



**UK COMMISSION FOR
EMPLOYMENT AND SKILLS**

Sector Skills Insights: Construction

Evidence Report 50
July 2012

Sector Skills Insights: Construction

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July 2012



Foreword

The UK Commission for Employment and Skills is a social partnership, led by Commissioners from large and small employers, trade unions and the voluntary sector. Our mission is to raise skill levels to help drive enterprise, create more and better jobs and promote economic growth. Our strategic objectives are to:

- Provide outstanding labour market intelligence which helps businesses and people make the best choices for them;
- Work with businesses to develop the best market solutions which leverage greater investment in skills;
- Maximise the impact of employment and skills policies and employer behaviour to support jobs and growth and secure an internationally competitive skills base.

These strategic objectives are supported by a research programme that provides a robust evidence base for our insights and actions and which draws on good practice and the most innovative thinking. The research programme is underpinned by a number of core principles including the importance of: ensuring '**relevance**' to our most pressing strategic priorities; '**salience**' and effectively translating and sharing the key insights we find; **international benchmarking** and drawing insights from good practice abroad; **high quality** analysis which is leading edge, robust and action orientated; being **responsive** to immediate needs as well as taking a longer term perspective. We also work closely with key partners to ensure a **co-ordinated** approach to research.

This report contributes to the UK Commission's work to transform the UK's approach to investing in the skills of people as an intrinsic part of securing jobs and growth. It outlines the performance challenges faced in the **Construction** sector, the 'real-life' skills solutions implemented by leading and successful businesses to overcome them, and the benefits from doing so. Similar reports are available for the following sectors: Advanced Manufacturing; Digital and Creative; Education; Energy; Health and Social Care, Professional and Business Services; Retail; Tourism. Each report is summarised by an accompanying PowerPoint slide pack. By understanding the key performance challenges employers face and the skills solutions available to address them on a sector-by-sector basis the UK Commission can make better use of its investment funds to support economic growth.

Sharing the findings of our research and engaging with our audience is important to further develop the evidence on which we base our work. Evidence Reports are our chief means of reporting our detailed analytical work. Each Evidence Report is accompanied by an executive summary. All of our outputs can be accessed on the UK Commission's website at www.ukces.org.uk

But these outputs are only the beginning of the process and we will be continually looking for mechanisms to share our findings, debate the issues they raise and extend their reach and impact.

We hope you find this report useful and informative. If you would like to provide any feedback or comments, or have any queries please e-mail info@ukces.org.uk, quoting the report title or series number.

Lesley Giles

Deputy Director

UK Commission for Employment and Skills

TABLE OF CONTENTS

GLOSSARY	VI
EXECUTIVE SUMMARY	VII
1 THE ECONOMIC AND POLICY CLIMATE	1
2 THE IMPORTANCE OF THE SECTOR	4
2.1 Overall Output and Employment Performance	5
2.2 Employment Structure (for 2010).....	9
2.3 Age structure of employment.....	11
2.4 Self-employment.....	13
2.5 Distribution of Employment by Nation and Region	14
2.6 International Standing of the Sector	16
2.7 Conclusion	17
3 KEY CHALLENGES FACING THE SECTOR OVER THE MEDIUM-TERM	18
3.1 Introduction	18
3.2 The Recession and Recovery.....	18
3.3 Investment, Innovation and R&D	20
3.4 Technology	22
3.5 Policy, Legislation and Regulation.....	23
3.6 Environment and Low / Zero Carbon.....	24
3.7 Global Competition	25
3.8 Migration	26
3.9 The Role of Skills in Overall Competitiveness	26
3.10 Strategic Role of Management	27
3.11 Conclusion	28
4 EMPLOYMENT AND SKILL DEMAND IN THE SECTOR	30
4.1 The Changing Demand for Employment	30
4.2 Factors Affecting the Demand for Skill	30
4.3 Changing Patterns of Skill Demand.....	33
4.4 Replacement Demands	36
4.5 Conclusion	38
5 SKILLS SUPPLY	39
5.1 The Supply Infrastructure	39
5.2 Trends in Skill Supply: The Levy Scheme and Certification	45
5.3 Trends in Skill Supply: Individuals	46
5.4 Employer Investment in Skills.....	50
5.5 Migrant Labour Supply.....	54
5.6 Conclusion	55
6 SKILL MISMATCHES	56

6.1	Defining Skill Mismatches.....	56
6.2	Evidence of Relative Wage Growth	57
6.3	Evidence of employer reported skill deficiencies	60
6.4	Other Evidence on Evidence of Skill Deficiencies	62
6.5	Causes, Impacts and Remedies	63
6.6	Conclusion	70
7	CONCLUSION	71
7.1	The Sector Today and Tomorrow	71
7.2	The Performance Challenge.....	72
7.3	Growth through Skills	73
7.4	Business Benefits	74
	REFERENCES	76

CHARTS

Chart 1.1	Employment and Gross Value-Added 1978 - 2020.....	3
Chart 2.1:	Trends in Employment and Output	6
Chart 2.2	Occupational Structure of Employment.....	9
Chart 2.3a	Size Structure of Employment (% of employment by employer size band) .	10
Chart 2.3b:	Size Structure of Employment (% of employment by employer size band) .	10
Chart 2.4a:	Age Structure of Construction Workforce.....	12
Chart 2.4b:	Age Structure of UK Workforce (all sectors)	12
Chart 2.5:	Employment by Nation and Region.....	14
Chart 4.1:	Replacement Demands.....	37
Chart 5.1:	Apprenticeship starts and achievements (all levels), 2002/03 to 2010/11 ...	48
Chart 5.2:	Higher Education qualifications attained in UK HEIs, 2005/06 to 2009/10 ..	50
Chart 6.1	Occupational Distribution of Skill Shortages in Construction	62
Chart 6.2	Occupational Distribution of Skill Gaps in Construction	63
Chart 6.3	Reasons for Not Providing Vocational Qualifications.....	64

TABLES

Table 1.1	Four recent periods of recession in the UK.....	1
Table 2.1:	Key Output and Employment Indicators.....	5
Table 2.2:	Key employment indicators by sub-sectors in 2010.....	7
Table 2.3:	Size Structure of Employment (% of employment by employer size band) .	10
Table 2.4:	Age Structure of Workforce by sub-sectors in 2010.....	13
Table 3.1:	Sector investment as a share of total investment	21
Table 4.1	Changing Pattern of Skill Demand	34
Table 4.2	Changing Pattern of Skill Demand by Qualification	36
Table 5.1:	Main construction qualifications – levels and descriptions.....	41
Table 5.2	Number of employees in receipt of work-related training over the past 13 weeks	47
Table 5.3:	Construction Apprenticeship starts by level and age, 2002/03 to 2010/11 ..	48
Table 5.4:	KPIs, 2005 to 2010.....	50
Table 5.5:	Employer Investments in Skill	51
Table 5.6	Recruitment of young people	51
Table 5.7	Recruitment of apprentices	52
Table 5.8	Other Indicators of Training Activity	53
Table 6.1:	Annual pay - Gross (£) - For full-time employee jobs: UK, 2010.....	57
Table 6.2:	Annual pay - Gross (£) - For full-time employee jobs in Selected Occupations in Construction: United Kingdom, 2010.....	58
Table 6.3a	Incidence of Skill Deficiencies.....	61
Table 6.3b	Density of Skill Deficiencies	62
Table 6.4	Investors in People Accreditation in IiP.....	66

GLOSSARY

This report uses data from several sources and uses a definition of the sector depending upon which data sources are available.

PRINCIPAL DATA SOURCES

Employer Perspectives Survey 2010 (EPS 2010)

The UK Commission's Employer Perspectives Survey 2010 (Shury et al., 2011) gathered the views of approximately 14,500 employers on the UK's employment and skills system. The aim of the survey is to provide evidence to stakeholders operating in the system across the four UK nations to inform policy and improve service delivery.

<http://www.ukces.org.uk/publications/er25-employer-perspectives-survey>

The UK Commission's UK Employers Skills Survey 2011 (ESS 2011)

The UK Commission's UK Employer Skills Survey (UK Commission, 2012) provides UK-wide data on skills deficiencies and workforce development across the UK on a comparable basis. It was undertaken at the establishment level and involved over 87,500 interviews, with a follow up survey of over 11,000 employers focusing on employers' expenditures on training.

<http://www.ukces.org.uk/publications/employer-skills-survey-2011>

Working Futures Database

Working Futures 2010-2020 (Wilson and Homenidou, 2011) is the most detailed and comprehensive set of UK labour market forecasts available. The results provide a picture of employment prospects by industry, occupation, qualification level, gender and employment status for the UK and for nations and English regions up to 2020. The database used to produce the projections is held by the University of Warwick Institute for Employment Research and Cambridge Econometrics.

<http://www.ukces.org.uk/assets/ukces/docs/publications/evidence-report-41-working-futures-2010-2020.pdf>

Labour Force Survey

The Labour Force Survey (LFS) is a quarterly sample survey of households living at private addresses in the United Kingdom. Its purpose is to provide information on the UK labour market that can then be used to develop, manage, evaluate and report on labour market policies. It is conducted by the Office for National Statistics. Figures quoted in this report are based on a four quarter average.

<http://www.ons.gov.uk/ons/guide-method/surveys/respondents/household/labour-force-survey/index.html>

SECTOR DEFINITIONS

Two definitions of the sector have been employed in this report.

Standard Industrial Classification (SIC) Based Definition

Construction is traditionally defined in SIC (2007) as Section F: construction of buildings; civil engineering, construction of specialised buildings.

Sector Skills Assessment (SSA) Definition

Information from the SSA for construction is also used to inform the analysis in this report. For the purposes of the SSA construction is defined as SIC (2007) Section F plus 71 Architectural and engineering activities; technical testing and analysis.

EXECUTIVE SUMMARY

This report considers the current situation of the UK construction sector, the challenges it faces over the medium-term and the implications for skills.

The Importance of the Sector

- Construction is a vital component of the UK economy, not only directly due to its contribution to output and employment, but also strategically in its contribution to the built environment and as part of various initiatives designed to stimulate growth.
- It also has a critical functional role in meeting the low-carbon agenda either through retro-fitting buildings and ensuring that all new buildings meet energy saving standards.
- The recent recession has adversely affected construction employment and performance with the sector experiencing a sharp drop in the total value of contracts. With cuts to public spending and low consumer confidence, the recession has presented the sector with a number of challenges. Construction has been one of the most affected sectors in terms of the relative decrease in employment with a decline of around 8 per cent resulting from the 2008/09 recession.
- The sector rebounded faster than other sectors in the first three quarters of 2010, but there have been contractions in construction output since. While construction is often the sector which helps to pull the entire economy out of recession, it is slow in doing so in the present global downturn.
- Employment in construction accounted for around 8.5 per cent of total employment in the UK in 2010 and the sector contributed more than 9 per cent of the economy's output in the same year.

Key Challenges and Implications for Skills

- The severely cyclical nature of employment in construction is a feature of the sector that has several implications for skills. In the most recent and previous recessions, the sector's workforce has dropped significantly. This has previously resulted in skills shortages in the recovery period as workers who have secured employment in other sectors are reluctant to re-join the construction workforce. The cyclical nature of employment is also a deterrent for younger entrants into the sector as well as for highly skilled workers, such as managers (including civil engineers) who seek more stable employment in other sectors where their skills are sought after.
- Technological advances (including modern methods of construction (MMC)) and the low carbon agenda are having significant impacts on the sector and its skills needs.

These will grow in importance in future so that the sector must respond to these challenges by acquiring the right quality and quantity of specific skills. Complying with environmental regulations requires not only skills in using green materials and methods in construction but also with managing construction sites in order to reduce carbon footprints. Similarly, increased use of pre-fabrication and automation in construction requires management of a different mix of labour on site as well as management of significant workforce off-site (e.g. in factories making the building components).

- Globalisation and increased international competition also require that employers in construction consider a wider range of skills including language and managerial skills in order to operate successfully in overseas markets, collaborate with international partners and compete with international companies in the domestic market.

Employment and Skill Needs in the Sector

- The key drivers of change in construction have a variety of implications of skills demand in the sector. Meeting low/zero carbon requirements, adopting new technologies and satisfying various regulations requires particular specific skills and alters the importance of particular occupations. Skills to fill replacement demand as older workers leave the sector are particularly important in construction given the nature of work and the age structure of the workforce.
- In order to meet these challenges, the skill profile of the sector has been changing with an increased share of people working in higher level occupations (managers, professionals, and associate professionals). This is matched by an increasing share of people qualified at a high level (Level 4 and above).
- Within occupations too there is the changing content of the skills required given the changes in construction processes and the use of new materials, and the need to meet a wide range of market demands (such as the low carbon agenda).

Skills Supply

- There is a well developed skill supply system operated through the levy system and ConstructionSkills amongst others, and a relatively high level of engagement by employers with the training infrastructure (private providers and FE colleges).
- There is evidence of an increasing number of Apprenticeship starts at Level 2 and 3, though this has tailed off over recent years due to a downturn in construction activity.
- It is apparent that construction employers are relatively sensitive to cost in relation to their training activities. Where employers do not provide training leading to vocational

qualifications they tend to provide reasons relating to cost more than employers in the sector as a whole.

- There is also evidence that many employers report that the skills of their workforce are under-utilised though less so than in the economy generally, which points to an extant source of skills supply within many organisations.

Skill Mismatches

- The evidence shows that the sector has relatively high levels of skill shortages which have a detrimental impact upon organisational performance. In part, the sharp cyclical shifts in demand for construction, poses problems in relation to planning employment and skill demand.
- The relatively large share of micro-employers and the number of self-employed people in the sector means that some people can fall outside of existing skills supply-mechanisms unless they are encompassed within industry supply chains which require people to be trained and qualified.
- In order to meet the challenges facing the sector over the medium-term, there is a clear need to continue to develop the skills of the workforce despite depressed demand for construction. This includes continuing to invest in training at an Apprenticeship level and at higher skill levels.
- There are a range of processes and programmes in place to assist construction employers attain this goal. And all the case study evidence suggests that where employers continue to invest in training there are substantial business benefits from doing so which improve organisational performance and, crucially, are associated with business survival.
- It needs emphasising that given the high levels of replacement demand, and the associated expected growth in output over the medium-term, the sector, if it effectively uses the employment and training infrastructure available to it, can, potentially, provide a large number of entry level training positions over the medium term which one would expect to go, predominantly, to young people. This would contribute thereby to an important policy goal of assisting young people enter the labour market.

Conclusion

Following previous recessions, output growth in the construction sector has risen strongly. Often large-scale infrastructure projects have been used as a demand-side

fillip. It is notable currently that the Government is looking to bring forward a number of previously planned and budgeted infrastructure projects to stimulate growth in the economy and, in so doing, will stimulate demand in the construction sector.

The above is very much a short- to medium-term development. From a more long-term perspective there are a number of challenges and opportunities facing the sector, including:

- meeting the low carbon agenda (*i.e.* reducing carbon emissions and the carbon footprint of buildings);
- raising productivity levels in order to retain, if not increase, the current share of the UK and world markets held by UK-based companies;
- bringing about increased levels of innovation in the design (*i.e.* the product) and the construction (*i.e.* the process) in order to increase productivity; and
- meeting changing regulatory standards relating to the construction of buildings and health and safety on site.

The above challenges and opportunities place a number of demands on the sector's skill requirements:

- investing in management skills to adequately equip managers with the skills to meet the performance challenges listed above;
- avoiding the skill-shortages which the sector encountered following previous recessions which potentially dampen the sector's growth potential. This points to the need for the sector to continue to:
 - provide initial vocational education and training to new entrants in order to meet future skill demands;
 - invest in the skills of the existing workforce to ensure they are prepared for the challenges ahead.

There is a substantial training and skills development infrastructure of which employers can utilise to meet their skill needs. The evidence indicates that where companies have made use of such programmes as Apprenticeships they have been able to obtain a number of business benefits from having done so.

1 The Economic and Policy Climate

Increasingly, the competitiveness of advanced industrial nations is explained with reference to the capabilities of their respective labour forces. Hence, national education and training systems are seen as providing comparative economic advantages. It is notable that over the recent past education and training have taken centre stage in policies designed to foster the UK's competitiveness and lie at the heart of the current Government's plans to kick start the recovery against a backdrop of challenging global economic conditions. To understand the role skills development might play in stimulating growth within the digital and creative sector requires some consideration of the current economic situation and current skills policy.

In 2012 the UK economy, and indeed the global economy, is still coming to terms with the repercussions of the 2008/09 economic recession. By comparison with previous recessions, 2008/09 was relatively deep and it continues to cast a long shadow over the country's medium-term economic prospects (see Table 1.1). The economic climate at the time of the 2008/09 recession and in the period afterwards has been characterised by low interest rates and a depreciation of sterling against other currencies, notably the dollar and the euro. Whilst these would usually be sufficient to give a fillip to the economy by boosting demand and, given time, increasing output, the potential for export led growth has been seriously undermined by continuing weak demand conditions across the global economy, especially in the Eurozone and the USA. Also the difficulties households and businesses have had gaining access to finance as the banks have sought to increase their capital has restricted growth. Moreover, the markets' continuing disquiet over developments in the Eurozone has contributed further to the climate of uncertainty in the global economy thereby further dampening demand.

Table 1.1: Four recent periods of recession in the UK

	Start date	Date of bottom of recession	Length of period from start to bottom of recession	Total decline in GDP (%)	Time taken for GDP to recover to level at start of recession
1	1974 Q4	1975 Q3	4 Quarters	3.8	7 Quarters
2	1980 Q1	1980 Q4	4 Quarters	5.9	13 Quarters
3	1990 Q3	1992 Q2	8 Quarters	2.3	11 Quarters
4	2008 Q2	2009 Q1	6 Quarters	6.3	?

Source: Office of National Statistics Quarterly Economic Accounts, 1975, 1981, 1993, 2010

As a consequence of the above developments, the rapid acceleration in growth observed after the recessions of the early 1980s and 1990s has failed to materialise. Nevertheless the economy is expected to resume its long-run growth path over time (see Chart 1.1) but in order to do so there are specific steps the UK economy needs to take. The UK Treasury has identified a number of weaknesses which need to be addressed if a sustained recovery is to be achieved (BIS / HM Treasury 2011):

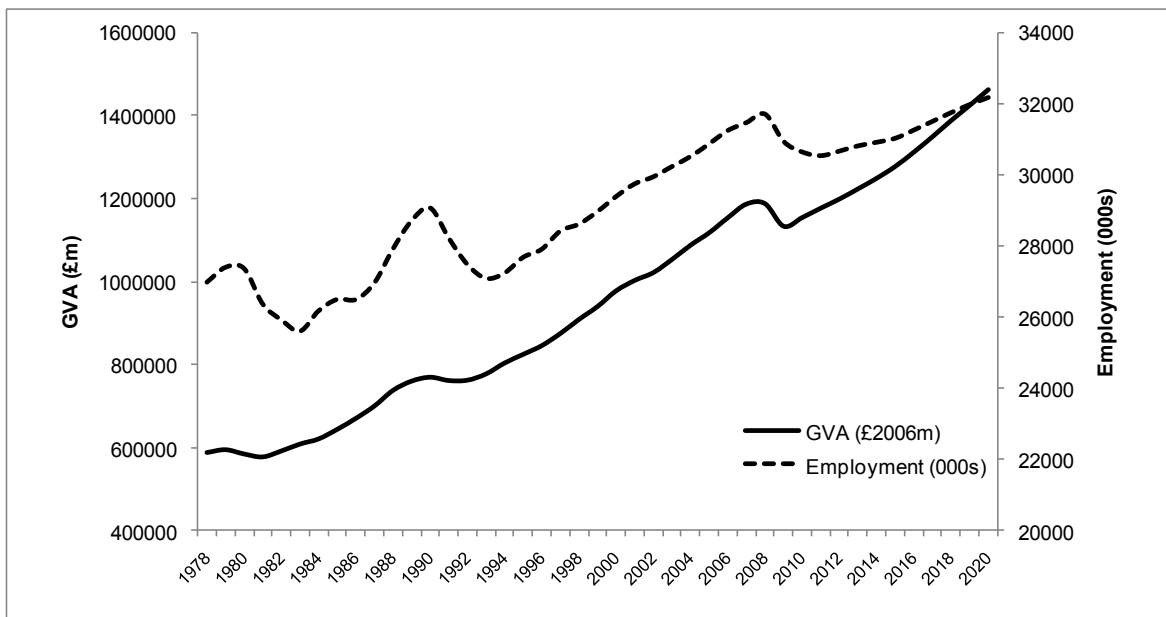
- the level of debt funded household consumption;
- the share of the economy accounted for by the public sector;
- weak business investment;
- an over-dependence upon financial and business services; and
- unbalanced regional growth.

Government has identified four ambitions which need to be realised in order to restore long-term sustainable growth (BIS / HM Treasury 2011):

- i. creating the most competitive tax system in the G20;
- ii. making the UK one of the best places in Europe to start, finance and grow a business;
- iii. encouraging investment and exports as a route to a more balanced economy; and
- iv. creating a more educated workforce that is the most flexible in Europe.

Therefore, the role of skills in national economic policy is clearly an essential one; to bring about recovery and sustainability by creating jobs and growth.

From the employer's perspective there is a need to adapt to both global demand side conditions and the consequences which are likely to arise from policies designed to rebalance the UK economy. Depending upon the sector there are likely to be a number of skill-related performance challenges which employers will need to address as they seek to consolidate existing markets, develop new ones, and introduce technical and organisational changes to improve their competitiveness. The importance of these challenges become even more apparent if one considers the role of skills in the economic cycle. Evidence demonstrates that the recovery from previous economic recessions was hampered by skills shortages, and that these skill shortages then contributed to further downturns in the economy (Blake *et al.*, 2000). Therefore, the message is clear: a failure to invest sufficiently in skills now has the potential to dampen future growth.

Chart 1.1: Employment and Gross Value-Added 1978 - 2020

Source: Wilson and Homenidou (2011)

At a time when capital investments are constrained as a consequence of problems in the global banking system, investments in skills, and human resources more generally, made through programmes such as Apprenticeships and Investors in People, and funded through initiatives such as the Growth and Innovation Fund, may be the most amenable to employers.

Based on the latest evidence available, this report considers the specific situation in the Advanced Manufacturing sector to provide:

- an overview of the size and structure of the sector and the principal drivers of change over the medium term which are likely to have some bearing upon skill demand;
- an outline of current and expected patterns of skill demand in the sector;
- a description of skills supply and how this has adapted to changing patterns of skill demand;
- an analysis of mismatches between the demand for, and supply of skills, and the implications of this for the sector.

In conclusion, the report identifies the performance challenges faced by the sector and highlights the skills solutions available to address them thereby delivering increased levels of growth and contributing to the recovery of the UK economy.

2 The Importance of the Sector

Construction was one of eight key sectors addressed in the Government's first growth review (HM Treasury, 2011). The construction sector is a fundamental part of the UK economy. Not only is it responsible for the construction of the built environment, but historically it has been an engine of growth following economic downturns. It is important to note in this context that the current Government has earmarked £200 billion for investment in public and private infrastructure investments over the next five years and, recently, has outlined a number of actions to stimulate and support the sector. These actions include:

- regular early identification of infrastructure projects and programmes in order to provide a degree of stability in which employers can plan their activities;
- changes to public procurement processes in order to improve its efficiency;
- stimulating demand through a number of actions including support for first time house buyers and reforming stamp duty land tax rules for bulk purchases;
- changes to various building regulations to reduce duplication and remove redundant rules.

These actions are designed to have an impact on distinct segments of the construction sector. It needs to be borne in mind that the construction sector is not homogeneous but is comprised of a number of sub-sectors which vary across a number of dimensions. The three main sectors of the UK construction industry, as set out in the UK Standard Industrial Classifications 2007 (SIC2007) are:

- (i) construction of buildings (41);
- (ii) civil engineering (42);
- (iii) specialised construction activities (43);
- (iv) architectural and related (71).

Activity also varies within these broad sub-sectors, from small companies – including sole traders – supplying specialist services to large, multi-national enterprises with responsibility for delivery large-scale projects.

2.1 Overall Output and Employment Performance

Construction comprises the second largest sector of employment in the UK, accounting for around 7.5 per cent of total UK employment. In addition, a significant number of construction workers are employed in the informal economy whose numbers are not readily captured in official statistics.

The sector had output of more than £99 billion in 2010 (2006 prices) which represents significant growth of 2.4 per cent a year between 2000 and 2010 (see Table 2.1). Business Population Estimates for 2011 (BIS) (private sector only) indicate that at the start of the year there were 876,000 businesses operating in the sector, representing 19 per cent of all UK private sector enterprises.

Productivity in construction had risen steadily over the period 2002 to 2008 but fell from £60,000 to £58,000 GVA per head between 2008-09 (Annual Business Inquiry (ABI) / Business Register and Employment Survey (BRES) and Annual Business Survey, Office National Statistics). This is a similar pattern to the economy overall but the economy average GVA per head is much lower at £37,000. The sector performs well compared to a number of other sectors in terms of productivity (c.f. productivity in manufacturing is around £49,000 GVA per head). In 2009, productivity in construction varied across the UK, from £39,000 GVA per employed person in Wales, £53,000 in Scotland and £60,000 in Wales (Sources: Annual Business Inquiry (ABI) / Business Register and Employment Survey (BRES) and Annual Business Survey, Office National Statistics). There are also variations in regional productivity; in 2007, productivity per head was £29,100 in the North East, to £38,000 in the East of England, and £42,400 in London (ONS Blue Book, Labour Force Survey).

Table 2.1: Key Output and Employment Indicators

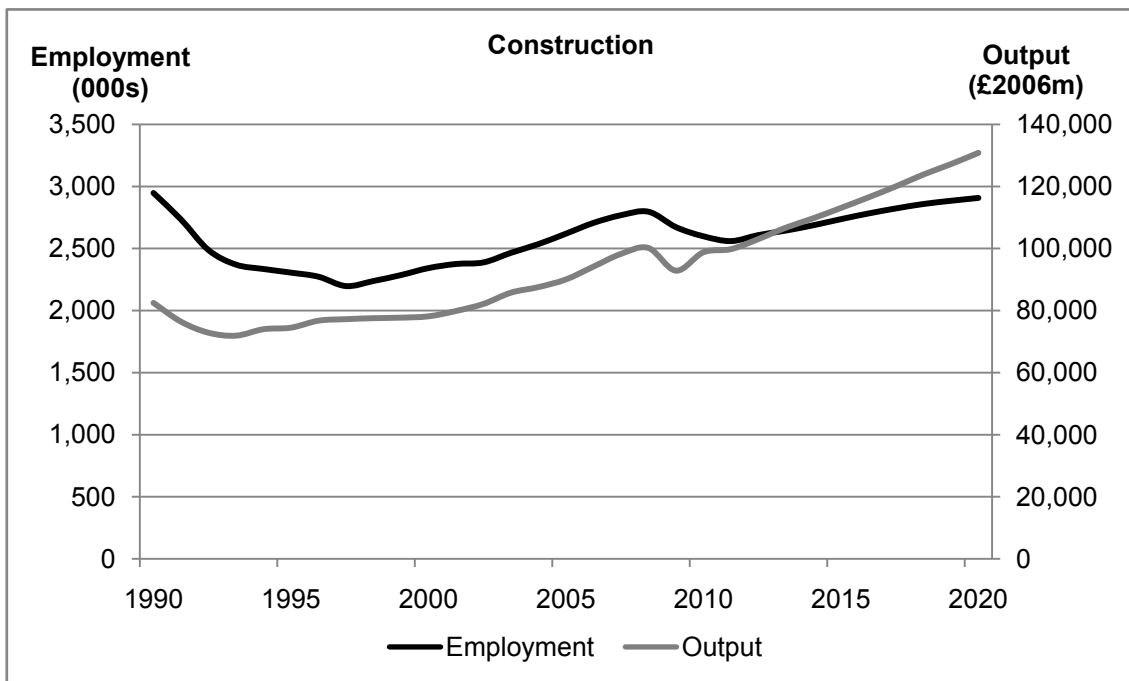
Construction	2010 level	Growth rate: 2000-2010 (% p.a.)	Changes (absolute)	Growth: 2010-2020 (%)	Growth rate: 2010-2020 (% p.a.)	Changes (absolute)
Output (£2006m)	98,814	2.4	20,631	32.4	2.8	32,025
Employment	2,599,254	1.0	256,203	11.9	1.1	309,057
Part time employment	159,819	-1.4	-24,232	16.5	1.5	26,339
Full time employment	1,458,381	0.5	75,911	12.8	1.2	186,065
Self employment	981,054	2.4	204,524	9.9	0.9	96,653
Male employment	2,255,200	1.5	308,907	12.3	1.2	277,080
Female employment	344,054	-1.4	-52,704	9.3	0.9	31,977

Source: Wilson and Homenidou (2011)

Base: SSA Definition

Employment and output in construction are both sharply cyclical and sensitive to macroeconomic conditions. Employment in the sector was just under 3 million in 1990. This decreased over the period to the mid-1990s to around 2.2 million in 1997. Between 1997 and 2008 there was steady growth in employment until numbers began to decrease again in response to the global recession. Data from 2010 indicates that 36 per cent of firms in the sector reported that they laid-off staff owing to the 2008/09 recession (ConstructionSkills, 2010). Employment and output are expected to begin to grow again in 2012 according to the latest Working Futures projections (Wilson and Homenidou, 2011). These estimate that over the 10 years to 2020, output will grow by 32 per cent – from a relatively low base in a historical context (compared to 30 per cent across all sectors) - and employment by 12 per cent (compared to 5 per cent across all sectors). Again, official figures do not count employment in the informal economy so that these figures are likely to be higher in reality.

Chart 2.1: Trends in Employment and Output



Source: Wilson and Homenidou (2011)

Base: SSA Definition

Output in the construction industry fell faster than total GDP during the recession and rebounded more quickly than the economy during the first three quarters of 2010, but output contracted again during the last quarter of 2010 and the first quarter of 2011 (Maer, 2011).

Of the three main sectors of the UK construction industry, specialised construction is the largest, accounting for about 51 per cent of overall employment in the construction, followed by construction of buildings (36 percent of construction employment) and civil engineering is the smallest sector (12 per cent) (see Table 2.2).

Table 2.2: Key employment indicators by sub-sectors in 2010

	All Construction (%)	Construction of buildings (%)	Civil engineering (%)	Specialised construction activities (%)
Employment	100	36.3	12.7	51.0
Male employment	86.8	87.1	85.7	91.5
Female employment	13.2	12.9	14.3	8.5
Full time employment	90.1	90.3	93.8	91.2
Part time employment	8.9	9.7	6.2	8.8
Self employment	37.7	37.0	13.0	47.0
Employee	62.3	63.0	87.1	53.0

Source: Labour Force Survey, 2010

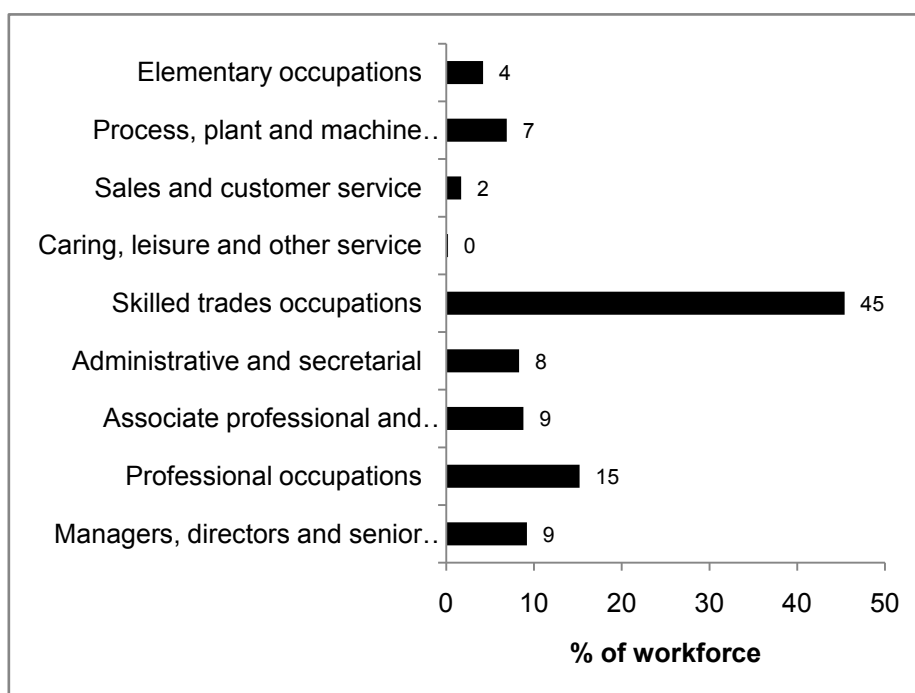
The construction industry in the UK has been adversely affected by the economic crisis exhibiting the greatest increase of all sectors in the redundancy rate during the economic downturn (18 per cent in Q1 2012 compared to seven per cent across all industries (ONS, Labour Force Survey, 2012). The civil engineering sub-sector has been the least affected and has, to a degree, benefited from Government investment in infrastructure. Despite the economic downturn, civil engineering construction output in Great Britain increased during much of the period from 2005 to 2010, apart from a 1 per cent decrease in 2006. The annual growth rate in the civil engineering sector rose from 5 per cent in 2007 to an estimated 21 per cent in 2010. In 2010, output reached £13.24 billion (over 13 per cent of total construction output), representing an overall increase of 57 per cent compared with 2006. The significant increase in 2010 partially reflected increased capital investment by utility companies and strong civil engineering construction output in the railways sector (MBD, 2011). The output of civil engineering construction is predicted to increase continuously over the years to 2015, reaching £15.97 billion (at 2010 prices) with the annual growth rate expected to fluctuate between 3 per cent and 5 per cent in real terms, indicating an overall growth of 21 per cent compared with 2010. The energy sector is expected to show strong growth to support a low carbon economy with investment plans for a new generation of nuclear power stations and increased investment in renewable energy projects (MBD, 2011).

After an annual growth of 15 per cent during the period from 2005 to 2007, the UK house building sector declined by 17 per cent in 2008 and by an even stronger 28 per cent in 2009, taking output to £14.59 billion (MBD, 2010). The output of the house building sector, which accounted for around 40 per cent of total construction output before the economic crisis, declined to 34 per cent in 2008 and further to 31 per cent in 2009 due to a significant downturn in the housing market caused by the financial crisis (MBD, 2010).

Table 2.2 describes the distribution of employment by gender, part-time work and self-employment in the sector as well as for each of the sub-sectors. Overall, construction is characterised by low participation of women in the workforce with only 13 per cent of employment being held by women compared with nearly 50 per cent across the whole economy. This varies across the main sub-sectors. The civil engineering sector had the highest proportion of female employees in 2010 (14 per cent), followed by construction of buildings sector (13 per cent) and specialised construction in which less than nine per cent of employment was held by women. The exceptionally low participation of women in construction is particularly pronounced in skilled trades occupations with only 2 per cent of employment in manual occupations being held by women. Black and Minority Ethnic people are under-represented in the construction industry, accounting for five per cent of the workforce compared with nine per cent across all sectors (Labour Force Survey, 2010).

Part-time work is relatively uncommon in construction, a characteristic of the employment structure which could, in part, affect female participation in the workforce. Overall, just under ten per cent of employment in the sector is part-time compared to 27 per cent across all sectors. The picture varies slightly across the sub-sectors; the share of employment in the construction subsectors that is part-time ranges from six per cent in civil engineering (SIC 42) to nearly 14 per cent in specialised construction activities (SIC 43).

The skill structure of the sector is described in detail in Section 4, but it is worth bearing in mind with respect to employment the sector's reliance upon skilled labour at both intermediate and higher levels (see Chart 2.2).

Chart 2.2 Occupational Structure of Employment

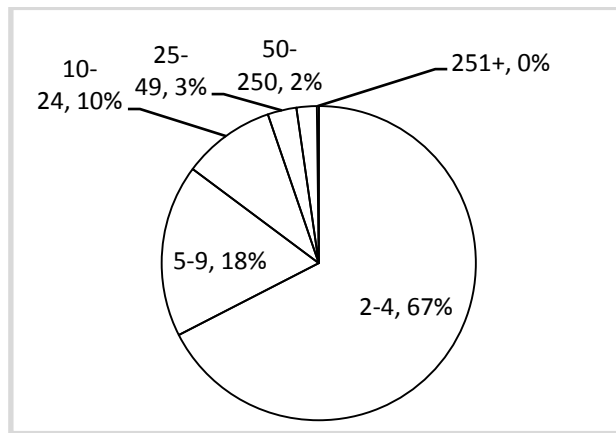
Source: Labour Force Survey, 2010

2.2 Employment Structure (for 2010)

The construction sector is made up of a small number of large companies and a long tail of small companies and self-employed individuals. Total turnover in the construction sector was £184.13 billion in 2010. The top 100 construction companies in the UK accounted for more than 37 per cent of the sector's total turnover (£68.421 billion). Amongst the top 100 construction companies by turnover in 2011, at least three were non-UK companies.

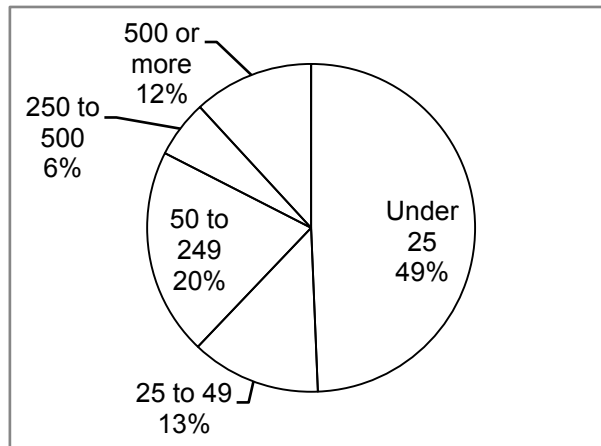
As depicted in Charts 2.3a and 2.3b employment in construction is concentrated in firms with less than 25 employees. These small employers account for nearly half of all employment in the sector. Companies with 250 to 500 employees account for the smallest share, 6 per cent, of employment in the sector whilst the largest employers (500 or more employees) make up 12 per cent of total employment. According to BIS Business Population Estimates (2011a) (private sector only), across all sectors in the UK, 59 per cent of employment is within SMEs (0-249 employees) while in construction 85 per cent of employment is concentrated in firms with less than 250 employees. The heavy concentration of small companies is an important feature of the sector which has implications for skills and training investments and productivity. What is more, SMEs account for 74 per cent of the turnover in the sector and is much higher than the all sector figure of 48 per cent (BIS, 2011a) (again, this is based on private sector only).

Chart 2.3a: Size Structure of Employment (% of establishments by employer size band)



Source: Inter-departmental Business Register (IDBR), ONS, 2010

Chart 2.3b: Size Structure of Employment (% of employment by employer size band)



Source: Labour Force Survey 2010

Table 2.3 indicates the size structure of employment by the three main sub-sectors in 2010. Firms with less than 25 employees, unsurprisingly, account for the largest proportion of total employment across the three sub-sectors, while firms with 250 to 499 employees account for the smallest proportion within each sub-sector. Employment in civil engineering is somewhat more evenly distributed across employers by size compared to construction of buildings and specialised construction. Employment in specialised construction activities is especially concentrated in smaller firms with almost one-third in companies with less than 25 employees and just over 7 per cent of all employment being in companies with 250 or more employees. The proportion of employment within companies with less than 25 employees is less than 30 per cent in civil engineering compared to more than 50 per cent in construction of buildings and more than 60 per cent in specialised construction activities.

Table 2.3: Size Structure of Employment (% of employment by employer size band)

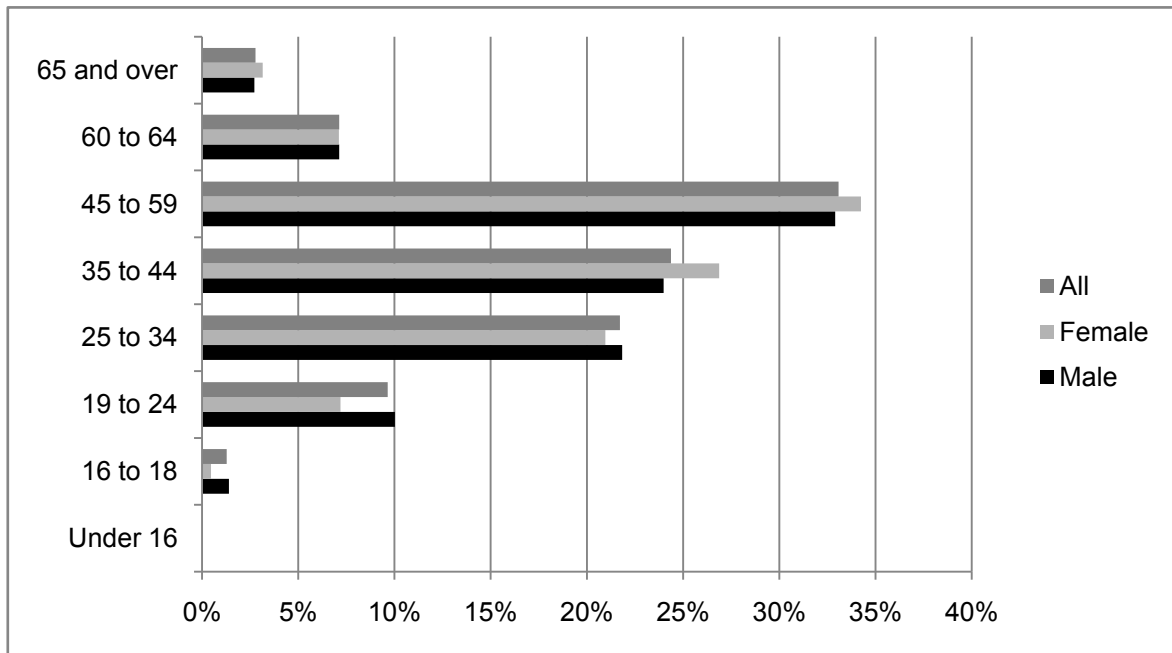
Number of employees	All Construction (%)	Construction of buildings (%)	Civil engineering (%)	Specialised construction activities (%)
under 25	49	52.2	29.8	64.3
25 to 49	13	13.8	14.0	12.7
50 to 249	20	20.8	29.3	15.9
250 to 499	6	6.0	10.5	3.0
500 or more	12	7.2	16.4	4.1

Source: Labour Force Survey 2010

2.3 Age structure of employment

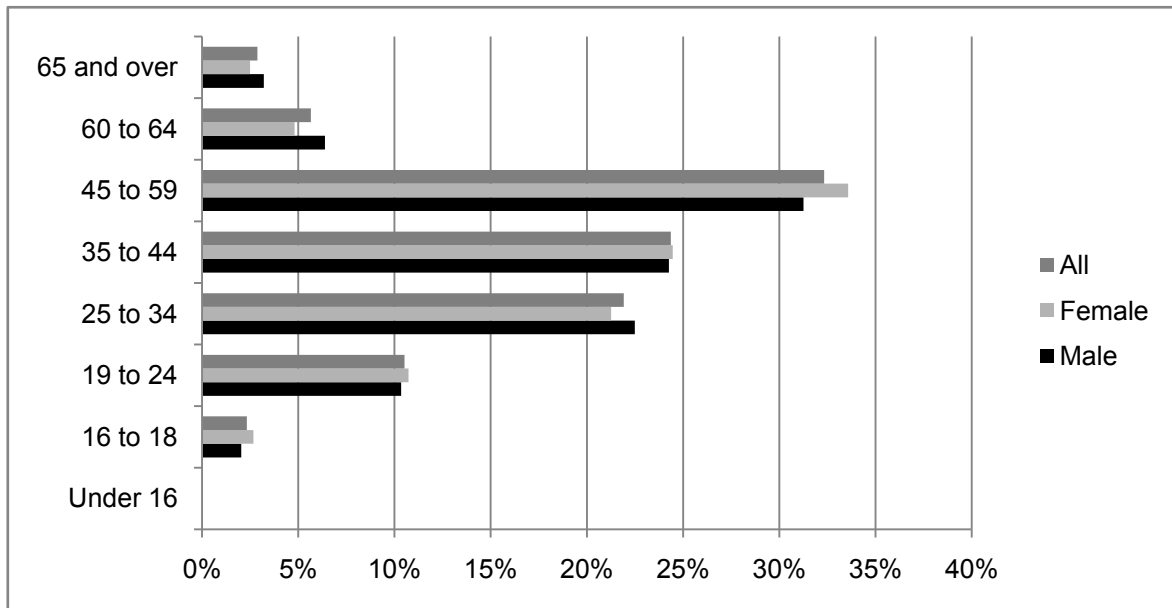
Construction employment is skewed towards the middle age groups indicated in Chart 2.4 with low employment of individuals aged 18 years or less and those aged 65 and over. The majority of construction workers are between the ages of 25 and 59 years (more than 80 per cent). The age distribution of workers in construction is not dramatically different from the distribution of workers across all sectors in the UK. The main difference is with regard to younger workers with a smaller proportion of workers in construction being between the ages of 16 and 24 years (11 per cent) compared to the whole economy (13 per cent). Employment of workers aged 18 years and younger is relatively uncommon in the construction industry largely due to the increased regulations imposed on their employment, including health and safety requirements on construction sites. The age structure in the three sub-sectors is similar to construction overall. Civil engineering has the lowest shares of employees aged 24 years and under (11 per cent) and 65 years old and over (3 per cent).

Chart 2.4a: Age Structure of Construction Workforce



Source: Labour Force Survey 2010

Chart 2.4b: Age Structure of UK Workforce (all sectors)



Source: Labour Force Survey 2010

The age structure of the construction workforce has implications for replacement demands (*i.e.* employment demand required to fill positions vacated due to retirement or other reasons). The nature of work in the sector contributes to the relatively low share of older workers with physically demanding work limiting perhaps limiting the age to which workers are willing to continue thus contributing to replacement demand for particular occupations.

Replacement demand for skilled construction and building trades over 2010 to 2020 is expected to be 434,000 (making up over 43 per cent of the sector workforce in 2020 compared with ten per cent across all sectors) (Wilson and Homenidou, 2011). There are concerns about the attractiveness of the sector to young people and the importance of bringing in skills in the younger age groups in order to replace skills lost through older workers leaving.

Table 2.4: Age Structure of Workforce by sub-sectors in 2010

Age of employees (years)	All Construction (%)	Construction of buildings (%)	Civil engineering (%)	Specialised construction activities (%)
16-18	1.3	1.5	0.8	1.6
19-24	9.6	10.2	8.4	11.5
25-34	21.7	21.2	21.1	21.8
35-44	24.4	24.5	27.7	23.3
45-59	33.1	32.6	33.5	32.7
60-64	7.1	7.1	7.0	7.0
65+	2.8	2.8	1.5	2.2

Source: Labour Force Survey 2010

2.4 Self-employment

There is a high incidence of self-employment in construction compared to other sectors and the UK economy as a whole. In construction, self-employment accounted for 38 per cent of the sector's total employment in 2010 (see Table 2.2) compared to around 14 per cent across the whole economy. The trend towards increasing levels of self-employment in construction is projected to continue with Working Futures projections indicating that self-employment will comprise more than 41 per cent of total employment in construction in 2020 (Wilson and Homenidou, 2011). Self-employment has been used as a means of creating a flexible workforce, of particular appeal to large companies in the sector, and has been attractive to many individual workers due to potential tax savings.

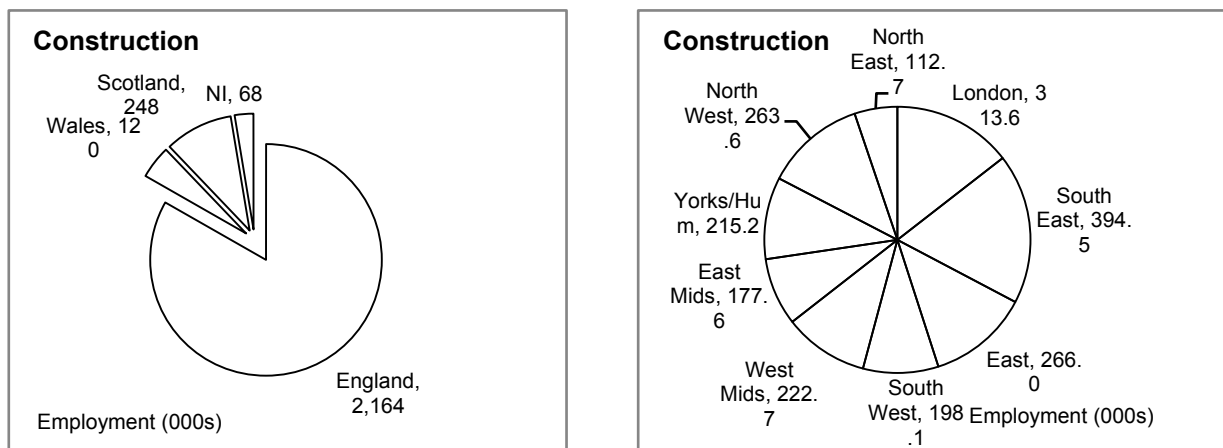
The prominence of self-employment and sub-contracting in the sector has caused concerns that such organisation of labour does not incentivise employers to provide training (Winch, 1998). Across the sub-sectors, self-employment is least common in civil engineering (13 per cent of total employment) and most common in specialised construction activities (47 per cent). Use of self-employed and sub-contracted labour is largely a response to the sensitivity of the sector to cyclical variations and the long-term nature of many construction projects (particularly large infrastructure projects) where

labour and skills needs vary over the project lifecycle. The Plan for Growth (HM Treasury, 2011) outlines a number of changes related to construction including publication of a rolling two year programme of projects (where public funding is agreed) as well as publication of a long-term forward view of infrastructure. In having advance information, the confidence of employers and investors should increase and construction employers may be able to plan their human resource strategies and workforce over longer periods and in doing so reduce the cyclical nature of employment.

2.5 Distribution of Employment by Nation and Region

More than 80 per cent of employment in the UK construction sector is based in England, 9 per cent is in Scotland, 5 per cent in Wales and 3 per cent in Northern Ireland (see Chart 2.5). Within England, construction employment is dispersed across the regions with the greatest shares being based in the South East (18 per cent), London (15 per cent), the East and North West (12 per cent each). The smallest share of construction employment is based in the North East (5 per cent). The distribution of employment in construction across the UK is not vastly different from that of employment in the economy as a whole.

Chart 2.5: Employment by Nation and Region



Source: Wilson and Homenidou (2011)

Base: SSA Definition

The distribution of construction employment by occupation differs across the regions (see Table 2.5). For the whole of the UK, skilled trades accounts for the greatest share of employment. This ranges from over a third in the East Midlands to well over half of the construction workforce in the North East and Northern Ireland, and is above average in London, the South West, West Midlands, Yorkshire and the Humber, North West and Wales.

The second largest category is professional occupations with the largest percentages in the East Midlands, London and Scotland and the lowest in Northern Ireland, the North East and Wales.

Table 2.5: Occupational profile of employment in construction, 2010 (% employed)

	Managers, directors and senior officials	Professional occupations	Associate professional and technical	Administrative and secretarial	Skilled trades occupations	Caring, leisure and other service	Sales and customer service	Process, plant and machine operatives	Elementary occupations
London	8.9	18.8	9.9	6.8	46.7	0.3	1.2	4.4	3.1
South East	11.3	16.3	8.9	8.9	42.7	0.2	1.5	6.3	3.9
East of England	10.6	14.7	8.8	8.4	42.7	0.2	1.8	7.7	5.1
South West	8.6	14.6	8.0	7.4	48.8	0.2	1.6	6.7	4.1
West Midlands	7.4	14.4	8.0	9.2	47.8	0.2	1.9	6.6	4.5
East Midlands	10.2	18.9	9.6	8.9	36.7	0.2	2.1	8.8	4.7
Yorkshire and the Humber	8.8	14.1	8.3	8.9	45.8	0.2	1.9	7.2	4.9
North West	9.0	13.2	8.7	7.4	49.8	0.2	1.7	6.8	3.3
North East	6.8	11.3	7.1	7.5	54.0	0.2	1.8	7.1	4.2
Wales	7.3	12.1	7.2	8.4	49.8	0.2	1.8	9.0	4.3
Scotland	10.0	15.7	10.8	10.1	38.3	0.3	1.8	8.1	4.8
Northern Ireland	6.0	9.8	5.2	7.3	56.5	0.2	1.3	8.1	5.7
UK	9.2	15.2	8.8	8.3	45.4	0.2	1.7	6.9	4.2

Source: Wilson and Homenidou (2011)

Base: SSA Definition

The percentage of construction workers who are managers, directors and senior officials is above average in the South East, East of England, East Midlands and Scotland and the lowest in Northern Ireland, Wales and the West Midlands. The share of associate professional occupations is largest in Scotland, London and the East Midlands. The proportion of construction workers in semi-skilled occupations is lowest in London and highest in Wales, the East Midlands, Scotland and Northern Ireland.

The representation of BMEs in the sector varies across the regions with BMEs comprising 17 per cent of the construction workforce in London and 6 per cent in the West Midlands. These figures are below the all sector averages in London and the West Midlands (31 per cent and 12 per cent, respectively).

2.6 International Standing of the Sector

The UK construction industry is one of the largest in Europe by employment, number of enterprises, and gross value added. In 2007, productivity *per* employed person (labour productivity) for the UK construction sector was second highest in the EU at €75,500 (£61,000). This was notably higher than that found in Germany (€38,100/£30,800 *per* employee) or France (€43,900/£35,500). Investment *per* head employed (€6,600/£5,300) was also higher than the EU average. (Eurostat, 2010).

Although the sector is strong compared to other EU countries, productivity is lower than in the USA, the country that is at the forefront of the global construction sector. There are also weaknesses in particular subsectors, notably engineering construction, where productivity is lower than in some other leading countries. In the EU there are around 16 million people employed in construction, 13 per cent of which is accounted for by the UK (in 2008). In the EU, the UK is the second largest sector with respect to employment, just behind Germany with 15 per cent of EU employment.

In 2005, the UK accounted for 21 per cent of construction activity in the EU-27 (Eurostat, 2011). UK-based construction companies perform relatively well in comparison to their European counterparts. Thirteen UK based companies were amongst the top fifty companies (by sales) identified as major players in Europe in 2010 (Deloitte, 2010). These include 13 UK companies including Balfour Beatty PLC (8th), Carillion PLC (14th), Taylor Wimpey Plc (21st) and Interserve Plc (27th). Average sales across these 13 companies was 9.766 € billion in 2010.

Construction accounted for 0.6 per cent of UK exports and for 0.5 per cent of imports in 2008 (UKCES Skills Almanac). More than £5 billion of construction products and materials are exported from the UK annually (UKTI website). Ernst & Young recently found construction services to be the sector with the greatest potential for average annual growth in exports to 2020 with possible growth of 10.8 per cent (CBI, 2011). Construction services currently accounts for 0.4 per cent of UK exports (CBI, 2011). UK construction companies have also fared well in winning work abroad.

Engineering construction has been identified as an 'emerging sector' in New Industry, New Jobs (BERR, 2009). The UK's engineering construction sector is the largest of its kind in Europe and globally is the second largest, behind the US. Whilst this sector is likely to remain relatively small in terms of the size of its workforce, it is recognised as vital to the regeneration of other sectors and to the delivery of major infrastructure projects.

2.7 Conclusion

Construction makes a significant contribution to the UK economy, directly through output and employment, as well as through underpinning and supporting growth in all other sectors. The composition of the sector is varied, with a wide range of sub-sectors carrying out a variety of activities and with wide-ranging requirements in terms of employment and skills. The structure employment in the sector differs from the rest of the UK economy with self-employment being far more common in construction and notably low employment levels amongst women and ethnic minority groups. Section 3 looks at the key challenges facing the sector over the medium-term, including implications for employment.

3 Key Challenges facing the Sector over the Medium-term

3.1 Introduction

A number of key challenges face the construction sector and will be particularly influential over the medium-term. The impact of the recent economic downturn will have implications for the sector's performance in the years to come whilst other issues which have been important for the industry in recent years will continue to present challenges and many will become increasingly important. This section considers these key challenges over the medium-term.

3.2 The Recession and Recovery

The recession has presented some new challenges to parts of the construction industry and has increased the significance of some issues that existed prior to the downturn. Previous recessions have had similar effects on construction but this most recent one is considered to be particularly difficult. Construction output did not fare well in 2009 with a fall 13.4 per cent between Q2 2008 and Q2 2009 (ONS, 2009).

Two of the main difficulties presented by the recession are the decrease in demand from consumers (owing to restricted mortgage lending and fall in house prices) and the tighter borrowing constraints on construction companies. In the CBI/Speedy Services national construction survey, 40 per cent of respondents indicated that the availability of finance had deteriorated in the 12 months to September/October 2011 with particular impact on SMEs and most companies believed credit conditions would worsen in the coming year.

Over the past forty years, there have been four instances of a fall in real house prices nationally that have adversely affected house-building, with the latest drop in prices believed to have had particularly significant effects on the industry. Combining the fall in house prices with constrained mortgage lending in this crisis, there has been dampened demand during the recession. After the 2008/09 recession, it is expected that lasting effects will include a shift in the balance between private and public housing demand with faster recovery for private work than for public due to substantial public spending cuts. The uncertainty which the recession has introduced into the housing market affects house-builders' actions and changes their risk preferences as well their preference for more profitable developments over those with longer time horizons and more complicated planning conditions.

The Comprehensive Spending Review (CSR) has also had an impact on publicly funded projects with cuts and/or delays to spending on infrastructure and public housing projects. In the CBI/Speedy Services survey, more than 86 per cent of companies reported that public sector cuts would have a significant impact on their business. Whilst infrastructure activity has remained fairly buoyant through the recession period, due largely to major transport projects (e.g. Thameslink and M25 widening) and other major projects such as the 2012 London Olympics, from 2012, there are to be fewer such projects coming online. The Construction Products Association (CPA) forecasts that construction output will decline 4 per cent in 2012 owing to public spending cuts.

The 2008/09 recession has had significant impact on construction employment and activity. From its peak in 2007, employment in the construction industry is expected to have decreased by 400,000 to 2011 (15 per cent drop) (ConstructionSkills, 2010). A number of construction occupations have been amongst the fastest declining occupations in England since the start of the recession (UKCES National Strategic Skills Audit, 2011). These include:

- steel erectors (42 per cent decline between Spring 2008 and Summer 2009);
- floorers and wall tilers (37 per cent decline);
- bricklayers, masons (36 per cent decline);
- glaziers, window fabric and fitters (28 per cent decline).

Construction professional services (CPS) have also been hard hit by recession with 54 per cent of firms experiencing decreased fee incomes in the 12 months to October 2009 (CIC, 2009) and 46 per cent of CPS firms making redundancies over the period. The claimant count for professionals with construction-specific skills has grown by more than 400 per cent from its lowest point in October 2007 to November 2009 (CIC 2009).

Over the medium term, growth in GDP is expected to be lower than long-term forecasts. The Office for Budget Responsibility (OBR) recently downgraded its forecasts for GDP growth for the next two to three years, but still predicts growth to be 2.5 per cent in 2015 (OBR, 2011).

Restrictions on credit (including mortgages) have shown signs of easing but it is unlikely that they will return to their pre-recession state for a long time to come. Over the medium-term, there is likely to be a rebalancing within construction: a change in balance between public and private contracts, favouring the latter; and more output stemming from repair and maintenance than new building as the client base looks to improve their existing properties rather than invest in new ones.

Reductions in construction employment tend to lag behind falls in output in a recession as employers try to maintain their experienced and skilled staff as long as it is viable to do so. This implies that in the recovery period, employment gains will again lag behind those in output. Employment in construction is not expected to reach pre-recession levels until after 2014.

In the 1990s recession, the sector's workforce and training activity reduced dramatically. Between 1990 and 1993 the total number of trainees in the construction sector decreased by almost 30 per cent and the number of workers under twenty years of age fell by almost 50 per cent. This has had longer term impacts on the sector in terms of skills shortages. Where young workers find work in other industries they do not as readily re-enter the construction industry in the post-recovery period, typically waiting until wages in the sector rise significantly. There have been indications that training activity has decreased similarly owing to the 2008/09 recession with 26 per cent of construction employers reducing their training activity in 2010 and 18 per cent planning to reduce training further in 2011 (CITB-ConstructionSkills, 2011).

Policy in the face of the most recent recession has emphasised the need to avoid such contraction in training in order to facilitate recovery and ensure severe skills shortages do not hinder future growth in construction. Employers in the sector have also recognised the importance of training staff to ensure recovery with 24 per cent considering it to be more important to improve the skills of their workforce post-recession (*ibid*).

3.3 Investment, Innovation and R&D

Investment is a key driver of productivity – raising productivity by increasing the amount of capital available per worker, or through the adoption of new, better technologies in production and / or delivery processes. Construction investment, as a share of economy-wide investment, fell from 2.3 per cent to 1.4 per cent in 2009 (Skills Almanac 2010) representing the smallest sector share behind Agriculture which accounted for 2 per cent of investment in 2009.

Table 3.1: Sector investment as a share of total investment

Sector	2006	2007	2008	2009
Agriculture	1.9	1.8	2.1	2.0
Mining and quarrying	3.1	3.5	3.1	3.5
Manufacturing	9.2	8.9	8.4	7.9
Electricity, gas and water supply	3.7	4.5	5.1	6.3
Construction	2.3	2.1	1.7	1.4
Distribution	12.1	12.4	10.9	10.1
Hotels and restaurants	4.1	4.2	4.2	3.6
Transport and communications	15.6	14.5	15.2	16.0
Financial intermediation	5.5	5.5	5.6	4.6
Real estate, renting & business services	14.0	15.4	13.8	11.5
Public administration and defence	7.9	7.9	9.1	10.8
Education	5.3	4.9	5.6	7.2
Health and social welfare	3.3	3.2	3.7	4.5
Other services	11.9	11.2	11.5	10.5
Total	100	100	100	100

Source: UK Commission (2011)

Note: Percentage shares of total investment based on current price data.

Construction is typically seen as a ‘low-tech’ or ‘traditional’ industry. Studies have indicated that construction firms tend to be: risk averse, low investors in R&D, and dominated by suppliers in the development of new technology (see Reichstein *et al.*, 2008, for a summary). The market orientation of construction firms, typically focused on local, regional and sometimes national markets, also contributes to low levels of innovation. Salomon and Shaver (2005) showed that firms that compete in different markets often need to develop more capabilities to innovate.

Many innovative practices in UK construction typically arise from outside the sector. Building material and products manufacturers, professional service firms and overseas construction industries are often the source of innovation rather than the large construction firms themselves. Firms in construction however, have been found to exhibit ‘innovativeness’ that is not captured by conventional definitions of innovation and R&D. Clients and suppliers may be considered sources of, or partners in, innovative activity in construction. Conventional measures of innovation, such as patent rates, are considered by many to miss much of the innovativeness of construction and often construction is omitted from cross-industry studies of innovation and performance (NESTA, 2007).

NESTA identified different types of 'hidden' innovation that are at play in 'low innovation' sectors. Particularly relevant to construction is innovation "without a major scientific and technological basis, such as innovation in organisational forms or business models. For example, the development of new contractual relationships between suppliers and clients on major construction projects" (NESTA, 2007, p.5). NESTA also identifies "Locally-developed, small-scale innovations that take place 'under the radar', not only of traditional indicators but often also of many of the organisations and individuals working in a sector. For example, the everyday innovation that occurs in multidisciplinary construction teams" (ibid, p. 5).

BIS (2009) identified a number of innovative practices across projects in engineering construction including projects that have features only found in the UK such as the Sellafield Product Residues Store which is the only one of its kind and contains bespoke handling equipment manufactured in the UK.

Formal R&D expenditure tends to be low in construction but there is evidence that firms can benefit from such investment. Research and development (R&D) is considered as an important input for innovation activity. It is seen to enhance the effectiveness of construction companies and to increase their international competitiveness through technological advances and managerial development (Kalatunga, 2009). Investing in R&D helps construction firms to find solutions to problems (both their own and those of clients) and to meet client's needs and expectations. R&D is considered to have a number of important benefits to construction companies including increasing their competitiveness through development of new and improved construction materials and development of products with lower costs and higher quality. Collaborative R&D is also found to generate important intangible benefits including creation of informal contacts and facilitation of knowledge transfer (*ibid*).

3.4 Technology

The use of automation and adoption of new technologies in construction has impacted on the sector in the past and will continue to do so in future. Powell (1996) indicated that the traditional methods in the construction industry are more amenable to gradual evolution rather than radical alteration which has been illustrated through the sector's adoption of prefabrication or modern methods of construction (MMC) over the past.

MMC (offsite prefabrication or offsite construction) is a particularly important technological advance in the construction industry which has implications for the sector as a whole and

in particular, for the skill needs of the sector. In 2003, the Government (Parliamentary Office, 2003) viewed use of MMC in building houses as a way not only to deal with housing shortages but also with skills shortages in the sector. Prefabrication and offsite construction have also been identified in recent literature as a means of improving the often inefficient and wasteful practices of the construction industry (see Taylor (2010) for a summary of related literature).

Adoption of MMC increased in the early 1990s and its use is now more common than ever in the sector. The offsite construction industry is now a significant contributor to the continuous improvement of construction processes and site procedures. The actual value of offsite construction varies by the methods and definitions used to measure the industry. Estimates range from: £800.9 million (GVA) in 2002 (Samuelsson Brown *et al*, 2003); £2.2 billion in 2005; £4 billion in 2007; to an estimated £6 billion in 2009 (Goodier and Gibb, 2005, 2007). Taylor (2010) estimated the total value added of the offsite construction sector to have increased from £731 million in 1998 to a peak of £2.08 billion in 2007 and down to £1.537 billion in 2008. Based on CPA forecasts (2009) and considering the 2008/09 recession, Taylor projected the offsite sector value added to be £1.295 billion in 2013 which is equivalent to around 7 per cent of all construction output. Taylor notes, however, that with increased emphasis on sustainable construction, demands for efficiency in construction and expectation of improved quality standards, growth in the offsite construction industry may outstrip that of the traditional construction sector.

3.5 Policy, Legislation and Regulation

There are long term policy trends towards improving the quality of work, including health and safety regulations, work-life balance policies and minimum wage legislation. Other long term trends include reducing the environmental impact of construction and promoting sustainability of buildings. These trends in policy have changed much in the construction industry for the better - improvements to workers' well-being, enhanced image of the sector – but have also imposed additional constraints and thus costs on employers.

Changes in health and safety legislation have resulted in improved working conditions and decreased workplace hazards in construction over the years. Health and safety is a key concern of the sector and thus improving conditions is vital to improving the attractiveness of the sector for new workers. Increased levels of regulation related to H&S also requires knowledge and skills to implement any changes and processes required for compliance. Increased health and safety regulation has had some negative effect on the

age structure of employment in construction with very few companies employing workers aged under 18 years (see IER Net costs studies, p. 43 of 2008) due to the increased complications of meeting health and safety requirements specifically related to younger people in the workplace.

3.6 Environment and Low / Zero Carbon

The current government has put energy and climate change high on its list of priorities. There are a vast number of initiatives related to climate change, zero carbon and sustainability which have implications for construction. These policy initiatives include:

- CRC Energy Efficiency Scheme 2010 – mandatory climate change and energy efficiency scheme in which companies using more than 6,000 MWh per year of electricity are required to register. Whilst larger companies are likely to be the only ones directly affected by this scheme in the construction industry, SMEs will also be affected indirectly as larger organisations seek to reduce their carbon footprint. The CRC scheme will present opportunities for construction companies to increase their competitiveness by providing cost-effective and energy-efficient services and buildings to clients.
- Zero Carbon Homes – from 2016, every new home in the UK will be required to be zero carbon. This implies a 100 per cent reduction in all carbon emissions covered by Building Regulations. In order to meet this requirement, companies will need expertise related to using particular technologies and materials in buildings as well as skills in assessing buildings' sustainability and carbon footprint.
- Green Deal provisions in the Energy Act 2011 – provides a financial mechanism which will eliminate the need for consumers to pay upfront for energy efficiency measures and instead, repayment will be based on the cost savings resulting from the improvements. The Green Deal is to start in late 2012. Installers under this initiative will need to be accredited and will be backed by the official Green Deal quality mark. The aim is that the Green Deal will result in an increase in the number of energy efficiency installations in homes and businesses. This will require supply chains to be in place to manufacture, specify, and install solutions to accredited standards thus there are opportunities for businesses in the construction sector to achieve the accredited skills and take advantage of increased activity.

The drive towards finding sustainable alternative energy sources, particularly, the view of nuclear energy as a viable option for the future is also an important environmental challenge facing construction. Moving to alternative energy sources will require

substantial construction activity in building structures, for example, nuclear power plants, wind turbines, as well as retrofitting existing buildings in order to accommodate these new power sources.

The construction sector is believed to be already demonstrating, at least in parts, that it has the capacity and inclination to play a significant role in meeting the challenge of climate change and using this challenge as an opportunity for growth in the UK and in other markets (HM Government 2010).

3.7 Global Competition

There are many potential benefits available to those UK construction companies able to compete globally. Working overseas enables firms to diversify their risk profile and to benefit from a rich and varied pipeline of new-build projects in high-growth areas (CBI 2011), though in the face of global economic downturn the degree to which this is possible is diminished. The standards of UK construction are internationally recognised so that the reputation of UK firms precedes them in foreign markets. The highest potential for growth is in markets such as China, Russia, India, Nigeria and Vietnam.

International competition in construction has been increasing as more firms expand into rapidly changing overseas markets in order to capitalise on opportunities in international economies. The revenue of ENR's "Top 225 International Contractors" from international construction contracts outside of their home countries has increased from US\$110.2 billion in 1997 to US\$224.4 billion in 2006 ([ENR, 1994–2007a] and [ENR, 1994–2007b]).

Construction services are perhaps the part of the sector most open to global competition. Ernst & Young recently found construction services to be the sector with the greatest potential for average annual growth in exports to 2020 with possible growth of 10.8 per cent. Construction accounted for 0.6 per cent of UK exports and for 0.5 per cent of imports in 2008 (Almanac) whilst construction services currently accounts for 0.4 per cent of UK exports. (CBI, 2011). International regulation, particularly EU regulations, in have also contributed to increased levels of international competition in the sector.

Being competitive in the global construction market requires contractors to be capable of managing many aspects of construction projects including design, engineering, procurement, and construction (Han *et al.*, 2010). Completing international projects

requires significant management skills and sustainable strategies and intensified international competition can increase the burden of bid participation.

Firms competing in the global construction industry face a number of key challenges, including: a shift from conventional price competition to a framework in which non-price factors are increasingly important (e.g. offering technology transfer, embarking on joint ventures with local businesses or guaranteeing employment for local citizens); delivery of more phases of the construction project process from planning and developing through to financing, engineering and construction; needing to exhibit financial capacity to offer finance arrangements as part of the service to owners; and existence of more complicated and varying risk factors stemming from economic instability and increasing costs of materials, equipment and labour (Han *et al.*, 2010).

3.8 Migration

Increased international competition results in demand for higher skills but at the same time, globalisation has also increased the supply of labour and skills for the UK construction. Increased international mobility of labour has permitted immigrant labour to serve as a short-term solution to skills shortages in the UK (RICS, 2005) but policy emphasis has been on ensuring the UK has its own supply of skills to meet the construction sector's future needs over the longer term.

In 2008, BERR (2008) estimated that more than of 1.8 manual workers in construction, 144,000 (8 per cent) were migrants. This figure does not account illegal workers. The Health and Safety Executive estimates that overseas workers make up around 6 per cent of the construction workforce in Great Britain and that the proportion of foreign or migrant workers on larger sites in the bigger cities such as London, Birmingham or Glasgow, may rise in excess of 25 per cent (HSE, website).

It should also be noted that UK workers are often engaged in construction works overseas, especially in the engineering construction sector where there appears to be an international labour market with workers moving from high paying major project to high paying major project.

3.9 The Role of Skills in Overall Competitiveness

Skills are vital to the competitiveness of firms in any sector, including construction. Construction firms need various skills in order to take advantage of opportunities currently presented in the sector and those expected to come to the fore over the medium to long term. These opportunities include major infrastructure activity for nuclear and other new

energy sources, implementation of low / zero carbon technologies in new and existing buildings, movement into BRIC markets (particularly for construction services e.g. architecture, project management) and moves towards increased repair and maintenance relative to new building.

Within construction, increased regulation such as health and safety requirements and zero carbon requirements, require compliance from companies and in order to ensure that this is achieved efficiently and without delay, companies need to have knowledge and understanding of the regulations. This requires particular skills for not only understanding and managing compliance but also for on-the-ground implementation of necessary processes.

Small firms play a key role in construction yet they are reluctant to take on trainees when output demand is uncertain (ConstructionSkills, 2011). Many such firms do not plan for the future and many consider themselves too small to do much about the challenges posed by climate change directly (Revell and Blackburn 2007; Bradford and Fraser 2008). Such firms, however, often act as subcontractors of larger firms which are implementing significant changes to meet environmental and regulatory challenges.

Insufficient skills capacity can lead to tender price inflation thereby reducing a firm's competitiveness. Having capacity in terms of skills also enhances a firm's ability to respond to tenders readily and to fulfil contracts in a timely fashion. In the face of increased global competition, having the right amount of the right skills is especially pertinent. While the increasing use of self-employed people and contractors can provide flexibility so that employers do not have people within their organisation whose skills are not being utilised at a particular point in time, the use of this form of working arrangement can present challenges, for example, employers have less direct control over the availability of such workers at times of high demand and must compete for their services, potentially driving up costs.

Whilst most training in the sector is carried out within small firms, there are many in the industry, large firms and self-employed gangs, who rely on 'pay and poach' policies to obtain skilled labour (Briscoe 1993).

Large projects, such as the Olympics, often induce skilled workers onto sites, away from other companies, by pay incentive, resulting in costs escalating.

3.10 Strategic Role of Management

Management skills will play a key role in how well construction firms can respond to the challenges presented above. Increasingly, management of construction projects, particularly those in international markets, requires management of all aspects of the

project, from planning and development to sourcing to actual building. Alongside this, management of human resources is vital to increase productivity and to ensure that projects are completed within contract terms (e.g. on time).

Construction managers need to take a strategic view, particularly when working within an environment of increased regulation and global competition. This includes considering investment in skills in a strategic manner. There is evidence that the quality of management in the construction sector has been improving. In 2007, 14 per cent of management had no qualifications whilst in 2010/11 just 7 per cent had none. Employers continue to develop their managers, with more than half providing training or development for managerial staff over the last year (2010/11) (Labour Force Survey).

With increased automation in construction, including the use of prefabricated components for homes, the role of management has changed with more need for managing workers offsite as well as in overseeing the coordination of various aspects of the job onsite such as the delivery of different components and trades during the building process. Whilst automation (and other technological advances) reduces the need for manual trades onsite, the need for management is not diminished and if anything becomes more important.

The CITB-ConstructionSkills survey of Management and Supervisory Skills in 2007 highlighted that the skills that were insufficient amongst managers and supervisory staff that were considered most important included: ensuring projects run to cost and managing project finances; maximising productivity of staff; indentifying potential new markets and clients and winding new business; and estimating costs accurately. Effective resource management and effective people management of people have been found to be critical success factors in collaborative research and development projects in construction (Kalatunga, 2009).

3.11 Conclusion

A number of key challenges face construction over the medium term (as well as immediately and in the long-run). The recent recession has had adversely affected the sector and the recovery presents a number of challenges to all parts of the sector. Adoption of new technologies and movements towards low/zero carbon building are particular challenges for the sector that have implications for skills demand and the

sector's performance. Operating in a sector with increasing levels of regulation in a variety of areas (e.g., health and safety and sustainability) and with increasing global competition presents further challenges to employers.

The UK construction sector is well placed to meet the challenges over the medium term. Most employers have shown willingness (and readiness) to comply with various environmental and sustainability requirements and many UK firms have been winning international contracts and taking part in international collaborations. The role of higher skills and in particular, management capabilities are vital in ensuring growth of the sector in response to these challenges and others.

Section 4 considers the implications of these various drivers of change for employment and skills demand.

4 Employment and Skill Demand in the Sector

4.1 The Changing Demand for Employment

Construction employment has reduced significantly since its peak in 2007. Since the 1990s, the share of the workforce working as self-employed individuals and / or as labour-only sub-contractors has been increasing. Between 2002 and 2009, the self-employed share of employment in construction has increased from 36.1 per cent to 37.3 per cent. This is compared to growth in self-employment across all sectors from 12.2 per cent in 2002 to 13.4 per cent in 2009. Construction employment has remained male-dominated with more than 90 per cent of workers being male compared to a reduction in the male share of employment across all sectors of 0.2 percentage points to 53.9 per cent in 2009. The share of employees in the sector who are on permanent contracts increased from 95.6 per cent in 2002 to 97.1 per cent in 2009.

Factors that affect skills demand in the industry, while not unique to construction, have different implications on the resulting demand for skills compared to other sectors. The main factors affecting the demand for skills in the construction industry are explored in section 4.2.

4.2 Factors Affecting the Demand for Skill

The National Strategic Skills Audit (UK Commission, 2010) identifies a number of key drivers that will impact on the demand for skills in the future. These drivers are interdependent and the dynamic interplay of these means that the future skill requirements are not certain. ConstructionSkills (2011) commissioned research of training and skills in the construction sector which indicated that, of those employers and sole traders who expect to need new skills and / or knowledge to be acquired by at least one person in the business over the next twelve months, almost half believed this need would be stimulated by new legislative or regulatory requirements. Other main sources of demand for skills/knowledge included introduction of new working practices (excluding 'green' practices); introduction of new technologies or equipment; development of new products and services. Just less than 30 per cent of employers indicated that environmental regulations and new eco or energy-saving design / build methods stimulated the need for new skills / knowledge in the next 12 months.

Many of these drivers and their impacts on construction have been discussed in Section 3. The implications of these drivers for skills demand are explored further here.

Policy, regulation and legislation

Government policy, regulation and legislation (locally, regionally, nationally and internationally), have significant implications for construction activity and hence for the sector's demand for skill. The UK Government has long been a major source of activity for the construction sector with 30 to 40 per cent of construction output being driven by the UK Government¹.

Legislative changes and policy initiatives influence the demand for skills in the construction sector in order to comply with regulations and legislation and thus to remain competitive in the presence of increased regulation. In the case of environmental-related regulations, there is a need for greater understanding of low carbon and zero carbon technologies in particular thus demand for higher skills.

In the 2007 survey of management and supervisory skills, where employers indicated that they had staff working in 'green roles' (e.g. solar panel installers, renewable energy installers, carbon managers) in most cases, these staff members were developed from within the business or the employer used specialist firms or self-employed staff to deliver the activity. Green roles were not found to require significant training that was hard to source.

Technology

With the use of MMC, new and upgraded skills are required by workers in the industry. Increased use of off-site construction, for example, brings about a shift in the mix of skills required onsite (e.g. more fitters, more site managers, fewer carpenters). Similarly, greater use of automated tools requires new skills and makes other skills redundant.

In general, increased use of offsite construction requires fewer workers on construction sites in the UK than more traditional forms of building but all is not lost in terms of overall employment. With MMC, employment is created in areas away from the building site including in the factory in which prefabricated components are manufactured and in the design process (Taylor, 2009). Use of MMC also requires improved and new skills in order to effectively build using such processes including technology-related skills (e.g. CAD, automated tools) and places greater emphasis on the management of projects.

Globalisation

¹ LEK Consulting, Construction in the UK Economy, 2009 (www.cbi.org.uk/lekreport)

Globalisation also has repercussions on regulation and legislation including international agreements on climate change as well as a number of European regulations regarding health and safety (e.g. working time), etc. In order to compete in overseas markets, UK construction companies need the skills to meet regulatory requirements in other countries as well as within the UK. Success internationally requires skills to ensure efficiency, innovativeness and differentiation.

Whilst significant growth in global construction markets is expected, the benefits of such growth will not necessarily accrue to the UK construction sector. Some construction companies will benefit but more often, firms that are not part of the defined construction sector will stand to gain.

The Review of Engineering Construction (Gibson, 2009) found that whilst some UK-based companies are taking advantage of business opportunities overseas, there is evidence that cultural and linguistic differences may pose significant barriers for UK companies seeking and winning work in other EU member states. The Review found little evidence that there are significant differences between the craft skills in the UK and other countries. The skills required for international competition then are somewhat more varied from those required for operation in only domestic markets.

Consumer demand

The construction sector, like all sectors, supplies goods and services to consumers – individuals, private companies or the Government. The demand from consumers then is ultimately the driver of the activities taking place in the sector and the types of outputs produced. As the construction sector covers a wide variety of sub-sectors, including civil engineering, engineering manufacturing and house building, consumer preferences vary considerably across parts of the sector.

Overall, consumer uncertainty in the face of recession and restricted credit conditions has increased overall uncertainty in the market and therefore has dampened consumer demand for construction and overall. In the thirist quarter of 2011, construction workloads remained broadly flat (RICS UK Construction Market Survey, Q3 2011).

There has been growing interest in property development in the UK over the past 25 years so that individuals place increasingly high demands on builders including requirements for energy efficiency and high quality finishes. Preferences between urban and rural dwellings and preferences regarding home ownership versus rental also have important effects on the demands placed upon the sector.

All clients in the construction sector influence the demand for skills through their demand for better performance, delivery and more importantly, value for money. Timely delivery is especially important with moves towards use of contracts which explicitly set out timescales and bonuses/penalties for early/late completion. Meeting these demands requires that companies develop accurate plans and are able to predict the duration of jobs. Being able to operate this way requires new and higher level skills, particularly non-manual, professional and management skills.

Demographic change

Demographic change also drives demand in the sector. An ageing population and changes in the overall health of the country has implications for needs in terms of healthcare, housing education and infrastructure building. Lower average family sizes and increased divorce rate have led to increased demand for single-person dwellings. Increased life expectancy and the health of older people, impact on the need for hospitals and care homes and thus their construction, repair and maintenance.

The ageing population also has implications for the construction sector workforce. The age structure of the construction workforce has implications for the supply of skills in the sector. Key skills can be lost through retirement and there is a need to attract younger workers to the industry in order to replace lost skills. The often physically demanding roles in construction also place restraints on workers as they age.

4.3 Changing Patterns of Skill Demand

Table 4.1 shows changing patterns of skill demand based on Working Futures forecasts. The shares of total construction employment in the higher occupational groups (managers, directors and senior officials, professional occupations and associate professional and technical occupations) are expected to increase over the period 2010 to 2020 by 25.6 per cent. This is compared to 15 per cent for all sectors (see Table 4.1). These increases are consistent with the drivers of skills demand and the key challenges facing the sector discussed above. Increase in the demand for managers is consistent with increased involvement in international construction markets and greater use of off-site construction processes. Similarly, rising demand for professional occupations and technical occupations is consistent with increased need for R&D and innovation in construction which are key to maintaining competitiveness as well as supplying more service-based products to both the domestic and export markets. The move towards low / zero carbon building and sustainability is also a driving force behind these changes in that taking advantage of the opportunities presented by such policies and regulations

requires specialist knowledge and expertise to design and construct suitable buildings and provide retro-fit solutions and maintenance to existing structures.

Demand for caring, leisure and other service occupations is also projected to increase by 27.3 per cent over the 10 years to 2020 (compared to a 11.5 per cent increase across all sectors) but the absolute change in employment in this occupation is small at only 2,000 jobs.

No change is expected in demand for process, plant and machine operatives but the share of employment in this group is set to decrease in the face of growing demand for other occupations (making up six per cent of the construction workforce in 2020 compared with five per cent across all sectors). A small change (4,000 jobs) is projected for elementary occupations in construction but this occupation's share of employment is also set to decrease (making up four per cent of the construction workforce compared to ten per cent across all sectors). Similarly, a relatively small increase in demand for sales and customer service occupations is forecast. These changes are consistent with technological advances in the construction industry including MMC and use of automated tools. Pre-fabricated building reduces the use of manual labour on construction sites and necessitates more use of automated tools for fitting components together. A significant increase in skilled trades occupations of 84,000 jobs (7.2 per cent increase) is also consistent with these trends in the sector and above that for the whole economy which is estimate to decrease overall (6.5 per cent reduction).

The only occupation in which demand is expected to decrease between 2010 and 2020 is administrative and secretarial for which the net change in employment is estimated to be 6,000 jobs or a 2.7 per cent decrease (whole economy comparison is 10.5 per cent reduction).

Table 4.2 shows the level of skill demand by qualification level. It reveals the relatively strong demand in the sector for people qualified to an intermediate level with 33 per cent qualified at QCF 3-4 in 2010 compared with 24 per cent in the economy as a whole. By 2020 the respective figures are expected to decrease to 28 per cent and 22 per cent.

Table 4.1: Changing Pattern of Skill Demand

Employment	Numbers (000s)	% shares	Change	2010-2020
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Sector Skills Insights: Construction

Growth							2010-2020		All sectors (%)
Occupation	2010	2015	2020	2010	2015	2020	(000s)	(%)	
Managers, directors and senior officials	240	274	312	9.2	10.0	10.7	72	30.1	18.0
Professional occupations	395	440	485	15.2	16.1	16.7	90	22.9	14.9
Associate professional and technical	228	256	283	8.8	9.3	9.7	55	24.0	14.0
Administrative and secretarial	217	212	211	8.3	7.8	7.3	-6	-2.7	-10.5
Skilled trades occupations	1180	1209	1264	45.4	44.2	43.5	84	7.2	-6.5
Caring, leisure and other service	6	7	8	0.2	0.3	0.3	2	27.3	11.5
Sales and customer service	43	47	51	1.7	1.7	1.7	7	16.4	0.1
Process, plant and machine operatives	180	181	180	6.9	6.6	6.2	0	0.0	-10.9
Elementary occupations	110	111	114	4.2	4.1	3.9	4	3.8	3.2
All occupations	2599	2737	2908	100.0	100.0	100.0	309	11.9	5.1

Source: Wilson and Homenidou (2011)

Base: SSA Definition

Table 4.2: Changing Pattern of Skill Demand by Qualification

	Column percentages			
Construction	1990	2000	2010	2020
QCF8 Doctorate	1	0	1	1
QCF7 Other higher degree	2	2	5	9
QCF6 First degree	7	8	11	13
QCF5 Foundation degree; Nursing; Teaching	5	4	3	3
QCF 5 - 8	16	14	20	26
QCF4 HE below degree level	5	5	6	6
QCF3 A level & equivalent	31	29	27	22
QCF 3 and 4	36	34	33	28
QCF2 GCSE(A-C) & equivalent	21	22	23	23
QCF1 GCSE(below grade C) & equivalent	15	16	15	17
No Qualification	13	13	9	6
<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>
Whole Economy				
QCF8 Doctorate	1	1	1	2
QCF7 Other higher degree	4	4	8	12
QCF6 First degree	8	10	15	19
QCF5 Foundation degree; Nursing; Teaching	7	6	6	5
QCF 5 - 8	20	21	30	38
QCF4 HE below degree level	6	4	5	5
QCF3 A level & equivalent	20	19	19	17
QCF 3 and 4	25	24	24	22
QCF2 GCSE(A-C) & equivalent	21	21	21	20
QCF1 GCSE(below grade C) & equivalent	19	19	16	15
No Qualification	14	14	9	6
<i>Total</i>	<i>100</i>	<i>100</i>	<i>100</i>	<i>100</i>

Source: Wilson and Homenidou (2011)

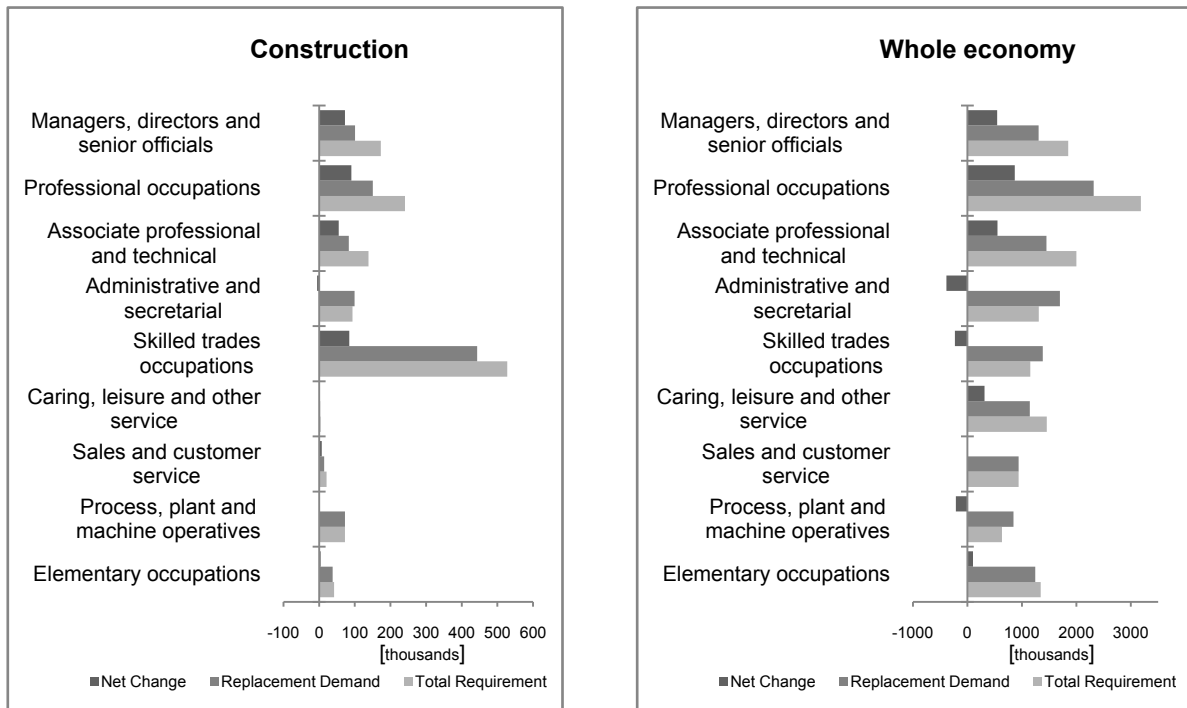
Base: SSA Definition

4.4 Replacement Demands

Chart 4.1 shows the net change in employment by replacement demand and total employment requirements for construction and the whole UK economy. Whilst across all sectors, there is a net decrease in employment forecast between 2010 and 2020 for administrative and secretarial occupations, skilled trades occupations and process, plant and machine operatives, the same is true only of administrative and secretarial occupations in construction. Replacement demand (*i.e.* the demand necessary to replace existing employees leaving the sector due to retirement, death, etc.) in construction is greatest in the skilled trades occupations at more than 400,000 jobs. The greatest replacement demand for the whole economy is expected in professional occupations (around 2 million).

Replacement demand in professional occupations in construction is around 150,000 - the second highest replacement demand in the sector. The highest net change in demand is forecast for professional occupations in both the construction sector as well as in the whole economy.

Chart 4.1: Replacement Demands



Source: Wilson and Homenidou (2011)

Replacement demand and the age structure of employment in construction are interrelated. As discussed in section 2.3, younger (under 24 years of age) and older workers (60+) account for relatively low shares of total employment in construction. The tendency of workers over the age of 60 to leave the sector increases replacement demand as vital skills held by older workers leave the sector. Meeting replacement demand is a concern as many of the skills held by retiring workers are essential to the sector and the sector is keen to attract younger workers in order to do this however, there have been concerns over the attractiveness of the sector to younger workers. If replacement demands are not met through the entry of young people initially in training positions into the sector, then it is not clear where those skills will come from. The danger then is that wage inflation is stimulated as companies scramble to recruit skilled employees. Replacement demand in the sector is also affected by the tendency of many workers with construction skills to move to other sectors. Recession in particular, tends to drive such workers out of the industry and it is only with wage rises in construction that they will return.

4.5 Conclusion

The key drivers of change in construction (as discussed in Section 3) have a variety of implications of skills demand in the sector. Meeting low/zero carbon requirements, adopting new technologies and satisfying various regulations requires particular specific skills and alters the importance of particular occupations. Skills to fill replacement demand as older workers leave the sector are particularly important in construction given the nature of work and the age structure of the workforce.

The interplay of the various key drivers means that there is a degree of uncertainty over future skills demands, which can be problematic in encouraging employers to invest in skills development. Amongst the key drivers, complying with regulatory changes, has been found to be the most likely to stimulate demand for new skills and knowledge. Remaining competitive in the face of increased regulation is a key challenge for employers in the construction industry. There is immediacy in the need of employers to develop skills that enable them to comply with regulatory demands. Whether employers are able to be pro-active in meeting the demands posed by other key drivers of skills development, such as technological change and globalisation, remains a key question.

5 Skills Supply

In order to cope with the challenges facing construction over the medium-term and resultant changes in demand for skills, adequate supply of skills (in terms of quantity and type of skills) is essential. This section looks at the current infrastructure and trends in the supply of skills in the UK construction sector.

5.1 The Supply Infrastructure

Organisations responsible for training supply

Skills supply is dependent upon the supply of labour, the skills infrastructure (including compulsory education, further education and higher education), and employers' investment in skills. A sufficient supply of skills is required to increase productivity and to meet future demand for skills thus encouraging growth in construction.

Training in skills for the construction sector is provided by a range of institutions, including private training providers and higher and further education institutions. The importance of different institutions varies by sub-sector within the construction industry, and whether training is designed for initial entry into the construction industry or is part of on-going vocational education and professional development.

Private training providers are most commonly used by employers in the construction sector to deliver training to their employees. In 2011, 63 per cent of employers said that they used these organisations, with construction contracting employers being more likely to use them than professional services employers. Higher Education institutions and professional institutions were more important sources of training for professional services establishments, in each case being used by at least half of the professional services employers (ConstructionSkills, 2011:36).

Various bodies oversee training in the construction sector:

- ConstructionSkills covers the building and civil engineering aspects of construction
- Summit Skills represent building services engineering, including industries such as electro-technical, heating, ventilation, air conditioning, refrigeration and plumbing. Summit Skills oversees the qualifications in this sector, apprenticeship frameworks, the quality assurance system for welders and the Engineering Services SKILL card for experienced engineers
- The Engineering Construction Industry Training Board, which operates the grant-levy system in the engineering construction sub-sector
- Similarly, Asset Skills covers housing, property and facilities management

- Proskills covers building materials, products and manufacturing
- LANTRA represents the environmental and land-based sector
- The Energy and Utilities sector has its own skills body.

Chan and Moehler (2008) find that this diversity of groups representing the construction sector causes confusion with regard to who drives skills development from a policy-making perspective and creates a lack of confidence in training provision amongst construction sector employers.

The main training board for the construction sector in the UK is ConstructionSkills. It is licensed as the Sector Skills Council (SSC) for construction through the UK Commission for Employment and Skills (UKCES). ConstructionSkills is, uniquely amongst the SSCs, a partnership comprised of three different organisations brought together to ensure coverage of the whole of the construction industry and the whole of the UK: CITB-ConstructionSkills, the Construction Industry Council (CIC) and CITB-ConstructionSkills NI.

The responsibilities of ConstructionSkills include maintaining qualifications and standards in the construction industry, including developing the National Occupational Standards (NOS) (ConstructionSkills (Craft) in partnership with the CIC (Technical, Supervisory and Management)), and overseeing the Qualifications and Apprenticeship Frameworks and the Diploma in Construction and the Built Environment (C&BE). ConstructionSkills collects an annual levy from all liable employers which is used to fund grants to employers for training their workforce. Grants are available for: apprenticeships and craft non-apprenticeships; work experience; off-the-job training; technical and professional achievement and attendance; vocational qualifications achievements; training and development plans and Independent Training Group; the Construction Plant Competency Scheme (CPCS) and Site Safety Plus.

ConstructionSkills works alongside employers, training providers and the Government in developing the ConstructionSkills Sector Skills Agreement to ensure that training is appropriate for employers and individuals and that future skills needs are met. The other organisations responsible for each sub-section of the construction industry undertake similar activities for the occupations that fall under their remit.

Other interested parties can play a role in determining the direction of skills development in the construction sector. These include groups like the Federation of Master Builders, the Federation of Small Businesses and the Confederation of British Industry.

Outline of the qualifications structure

Training and education in the construction sector covers a wide range of qualification types, levels and subjects, and is done both on- and off-the job. Currently there are at least 20 awarding bodies which provide qualifications to different branches of the construction industry.

A major reform of the vocational qualifications system has been undertaken, with the introduction of the new Qualification and Credit Framework (QCF), which is designed to make the system more intelligible. Prior to this, there was widespread concern that the range of qualifications available was not understood by employers, and this, together with the continual changes to the structure of the qualifications most relevant to the construction industry, acted as a barrier to take-up of training. The different nations of the UK have traditionally had different levels and credit systems. The QCF has three basic levels and a further eight levels. The three entry levels cover basic skills and the further eight levels range from the equivalent of GCSEs or Level 2 NVQs to PhD or Level 5 NVQ standard. The main qualifications levels are outlined in Table 5.1.

There are additional qualifications aimed at demonstrating competencies in specific areas. The Construction Skills Certification Scheme (CSCS) covers 220 occupations, and different cards are available depending on job type, experience, qualifications and membership of professional bodies. To qualify, applicants must pass an appropriate CITB-ConstructionSkills health and safety test, and in some cases register for particular qualifications.

Schemes aimed at particular occupations include: the Construction Plant Competence Scheme (CPCS) which provides a competence card for the plant sector; the quality assurance scheme for welding; and the Engineering Services SKILL card aimed at advanced engineers. The Competent Persons Schemes (CPSs) require individuals to complete an application and vetting process, after which they can self-certify that their work meets building regulations.

Around a third of the construction employers who offer training provide training designed to lead to a nationally recognised qualification. The majority of training is focussed at Level 2, and professional service employers are more likely than construction contracting employers to offer higher level training. Amongst the UK nations, achievement of Level 3 qualifications is highest in the sector in Scotland and lowest in England (ConstructionSkills, 2011:35).

Table 5.1: Main construction qualifications – levels and descriptions

Qualification and level	Description / examples
QCF - Entry, Levels 1, 2 and 3	Basic, key skills
QCF – Levels 1 and 2	Young Apprenticeships, Intermediate Apprenticeships, Specialist Apprenticeships, GCSE in Construction and the Built Environment, NVQ/SVQ Level 1 and 2, Scottish Skills For Work: Construction SCQF Level 4 or 5, Diploma in Construction and the Built Environment
QCF – Levels 3 – 5	Advanced Apprenticeships, HNC (Level 4), HND (Level 5), Foundation degrees, NVQ Level 3 and 4
QCF – Level 6	Degree level qualifications
QCF – Level 7 and 8	Higher degrees
Vocational Related Qualifications (VRQ)	Including craft construction awards and craft certificates, which can be at any QCF level
Other	<ul style="list-style-type: none"> • Qualifications and training programmes aimed at progression into management and supervisory roles; • Qualifications from professional institutions, often linked to an existing course, for example in the accreditation of degree courses

Source: Adapted from ConstructionSkills and UKCES (2007)

Apprenticeships

Although no formal pre-apprenticeship programmes exist, colleges in the UK offer programmes designed to provide an introduction to the construction industry. The GCSE in Construction and the Built Environment and the Scottish Skills for Work: Construction SCQF Level 4 or 5, serve such a purpose, as did the now discontinued Young Apprenticeships, which aimed at 14-16 year olds who study for a Level 2 qualification. At the post-16 level, the Diploma in Construction and the Built Environment is also designed to introduce young people to the construction sector.

Formal Apprenticeships are primarily aimed at those aged 16 to 19. These are work-based training programmes undertaken with an employer in combination with off-the-job learning. These Apprenticeships are designed to give apprentices practical work experience while also gaining a nationally recognised qualification. Apprenticeships usually last for two years (for an Intermediate Level Apprenticeship, giving a Level 2 qualification) or three years (for an Advanced Apprenticeship giving a Level 3 qualification). Apprenticeships are available in a range of areas, including:

- Construction, which is one of the broadest groups of apprenticeships, including pathways covering job roles such as bricklaying, scaffolding, painting and decorating, roofing, joinery and crane operation
- Electrical and Electronic Servicing
- Electro-technical, which covers installation and maintenance electricians
- Domestic Heating
- Plumbing
- Set crafts – carpenters, painters and plasterers working in theatres
- Surveying.

Specialist Apprenticeships have been designed for specific sectors, and these have a larger component of on-the-job training while still providing a Level 2 equivalent qualification. Occupations that offer Specialist Apprenticeships include: Diamond drilling and sawing; Hire and rental desk operative; Resin flooring; Road safety marking; Demolition site operative; and various types of roofer. The heritage construction sector has pioneered Level 3 qualifications in a range of occupations, but there is scope for growth of higher level apprenticeships more generally. There is a danger that the emphasis on providing training for school leavers entering the sector results in higher level Apprenticeships for those already working in the sector being neglected.

Employers have expressed concerns about the balance between on-the-job training and off-the-job learning on apprenticeships, particularly the basic skills element of off-the-job learning which employers feel should have been adequately addressed prior to the apprenticeship and which some apprentices have found hard to pass while still possessing the necessary technical or job specific skills to enable them to do their job (Construction Skills and UKCES, 2007). The sector has been a key employer for school leavers with relatively low qualification levels and basic skills, who could benefit most from an apprenticeship programme but may be deterred by the perception that an apprenticeship of this type will focus more on these areas than equipping them with job-related skills, leading them to forgo the apprenticeship for informal on the job training. There need to be clear progression routes from completion of a Level 2 apprenticeship to further training at Level 3 and above to develop skills in the sector and retain trained individuals.

On completing an apprenticeship, employees may progress onto an HNC, HND, Foundation or undergraduate degree or alternatively seek further training designed to enable them to progress into managerial or supervisory roles. Further or Higher

Education is most common in the sectors of the construction industry connected to engineering and architecture, particularly civil engineering, building surveying and property management and construction design. For these professions, course accreditation by a professional institution is important.

Recruitment into the sector and initial and continuing vocational education and professional development

The construction sector has faced on-going problems of skills shortages (Chan and Moehler 2008). The industry has traditionally not invested heavily in formal training, and qualification levels have historically been low, with only around a third of the construction workforce trained to Level 2 or higher. Train to Gain had a significant effect on publicly funded training and qualifications in the construction sector. ConstructionSkills estimate that nearly 50,000 construction related Level 2 NVQs were achieved in 2008-09 (ConstructionSkills Insight, 2010). The construction sector is also vulnerable to fluctuations in the economy. Loss of workers during the recession has caused concern about the sector's ability to meet the demand for skills during a recovery, as well as limiting investment in training aimed at long-term increases in skill levels in the sector.

It has been forecast that on average 88,000 new entrants per year are needed to meet expected workloads 2008-2012 (ConstructionSkills 2008), but the sector has experienced problems in attracting new entrants. ConstructionSkills and UKCES noted in 2007 that young people applying to enter the construction sector were not of the right quality and were poorly prepared, and that the construction sector was regarded as being most suitable for those who had been unsuccessful in education (ConstructionSkills and UKCES, 2007). The Aldersgate Group identify a lack of basic skills amongst new recruits as being a problem for the construction sector, and highlights ICT skills as being particularly important for new recruits given developments in the industry.

Over recent years, there has been a change to the way in which apprenticeships are offered by employers. A higher proportion are now aimed at new recruits to the sector, rather than, as had previously been the case, encouraging existing employees to undertake this type of training (ConstructionSkills, 2010), and attempts have been made to inform students about careers in construction, and the qualifications available to them, while they are still at school.

At graduate level, Universities UK found that there has been an increasing demand for graduates in the construction sector and that universities were working with employers to address skills needs both in terms of the provision of courses for continuing professional education and for new graduate entrants to the construction industry (UUK, 2007).

Despite this, skills gaps at higher levels have been identified, including those in engineering, management and ICT and in SMEs (Aldersgate Group, 2009)

The focus on improving qualifications prior to entering employment has been a response to the historically low levels of continuing vocational education and professional development in the construction industry, and in particular a lack of formality both in training provision and accreditation. A 2010 survey by ConstructionSkills found that employers generally believed that on-going training and skills development was lacking in the sector and that the training provided was not appropriate (ConstructionSkills Insight, 2010:17). In 2007 the median annual training days per full time equivalent employee was just one day (BERR, 2007). This is exacerbated by the relatively high levels of self-employment and high proportion of SMEs in the sector.

When training has taken place, it has tended to be informal and done on the job. Chan and Moehler (2008) identify a lack of confidence in formal training as one barrier to increasing training and qualification levels in the construction sector.

Some parts of the construction industry face particular problems due to a lack of skills available and have specific training needs. As has been mentioned, a lack of higher level skills has been noted in project management, planning and design, particularly in architecture, civil and construction engineering and domestic house-building sectors. This has been a problem for the sector for several years, being noted in reports from 2008 (BERR), 2009 (Gibson) and 2010 (ConstructionSkills). ConstructionSkills (2010:18) also identified particular training needs in the areas of air tightness and thermal bridging for which no training course was offered to address skills gaps. The renewables sector was also identified as requiring higher level, specialist skills in planning and design.

5.2 Trends in Skill Supply: The Levy Scheme and Certification

Important in relation to skills supply is the industry's use of a grant-levy scheme administered at the sectoral level to ensure that certificated, industry approved training (especially of new entrants) takes place, and the use of a card scheme so that skilled workers can demonstrate their bona fides. In combination, these work to drive up skill levels in the sector.

In the construction sector it is often the smaller firms which carry out training of new entrants but it is the larger companies who often benefit from this training either through subcontracting arrangements or recruiting fully experienced workers later in their careers. In order to offset the negative impact this might have on training supply, the industry has a grant-levy scheme whereby all employers within scope of Construction Skills with an

annual wage bill of over £80,000 a year pay a levy.² Grants are then paid to employers who engage in training. A similar scheme operates with respect to those employers in-scope of the Engineering Construction Industry Training Board.

The sector has introduced a form of occupational licence through the Construction Skills Certification Scheme (CSCS). This has been implemented by the industry to ensure that people are competent to practice in their occupation and reduce the number of accidents. They cards which are issued to people who satisfy the application criteria are provided with a smart-card which is increasingly demanded as proof of occupational competence by contractors in the public and private sectors. Successful applicants need to pass a health and safety test and demonstrate their competence (such as demonstrating qualifications possessed).

5.3 Trends in Skill Supply: Individuals

Table 5.2 indicates the number of employees in receipt of work-related training over the past 13 weeks. The proportion of the construction workforce in receipt of such training (18.2 per cent) is lower than the proportion across the whole economy (25.5 per cent). The percentage of workers aged 25 years and under who have received such training, however, is greater in construction (32.3 per cent) than across all sectors (29.5 per cent). By major occupation groups, the construction sector provides more training to workers in lower occupations (sales and customer service, process, plant and machine operatives and elementary occupations) than is the case across the whole economy but for administrative and secretarial and caring, leisure and other service occupations, in particular, much less training is provided to workers in construction than across all sectors.

The construction sector has a long standing history of participation in Apprenticeships which form a core part of the development of future skilled workers in the industry through combining off-the-job training and practical on-the-job experience. Apprenticeships account for a large part of the skills supply in construction with many employers viewing such training as a vital part of their skills planning and indicating that Apprenticeships provide invaluable skills to workers (particularly in skilled

² This is the Construction Skills Levy – it is levied at 0.5 per cent of the wage bill of directly employed workers and 1.5 per cent of labour only sub-contractors (data for 2011).

trades) (Hogarth et al, 2008). Apprenticeships in construction are highly structured, often costly and take several years to complete.

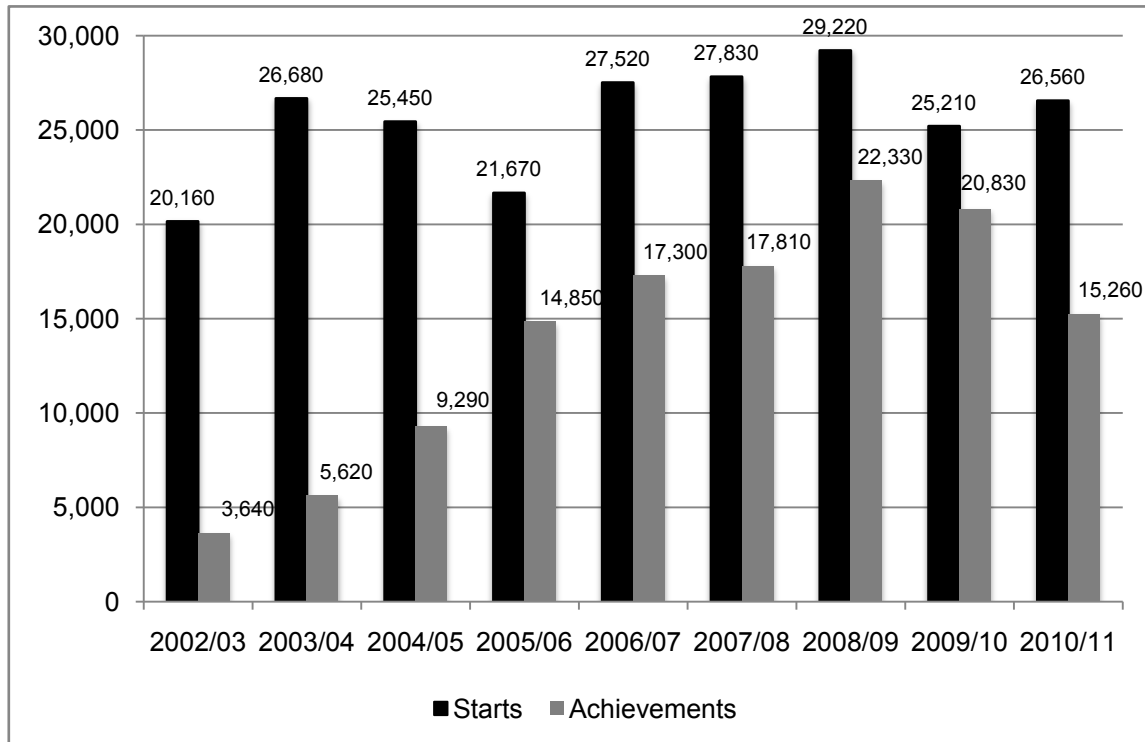
Table 5.2 Number of employees in receipt of work-related training over the past 13 weeks

Occupation (SOC Major Groups)	Construction		Whole economy	
	Number	% of workforce	Number	% of workforce
All	490,600	18.2	7,352,628	25.5
Managers, directors and senior officials	86,338	19.9	1,008,425	22.6
Professional occupations	94,502	26.8	1,588,563	39.5
Associate professional and technical	51,106	27.1	1,505,022	35.3
Administrative and secretarial	26,241	14.6	670,009	21.1
Skilled trades occupations	170,468	14.7	476,943	15.6
Caring, leisure and other service	545	11.0	927,704	36.5
Sales and customer service	4,820	20.6	416,531	19.4
Process, plant and machine operatives	30,648	16.4	288,954	15.2
Elementary occupations	25,932	15.4	470,477	14.5
Women	70,287	19.8	3,868,241	28.9
Men	420,313	18.0	3,484,387	22.6
People aged under 25	95,148	32.3	1,091,698	29.5

Source: Labour Force Survey 2010

Chart 5.1 shows Apprenticeship starts and achievements between 2002/03 and 2010/11 in England for construction, planning and built environment. Since 2002/03, the number of Apprenticeship starts in construction has increased from 20,160 to 26,560 (equivalent to 32 per cent behind the pace for all sectors which is 172 per cent). The highest number of starts was 29,220 in 2008/09. Apprenticeship achievements in construction steadily increased between 2002/03 and 2008/09 whilst there has been a decline in achievements since 2009/10.

Chart 5.1: Apprenticeship starts and achievements (all levels) for construction, planning and built environment, 2002/03 to 2010/11



Source: Data Service (2012)

Notes: England data only, 2010/11 figures are provisional

Table 5.3 shows starts in Intermediate and Advanced Apprenticeships by age between 2002/03 and 2010/11 for Construction Planning and Built Environment in England. The majority of starts were by apprentices under the age of 19 years at level 2 and this is also true of the all-England figure for starts. Advanced Apprenticeship starts in Construction have been more evenly distributed between under 19 years of age and 19 to 24 year olds. A similar pattern exists at the all-England level but starts at 19-24 and 25 age groups have grown substantially in recent years. Given the high proportion of young apprentices in construction, particularly at level 2, increasing the proportion of the construction workforce in younger age groups should be possible provided that completion rates are sufficiently high.

Table 5.3: Construction, planning and built environment Apprenticeship starts by level and age, 2002/03 to 2010/11

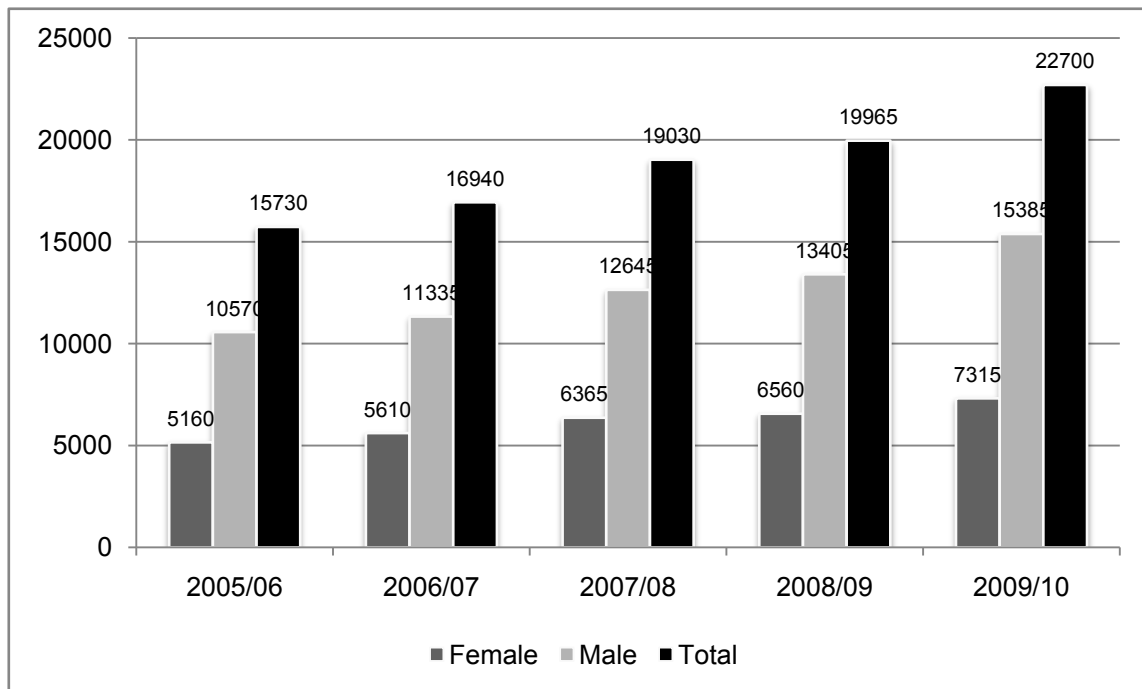
Intermediate Apprenticeships									
	202/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
<19	11,390	14,150	15,550	11,890	16,170	16,040	12,080	10,660	9,960
19-24	2,320	3,620	4,220	3,390	4,410	4,760	3,850	3,460	3,960
25+	-	-	-	-	-	420	960	690	1,630
Total	13,710	17,770	19,780	15,280	20,580	21,220	16,890	14,760	15,540
Advanced Apprenticeships									
	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
<19	4,840	5,800	2,770	3,080	3,090	2,890	6,230	5,000	4,850
19-24	1,610	3,110	2,890	3,300	3,850	3,500	5,080	4,790	4,900
25+	-	-	-	-	10	220	1,020	670	1,270
Total	6,450	8,910	5,670	6,390	6,940	6,610	12,330	10,450	11,020
All Apprenticeships									
	02/03	03/04	04/05	05/06	06/07	07/08	08/09	09/10	10/11
<19	16,220	19,950	18,320	14,970	19,260	18,930	18,310	15,660	14,810
19-24	3,930	6,730	7,110	6,690	8,260	8,260	8,930	8,250	8,860
25+	-	-	-	-	10	640	1,980	1,360	2,900
Total	20,160	26,680	25,450	21,670	27,520	27,830	29,220	25,210	26,560

Source: Data Service (2012)

Notes: England only, 2010/11 figures are provisional

Higher Education Institutions (HEIs) are one of the main suppliers of professionals to the construction industry. The UK has a high-quality of training on offer and many UK HE programmes in the built environment are closely tied to associated professional bodies, such as the Institute of Civil Engineering (ICE).

There were just under 66,000 students studying Architecture, Building and Planning in UK HEIs in 2009/10. Chart 5.2 shows the number of qualifications attained in the subject area between 2005/06 and 2009/10. The numbers of qualifications attained has been increasing over the period shown for both men and women though women account for only around a third of those obtaining these construction-related qualifications. The overall number of qualifications attained has increased by almost 44 per cent over the period 2005/06 to 2009/10, compared to an increase across all HE qualifications of 12 per cent.

Chart 5.2: Higher Education qualifications attained in UK HEIs, 2005/06 to 2009/10

Source: HESA (2011)

5.4 Employer Investment in Skills

Key performance indicators (KPI) for the construction sector indicate that training employer investment in training has been increasing since 2005 (ONS, 2011) (see Table 5.4). The median annual training days per full-time equivalent employee in the sector has increased from 1.0 days in 2005 to 1.2 days in 2010. The proportion of direct employees covered by Investors in People has also increased over this period, from 14.9 per cent of employees to 16.7 per cent in 2010.

Table 5.4: KPIs, 2005 to 2010

KPI	2005	2006	2007	2008	2009	2010
Training: median annual training days per FTE employee	1.0	1.0	0.9	1.0	1.1	1.2
IiP: mean % of direct employees covered	14.9	11.1	11.1	12.4	17.6	16.7

Source: *Construction Statistics Report 2011, ONS (Ch. 16)*

In the Employers Skills Survey 2011, 53 per cent of employers in construction reported that they were providing training to their employees while 59 per cent of employers across all sectors provided training (see Table 5.5). The average number of days of training per trainee was 9.6 days in construction but slightly less, 8.9 days, across all sectors.

Table 5.5: Employer Investments in Skill

	Construction	Whole economy
% of employers training	53	59
% of workforce receiving training	41	46
% average number of training days <i>per</i> trainee	9.6	8.9
Average expenditure on training <i>per</i> trainee	£3,975	£3,275
Average expenditure on training per employee	£1,925	£1,775

Source: Davies et al. (2012)

Note: Based on SIC definition of sector

Base for training: All establishments, 87,572 unweighted

Base for expenditure: All trainers completing the Investment in Training Survey 11,117 unweighted

As the indicators in Table 5.5 reveal, employers in construction are major investors in training by expenditure relative to the UK as a whole, but its recruitment of young people, most of whom will be new entrants to the industry, is relatively low compared with the UK as a whole with the exception of apprenticeships where the percentage of employers with apprentices is relatively high compared with the UK. This is reinforced by data for the EU-27 which reveals that 86 per cent of construction employers engage in training compared with 53 per cent in the EU-27, and the average duration of training was longer at 8 hours compared with 6 hours in the EU-27 (data for 2005).

A further indicator of employer engagement in training is the number of young people taken on each year straight from school or college (see Table 5.6). As can be seen, employers in construction recruit young people to a somewhat lesser extent than employers across the economy as a whole. At least some of this difference reflects health and safety considerations related to employing young people on construction sites.

Table 5.6: Recruitment of young people

Employers who have recruited young people	Construction (per cent)	Whole Economy (per cent)
16 year olds recruited to first job from school	3	4
17 or 18 year olds recruited to first job from school	3	5
17 or 18 year olds recruited to first job from FE College	3	5
Recruited to their first job from University or other Higher Education institution	4	7

Source: Davies et al. (2012)

Note: Based on SSA definition of sector

Base: All establishments 86,069 unweighted (not asked in Scotland)

Table 5.7 gives an indication of the extent to which employers in construction engage in initial vocational education and training with respect to Apprenticeships. The data clearly reveal that relatively high percentages of employers engage in Apprenticeships: 12 per cent of employers in construction participate in Apprenticeships compared with 5 per cent in the economy generally. Importantly, relatively high percentages of employers in the sector expect to continue supplying Apprenticeships in the future (12 per cent) compared with all employers (8 per cent).

Table 5.7: Recruitment of apprentices

	Construction (%)	All Employers (%)
Currently have staff undertaking Apprenticeships	12	5
Currently offer but have no staff on Apprenticeships	5	4
Plan to offer Apprenticeships in future	12	8

Source: Shury et al. (2011)

Note: Based on based on SIC 41-43 only

Base: All establishments 14,390 unweighted

Table 5.8 provides further information about employer engagement in training. Generally, construction is characterised by less formality attached to training with relatively low percentage of construction employers having a training plan or a training budget. It is also the case that relatively few construction employers engage in an annual review of skills, or assess the training provided to their employers.

With respect to the percentage of employers training to accredited qualifications at any level, Table 5.8 reveals that there is not much difference with respect to the economy as a whole.

Table 5.8: Other Indicators of Training Activity

	Construction	UK
% all establishments with business plan	44%	61%
% all establishments with training plan	27%	38%
% all establishments with training budget	19%	29%
Annual review of staff (all establishments)		
All staff reviewed	31%	47%
No staff reviewed	59%	43%
Provide training (all establishments)	53%	59%
Train towards qualification (all employers providing training)	47%	43%
Training to Level 2 qualification	13%	14%
Training to Level 3 qualification	15%	16%
Training to Level 4 qualification	11%	12%
Assess training delivered	54%	65%
% of employees trained towards a qualification in last 12 months	16%	12%

Source: Davies et al. (2012)

Note: Based on SSA definition of sector

Base: All Establishments 87,572 unweighted; All Establishments providing training 66,916 unweighted

Skills Utilisation

Sometimes within organisations there are untapped sources of skill supply. Employees may have a wide variety of skills which are not deployed in the workplace for one reason or another. The evidence suggests that in the economy generally around 49 per cent of establishments have employees whose qualifications and skill levels are in advance of those required to do their jobs. This compares with 42 per cent in the construction sector (Davies et al., 2012). On the other hand it does suggest that in both construction and the economy generally that there might substantial stocks of untapped skills and knowledge – depending upon how many employees this affects and the extent to which skills are being under-utilised - which could be deployed for the benefit of the workplace. A critical issue here is how to unlock those skills for the benefit of the workplace.

Related to programmes such as liP are having formal processes in place to allow them to identify high potential or talented individuals. The evidence from the UK Commission's UK Employer Skills Survey 2011 (Davies et al., 2012) shows that the construction sector has a relatively low share of establishments with formal processes (7 per cent versus 14 per cent in the economy as a whole), and around the same percentage with informal processes (29 per cent versus 31 per cent).

Employer use of, and satisfaction with, the external training infrastructure

If it is possible to ratchet up the demand for skills and training within construction employers then there is a need to ensure that training suppliers are in place to meet that demand. In construction there is often a need to engage with external training providers due to the fact that Apprenticeship programmes, for instance, often contain a significant amount of block or day release typically at a local college. In fact, the evidence suggests that employers in construction are slightly more likely engage with external training providers than employers in general: 22 per cent of construction establishments had no contact with external providers compared with 29 per cent of all employers. The extent to which they are likely to use private training providers (67 versus 54 per cent) and FE colleges (33 versus 23 per cent) shows, in general, that construction employers are more likely to engage with these institutions than is the case for all employers in the economy. Construction employers are less likely to use not-for-profit / third sector organisations for training (14 per cent versus 19 per cent) and HE institutions (11 versus 13 per cent). There overall satisfaction with the use of FE colleges – 7.2 out of 10 where a high score indicates relative satisfaction – is not much different from the overall average of 7.4 for all employers (Shury et al., 2011).

5.5 Migrant Labour Supply

Construction in many respects an industry which relies upon an itinerant workforce willing to move to wherever the next project is taking place. It is apparent that parts of the sector rely upon workers willing to move around the globe from contract to contract as is the case in sub-sectors related to engineering construction. Accordingly, migration has historically played a large role in meeting the industry's labour requirements (Construction Skills, 2010)

Data reveals that with the accession of countries from Eastern Europe to the EU, the share of the construction industry's workforce which is non-UK born has risen from 4.7 per cent in 1994, to 4.5 per cent in 2002, to 7.9 per cent in 2008 (MAC, 2010). It is also possible to look at the pattern with selected construction occupations. The share of construction trades works who were non-UK born stood at 3.8 per cent in 2002 and rose to 8.5 per cent in 2008 (MAC, 2010). Construction Skills is of the view that the number of migrant workers in the construction industry has peaked – at around 11,000 workers in 2006 - and that the relatively high inflows of migrant workers over the 2000s will decline over the medium-term. In part this reflects the downturn in UK construction and the improved prospects in the construction sector in other parts of Europe (e.g. in Poland where the downturn in the EU economy has been much less marked).

Migration increases the flow of labour and skills into the construction sector, especially at peaks in the economic cycle and the evidence indicates that it has improved skill supply. The percentage of the workforce who possess the minimum level of qualification deemed necessary to work in the sector is a Level 2 vocational one. In the UK, Construction Skills estimates that around 40 per cent of UK construction workers and a third of migrant workers have a highest qualification that is below Level 2,³ meaning that construction workers who have migrated to the UK generally are better qualified than the indigenous workforce.

In relation to managerial and professional workers, it is estimated that around 80 per cent do not possess a Level 4 qualification (UK Commission, 2010). It is notable in this regard, that the Civil Engineers, since 2008, has been an occupation which is open to suitably qualified people from anywhere in the world and exempt from the immigration restrictions which would otherwise apply (MAC, 2011).

5.6 Conclusion

The evidence demonstrates that the sector has a well developed training infrastructure, which is supported by the grant-levy scheme which applies to most of the sector, and which has seen improvements in the level of skills in the sector over the recent past.

A key issue for the sector is the development of higher level skills, particularly in management, which will allow employers to respond positively to the challenges posed by increased regulation, technological development and global competition and the flexibility that these developments require.

Self-employment and the use of labour only contracts permit some construction firms to utilise skills as and when necessary, but such organisation of labour can present an obstacle to overall skills supply in the sector. Self-employed individuals are less likely to engage in training, and employers are less likely to provide training for employees who are not employed on permanent contracts with their organisation. Retention and progression in the sector can be affected, because individuals see few opportunities to develop their careers (Booth et al, 2002).

The next section will reveal that the highly cyclical nature of the construction industry tends to impose limits on the extent to which employers invest in skills during periods of downturn which in turn affects its capacity to fully capitalise upon the economic recovery.

³ The UK CES National Skills Audit for England (Figure 3.3) suggests that around 30 per cent of workers in the sector in England have a qualification below Level 2 in occupations other than managerial, professional, and associate professional ones.

6 Skill Mismatches

6.1 Defining Skill Mismatches

Previous evidence has demonstrated that mismatches between the demand for, and supply of skills, can be damaging for organisational performance (Wilson and Hogarth, 2002). To some extent, skill mismatches will result from ongoing processes of technical and organisational changes within firms, and shifts in the pattern of demand in external markets. To some degree these will be transitional mismatches as the demand side begins to fully articulate its skill requirements and the supply side responds accordingly. But there are also likely to be structural mismatches where the demand for, and supply of, skills remain out of kilter despite the market signalling what skills are required. The construction sector is one which has experienced relatively high levels of skill mismatch over recent years. In part, this is because the year-on-year demand for construction has increased so much. The nature of the employment relationship also contributes to reported skills mismatch as employment tends to be on project-by-project basis. Long-term employment relationships with continuing training and development are not as commonplace as in other sectors.

As there is no direct measure of mismatches between the demand for, and supply of, skills, at the sectoral level inferences about the balance between the two are typically made through various means given that each measure provides only partial information. The common methods of gauging the level of mismatch are:

- Observing trends in wages is a common method of measuring skills mismatches. This assumes that employers respond to difficulties finding the skills they need by increasing wages. In reality, not all employers respond in this way to an excess demand for skills. Regulation regarding pay, collective bargaining, and job-related risk factors will also affect wage rates, and non-wage incentives, including training, may be offered to potential employees to attract them to an organisation. There is also a more general question about the extent to which wage levels are responsive to the market. Evidence suggests that nominal wage rates are relatively more responsive in the UK than elsewhere, but this might be little more than a reflection of the demand for overtime.

- Estimating the rate of return to obtaining sector related qualifications provides a further indication of the extent to which a premium is attached to obtaining the skills deployed in a given sector. Qualifications, however, are an imperfect measure of skills and the rate of return to obtaining a given qualification and given that the measure of return is based on wages all of the caveats which relate to this as a measure of skills mismatch.
- Employer reports of skill mismatches in the form of hard-to-fill vacancies (HtFVs) and skill-shortage vacancies (SSVs) which provide an indication of the difficulties employers have in recruiting people from the external labour market with the skills and attributes they require. Surveys also capture information about problems employers experience with the skills of existing staff with respect to the extent they lack full proficiency in their jobs (i.e. skill gaps).

Each of these is now considered in turn with respect to the construction sector.

6.2 Evidence of Relative Wage Growth

Wage levels and differentials

Table 6.1 provides a comparison of wage levels for full-time employees in the construction sector compared with the economy as a whole. It should be noted that self-employed workers, which comprise a significant part of the construction workforce, are not included in these figures and data on earnings of self-employed individuals is not readily available. In general, the median and mean wage in the construction sector is slightly higher in construction than in the economy as a whole, but over the past year wage levels have been falling in construction whilst there has been, by historical standards, low positive growth in wage levels in the economy overall. As indicated in previous sections the recession has adversely affected the construction industry with the lay-off of many thousands of construction workers which, as a consequence, has dampened wage rates.

Table 6.1: Annual pay - Gross (£) - For full-time employee jobs: UK, 2010

Description	Median	Annual Change (%)	Mean	Annual Change (%)
All Employees	25,882	0.3	32,204	1.0
Construction	27,492	-2.1	32,853	0.0

Source: Annual Survey of Hours and Earnings, Table 16.7a

Note: Based on SIC 2007

Wage levels, however, vary significantly throughout the sector with the sub-sector concerned with the development of building projects reported an average annual salary of £56,000 (with a year-on-year rise of 17 per cent) compared with that of £24,000 (with a year-on-year change of -23 per cent) in the construction of utility projects for electricity and telecommunications. These differences will reflect the occupational composition of each sub-sector as well as the state of overall demand for the output of these sub-sectors. Wage levels in the overall construction sector also vary significantly around the median and when employment levels start increasing in the sector, wages often respond very strongly.

Table 6.2 shows the occupational distribution of wages in the construction sector. In general, construction managers are paid more than managers overall in the economy, but civil engineers are paid slightly less than professionals overall. The mean wage level of construction managers has increased by around 6 per cent which is more than that for managers overall who received a wage increase of 3 per cent. The situation in relation to civil engineers, whose employment prospects have been affected by the slowdown in the commissioning of public infrastructure projects, have seen their salaries decrease on average by around 3 per cent.

Table 6.2: Annual pay - Gross (£) - For full-time employee jobs in Selected Occupations in Construction: UK, 2010

Description	Median	Annual Change (%)	Mean	Annual Change (%)
Whole Economy	25,882	0.3	32,204	1.0
All managers and senior officials	38,000	1.3	51,210	2.6
Managers in construction	41,680	0.4	54,539	6.4
All professional occupations	36,528	0.7	41,764	0.9
Civil engineers	35,484	-2.8	38,558	-3.3
All skilled trades occupations	23,818	-0.6	25,113	-0.4
Skilled construction and building trades	23,420	-0.8	24,594	-0.7
Construction Trades	23,843	-0.7	24,904	-0.6
Steel erectors	22,914	-0.8	23,926	1.1
Bricklayers, masons	23,201	1.7	23,925	0.7
Roofers, roof tilers and slaters	21,665	1.4	23,280	2.2
Plumbers, heating and ventilating engineers	27,731	0.4	27,850	-0.7
Carpenters and joiners	23,398	-2.5	24,150	-2.9
Glaziers, window fabricators and fitters	20,082	2.4	20,716	0.8
Construction trades n.e.c.	24,039	1.3	26,238	4.6
Building Trades	22,092	-0.9	22,980	-1.2
Plasterers	21,648	-2.4	22,624	0.4
Floorers and wall tillers	21,217	-12.5	22,711	-8.6
Painters and decorators	22,337	0.6	23,138	0.7

Source: Annual Survey of Hours and Earnings, Table 14.8a

Note: Based on SIC 2007

The situation with respect to skilled trades workers in construction reveals a mixed pattern. Overall, skilled construction workers earned slightly less than the average for the skilled trades occupation overall. Moreover their wage levels had fallen more over the past year. But within this group there are occupations which either show relatively high wage rates - such as plumbers and heating and ventilating engineers who earned around £28,000 compared with £25,000 for skilled trades workers overall – and those which have shown a relatively high year-on-year increase (such as roofers, roof-tilers and slaters who experienced a wage increase of 2 per cent compared with -0.7 per cent amongst skilled construction trade workers generally).

The above depicts the national picture but there are often local hotspots, typically in London and the South East and related to large-scale infrastructure projects such as the Olympics and Crossrail, which can result in localised skill shortages resulting in relatively high wage rates designed to attract people from all over the UK and the EU.

The Returns to Acquiring Qualifications in Construction

The previous section has demonstrated that a relatively large part of the construction sector's workforce comprises people working in skilled trades occupations typically with a vocational qualification at Level 2 or 3. In general, the evidence indicates that there are significant marginal returns to obtaining qualifications at these levels compared with qualifications at a lower level (Jenkins et al., 2007; McIntosh, 2009).

In relation to the construction sector specifically, the evidence points to their being a relatively favourable return to the individual working in construction obtaining a Level 2 and 3 qualifications compared with other sectors. Whereas the overall wage return to obtaining a qualification at Level 2 over and above a lower level qualification was around 4 per cent in the economy as a whole in Jenkins *et al's* 2007 study, it was found to be 9 per cent in construction. Similarly, Dickerson and Vignoles (2007) found that the return to a Level 2 qualification in construction was around 10 per cent compared with 2 per cent in the economy generally. Specifically in relation to Apprenticeships, McIntosh (2006) calculated that the net present value of an Apprenticeship in construction was £156,523 compared with engineering at £78,351 and retail at £31,928.

Much of the evidence on the returns to the individual predates the current period of downturn in the construction sector. As noted above wage levels have been depressed over the recent past in many construction occupations as a consequence of the 2008/09 recession. The earlier evidence is consistent with respect to the premium attached to obtaining higher level vocational qualifications in the construction sector. Given that the

construction sector will revive over the longer-term, and will be critical to the success of the recovery given that public infrastructure projects are likely to be used to kick-start the economy, it is likely that the relatively positive returns to gaining Level 2 and 3 qualifications will re-emerge as the supply side tries to keep pace with demand.

Other research in relation to completing an Apprenticeship suggests relatively high returns to the employer in sectors such as construction. McIntosh calculated the Net Present Value (NPV)⁴ of Apprenticeships (at any level) in five different sectors of the economy (McIntosh, 2006, 2009). The NPV was highest in construction (£156,523) compared with the service sector where, in retail for instance, the NPV was £31,928 (McIntosh, 2006, 2009).

6.3 Evidence of employer reported skill deficiencies

Historically, the national Employers Skills Surveys periodically carried out in each of the four nations of the UK have shown that the construction sector is relatively adversely affected by recruitment problems. Given that the period of unbroken economic growth over the 1990s and 2000s was based in part on the boom in construction the supply of skills struggled to keep pace with the level of demand. Given the fall in employment following the 1990/91 recession the sector had to quickly re-supply itself with the skills it needed to meet the relatively strong growth in demand. In part, the supply side was eased by skilled construction workers entering the UK from the EU (mainly Eastern Europe) but skill shortages over the 2000s were relatively high compared with those experienced in many other sectors.

The Employers Skills Survey (2011) provides an opportunity to gauge the current state of recruitment problems at a time when demand in the construction sector has declined substantially. The evidence suggests that the sector is still relatively adversely affected by recruitment problems. Whilst employers in the sector are just as likely to report vacancies compared with all employers (4 per cent of HTFVs of employers in both the sector and the economy generally report HTFVs), they are more likely to report HtFVs and more likely to report that HtFVs are due to a shortage of applicants with the required experience, skills, or qualifications, i.e. due to skill shortages (see Tables 6.4a and 6.4b). So the evidence points to skill shortages continuing to adversely affect the sector. If one looks at the density of recruitment difficulties it is apparent that HTFVs form a relatively high share of all vacancies at 40 per cent compared with 23 per cent in the economy as a

⁴ McIntosh (2009) estimates the marginal returns to Apprenticeships. The estimated wage returns are then combined with (i) the increased likelihood of apprentices being in employment; (ii) costs of providing the Apprenticeship by employers and government; (iii) and the costs to the individual (foregone earnings). The future results are then discounted to give a net present value (McIntosh, 2009, p. 59)

whole. As will be reported below recruitment problems, and in particular skill shortages, have a considerable impact on the performance of the sector.

The evidence suggests that the construction sector is less affected by skill gaps. The number of skill gaps per 1000 people employed is lower than in the economy generally at 44.4 per 1000 employees versus 54.1 in the economy as a whole. The percentage of employers reporting skill gaps is also lower than in the economy as a whole.

Table 6.3a: Incidence of Skill Deficiencies

	Construction	UK
Vacancies (total)	47,250	635,900
Vacancies / 1,000 employees	21.1	23.1
% of establishments with at least one vacancy	7%	12%
HtFVs (total)	19,100	143,550
% of establishments with at least one HTFV	4%	4%
SSVs (total)	12,400	103,450
SSVs / 1,000 employees	5.5	3.8
% of establishment with at least one SSV	3%	3%
Skill gaps	99,200	1,489,500
Skill gaps / 1,000 employees	44.4	54.1
% of establishments reporting a skill gap	10%	13%

Source: Davies et al. (2012)

Base: Vacancies as a % of employees based on all employment (N=87,571 establishments unweighted).

Hard-to-fill vacancies as a % of vacancies based on all vacancies (N=17,166 establishments unweighted)

SSVs as a % of vacancies based on all vacancies (N=17,166 establishments unweighted)

Skills gaps as a % of employees based on all employment (N=87,571 establishments unweighted)

Notes: numbers rounded to nearest 50
based on SSA definition of sector

Table 6.3b: Density of Skill Deficiencies

Density	Construction	UK
Vacancies as a proportion of employees	2%	2%
HTF vacancies as a % of vacancies	40%	23%
SSV as % of all vacancies	26%	16%
Skills gaps as a % of all employees	4%	5%

Source: Davies et al. (2012)

Base: Vacancies as a % of employees based on all employment (N=87,571 establishments unweighted).

Hard-to-fill vacancies as a % of vacancies based on all vacancies (N=17,166 establishments unweighted)

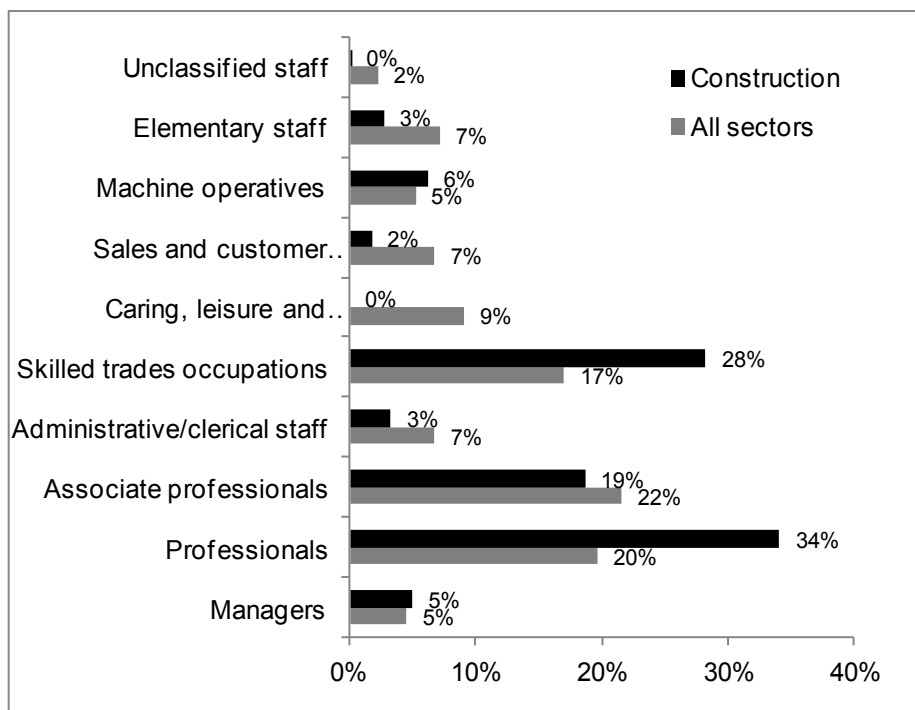
SSVs as a % of vacancies based on all vacancies (N=17,166 establishments unweighted)

Skills gaps as a % of employees based on all employment (N=87,571 establishments unweighted)

Notes: numbers rounded to nearest 50 based on SSA definition of sector

6.4 Other Evidence on Evidence of Skill Deficiencies

Overall, where employers report skill shortages these are much more likely to be in skilled trades and professional occupations compared with the economy as a whole (see Figure 6.1). These are two critically important occupations for the sector, especially the former which comprises the largest occupational share of the workforce.

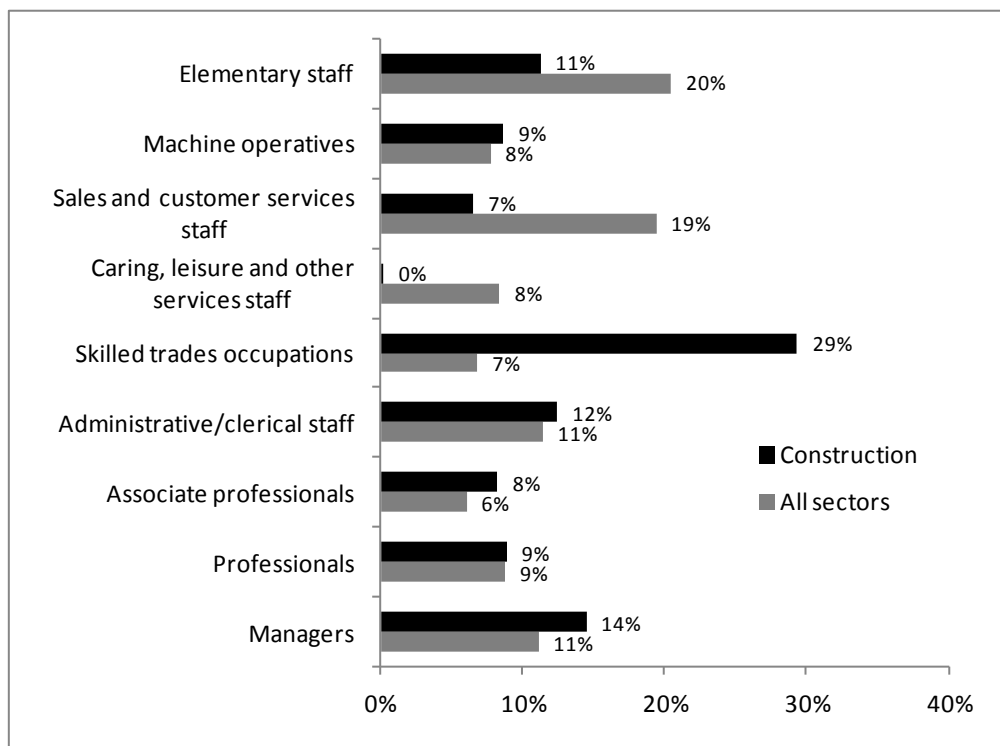
Chart 6.1 Occupational Distribution of Skill Shortages in Construction

Source: Davies et al. (2012)

Base: All skill shortage vacancies

With respect to skill gaps it is only with respect to skilled trades workers that there is a disproportionate share of skill gaps, otherwise the occupational distribution of skill gaps is more or less the same as for the economy as a whole. This is quite interesting insofar as the evidence indicates that it is amongst higher level occupations that employees are least likely to be qualified to the typical standard expected at that level (UK Commission, 2010). Clearly the sector has found some means, such as continuing professional development and training, to ensure that its workforce in managerial and professional occupations are proficient at their jobs even if they are not qualified at the appropriate level (*i.e.* Level 4).

Chart 6.2 Occupational Distribution of Skill Gaps in Construction



Source: Davies et al. (2012)

Base: All skill shortage vacancies

6.5 Causes, Impacts and Remedies

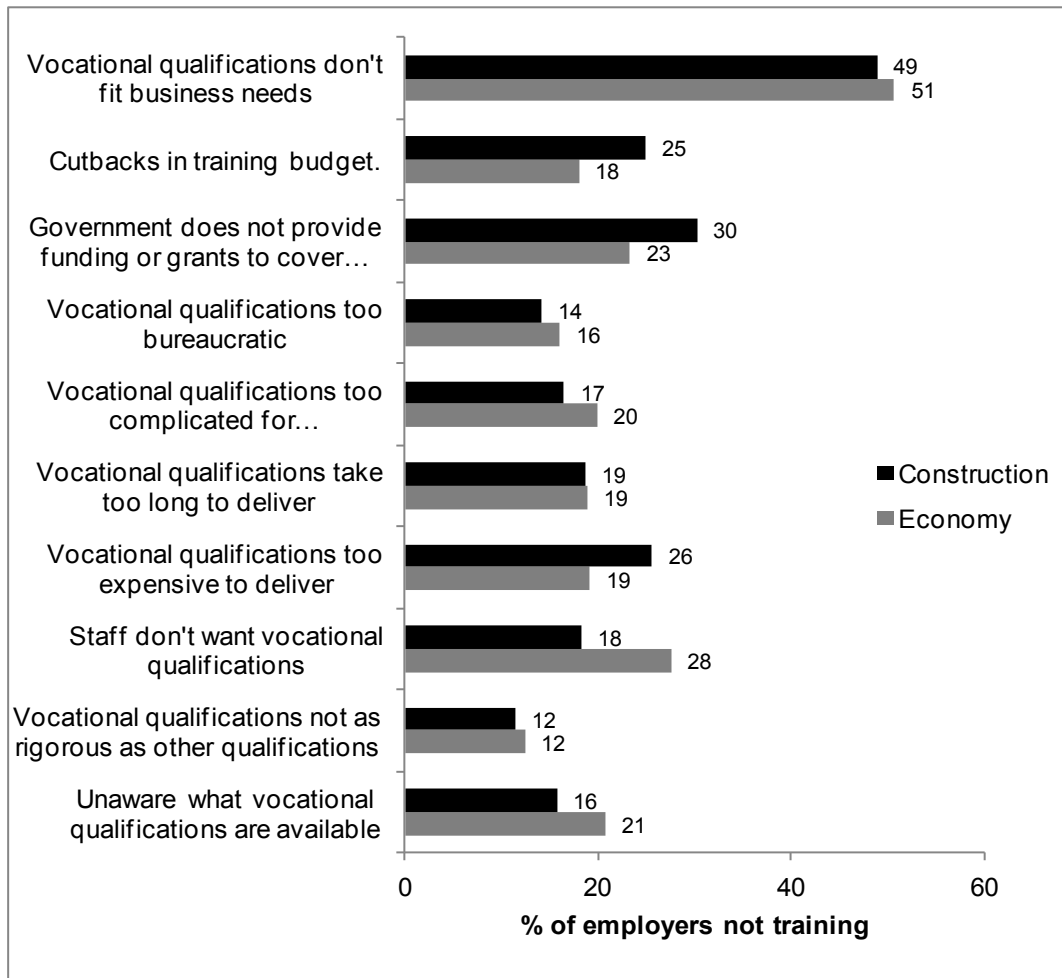
Causes and Impacts of Skill Deficiencies

The UK Commission's UK Employers Skills Survey 2011 (Davies et al., 2012) provides a wealth of information about the causes and implications of skill shortages and skill gaps. In general, the cause of skill shortages was reported as being a shortage of applicants with technical / practical skills, job specific skills, planning and organisational skills, and

problem solving skills. The main response to experiencing skill shortages was to either increase recruitment activity or find new means of recruitment. Only 3 per cent of employers with skill shortages said they would increase salaries to attract more suitably skilled employees. In relation to skill gaps, these were seen to result from staff being only partially trained or being new to their role. Where employers had skill gaps just over half of them reported that it was damaging their performance. In order to offset this they were currently, or planning, to introduce more training, more supervision, and more mentoring of staff. The main impacts of internal skills gaps include increased operating/running costs, and difficulties in introducing new working practices. Having hard-to-fill vacancies increased the workload of other staff, delayed development of new product and services, increased operating costs, and resulted in a loss of business or orders to competitors. There is also a risk that employers will fail to meet legislative requirements, for example, in health and safety, if their staff lack skills and experience.

One of the solutions employers turns to in the face of skill deficiencies is to increase the amount of training they undertake. Figure 6.3 shows the reasons employers report for not providing training leading to a vocational qualification.

Chart 6.3 Reasons for Not Providing Vocational Qualifications



Source: Shury et al. (2010)

Note: Based on SSA definition of sector

Base: All establishments 14,390 unweighted

There is not much difference between the construction sector and economy as whole, with the principal reason for both being that vocational qualifications do not fit the business (49 per cent of construction establishments versus 51 per cent in the economy as whole). It is noticeable, however, that construction employers are more likely to report cutbacks in their training budget (25 per cent in construction versus 18 per cent in the economy as a whole), lack of public funding (30 per cent versus 23 per cent), and vocational qualifications being too expensive to deliver (26 per cent versus 19 per cent). On the other hand, construction employers are less likely to report that staff are resistant to training (18 per cent versus 28 per cent).

Remedies to Skill Shortages

There are a range of programmes available which potentially boost skills supply, in addition to the payment of the levy. Through their Employer Investment Fund (EIF) and Growth and Innovation Fund (GIF), UKCES, with matched direct employer investment and employer in-kind investment, provide funding aimed at improving employers'

ambition and attitudes to investment in skills development. Projects funded through these initiatives include providing training for women to help them succeed and be retained in the construction sector and helping organisations respond to the 'low-carbon challenge'. UKCES funding for the women and work programme is £116,800 whilst employer investment is £17,250 and £99,280, in-kind. For the low carbon programme, UKCES investment is equal to more than £1.3 million and employer in-kind investment is £496,000.

Investors in People is "...the UK's leading people management standard. It's a business improvement tool designed to help all kinds of organisations develop performance through their people."⁵ Table 6.4 shows that in construction relatively few establishments are accredited to IiP than in economy as whole.

Table 6.4: Investors in People Accreditation in IiP

	IIP accredited (%)	Not IIP accredited (%)	Don't know (%)	Total (%)
Construction	8	83	9	100
UK	16	69	15	100

Source: Davies et al. (2012)

Note: Based on SSA definition of sector

Base: All Establishments 87,572 unweighted

The example of a smaller company illustrates how initiatives such as Investors in People can provide a framework in which skills can be developed to avoid both skill shortages and skill gaps (see panel).

**Case study:
Anthony A Davies Limited**

Anthony A Davies Limited and its sister companies Anthony A Davies Construction and Coed Derwen stemmed from a small joinery business set up by sole trader Anthony Davies in Abergavenny in 1980. The operation now has 84 people, making it one of the fastest growing businesses in Wales.

The original company - Anthony A Davies Ltd - specialised in joinery, carpentry, roofing, restoration and building works. In 2000, Anthony A Davies Construction Ltd followed, offering construction, design and management and restoration services. Finally, Coed Derwen opened for business in 2005 making environmentally-friendly windows and doors. Since achieving The Standard in 2000, the business has made continued improvements to its processes and the benefits have been manifold.

Standardised recruitment procedures have been implemented. Not only has this helped speed up

⁵ <http://www.investorsinpeople.co.uk/About/Pages/default.aspx>

the recruitment process, it has also been instrumental in improving the quality of new recruits. A company induction procedure is now firmly in place with both existing and new employees receiving a pack which includes comprehensive detail on the company. This has ensured that each employee has access to adequate information to help them to understand the company's procedures and culture from day one.

Training is no longer simply a good intention, it happens in a structured manner for both existing employees and new hires. A programme for regular performance reviews is also in place to monitor progress and training needs. This, in combination with the other procedures, has helped ensure staff morale and retention rates remain high. The business also extends this ethos to its sub-contractors, providing them with training and development opportunities as they arise.

At the same time, these procedures have made the business less fearful of expansion. With robust processes in place, it has been possible to roll out effective procedures across Anthony A Davies's sister companies, Anthony A Davies Construction and Coed Derwen Joinery, which were both awarded the Standard in 2006.

"Investors in People gave us the confidence to quadruple our workforce and helped new employees to adopt our ethos quickly. Our intentions were always positive towards issues such as staff communication and development, but we didn't quite know how to get started. When we committed to The Standard it gave us the initiative to address these issues seriously", says Dawn Davies, Director

Source:

<http://www.investorsinpeople.co.uk/MediaResearch/CaseStudy/Pages/CaseStudyDetails.aspx?CSID=84>

Apprenticeships provide one means of boosting skills supply. The evidence suggests that there are significant business benefits from employers investing in Apprenticeships. Since the mid 1990s the University of Warwick Institute for Employment Research (IER) has been undertaking a series of studies on the net costs and benefits of training to employers engaged in Apprenticeship training in the construction sector. The studies give an indication of the benefits which accrue to employers who invest in this form of training. The latest case study research (Hogarth et al., 2012) indicated that:

- The net cost to the employer of engaging in Apprenticeship training at Level 3 were relatively high compared with other sectors, but that employers were able to recoup much of the cost of their investment within about two years or so if they were able to retain the services of the apprentice.
- When deciding to recruit apprentices, the following factors were considered by these employers: bringing young people into the industry; meeting future skills needs; and developing staff for specific business needs.
- Accreditation and qualifications which supported the firm in rendering for work was highlighted as a strength of the Apprenticeship programme.
- For many of the companies the Apprenticeship programme was the main method for recruitment and training of staff. It was also viewed as a tool to support retention.

The statistics give an overview of the level of training and skills development activity undertaken by employers, but insights can be obtained into how these activities alleviate skill deficiencies by looking at specific examples of employers training activities and the value they place in what they provide. The example below provides an indication of the

activities undertaken by a medium-sized employer engaged in the construction of commercial and public buildings which has continued to invest in training to maintain its own skill supply (see panel).

Case study:

Stepnell

Stepnell is registered with ConstructionSkills and is working towards accreditation with Investors in People. In addition, Stepnell is recognised by many teaching establishments as an appropriate employer for site based training in vocational subjects at Level 2 and 3. To meet this standard Stepnell has trained many of our staff as approved Site Based Recorders for assessing course work and experience.

The Stepnell commitment to training is further demonstrated in our leading role with The Minster College Training Initiative.

Stepnell understands that our Supply Chain deliver our promises and maintain our reputation as "best in class". We are therefore very careful who we ask to join our team and do so on the basis of an open and honest dialogue.

Part of The Minster College Training Initiative is to help our entire supply chain, not just those involved with the Minster College Project, identify training needs and source that training.

About The Minster Training Initiative

The Minster College Training Initiative is the first 'Mini Academy' scheme of its kind to be run in the West Midlands.

The aim is :-

- To have a fully qualified Supply Chain to CSCS or equivalent standard
- To provide work experience and other career related opportunities to the Minster College students and the wider community.

The initiative led by Stepnell Ltd, a family owned building and civil engineering contractor with a 140 year history. Stepnell Ltd, who place a great importance in employing trained, progressive and competent individuals, has come together with key West Midlands partners to participate in this training initiative and create a model of best practice in terms of developing and delivering skills.

The minimum requirements to work on The Minster College Project are:-

- A fully qualified workforce to NVQ/CSCS standard;
- provide relevant working opportunities to the college pupils and the wider community

Source: <http://www.stepnell.co.uk/ourcompany/people/training.aspx>

In many respects if employers are able to put in place policies which ensure that they are able to recruit the employees with the skills and attributes they require which relates in many respects to providing an attractive employment offer to would-be recruits - with respect to remuneration, career development and progression, *etc.* – and support existing employees to further develop their skills, they will be able to avoid both skill shortages and skill gaps.

Potentially the combination of vocational and continuing professional development and training can ensure that companies can acquire the skills they need via recruitment and then continue to develop the skills of those recruits subsequently through continuing training. The example of Costain is instructive in this regard (*see panel below*).

Case Study:

Costain Group PLC Constructing talent and skills development opportunities for all

Costain is an international engineering and construction group focused on providing intelligent solutions to meet national need. Primarily, the business's aim is to drive improved business performance by:

- supporting staff in their individual job roles
- developing the skills necessary for the future of the business
- promoting individuals internally and encouraging effective succession planning
- leading the National Skills Agenda in customers key sectors

With these aims in mind, Costain runs several highly successful initiatives:

- a series of advanced high performance programmes that identify future leaders within the business and provide opportunities to develop their talents
- a structured, well-defined and highly regarded graduate training programme
- providing access to nationally recognised qualifications e.g. NVQ Diploma's , and supporting learners through these qualifications
- an apprenticeship centre where apprentices can develop their knowledge and skills through combining work experience and study.
- identifying potential to progress for ALL staff through the performance and talent management cycle and using the information to support staff progression through focused talent and development programmes

Costain actively incentivises skills development through a number of methods, including the annual 'Celebrating Success' awards which reward staff and other stakeholders, and a financial reward scheme for employees achieving key milestones within their careers (for example gaining NVQ qualifications or achieving chartered status). The business operates a Building Awareness Scheme promoting the sector to school pupils, and offers apprenticeship schemes, university sponsorship and an NVQ training scheme.

Impact on the business

There are compelling business reasons for Costain's committed approach to skills in the workplace and the business has seen real benefits arising from training, including improved safety, environmental enhancements, efficiency improvements, opportunities for new business and cost savings.

Training has **improved employee satisfaction and engagement** within the company, as employees feel they can develop their career, which has contributed to a **low staff turnover** (7% in 2011).

Direct financial benefits have been also been brought about by training and skills development. For example, the Save IT campaign was launched in 2005 to improve the efficiency with which raw materials are used and managed on site, with the aim to reduce the amount of wasted materials. The campaign is heavily dependent on developing skills and building awareness within the workforce, from managers to site operatives. The financial benefits of the campaign exceeded expectations – for example, between 2007 and 2010 the annual cost of skip waste disposal on Costain sites has been reduced by over 51%, a saving of over £1.1 million. When the cost of raw material and the labour associated with waste disposal are taken into account, this amounts to a **saving of over £5 million**.

Absence rates are a key indicator of employee engagement and satisfaction and Costain's

absence rate has decreased over the last four years. This can be attributed to improved training of managers and an overall reduction in accidents due to better training. The environment Costain has created, where skills development is genuinely valued, has led to **employees becoming increasingly proactive about their professional development.**

The company says:

“This makes us an attractive employer to join, and motivates our team members to continue with us, as they feel they have a clear career path, and opportunities for internal promotion. Our senior managers act as role models for junior staff, especially the fact that two of the current Executive Board joined Costain as graduates, and have worked their way to the top of the company.”

The company' believes that its structured development programmes, and close relationships with schools and universities give it a **competitive edge with regards to recruiting talented and ambitious employees.**

Source: BITC case study - http://www.bitc.org.uk/resources/case_studies/afe2923.html

Costain Group represents an example of a relatively large organisation which has been able to develop training programmes, as well as making use of programmes such as Apprenticeships, to ensure that it is able to avoid both skill shortages and skill gaps.

6.6 Conclusion

The most recent evidence relating to wage differentials and wage increases indicates relatively weak demand for skills at the current time, but there are reasons to be wary of placing too much store in figures. The construction sector has endured a steep decline in demand as a consequence of the 2008/09 recession with recovery to date being relatively weak. Over the slightly longer-term, as the recovery gathers pace, it is anticipated that demand for construction will increase, initially through the commencement of major infrastructure projects and then through house and commercial property building. Depending upon the pace of the recovery there is a danger that skill shortages of a type observed following previous recessions will emerge with companies increasingly competing on the basis of wages to capture relatively scarce skills. The case study examples provided in this chapter illustrate the way in which companies can develop the skills of their existing employees, and make use of various national programmes such as Apprenticeships to train new entrants to the sector.

7 Conclusion

7.1 The Sector Today and Tomorrow

Construction is vitally important to the UK economy with respect to both the volume of employment and gross value added it contributes (accounting for around 10 per cent of the total in the UK on both measures), but also more strategically in contributing to the built environment and as part of packages designed to stimulate growth. Possibly more than any other sector, construction has provided a means of stimulating growth following recessions through undertaking publicly funded infrastructure projects. Whilst there is less scope than previously to engage in publicly funded infrastructure projects it is nonetheless apparent that the Government is trying to bring forward a number of previously planned and budgeted for projects in order to help kick-start the economy.

This poses a number of challenges for the sector given that it has been adversely affected by the current recession with a sharp drop in the value of contracts commissioned and people employed. As the sector develops over the medium-term it has a number of opportunities related to:

- capitalising upon the green, low carbon agenda with the demand for retro-fitting of buildings to meet new environmental standards, as well as building renewable energy plants and nuclear energy installations;
- driving up productivity levels through the introduction of new technologies and new ways of working, including increased use of pre-fabrication, use of new materials, etc.
- becoming a sector which is able to better plan for the future by being able to identify in a more timely fashion demand for construction projects of one kind or another;
- capturing an increased share of global markets in various sub-sectors of the world market (e.g. engineering construction, professional building services).

Whilst the Government has set out plans for around £200 billion of public and private infrastructure over the next five years, this total is likely to be subject to considerable variation over the period. The timing of these investments creates great uncertainty in construction demand. Firms hesitate to take on new trainees where future demand is so uncertain. In looking to the future, the aim is very much to create a sector which has fully recovered from the losses incurred in the 2008/09 recession and has been able to take full advantage of the opportunities listed above, to bring about a much improved built environment in the UK. Realising this vision, as will be summarised below, is dependent upon the sector being able to drive up its skill levels across the workforce and introducing the types of higher performance working practices which will make it an enticing sector in which to work and will thereby attract talented individuals to work in the sector. Hence

effective people management in the widest sense of the term is a necessity for the industry.

7.2 The Performance Challenge

The performance challenge for employers currently based in the UK is that of rising to the challenges which will be posed by:

- the low carbon agenda (reducing carbon emissions and the carbon footprint of buildings);
- a need to drive up productivity levels in order to retain at least the current share of the UK and world markets held by UK based companies and fend off competition from companies based outside the UK;
- bringing about increased levels of innovation in the design (i.e. the product) and the construction (i.e. the process) in order to increase productivity; and
- meeting changing regulatory standards relating to the construction of buildings and health and safety on site.

At the heart of these performance challenges is the need to bring about change at a time when many employers are clearly faced with substantial risks to their survival as a consequence of the low levels of demand for all types of construction activity. Importantly, the sector will need to ensure that it possesses the skills it requires to rise to these performance challenges. Again this is a formidable challenge for two inter-related reasons:

- i. the current recession has seen many people made redundant with a consequent leaking of skills from the sector;
- ii. the sector, historically, has encountered severe recruitment problems related to the under-supply of people with skills, qualifications, and experience the sector requires.

In summary, the sector has lost skills during downturns and has struggled to regain them quickly enough as the sector has recovered resulting in skills being imported from abroad and relatively high wages being paid in localised hotspots where substantial construction activity has been taking place (as was the case in London during the 2000s when several major projects were taking place more or less simultaneously – e.g. Terminal 5, Crossrail, the Olympic sites). At the same time as building up the quantity of skills there has also been the need to accommodate qualitative changes in skills as new construction processes using new materials come increasingly to the fore.

The skills challenge is made all the more difficult given the relatively high levels of self-employment in the sector. This means the changes in skills demand and practices to attract and retain talent are driven through the supply chain where the lead company requires certain minimum standards to be in place before they are eligible to work on site.

Nestled within the wider set of performance challenges, therefore, is a specific set of skill challenges which the sector, though well aware of, will need to increasingly address, including:

- investing in management skills to ensure that managers possess the skills required to (a) meet the business challenges listed above; and (b) ensure that the skills and people management systems are in place to offset any risk of skill shortages pushing the sector off-course;
- ensuring that there is a good supply of new entrants to the sector qualified to the appropriate level to work in their chosen occupation. At the moment many people lack the qualifications required. This is not just about investing in skills but also the people management skills which will attract and retain people in the sector;
- continuing to invest in the skills of the existing workforce – especially self-employed people, many of whom are older people – to ensure that they possess the skills which will be required on the construction site of tomorrow. Currently, it appears that training of self-employed workers is low. The question of who is responsible for developing the skills of freelance workers – the individual worker or the employer who uses their skills is important if this is to be improved.

The UK has a substantial training infrastructure which can be drawn upon in meeting these skills and human resources challenges.

7.3 Growth through Skills

There is a substantial training and skills development infrastructure in the sector. This provides structured, externally accredited training at both initial and continuing levels. The use of the grant-levy system and the CSCS ensure that training is provided and that having accredited skills have become in many parts of a *de facto* licence to practice.

This report has shown that leading employers of all sizes and across all of the various sub-sectors are acting to develop their own staff, influence the supply of skills and draw on current initiatives in response to the challenges they face. For example:

- the strong supply of construction graduates exiting the higher education sector in a range of disciplines – such as architecture, surveyors, civil engineers, and building management;

- the Apprenticeship programme is well established at Levels 2 and 3 with relatively high number of entrants each year across a range of disciplines – including, bricklaying, carpentry, plumbing, heating and ventilation, electrical trades;
- continuing professional development and training is well established across large parts of the sector as companies look to support the career progression of their staff;
- programmes such as liP provide a broad framework within which employers can attract, develop, and retain talented individuals at all levels of the business; and
- the CSCS is one way larger employers can ensure that all of their subcontractors are sufficiently skilled.

The evidence points to where companies have made use of the above programmes they have been able to obtain significant returns with respect to being able to obtain the skills they need to meet the demands of a dynamic construction environment and being able to either retain those skills or, where the use of subcontractors is to the fore, ensure that these too have the skills they need.

7.4 Business Benefits

One of the principal business benefits of investing in training is company survival. The evidence suggests that where construction employers invest in training they are four more times likely to survive than their counterparts who do not do so (Collier, *et al.*, 2007). At a time when the demand for the services of construction companies is at a low point this is a strong message especially when one takes into consideration the fact that as the recovery gathers pace the demand for construction skills is likely to increase quite sharply. Hence being able to capitalise upon the recovery will be largely dependent upon having access to skills. The research by Garrett *et al.*, (2010) also reveals a wide range of benefits from investing in construction skills.

The business benefits of training go beyond company survival. The beginning of this section pointed to the range of performance or business challenges which will face the sector over the medium-term. These are formidable with respect to the need to acquire new skills needed to deal with the green agenda, the drive to increase productivity, being innovative in both the design of buildings and construction of buildings, and being regulatory compliant. Many companies recognise the large skill element in meeting these challenges for management skills, the skills required of construction professionals, and skilled trades employees. In the past, skill shortfalls to some extent have been offset by attracting migrant labour but as the construction sectors in other parts of the EU also begin their recovery, there will be less scope to rely upon this source of labour. Put another way, the costs of not training for the sector might be substantial.

The evidence demonstrates that there are relatively good returns for individuals and employers to invest in skills and that there is a strong supply side able to deliver the skills the sector needs via programmes such as Apprenticeships and IiP.

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Evidence Report 9

Review of Employer Collective Measures: Policy Prioritisation

Evidence Report 10

Review of Employer Collective Measures: Final Report

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Evidence Report 44

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Evidence Report 45

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Evidence Report 46

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Produced by the Institute for Employment Research,
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ISBN 978-1-908418-16-6
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