1
22 Health professionals	500	0.0	241,100	0.9
23 Teaching/research professionals	3,000	0.2	1,159,300	4.3
24 Business/public sector professionals	25,800	1.5	684,100	2.5
31 Science associate professional	21,400	1.2	389,800	1.4
32 Health associate professionals.	1,300	0.1	889,500	3.3
33 Protective service occupations	3,700	0.2	249,200	0.9
34 Culture/media/sport occupations	6,900	0.4	469,100	1.7
35 Business/public sector assoc prof.	40,900	2.3	1,352,300	5.0
41 Administrative and clerical occupations	94,500	5.4	2,855,100	10.5
42 Secretarial occupations	54,100	3.1	1,192,300	4.4
51 Skilled agricultural trades	3,800	0.2	334,400	1.2
52 Skilled metal/electrical trades	231,700	13.1	1,537,600	5.7
53 Skilled construction trades	568,600	32.2	966,900	3.6
54 Other skilled trades	32,500	1.8	898,800	3.3
61 Caring occupations	400	0.0	980,200	3.6
62 Leisure occupations	6,700	0.4	544,700	2.0
71 Sales occupations	11,200	0.6	1,701,200	6.3
72 Customer service occupations	2,900	0.2	100,200	0.4
81 Process plant and machinery operatives	129,900	7.4	1,529,000	5.6
82 Transport drivers and operatives	55,300	3.1	925,900	3.4
91 Elementary manual workers	171,400	9.7	1,042,300	3.8
92 Elementary non-manual workers	35,700	2.0	2,628,800	9.7
Total	1,766,100	100.0	27,143,400	100.0

Source: Institute of Employment Research Estimates

The concentration of skilled craft workers is represented by occupations 51 to 54 in the table, which uses the SOC 2000 occupational classification.

Construction and specialist contracting firms are large users of skilled manual workers, but are not large users of semi-skilled or unskilled manual workers (occupations 81-82 and 91-92). Figures here along with the following tables may not sum exactly due to rounding.

Table 2.2 Changing employment, including self-employment, by occupation - construction and specialist contractors

	1998		2009		per cent growth	
		%		%	Construction	All industries
11 Managers	189,300	10.7	204,000	11.7	7.8	15.2
12 Proprietors	11,600	0.7	11,900	0.7	2.2	-11.2
21 Science/technology professionals	62,800	3.6	69,500	4.0	10.5	28.7
22 Health professionals	500	0.0	600	0.0	22.3	34.8
23 Teaching/research professionals	3,000	0.2	4,000	0.2	32.8	20.2
24 Business/public sector professionals	25,800	1.5	32,100	1.8	24.5	43.6
31 Science associate professionasl	21,400	1.2	21,100	1.2	-1.4	-5.6
32 Health associate professionals.	1,300	0.1	1,600	0.1	19.6	18.1
33 Protective service occupations	3,700	0.2	4,500	0.3	20.9	19.8
34 Culture/media/sport occupations	6,900	0.4	9,400	0.5	36.1	42.1
35 Business/public sector assoc prof.	40,900	2.3	53,600	3.1	31.0	32.0
41 Administrative and clerical occupations	94,500	5.4	104,400	6.0	10.4	1.9
42 Secretarial occupations	54,100	3.1	54,000	3.1	-0.2	-7.1
51 Skilled agricultural trades	3,800	0.2	3,300	0.2	-12.9	-9.7
52 Skilled metal/electrical trades	231,700	13.1	192,600	11.1	-16.9	-14.8
53 Skilled construction trades	568,600	32.2	520,200	29.9	-8.5	-9.5
54 Other skilled trades	32,500	1.8	33,700	1.9	3.7	9.7
61 Caring occupations	400	0.0	400	0.0	7.0	48.9
62 Leisure occupations	6,700	0.4	6,800	0.4	1.0	-2.0
71 Sales occupations	11,200	0.6	13,400	0.8	19.1	10.7
72 Customer service occupations	2,900	0.2	3,300	0.2	13.5	3.6
81 Process plant and machinery operatives	129,900	7.4	131,300	7.5	1.1	-2.2
82 Transport drivers and operatives	55,300	3.1	54,400	3.1	-1.7	-0.1
91 Elementary manual workers	171,400	9.7	169,200	9.7	-1.3	-9.7
92 Elementary non-manual workers	35,700	2.0	40,700	2.3	14.0	1.6
Total	1,766,100	100.0	1,739,800	100.0	-1.5	8.2

Source: Institute of Employment Research

Table 2.3 Projected skilled craft employment in construction and specialist contracting

SOC code		1998	2009	% change
521	Metal forming, welding and related trades	80,400	64,900	-19.3
522	Metal machining, fitting, instrument making	20,500	15,600	-23.9
523	Vehicle trades	3,000	2,200	-26.7
524	Electrical trades	127,800	109,900	-14.0
531	Construction trades (steel erectors, bricklayers, masons, roofers, roof tilers and slaters, plumbers, heating and ventilating engineers, carpenters and joiners, glaziers, window fabricators and fitters, construction trades n.e.c.)	392,800	356,200	-9.3
532	Building trades (plasterers, floorers and wall tilers, painters and decorators)	3,000	2,200	-26.7

Source: Institute of Employment Research

Detailed projections for the construction and specialist contracting craft trades in Table 2.3 above indicate that:

- the projected declines are spread across different trades
- they are less marked in building trades (such as plasterers, floor and wall tilers, and painters and decorators) and to some extent amongst construction trades (such as bricklayers, plumbers, heating and ventilating engineers, carpenters and joiners) than amongst metal workers, electricians and the vehicle trades (drivers, crane operators and the like).

Table 2.4 Projections of replacement demand for construction, specialist contracting and extractive industries combined 1998-2009

	Employment level in 1998	Expansion/ contraction	Replacement demand	Net requirement for new entrants
Corporate managers	192,960	14,230	81,470	95,700
Managers and proprietors	11,910	200	4,590	4,800
Science/tech professionals	63,710	6,500	22,600	29,110
Health professionals	550	110	210	320
Teaching/research prof..	3,220	970	1,710	2,680
Business/public service prof.	26,140	6,310	9,980	16,300
Science associate prof.	21,800	-410	6,280	5,870
Health associate prof.	1,400	250	670	920
Protective service occs	3,820	770	2,450	3,220
Culture/media/sport occs	6,970	2,470	3,030	5,510
Bus/public serv. assoc prof.	41,650	12,520	18,070	30,590
Admin and clerical	97,700	8,970	50,800	59,770
Secretarial and related occs	54,720	-390	31,840	31,450
Skilled agricultural trades	3,860	-500	1,400	900
Skilled metal/elec trades	235,970	-40,450	126,760	86,320
Skilled construct. trades	570,540	-48,970	221,930	172,950
Other skilled trades	32,540	1,160	12,740	13,900
Caring personal services	450	10	190	200
Leisure/oth pers services	7,170	10	2,420	2,430
Sales occupations	11,500	2,070	5,810	7,880
Customer services	2,950	350	1,290	1,640
Process plant and mach ops	134,800	630	48,780	49,410
Transport drivers and ops	59,340	-1,760	25,480	23,720
Elementary: trades/plant/mach	175,730	-3,120	55,430	52,310
Elementary: clerical/service	37,780	4,580	17,410	21,980
All occupations	**1,799,200**	**-33,470**	**753,350**	**719,880**

Source: IER

Table 2.5 CITB projections of annual net requirements for new entrants (replacement plus/minus expansion/contraction) in the construction and specialist contracting sectors, 2000-04

Managers	7,300	
Clerical, supervisory, sales	6,500	
Professional	2,100	Mainly surveyors and technicians
Technicians	2,100	
Carpenters and joiners	10,500	Mainly siteworkers
Bricklayers	6,500	
Painters	4,600	
Plasterers	2,100	
Roofers	2,400	
Floorers	1,100	
Glaziers	400	
Other specialist building	1,900	Includes demolition experts
Scaffolders	900	
Plant operatives	2,100	
Plant mechanics/fitters	1,100	
Steel erectors/structural	700	
Other civil engineering	4,600	Includes utilities distribution workers
General operatives	3,800	
Maintenance workers	1,300	
Electricians	7,100	
Plumbers	5,700	Includes heating and ventilation engineers
Total	74,800	

Source: CITB Construction Employment and Training Forecast 2000-04

Chapter 3: tables

Table 3.1 Number of qualifications held by employees in construction and specialist contracting sectors by NVQ equivalent levels, 000s.

	5	4	3	2	1	0	Total
1999							
Managers and Administrators	4.3	53.0	68.7	20.4	13.8	10.0	170.2
Professionals	3.3	27.7	8.3	1.4	2.6	0.3	43.5
Associate Prof and Technical	0.0	28.8	18.5	4.7	2.7	2.2	56.8
Clerical and Secretarial	0.3	7.8	20.0	44.2	19.3	18.4	109.9
Craft and Related	2.4	38.7	646.7	134.2	107.2	145.4	1074.6
Personal and Protective	—	—	—	—	—	—	—
Sales	—	—	—	—	—	—	—
Plant and Machine Operatives	0.0	3.3	40.8	21.5	54.3	25.2	145.2
Other Occupations	0.0	2.6	23.3	29.7	48.8	51.1	155.5
Total	10.3	162.0	826.6	256.3	248.6	253.0	1756.8

Source: Business Strategies Ltd.

Sample size problems mean that meaningful data are not available for personal and protective services occupations and sales occupations.

Note that the data are for NVQ equivalents as well as NVQs themselves.

Table 3.5 Extractive and mineral processing qualifications by NVQ Levels (survey results - number of employees)

	4 and 5	3	2	1 and 0
Senior Management	92	10	1	
Professional	93	6		
Middle Management	60	8	6	
Unit Management	51	7	3	
Supervisors	3	5	1	1
Foremen	3	5	1	1
Drillers			3	
Shotfirers	2			
Operatives	2	2	151	82
Road surfacing operatives Other drivers		1		
Engineering staff	16	66	15	
Laboratory staff	21	5	1	
Customer service staff	5	2		
Sales representatives	4	8		
Administration	8	29	6	
Apprentices and trainees	2	1	3	2
Total	**362**	**155**	**191**	**86**

Source: EPIC Survey 1999

Table 3.6 Numbers awarded constructing NVQ

NVQ Level	Before 1991/92	1991/1992	1992/1993	1993/1994	1994/1995
1	0	0	2,950	4,290	6,300
2	0	2,650	12,060	18,760	13,700
3	6,420	4,370	4,170	4,690	5,940
4	0	0	0	1	20
5	0	0	0	0	0
TOTAL	6,420	7,020	19,190	27,740	25,960
per cent of all NVQs awarded	4.7	4.6	10.1	11.8	9.5

NVQ Level	1995/1996	1996/1997	1997/1998	1998/1999	TOTAL
1	5,040	6,530	6,340	6,560	37,990
2	12,660	15,800	14,640	15,320	105,610
3	6,310	5,970	5,930	5,800	49,600
4	3	20	40	40	120
5	0	0	0	0	0
TOTAL	24,010	28,320	26,950	27,710	193,320
per cent of all NVQs awarded	6.9	6.4	6.0	6.5	7.3

Source: QCA and DfEE Statistics Bulletin Issue no. 9/99 Vocational Qualifications in the UK 1997/98

Note: there are also small numbers of GNVQ and other VQs not included in the table

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