

Construction Skills Gap Analysis for the West of England Combined Authority & Local Enterprise Partnership

Final Report



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& Local Enterprise Partnership

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Executive Summary

Introduction

The **West of England Combined Authority and Local Enterprise Partnership** (WECA & LEP) is working with the Construction Industry Training Board (CITB) to create a construction strategy and action plan to help take advantage of the opportunities the construction industry is facing across the West of England area.

This report is one step in maintaining an evidence base, utilised by the WECA & LEP to inform decision making and enable the creation and execution of that wider construction strategy that will help determine the employment and skills opportunities emerging in the construction industry for the West of England area.

Construction is a significant part of the economy and is a major employer. But it is also an enabler of economic growth and job creation and has a significant impact on enhancing the built environment, in creating the facilities required of a modern economy and addresses significant social issues, such as a shortage of housing. It is also an enabler of other sectors' success by building the facilities required for commercial and industrial advances as well as the infrastructure that is, in turn, an enabler of growth. It is, therefore, essential for the WECA & LEP to invest in supporting the actions proposed in this report and the wider evidence base as well as involving stakeholders in the development of the associated plans.

This report represents the concluded research, taking into account key issues posed by the WECA & LEP seeking to identify issues so that a practical approach can be taken to realising the opportunities that activity in the construction sector can generate in developing skills, creating jobs and enhancing the local economy, built environment and opportunities.

The WECA & LEP is seeking immediate opportunities to investigate and respond to as well as identifying actions that can lead to longer term development.

Affordable housing is seen as a priority for the WECA & LEP and so it is notable that, compared with 2012, there has been an increase in the proportion of construction workers that have worked on new housing within the South West; up from 76% to 83%.

Hinkley Point C nuclear power station, that will be built close to the WECA & LEP area, is seen as being a significant influence on the local economy and, therefore, a project that is essential to understand better. At the time of writing only limited information is available regarding the impact of Hinkley Point but this is referenced as far as possible.

The analysis starts to determine the priorities for interventions to address to ensure local opportunities are maximised and that the West of England has the right future curriculum in place to deliver demand led solutions.

For **Construction**, the WECA & LEP has stated the need to:

1. Improve careers education, information, advice and guidance.
2. Improve the quality and local responsiveness of education and training.
3. Increase apprenticeship starts and improve access to higher and degree apprenticeships.
4. Engage SMEs to boost productivity and build capacity for growth.
5. Promote pathways for employment to enhance equality and diversity in the workforce.

[In some places this report refers to data relevant to the local authority areas that now make up the Combined Authority area.]

The West of England councils are working together and have produced a Joint Spatial Plan (JSP) that will allow strategic decisions to be made to deliver integrated housing, employment and transport opportunities so we can build sustainable, diverse communities that are well connected to job opportunities. The JSP will provide the framework to deliver up to 105,000 net additional new homes between 2016 and 2036 of which, around 32,200 (30%) should be affordable homes.

The housing target supports a planned job growth of 82,500 jobs for the period 2016-2036 (125,900 jobs between the period 2010-2036).

While construction workers do not train to work only in an individual sub-sector there are a number of roles that are of particular relevance to housing, notably:

- Wood trades and interior fit-out
- Electrical trades and installation
- Plumbing and heating, ventilation and air conditioning trades
- Labourers
- Bricklayers
- Painters and decorators
- Plasterers and dry liners
- Scaffolders

Highlighted findings

Demand by sector

For the total five year pipeline of identified projects, construction demand is dominated by new housing (33% of spend), private commercial developments (30%) and infrastructure (27%). And there appear to be relatively low levels of investment in industrial developments and public non-residential developments.

When estimates of the other work and repair and maintenance are taken into consideration in addition to the total defined projects over the five years, the division of workforce demand is for: new housing (27% of labour demand); commercial developments (22%); new housing (20%); housing R&M (19%). This reflects the disproportionately high labour demand for housing and R&M compared with infrastructure and industrial developments.

Prioritisation by occupation

There are a number of factors to consider in identifying priority occupations for the region.

1. **Demand** – how great is the demand for workers in this occupational category?
2. **Risk** – what is the perceived risk of a shortfall of workers in in any one occupational group in comparison with the other 27? What is the correlation between demand and supply?
Risk has been given a value that indicates the relative risk of a shortfall in workers.
3. **Site based or remote workers** – do workers in an occupational category need to be on site? Those employed within the construction industry can be considered as:
 - **Non-construction workers and Office based workers.**
These job roles are filled by people who spend the majority of their time based away from the construction site. They often need not be based within the locality of the site. However some of these roles may visit the site for the purposes of management, quality control or inspection.
 - **Mobile workers and “Professionals”.** These job roles are filled by occupations that do require some attendance on site. However they may work remotely or be highly mobile and so can travel significant distances to get to the site from outside the region. Or they are roles that require a significant element of off-site manufacture.
 - **On-site workers.** These roles tend to require the majority of time to be spent on site, so they need to be based within reasonable travelling distance on a day to day basis during construction. In most cases these workers are describes as being “**skilled trades**”.
4. **Provision of training** – for some occupations (in most cases skilled trades) some data is available on the number of relevant qualification achievements completed in the recent academic years – this gives an indication of the training provision available and so should be helpful in engaging with training providers, and in curriculum development, to address potential shortfalls or opportunities.

Demand by occupation for known projects

Of the 28 occupations listed in the report, those for which there appears to be greatest demand for the known pipeline of projects are (top two quartiles):

1. Non-construction professional, technical, IT, and other office-based
2. Wood trades and interior fit-out
3. Other construction process managers
4. Other construction professional & technical
5. Electrical trades and installation
6. Senior, executive, and business process managers
7. Plumbing and HVAC Trades
8. Painters and decorators
9. Labourers nec*
10. Bricklayers
11. Building envelope specialists
12. Specialist building operatives nec*
13. Surveyors
14. Plasterers & dry liners

Risk of a shortfall of workers

There are only two occupations for which it appears there is an **immediate gap** between supply of, and demand for, workers – Floorers and Logistics. It is possible that gap is filled by the movement of workers in and out of the West of England area and that is more likely for Logistics that is by its very nature mobile.

In order of greatest risk of shortfall first, the occupations showing the greatest risk are (top quartile):

1. **Floorers**
2. **Logistics**
3. Non-construction operatives
4. Specialist building operatives nec*
5. Construction Project Managers
6. Other construction process managers
7. Labourers nec*

Prioritising occupations – high risk AND high demand

In addition to identifying occupations at risk of shortfall (above), one approach to identifying priority occupations is to identify those occupations for which there appears to be both high demand AND high risk of a gap between demand and existing supply.

This does not mean, and it should not be inferred, that other occupations are not: important; in demand or at risk of suffering a gap between demand and supply.

For the West of England area it is noticeable that the high demand occupations and high risk occupations do not typically appear to correlate.

There is only one occupation in the top quartile of both measures:

- Other construction process managers

The occupations appearing in the top two quartiles of both measures are:

- Labourers.
- Specialist Building Operatives
- Painters and decorators
- Non-construction professional, technical, IT and other office based workers.

Comparing priority occupations with training provision

Across several main occupations there has been a decline in training achievements between 2012/13 and 2015/16. This can be seen in Table 6 in the report that shows:

There appear to be relatively **low overall learner volumes** (all with no achievements in 2015/16) for:

- Construction trade supervisors
- **Logistics** – one of the occupations appearing to show high demand and risk of a gap
- Steel erectors/structural – likely to be of interest for Hinkley Point

Occupations to monitor, where there appears to have been a decline in achievements are:

- Civil Engineering operatives
- Construction managers
- Glaziers
- Plasterers and dry liners
- Roofers
- Specialist building operatives nec*.

The 2015 report

A similar construction pipeline and supply report was produced for the West of England area by CITB in the summer of 2015.

It is important to note that the methodology used in this report has been developed since 2015 and the labour coefficients used in the associated calculations have been refined. This means that the data sets presented in the two reports are not directly comparable in absolute numerical terms. However, the occupational comparisons relative to one another remain relevant.

In comparison, it is notable that in the main the occupations listed as being in the top two quartiles in terms of demand remain similar. And the occupations appearing to have the greatest relative risk of shortfall remain broadly similar. There is one exception to this where a relatively high risk for civil engineering operatives in 2015 appears to have dissipated in 2017 (this could be down to several factors).

Recommendations made in 2015

This 2015 report made a number of recommendations. These included:

- A clear need for a dedicated Construction Skills Plan underpinned by an Investment Plan that will enable the skills challenges to be acted on a regularly updated evidence base that will inform decision making.
- An agreed action from the Infrastructure Forum was for the formation of a LEP facilitated partnership between employers to provide an 'incubator' for apprentices and graduates that would provide brokerage for the 'talent pool'.
- Whilst the major project at Hinkley Point C has significant impact there is considerable opportunity that sits outside of the project particularly in the housing sector, and this represents a real opportunity for the LEP to support business and education providers through a well-developed partnership approach as described in the dedicated Construction Action Plan.
- A number of risks need to be managed and mitigated, particularly regarding the peak demand levels next year. These include ensuring the local labour force can benefit from the opportunities materialising, ensuring skills gaps are addressed through training interventions in both the short and longer term and that curriculum across the area is well planned.
- Further strong links need to be formed between employers and educational providers at both HE and FE level to co-develop and co-design modules to support specialist learning relating directly to delivery.
- Occupations high-lighted as having pinch-points' should form part of an early Action Plan to assess what short-term interventions can be activated to address these concerns and identify funding that can be utilised to pump-prime short term training interventions.
- Image and recruitment into the industry remains a constant issue. Given the demand profile for the LEP area it is vital that stakeholders work together to create a campaign to promote the construction industry and clear career pathways for all members of society to pursue a construction based career. This includes apprentices, graduates, the long term unemployed, adult returners and new entrants, regardless of ethnicity or gender.
- Commission regularly updated Labour Market Intelligence (LMI) which will provide an evidence base to support decision making which demonstrates to tomorrow's construction workers both the opportunities in construction that are in the pipeline and the future vision.
- Explore the opportunity to create a Shared Apprenticeship Scheme across the LEP area which can benefit from employer collaboration and the range of projects on the horizon.

- Promote innovation through initiatives developed between employers and universities to understand the impact of technological change in the sector, particularly in relation to major projects.
- Explore with commissioning clients how procurement good practice can drive employment and skills opportunities and influence the behaviour of suppliers to achieve greater social value.

Progress since the 2015 report

The 2015 report prompted action that has achieved progress in qualifying and addressing skills gaps and capacity issues. That activity has often been in collaboration with CITB advisors to develop and deliver an action plan. Highlights include:

- The West of England Infrastructure Forum in 2015 identified key priorities that helped inform the development of a Local Sector Skills Statement for Construction and Development. The LEP commissioned an ESF programme for Employer Engagement to undertake the development of local sector skills statements.
- Funding was secured via CITB to support subcontractors to access Hinkley Point skills development opportunities. This included collaboration with Hinkley Point Education, Employment and Skills Operational Group and Hinkley Point Training Agency (HPTA) to develop infrastructure to support local workforce needs and replacement of displaced jobs.
- An educator influencer event promoted construction careers and the Go Construct portal.
- Construction Ambassador training was established to help industry professionals promote careers in construction to new entrants and work returners.
- Trailblazer Apprenticeships in Civil Engineering are in development with West of England employers leading the way.
- CITB funding has supported local SMEs to facilitate training across smaller companies, to enable job creation for new entrants, help promote Go Construct and use activity based planning to apply for industry funds to enhance and deliver right time right place training.
- Work is underway to enhance awareness among DWP teams of construction industry opportunities, this includes a *women-into-construction* co-delivered project.
- Colleges of Further Education have been engaged to establish accurate supply and demand data and apply solutions to address skills gaps. South Gloucestershire College and Weston College are exploring local provision and need and solutions to address dry-lining, groundworks and scaffolding provision across the West of England area.
- CITB is working with Highways England to support inclusion of employment and skills opportunities across their Motorway upgrade programme. This includes projects for the West of England area and neighbouring LEP areas.
- A Skills Prospectus was published to promote training and employment opportunities in growth sectors including construction.
- £2.7million Local Growth Fund capital invested in Bath College's construction skills centre.
- Education partnerships established with Further Education for construction and engineering that includes supporting schools in promoting of opportunities.
- A locally managed apprenticeship grant for Employers, ran from August 16 to April 17, incentivising construction apprenticeship starts, achieving 29% of all claimed starts to date.

Table of Contents

1.	Introduction	13
2.	DEMAND ANALYSIS METHODOLOGY	14
2.1.	Introduction.....	14
2.2.	About labour forecasting.....	1
2.3.	Pipeline analysis.....	2
2.3.1.	Analysis of the Glenigan pipeline	2
2.3.2.	Supplementing with additional data.....	4
2.3.3.	Dealing with “cliff edges” in pipelines	4
2.4.	Aligning the Glenigan pipeline with CSN output	5
2.5.	Calculating total labour demand	5
3.	A VIEW OF DEMAND	15
3.1.	Pipeline of defined projects.....	15
3.1.1.	Glenigan pipeline analysis.....	15
3.1.2.	Glenigan & NICP spend analysis.....	17
3.1.3.	Hinkley Point C	17
3.2.	Estimate of total labour demand	18
3.2.1.	Glenigan and NICP labour demand	19
3.2.2.	Breakdown of labour demand by project type	20
3.3.	Summary of demand	20
3.4.	Hinkley Point C.....	21
3.4.1.	Job roles and skills required for the project	22
4.	A PICTURE OF SUPPLY	23
4.1.	Main points	23
4.2.	Existing workforce.....	24
4.3.	Training Provision	29
5.	MOBILITY OF THE WORKFORCE	34
5.1.	Main points	34
5.2.	Work history.....	34
5.3.	Workers Origins	35
5.4.	Travel to Site.....	35
5.5.	Site duration and change.....	36
5.6.	Sub-sector and sector mobility	36
5.7.	Leaving the sector	36

6.	DEMAND AGAINST SUPPLY.....	38
6.1.	Main points	38
6.2.	Gap Analysis	39
6.2.1.	Construction specific.....	41
6.2.2.	Cross sector occupations	41
6.3.	Gap Analysis – Long Term.....	42
6.4.	Gap Analysis – Training Needs	43
7.	RECOMMENDATIONS.....	45

List of Figures

Figure 1: Map of West of England area and surrounding areas	13
Figure 2: The West of England area significant projects in Glenigan used in this analysis.....	16
Figure 3: Total construction labour demand including estimates for both R&M and projects not in the defined project pipeline.....	18
Figure 4: Construction labour demand by occupation in the peak year	19
Figure 5: Year on Year change in Construction Employment (Experian/CITB & NOMIS 2016)	24
Figure 6: Year on year change in Construction Businesses (UK Business Count, NOMIS 2016)	25
Figure 7: Distribution of construction businesses within the West of England area (UK Business Count NOMIS 2016)	26
Figure 8: Construction employment by area within the WOE LEP region (NOMIS 2016)	26
Figure 9: Size of Construction Businesses (UK Business Count, NOMIS 2016)	27
Figure 10: Furthest distance worked in past 12 months (CITB, 2015).....	35
Figure 11: Average number of weeks from planning to work on site, UK 2010 - 2013 (Source: UKCG/Glennigan0.....	38

List of Tables

Table 2: Breakdown of the significant project and total values in the West of England area, as captured in Glenigan	15
Table 3: New-build construction spend by project type in 2017 (total defined project pipeline)	17
Table 4: Construction spend per infrastructure sub-type in 2017 (total defined project pipeline)	17
Table 5: Defined project new-build projects construction labour demand ...	20
Table 6: Construction occupational breakdown, 2016 (Source Experian and CITB).....	28
Table 7: Competence qualification achievement in West of England area as a % of total achievements in South West	30
Table 8: Top 4 providers within the West of England area (Source: CITB/SFA)	32
Table 9: Unique Learner starts by area, construction subjects, all levels (Source CITB/SFA).....	32
Table 10: Occupational breakdown of demand for the West of England area against current employment (Source CITB/WLC).....	40
Table 11: Occupational breakdown of ARR for South West as a whole	42
Table 11: Proportion of total value related to construction.....	3
Appendix Table 12: Region/nation employer operates in, compared with region/nation working in currently	28

1. Introduction

The demand analysis examined the construction projects for which details were available for the local authorities in the West of England area:

- North Somerset

And the three local authorities that now make up the West of England Combined Authority:

- Bath & North East Somerset
- Bristol
- South Gloucestershire

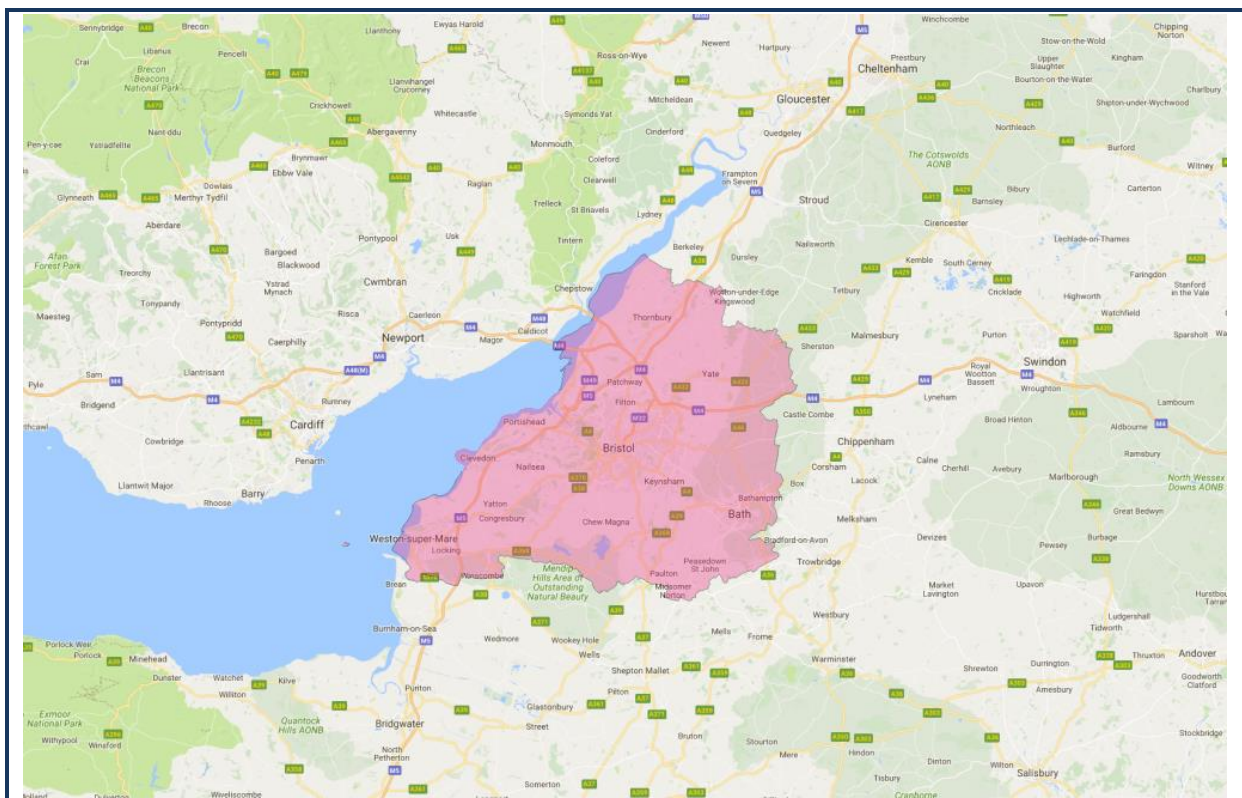


Figure 1: Map of West of England area and surrounding areas

2. Demand analysis methodology

Labour demand depends on the expected level and type of construction activity within a defined geographical area. This commission involves a mixture of projects with different types of work (e.g. housing, infrastructure) happening at different times. Our analysis derives as complete a picture as possible of the type and timings of projects within an area. Once this picture has been determined the labour demand for each project is estimated using our Labour Forecasting Tool (LFT). To produce the demand forecast we have utilised the following.

- **Labour Forecasting Tool:** CITB's Labour Forecasting Tool is an online application that can forecast labour needs for a range of construction projects using labour coefficients derived from data provided by the Office for National Statistics (ONS). The LFT forecasts monthly skills and employment needs from a project's value and start/completion dates.
- **Construction Skills Network:** The Construction Skills Network (CSN) provides market intelligence for the UK construction industry. The data it produces highlights trends and how the industry will change year-on-year, allowing businesses to understand the current climate and plan ahead for the future.
- **Glenigan Pipeline:** Glenigan produce a pipeline of forthcoming projects within each local authority of the UK. These are collated to allow contractors to identify leads and to carry out construction market analysis.
- **National Infrastructure and Construction Pipeline (NICP):** The Infrastructure and Projects Authority (formerly Infrastructure UK and Major Projects Authority) compile a pipeline of UK infrastructure and construction projects and the associated annual public and private investment¹. The Autumn 2016 NICP includes details of the annual spend on each of around 720 items valued at some £500bn to 2020 and beyond.

The LFT produces an estimate of the labour demand on a monthly basis. It should be noted that the workforce will only peak for a relatively short period of time. The ramp up and ramp down to that peak may be quite large and is likely to be smoothed by local contracting markets. In light of that we have presented the average workforce during the year of the peak. Labour demand figures have been rounded to the nearest 50.

An explanation of the methodology is included in the Appendices.

¹ The Autumn 2016 pipeline includes both construction and infrastructure projects but for the purposes of this analysis we have solely used projects which are clearly defined specific projects rather than regional programmes of work.. This reduces the risk of double counting with data in Glenigan.

3. A view of demand

The following sections provide an estimate of the labour demand that construction investment will create across the West of England area over the period 2017-2021.

As outlined in the methodology section the demand analysis was carried out in three stages:

- The first stage comprised analysis and processing of the defined project pipeline to create a snapshot in time of the labour demand arising in the area from the currently recorded projects together with additional data from the NICP. This value of work has been capped to be consistent with the volume of activity in each sector from the CSN
- Secondly, an estimate of the labour demand generated by the new-build supplement is calculated.
- Thirdly, the labour demand generated by R&M projects not included in Glenigan is estimated.

3.1. Pipeline of defined projects

3.1.1. Glenigan pipeline analysis

The initial review of the Glenigan database resulted in the removal of one project due to missing values and 49 projects due to missing dates. Also excluded were nine projects which were clearly identified as consultancy projects and 104 duplicated projects. A full set of the projects which were omitted from the analysis is provided in Appendix C.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects in the West of England area. The application of the mean value theorem identified 125 significant projects accounting for 74% of the total construction spend in the area. This allowed a detailed analysis of a large proportion of all the projects and a comprehensive consideration of the project types to which they were assigned.

Table 1 shows the number of significant projects within the West of England area, the percentage of spend arising from the significant projects and the total spend. The construction spend shown in this table takes account of any adjustments for engineering works and any incomplete, duplicate or consultancy projects. Values are shown in 2016 prices, the base price used in the Glenigan database.

Table 1: Breakdown of the significant project and total values in the West of England area, as captured in Glenigan²

	West of England LEP Area
Total construction spend in all projects (£m – 2016 values)	£12,652
Total number of projects in pipeline	668
Number of significant projects in pipeline	125
Total Construction spend in significant projects (£m – 2016 values)	£10,602
Percentage of total construction spend in significant projects	84%

Appendix D provides a full breakdown of the significant projects and their construction values. The peak year for the spend profile is 2017. The location of the significant projects within the West of

² The values in this table are the values from the Glenigan pipeline to which the construction element percentage has been applied and thus reflect the adjusted values of infrastructure projects values to distinguish between construction and engineering construction.

England area can be seen in Figure 2. The radius of the markers is in proportion to the value of the work taking place.

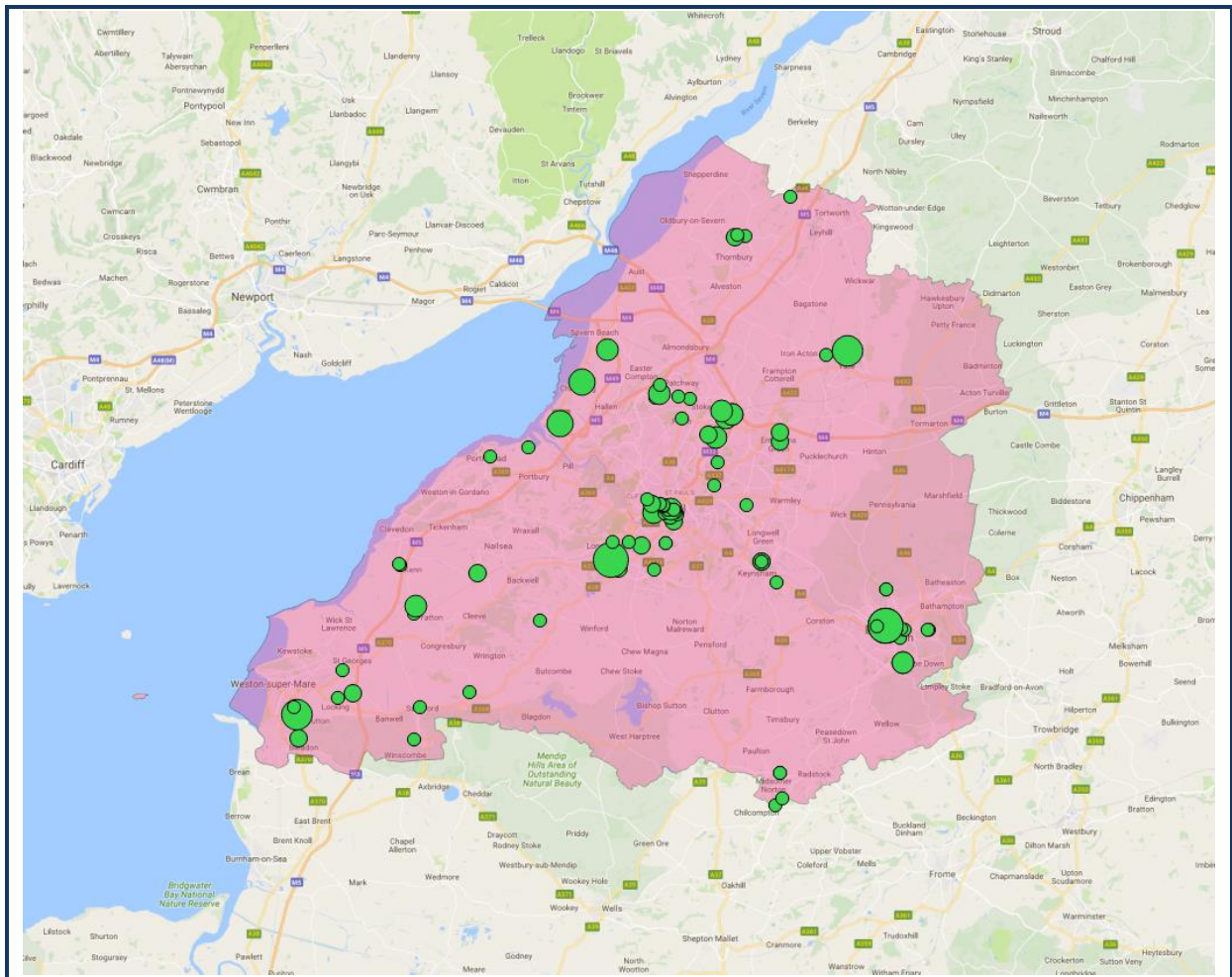


Figure 2: The West of England area significant projects in Glenigan used in this analysis

3.1.2. Glenigan & NICP spend analysis

Implementing the methodology outlined in section 2 leads to the following findings. The spend in 2017 of the total defined project pipeline is shown in Table 2 for new build projects only.

Table 2: New-build construction spend by project type in 2017 (total defined project pipeline)

Project Type	Construction spend in 2017 (2016 values - £m)	% of total
New Housing	378	33%
Private Commercial	347	30%
Infrastructure	306	27%
Public Non-housing	81	7%
Private Industrial	28	2%
Total	1,140	100%

The analysis considers demand from new build projects valued at £1.14 billion for 2017.

Table 3 shows the infrastructure construction spend from both Glenigan and the NICP in 2017 by sub-sector.

Table 3: Construction spend per infrastructure sub-type in 2017 (total defined project pipeline)

Project Type	Construction spend in 2017 (2016 values - £m)	% of total
Transport	175	57%
Water	64	21%
General Infrastructure	44	14%
Energy	12	4%
Flooding	10	3%
Communications	0	0%
Total	305	100%

3.1.3. Hinkley Point C

The site of Hinkley Point C sits close to the WECA & LEP area. While there is some understanding of the total value of the project, this is an unusual and largely unknown project for which data is limited and where there are insufficient similar precedents from which to draw reasonable forecasts. Hinkley Point is, therefore, considered separately from the main demand analysis.

The most recent edition of the National Infrastructure and Construction Pipeline (NICP) shows total capital expenditure on the project rising from £320m in 2016/17 to £1.44bn in 2017/18 and £2.08bn in 2018/19. Expenditure is expected to continue at the same level for the following two years, with a further £8bn to be spent from 2021. The construction element will make up only a part of these figures – though the proportion made up by construction is likely to be greater in the first half of the project.

The influence of Hinkley Point C may extend beyond the boundaries of the site with additional demand for new housing and facilities to accommodate the needs of a significant workforce as well as the associated infrastructure.

3.2. Estimate of total labour demand

As outlined in the methodology the defined project pipeline may not include smaller projects or repair and maintenance work. This section shows the outcomes of the analysis which includes the total construction labour demand with an employment growth rate included. This output is shown in Figure 3. The solid blue area shows the labour demand arising from the Glenigan and NICP projects including any R&M included in Glenigan or the NICP. The red shaded area shows the likely total labour demand arising from estimates of other work. The total construction labour demand including the volume of R&M imputed from the CSN model peaks for the area in 2021 at 30,800.

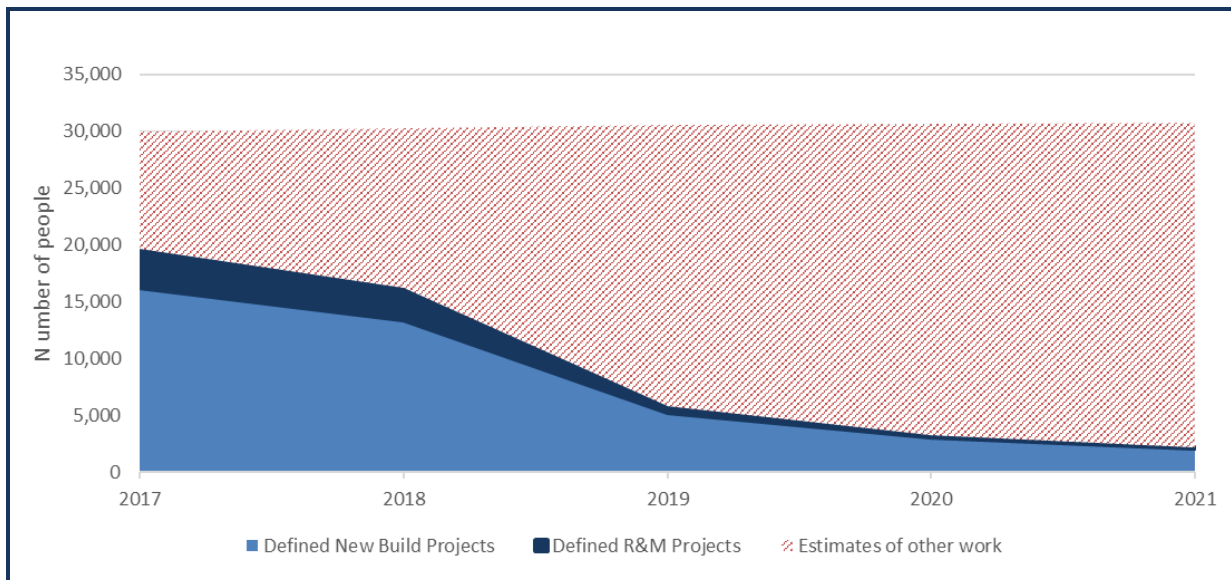


Figure 3: Total construction labour demand including estimates for both R&M and projects not in the defined project pipeline

3.2.1. Glenigan and NICP labour demand

For the peak year in Glenigan of 2017 the detailed breakdown by each of the 28 occupational groups for the Glenigan and the NICP projects is shown in Figure 4. This chart shows the breakdown by occupation for both the defined pipeline and the estimates of other work.

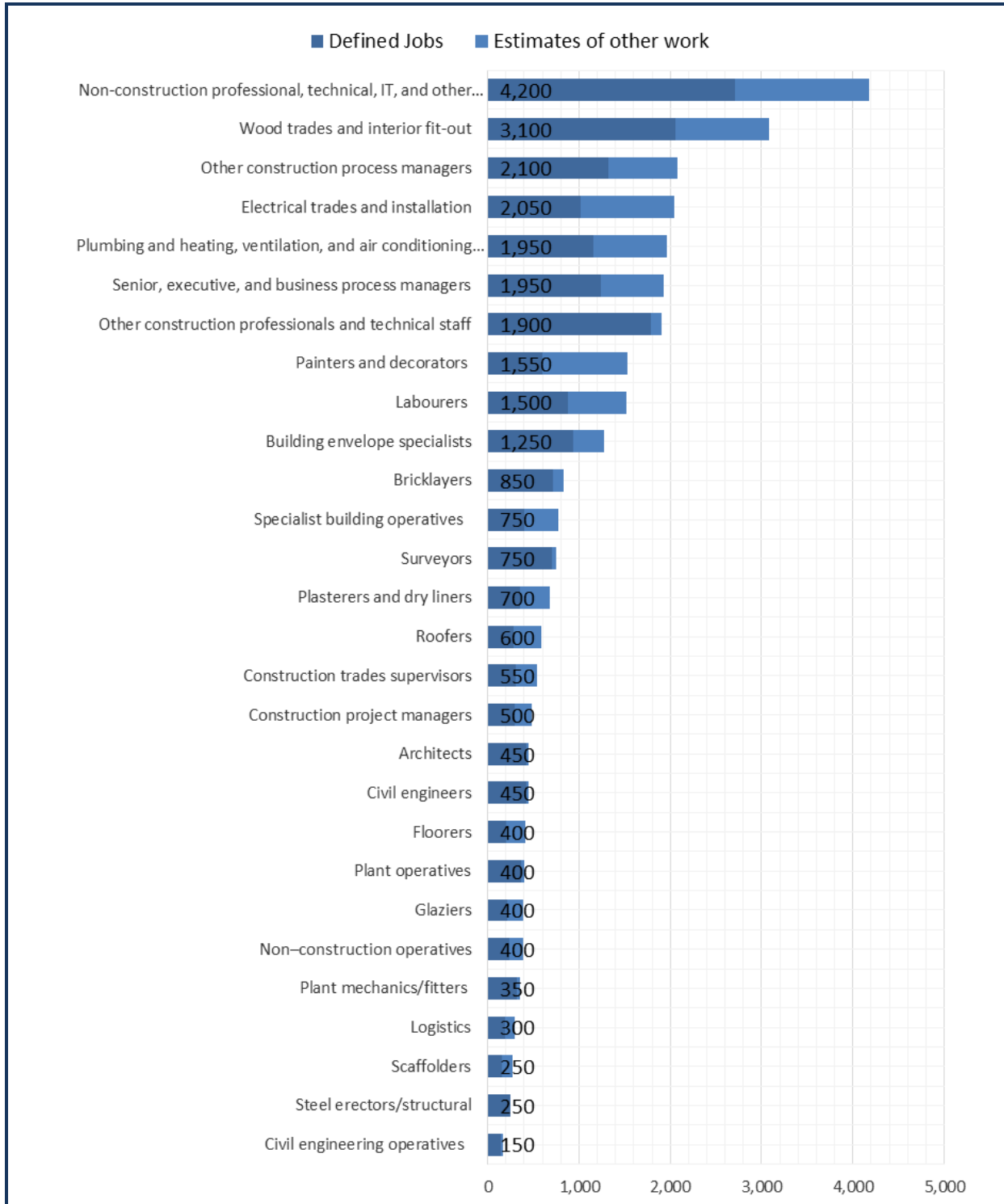


Figure 4: Construction labour demand by occupation in the peak year

3.2.2. Breakdown of labour demand by project type

The labour demand generated by the total defined projects and the estimates of other work have been calculated by each sector as shown in Table 4.

Table 4: Defined project new-build projects construction labour demand

Project Type	Defined Pipeline Labour Demand in 2017 (People)	Estimates of Other Work Labour Demand in 2017 (People)	Total Labour Demand in 2017 (People)	% of total in 2017
Non-housing R&M	250	7,700	7,950	27%
Private Commercial	6,550	-	6,550	22%
New Housing	6,050	-	6,050	20%
Housing R&M	3,250	2,550	5,800	19%
Infrastructure	1,600	-	1,600	5%
Public Non-housing	1,450	-	1,450	5%
Private Industrial	550	-	550	2%
Total	19,700	10,250	29,950	100%

3.3. Summary of demand

- The analysis of the labour demand arising from the construction spend in the West of England area peaks at around 33,450 people in 2017, taking account of estimates of other work including R&M in addition to the defined project pipeline of projects.
- During 2017, the peak year of the Glenigan pipeline demand, the most labour-intensive occupation group is “non-construction professional, technical, IT and other office-based staff” with an annual demand of 4,200 people.
- The estimate of labour demand for the trade occupations for the peak year of 2017 are as follows:
 - The trade occupation for which demand is highest is “Wood trades and interior fit-out” with 3,100 people demanded;
 - “Electrical trades and installation” follows, with a demand of 2,050 people.

3.4. Hinkley Point C

It is expected that the construction and operation of Hinkley Point C will have a significant impact on the economy of the West of England. The total value of the project is predicted to be around £18bn (excluding financing) spread over eleven years.

The most recent edition of the National Infrastructure and Construction Pipeline (NICP) shows total capital expenditure on the project rising from £320m in 2016/17 to £1.44bn in 2017/18 and £2.08bn in 2018/19. Expenditure is expected to continue at the same level for the following two years, with a further £8bn to be spent from 2021. The construction element will make up only a part of these figures – though the proportion made up by construction is likely to be greater in the first half of the project.

At the time of writing many of the contracts between Tier one contractors and EDF have still not been signed. So although work has commenced on site, no labour forecasts or Employment & Skills Plans have been released.

Once contracts are signed, the hope is that plans will become more visible, as the three *Tier-one* contractors will be expected to report progress every month and show labour forecasts on a 16 week basis. The three main tier one contracts are with:

- Kier BAM JV – earthworks
- Costain – a temporary jetty and marine tunnels
- BYLOR JV – main civils works.

EDF Energy started preliminary work at Hinkley Point C, following government approval and the signing of contracts in September 2016. During the anticipated ten or eleven year construction, as many as 25,000 new jobs have been predicted. Though it is not clear how many of these jobs will be in construction, nor on-site or nearby at any one moment in time.

Indicative construction phasing information indicates that:

- **Earthworks** are likely to take between 24 and 30 months.
- **Civil construction** will commence at the start of year two and take approximately six years.
- **Mechanical, electrical and instrumentation** work will commence during year five and last for four or more years.
- **Commissioning** should start towards the end of year seven and last for up to four years with first one and then the second reactor commissioned.
- **Site clearance and landscaping** will take place in years ten and eleven.

	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Earthworks											
Civil construction											
Engineering											
Commissioning											
Clear & landscaping											

There are likely to be a significant range of new activities and associated training, certification and support required across a huge range of activities.

3.4.1. Job roles and skills required for the project

Once main contractors have published employment and skills plans it will be easier to identify the likely demand for workers and skills and at what point in time. At this point the WECA & LEP can review and further develop any plans for local training and development with colleges and other institutions.

In particular the WECA & LEP will be able to work with the *Hinkley Point Training Agency*, which is a coalition of local colleges and training providers established to provide a brokerage service to meet the skills challenge presented by Hinkley Point.

The following key areas of construction recruitment have been identified as of importance.

- Steel Fixers
- Light Plant
- Medium Plant
- Heavy Plant
- Construction Operatives.

In the 2015 report, the estimate was that the peak workforce for Hinkley Point C would be approximately 4,300 workers. This compares with:

- a) An estimated peak demand of 29,500 workers for the known construction pipeline for 2017 for the West of England area. [See the labour demand generated by the total defined projects and the estimates of other work, calculated by each sector shown in in Table 4.]
- b) An estimated total construction workforce from the Construction Skills Network for the West of England area of 52,136 and for the South West Region of 226,680. {See in Table 5 below.]

That indicates that the peak Hinkley Point construction workforce is approximately equivalent to:

- 1.9% of the South West Region construction workforce.
- 8.2% of the West of England construction workforce.
- 14.6% of the peak West of England workforce demand

It is important to note the particular and unusual labour demands expected of Hinkley Point that are unlikely to match the profile of the South West region construction workforce.

4. A picture of supply

When looking at the supply of workers there are two main elements to consider: the size of the current workforce and the existing amount of training.

The first element of this section takes a view on the current employment levels in the West of England area and how this relates to overall employment across the wider South West region and the UK as a whole. The West of England area covers Bath and North East Somerset, City of Bristol, North Somerset and South Gloucester local authority areas, and the West of England area falls entirely within the larger South West region (which in addition to those mentioned, also includes Bournemouth, Cheltenham, Christchurch, Cornwall, East Devon, East Dorset, Exeter, Forest of Dean, Gloucester, Isles of Scilly, Mendip, Mid Devon, North Devon, North Dorset, Plymouth, Poole, Purbeck, Sedgemoor, South Hams, South Somerset, Stroud, Swindon, Taunton Deane, Teignbridge, Tewkesbury, Torbay, Torridge, West Devon, West Dorset, West Somerset, Weymouth and Portland, and Wiltshire) All comparisons have therefore been made against the South West area and, where applicable, the UK. Data from CITB's Construction Skills Network is used along with official Government Sources.

For the second section, whilst training occurs at Further Education (FE) and Higher Education (HE) levels, the focus of this report is more often on the FE that takes place. This is because FE tends to be sourced and delivered in a closer proximity to the home and workplace, whereas the length of study time and specialism for Universities for HE typically give much greater degrees of mobility. The much longer period of time taken to acquire qualifications and experience mean most HE qualified occupations are outside the period that this report can consider.

(That does not mean that the West of England Combined Authority & LEP should not have ambitions to move workers through to higher level training and education. There may also be opportunities for more leadership and management, as well as specialist training and development.)

Finally, the demand forecasts are then compared against employment, training and workforce mobility to give an indication of possible gaps and/or occupational pinch points.

4.1. Main points

- Over half of the workforce in the West of England area is located within the City of Bristol local authority area.
- Current construction workforce within the LEP is estimated at just over 51,000.
- Recent employment trends show that in 2016 employment grew at a greater rate in the LEP area than the South West as a whole.
- Around 60 training providers have delivered construction relevant FE courses with the West of England area over the last four academic years with four main providers delivering 88% of provision.

4.2. Existing workforce

Recent trends: workforce & Business

- The West of England area construction workforce grew by nearly 19% between 2012 and 2016, above the South West rate of growth of just over 5%.
- There has been a 18% increase in the number of Micro-sized construction businesses from 2012 – to 2016 within the West of England, accounting for almost all (96%) of the growth in construction businesses in the area over this period.
- Self-employment in 2016 almost 43% of the total workforce, up from almost 39% in 2012.

An analysis of the Annual Population Survey shows that the **West of England area accounts for around 23% of construction employment in the South West**³ Figure 5 applies this percentage share across the CSN occupation breakdown for the South West region as a whole to give an estimate of total employment at occupational and industry level in the West of England. For comparison the wider South West region has been included.

Between 2012 and 2016 the construction workforce in the West of England area grew by 11.8%. However this growth has not been seen each year with declines in both 2012 and 2014. This follows a similar pattern in the whole of the South West with an overall growth over the five years of 5.2% but with declines in both 2012 and 2014. The changes in the construction workforce at LEP, region and UK wide are detailed in Figure 5 below

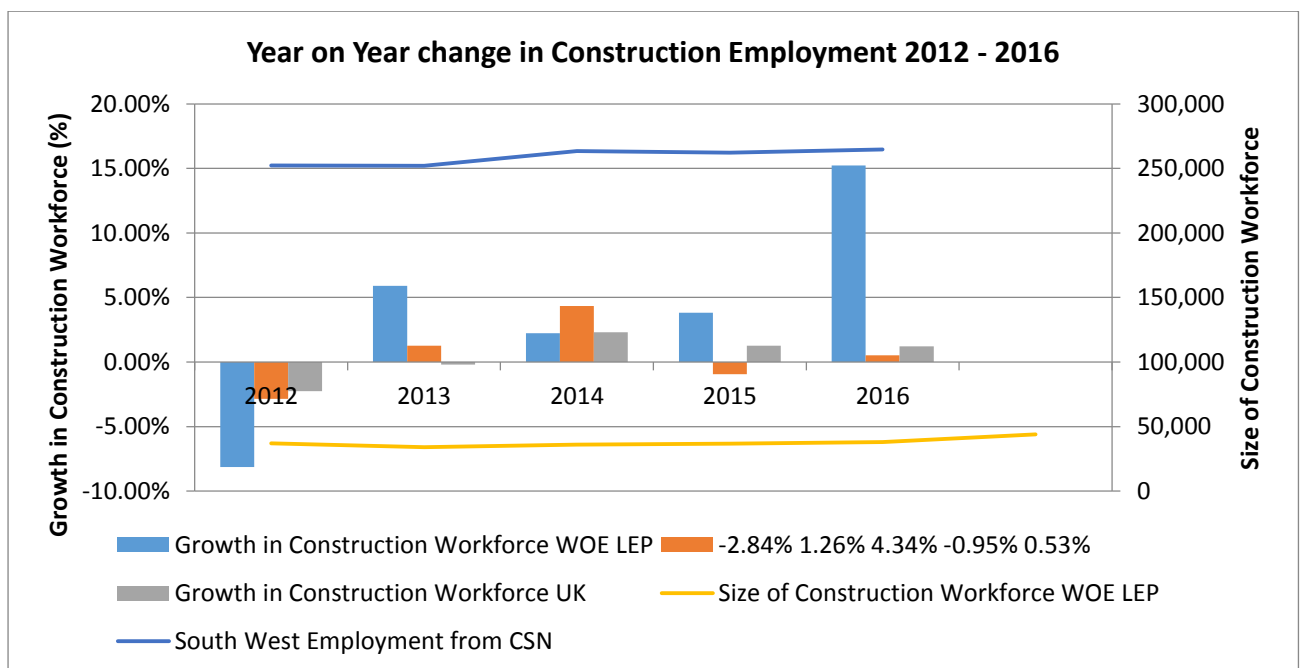


Figure 5: Year on Year change in Construction Employment (Experian/CITB & NOMIS 2016)

The share of South West construction businesses in the West of England area has risen from almost 18% in 2012 to just over 19% in 2016. The number of businesses in the LEP area in 2012 was 4,715, this increased to 5,545 in 2016, an increase of 18%. In the South West as a whole the number of businesses increased by only 10%. Figure 6 shows the year on year change in construction businesses across the West of England area, the South West region and the UK as a whole.

³ ONS/NOMIS (2016) Annual Population Survey Workplace analysis Jan 2016 – Dec 2016

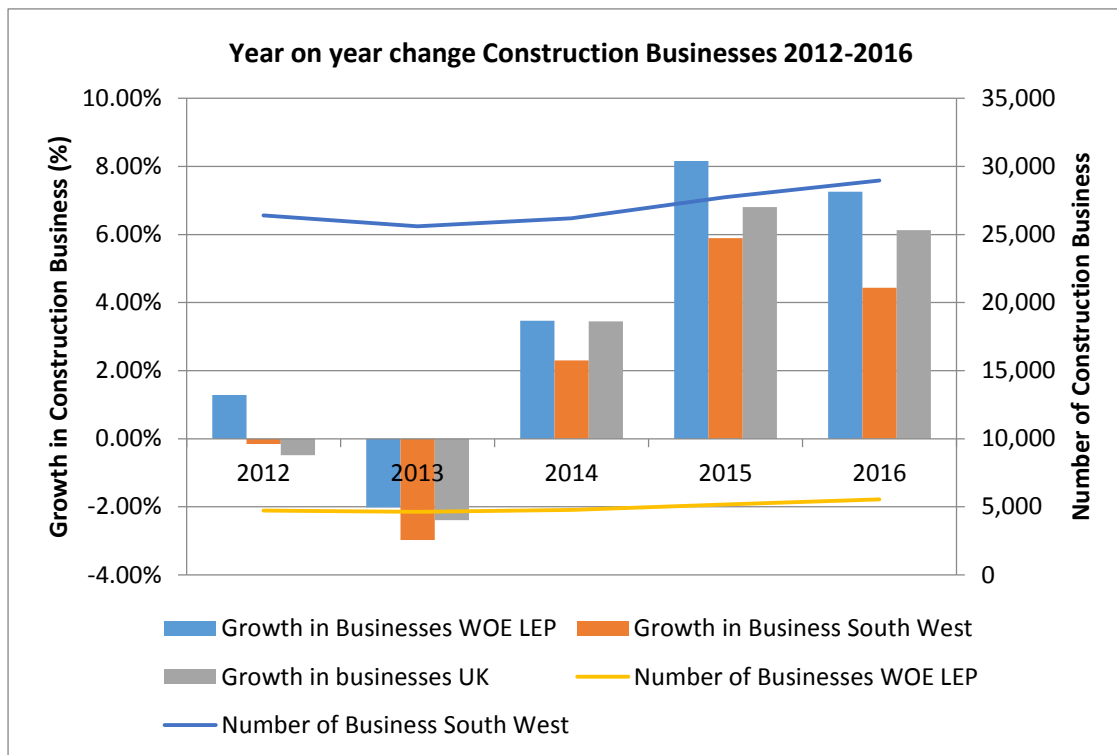


Figure 6: Year on year change in Construction Businesses (UK Business Count, NOMIS 2016)

Figure 7 shows the distribution of construction business within the West of England area, and Figure 8 shows the distribution of the construction workforce. The distribution of businesses and workforce are quite similar in North Somerset and Bath and East Somerset local authority areas with North Somerset having a 21% share of the LEP businesses and workforce and Bath and East Somerset having a 17% share of businesses and 16% of the workforce. However in Bristol City and South Gloucester the share is quite different with Bristol City having a 16% share of the total businesses in the LEP area but a 51% share of the construction workforce and South Gloucester having a 28% share of businesses but only a 12% share of the construction workforce.

This difference in share of businesses and workforces means that Bristol City is likely to have more medium or large companies whilst the remaining local authority probably have more micro and small businesses. It could also be the case in South Gloucester that the construction workforce could also consist of a greater number of people from outside of the district as the share of workforce is much lower than that of the businesses.

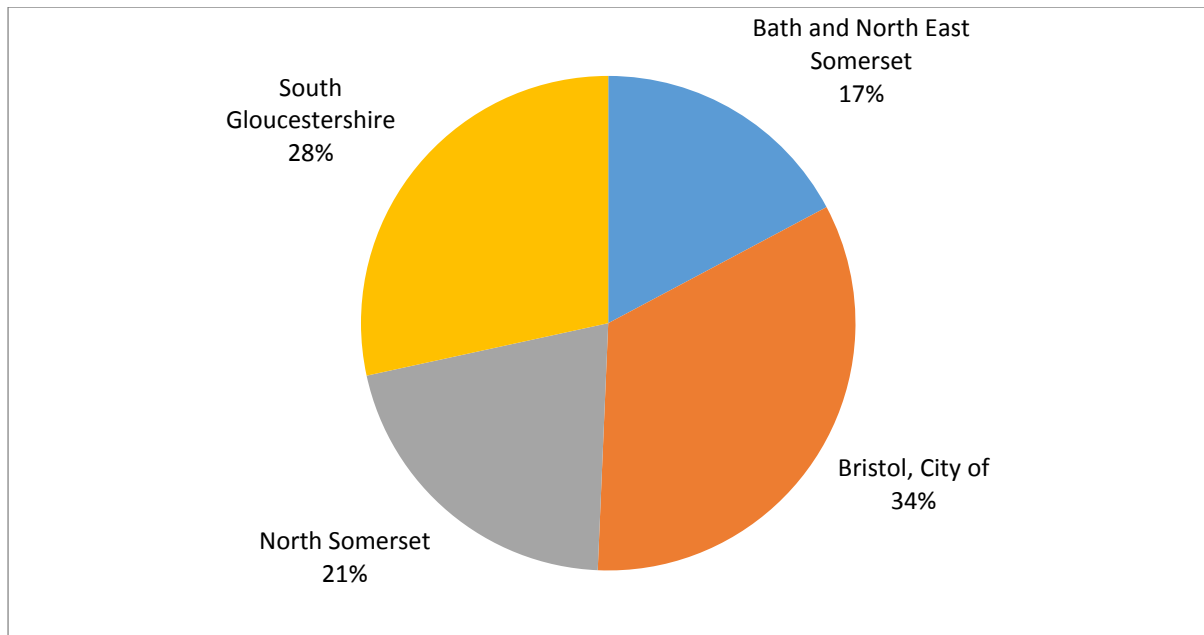


Figure 7: Distribution of construction businesses within the West of England area (UK Business Count NOMIS 2016)

Between 2012 and 2016 the distribution of the workforce has changed slightly, both Bath and East Somerset and City of Bristol share has decreased whilst North Somerset and South Gloucestershire have increased their share. However despite these changes the highest proportion of the workforce both in 2012 and 2016 is City of Bristol and the lowest is North Somerset.

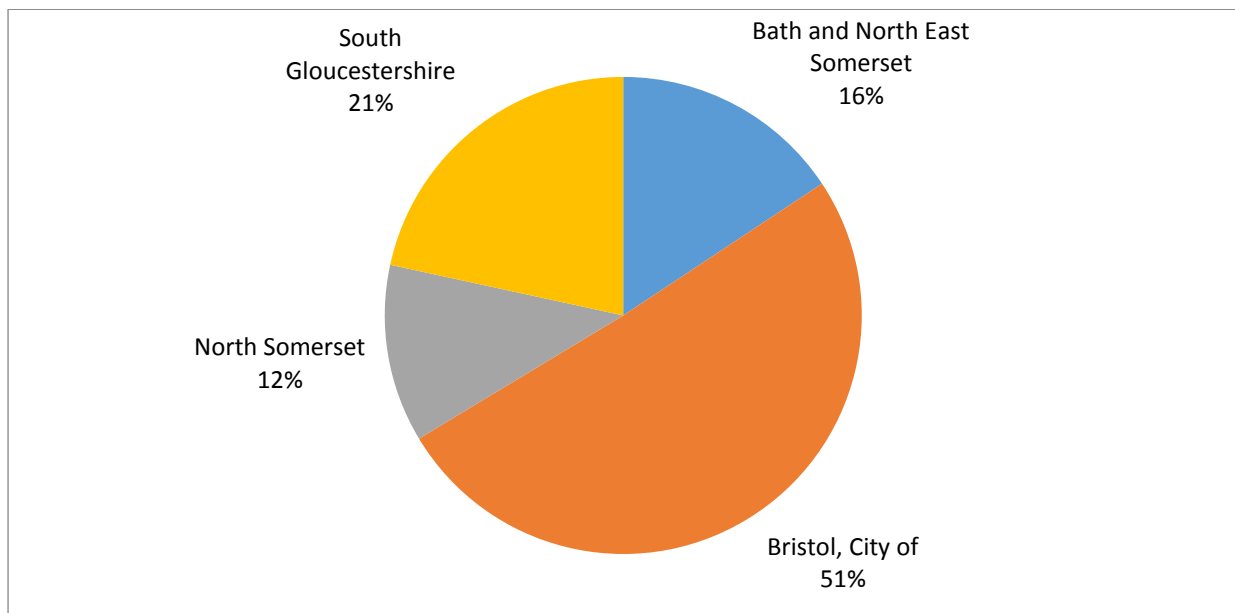


Figure 8: Construction employment by area within the WOE LEP region (NOMIS 2016)

There are two main factors that are important when looking at the construction sector. These are:

- Direct employment vs self-employment
- Size of business.

The construction sector traditionally has high levels of self-employment with around 40% of the GB construction workforce being self-employed. In the LEP area this is even higher with nearly 43% of the workforce being self-employed. The number of self-employed workers in the LEP area has increased by nearly 18% since 2012.

When it comes to business size, the distribution of companies across the West of England area is very close to the pattern seen across the South West as a whole and indeed the United Kingdom, with the majority of construction companies being micro sized, i.e. less than 10 employees, ref Figure 9.

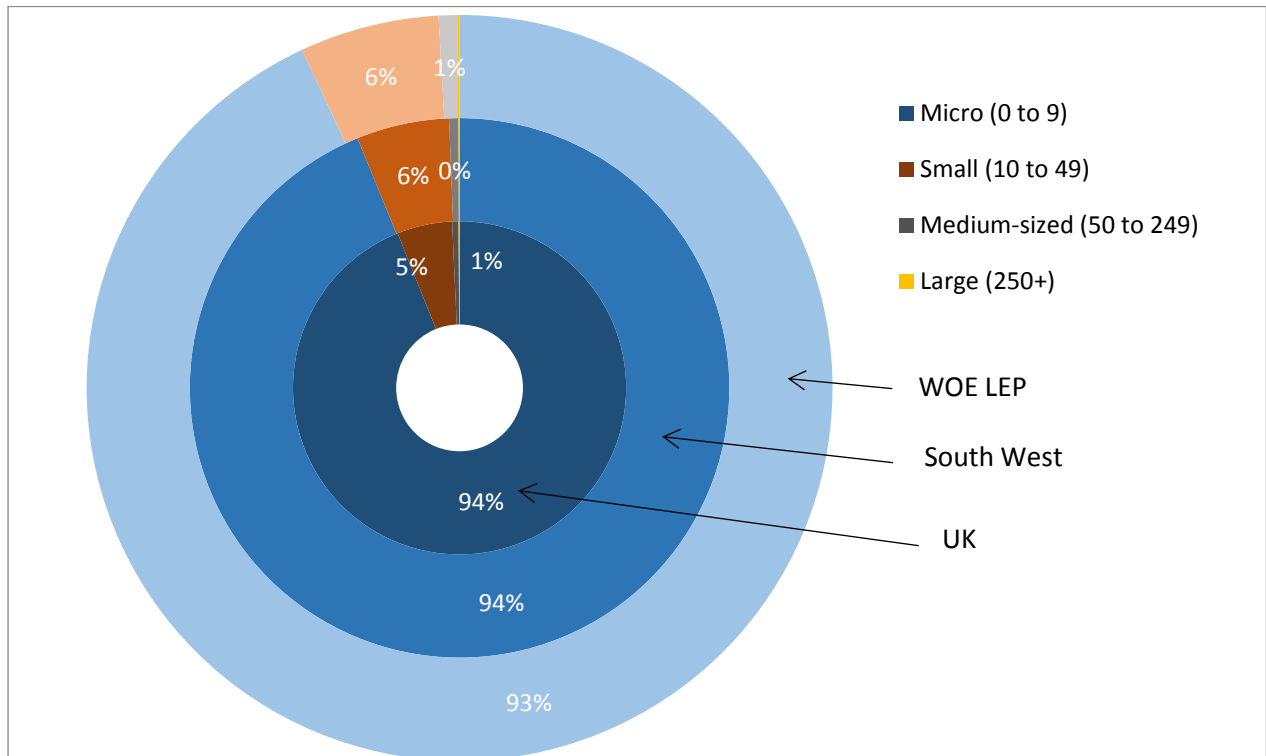


Figure 9: Size of Construction Businesses (UK Business Count, NOMIS 2016)

In the West of England area, 93% of all construction businesses are Micro sized. This is in line with both the wider South West region (94%) and also the United Kingdom as a whole (94%). The majority of the growth in construction businesses has been due to an increase in the number of Micro size companies, accounting for 96% of the growth in construction businesses from 2012 to 2016 in the LEP during this period. The pattern of growth in the South West region as a whole is slightly different from the West of England area as the number of large companies has increased by 100% although in actual numbers there were 10 companies in 2012 and 20 in 2016.

Table 5: Construction occupational breakdown, 2016 (Source Experian and CITB)

Occupation	West of England area	South West
Other construction professionals and technical staff	3,478	15,121
Senior, executive, and business process managers	3,433	14,925
Other construction process managers	2,679	11,649
Surveyors	1,498	6,512
Construction Trades Supervisors	749	3,256
Architects	643	2,795
Civil Engineers	611	2,656
Construction Project Managers	602	2,619
Wood trades and interior fit-out	6,350	27,608
Plumbing and HVAC Trades	4,249	18,474
Electrical trades and installation	3,670	15,958
Building envelope specialists	2,799	12,168
Painters and decorators	2,557	11,116
Labourers nec*	1,981	8,613
Bricklayers	1,767	7,684
Plasterers	1,145	4,979
Roofers	1,033	4,493
Specialist building operatives nec*	920	4,001
Plant operatives	889	3,867
Scaffolders	852	3,702
Glaziers	635	2,762
Steel erectors/structural fabrication	559	2,431
Civil engineering operatives nec*	542	2,355
Plant mechanics/fitters	499	2,169
Floorers	296	1,287
Logistics	216	940
Non-construction professional, technical, IT, and other office-based staff	7,059	30,693
Non-construction operatives	424	1,845
Total	52,136	226,680

Key

Manager/Professional occupations
Skilled Trades
Office-based Staff

4.3. Training Provision

West of England area has:

- Nearly 88% of learner volumes covered by four main providers.
- Training across the full range of construction occupations.
- Good levels of competence qualification achievements across many construction occupations, most notably bricklaying, plumbing and HVAC trades, electrical trades and installation and wood trades and interior fit-out.

Although training provision in the West of England area has remained fairly stable over the three years from 2012/13 to 2014/14, in 2015/16 the number of starts fell by 23%.

- The fall in starts is largest in the City of Bristol (39%) and smallest South Gloucester (8%).

CITB analysis of Skills Funding Agency Individualised Learner Records from 2012/13 through to 2015/2016 academic years for construction learners shows that:

- The West of England area accounts for 22% of identified construction related training across the South West region.
- The decrease in starts in the LEP area in 2015/16 is mirrored in the South West as a whole although the fall in starts here is only by 10%.
- Although the overall number of starts has fallen in the West of England area in 2015/2016, the number of apprenticeships have increased since 2013/2014 and increased by almost 4% over 2014/2015.
- The number of achieved apprenticeships has also increased within the West of England area with an increase of 23% from 2014/15 to 2015/16.
- Although the majority of training undertaken in the West of England area is more “Knowledge” based the proportion of these in the overall starts has fallen with the proportion of “Competence” based qualifications increasing from a 14% share in 2014/15 to 21% share in 2015/16.
- An increase in “Competence” based training would be beneficial as these qualifications are generally more readily sought by construction employers.
- The increase in the proportion of “Competence” based qualification is also seen in the wider South West area with the proportion of “Competence” based qualifications increasing from 17% in 2014/15 to 22% in 2015/2016.

Looking at the “Competence” based qualifications (which are, in the main, NVQs) a link can be made between the qualification’s title and the likely occupation that an individual will have. For example someone starting or achieving a Bricklaying qualification is highly likely to be working as a Bricklayer as competence based qualifications are based on an assessment of work based skills.

Table 6: Competence qualification achievements in the West of England area as a total of achievements in the South West as a whole (all qualification levels) looks at qualification achievements over the last four academic years for the identified competence based qualifications. It compares achievement volumes against the overall pattern within the South West as a whole. From this analysis we look for patterns for particular occupations.

[The information shown in Table 6: Competence qualification achievement in West of England area as a % of total achievements in South West as a whole (all qualifications levels) has been produced by mapping qualification reference numbers and titles to the most appropriate Construction Skills Network occupations. This has been built up over a number of years by CITB with over 1,800

qualifications reviewed and linked where possible. Note: there are some qualifications that have broad or generic titles that cannot be linked to distinct occupations.]

Table 6: Competence qualification achievement in West of England area as a % of total achievements in South West

Construction Occupations	2012-13	2013-14	2014-15	2015-16	Total Achievements	Total
Grand Total	1229	946	940	522	3637	
Main Occupations	%	%	%	%	Number	%
Bricklaying	20	16	17	7	260	14
Electrical trades and installation	16	13	11	12	380	13
Painters and decorators	16	28	27	32	150	24
Plant operatives	9	11	8	11	160	9
Plumbers and HVCA	25	26	20	12	410	20
Wood trades and interior fit-out	23	24	25	13	650	21
Occupations to Monitor						
Civil Engineering operatives	64	54	37	31	450	45
Construction managers	33	20	50	0	<25	33
Glaziers	78	42	15	7	390	47
Plasterers and dry liners	25	21	13	4	50	17
Roofers	60	22	0	29	70	42
Specialist building operatives nec*	34	12	13	8	130	19
Occupations with good provision						
Building envelope specialists	25	4	35	54	140	19
Floorers	13	14	20	30	80	19
Other construction professionals & technical staff	40	33	48	9	40	33
Plant mechanics and fitters	5	2	10	13	<25	
Scaffolders	27	38	49	29	220	37
Low Overall Learner Volumes						
Construction trade supervisors	23	73	0	0	30	40
Logistics	0	0	0	0	0	0
Steel erectors/structural	63	0	11	0	<25	10

*nec – not elsewhere classified

Note: Total achievements are across the period 2012-2013 to 2015-2016 and have been rounded to nearest ten

The majority of the achievements referred to in Table 6: Competence qualification achievement in West of England area as a % of total achievements in South West as a whole (all qualification levels) are at Level 2 with a smaller proportion at Level 3 and a very small minority at Level 4 and above.

The percentage comparison with the South West as a whole is used as a device to demonstrate the provision of training in the West of England area by occupations relative to one another to gauge where provision is relatively high or low.

Relatively high provision is highlighted in green and **Relatively low provision is highlighted in red**

In some cases, where total provision across the whole South West has declined, while as a proportion the West of England may appear to have increased provision, the actual number of completions may have declined – this is the case for Building Envelope Specialists.

There are a group of occupations that account for the main training volumes, which are generally consistent with the overall pattern seen in the South West. These are:

- Bricklaying
- Electrical trades and installations
- Painters and decorators
- Plant operators
- Plumbers and HVCA
- Wood trades and Interior fit-out

Here the qualification achievements are consistent to the overall share of training being achieved in the LEP area or there is a larger volume being delivered against them. For occupations such as wood trades and plumbing, the volume of training will be related to their share of employments. While for others such as plant operators training will be more related to the need to demonstrate competence for these roles through card scheme monitoring, for example the CPCS card scheme for Plant Operatives.

The second group – occupations to monitor identifies a number of occupations where we would expect higher levels of training again linked to either the occupational size and/or demonstrating competence. For this cluster which covers civil engineering operatives, construction managers, glaziers, plasterers and dry liners roofers and specialist building operatives, the share of training happening through the LEP is slightly lower than would be expected. It is possible that individuals with the West of England area may be travelling outside the area for this type of training.

For the third group – occupations with good provision the reverse is the case and there appears to be a higher level of provision for occupations such as building envelope specialists, floorers, other construction professionals and technical staff, plant mechanics and fitters and scaffolders. It could be that there are providers with particular specialisms in these areas operating within the LEP or a particular need for this type of training.

Lastly there is a group of occupations where the low level of learner volumes makes it difficult to judge patterns across the years. Whilst the training provider can adjust to cover changes in demand, there will be a requirement for a certain volume of training to make it viable for a provider to deliver it. These occupations could suffer from this intermittent demand or learners could be travelling further afield to more specialist training providers.

It is also interesting to note that there are some occupations where in 12/13 there was a quite a high level of achievement but this has then fallen quite significantly over the years to 2015/16. This is particularly apparent for glaziers 78% in 2013/14 down to 7% in 2015/16 and steel erectors/structural 63% in 2012/13 to nothing in 2015/16. This could be due to changes in provision where a local college ceases to offer that course or where provision for particular occupations is increased to meet the needs of a specific project. This could particularly apply to the increase in the delivering of steel fixers in preparation for Hinkley Point C.

In terms of training providers, from 2012/13 through to 2015/16 66 different providers have delivered training for the West of England area. However there is a consistent pattern with 85% of training delivered by four training providers. Ref: Table 7: Top four providers within the West of England area (Source CITB/SFA).

Table 7: Top four providers within the West of England area (Source: CITB/SFA)

Provider	2012/13	2013-14	2014-15	2015-16	Total	% Share of Total Quals
City of Bristol College	1,107	1,421	1,231	717	4,476	32%
Weston College of Further & Higher Education	398	1,207	1,084	767	3,456	25%
South Gloucestershire and Stroud College	511	565	595	670	2,341	17%
Bath College	388	431	414	421	1,654	12%

All of the main providers are located within the West of England area; this profile is typical of many geographical areas in that there is a relatively small group of FE colleges delivering the majority of construction training. A smaller proportion of additional training is then delivered by a larger number of other providers. Sometimes these smaller specialist providers can operate far from the normal base for those they provide training for. In total this training covers the majority of the main occupations involved in the construction workforce

When looking at training provision across individual local authorities within the West of England area, three of the local authorities have seen an increase in learner starts from 2012/13 to 2015/16 with City of Bristol showing a small decrease, illustrated in detail in Table 8: below.

Table 8: Unique Learner starts by area, construction subjects, all levels (Source CITB/SFA)

Local Authority	2012-13	2013-14	2014-15	2015-16	% Net change
Bath and North East Somerset	500	520	557	506	1.20%
City of Bristol	1179	1698	1832	1115	-5.43%
North Somerset	307	442	533	464	51.14%
South Gloucestershire	935	1092	1060	972	3.96%
Total	2827	3641	3875	3002	6.19%

As a whole, the West of England area is showing a small increase in the number of construction learner starts of 6.19% across the four academic years. This is similar to the wider South West region where the increase is 6.85% across the four years.

Overall, within the West of England area, when looking at the starts in terms of apprenticeship and other FE courses there was a slight decline in apprenticeship starts over the four academic years of just over 6% as opposed to an increase in FE starts of 13%. As with the overall starts the City of Bristol local authority area had a fall in apprenticeship starts whilst the other 3 local authority areas showed increases from just over 5% in North Somerset to almost 31% in Bath and North East Somerset. For the FE starts only Bath and North East Somerset showed a decrease over the four academic years whilst the rest of the local authority areas the FE starts increased over the four years.

4.4. Higher Education in context

This report has not considered in detail the provision of higher education qualifications by universities in the West of England Combined Authority and LEP area.

There are five broad HE qualifications that relate to construction. Of greatest relevance are: Architecture, Civil Engineering and Building; plus Landscape & garden design and Planning. There are also a small number of other courses linked to these fields.

There are a number of significant challenges to address in understanding Higher Education's place in UK construction. Most significantly, those starting and completing HE level qualifications tend to be willing to travel significant distances to study and then find employment.

For many students the opportunity to leave home and move to a new town or city is one motivation for entering HE. In the UK, this has become normalised. University students are more likely to move into a region to study and then once graduated, out of a region to find employment.

A 2014 study undertaken by Education Phase on behalf of TV Licensing indicated that the average distance from home to place of HE study was around 90 miles. This also indicated that of the sample, only around 5% of HE students were studying within 20 miles of home but that 78% moved 60 or more miles or were from overseas.

However, anecdotal evidence suggests that different institutions respond differently – with some universities indicating that they believe they attract students from closer to home while others have a more national and often international focus. This is, in part, down to the course type and its availability elsewhere. But there appears to be a rough correlation between the UCAS points required for entry to some universities and the distance students travel. Typically the most demanding universities draw students from a greater average distance.

Data available from: HESA 2014-15 Industry of full-time first degree graduates, indicated that

The employment destinations of students graduating in **Architecture, Building and Planning graduates were subsequently employed in:**

- 51% Professional, scientific and technical activities
- 23% Other sectors
- 20% Construction
- 6% Real estate activities

For graduates working in the construction industry, the subject in which they graduated was recorded as being:

- 24% Architecture, Building; Planning
- 30% Engineering
- 46% Other subject areas

5. Mobility of the workforce

Construction workforces are fluid by nature and this section of the report will look at findings from the CITB survey into Workforce Mobility and Skills in the UK Construction Sector 2015 to give picture of mobility within the workforce. Data specific to the South West will be analysed to understand how this might impact on future training interventions and the supply of job opportunities for local people.

5.1. Main points

- Nearly a third of South West construction workers have worked in the construction industry for over 20 years (31%) and more than half have worked in the industry for at least 10 years (55%).
- Overall three quarters of all construction workers in the South West were interviewed in the same region in which they were living in when they started their construction career (76%). This is lower than Northern Ireland which has the highest proportion (97%) but higher than London which has the lowest proportion (50%).
- The average distance from workers' current residence to their current site was 24 miles. The UK average is 22miles.
- Almost three quarters of all South West construction workers are confident when they finish their current job their next job will allow them to travel to work from their permanent home on a daily basis (73%).
- Overall nearly half of all construction workers have only worked on one project type
- Almost half (48%) of South West construction workers say they definitely will be working in construction in 5 years-time and a further two fifths (38%) think it is quite likely or very likely they will.

5.2. Work history

Nearly a third of South West construction workers have worked in the construction industry for over 20 years (31%) and more than half have worked in the industry for at least 10 years (55%). The most likely reason for working in the region is because they grew up there/have always lived there (73%) higher than the UK average of 55%. The majority of construction workers in the region have remained in the South West for all or most of their career (83%), this compares with a UK average of 80%. Also in the majority of cases, the last site workers were based was also in the South West (76%).

In terms of the regions/nations in which workers' current employer operates in, workers in the south West (83%) reported that their employer operated within the region/nation they were currently working in. In addition 18% reported operating in the South East, 15% in the West Midlands and 10% in both the North East and Wales. This is shown in Appendix E Region/nation employer operates in, compared with region/nation working in currently.

5.3. Workers Origins

Workers were asked which region they were living in just before they go their first job in construction in the UK. Overall three quarters of construction workers in the South West (76%) were interviewed in the same region in which they were living in when they started their construction career. By region/nation the highest proportion is 97% in Northern Ireland whilst the lowest is 50% in London.

In addition three quarters of construction workers in the South West (76%) have remained in the same region as they did their first qualification/training in. By region/nation, the highest proportion is 96% in Northern Ireland, followed by 95% in Scotland. At the lower end of the range, only around half of construction workers in the East of England (50%), South East (55%) and London (58%) are based in the same region/nation as where their first qualification was achieved.

5.4. Travel to Site

The majority of construction workers were interviewed on a site that was located within the same region/nation as their permanent home (83%) with 7% travelling in from the South East, 2% from Wales and the West Midlands and 1% from East of England, London and Northern Ireland.

All workers were asked to indicate the furthest distance they have worked from their permanent or current home in the last 12 months. Figure 10: Furthest distance worked in past 12 months (CITB, 2015) shows that within the South West, approximately 1 in 6 construction workers have worked no more than 20 miles away (16%) and a further third have worked between 21 and 50 miles away (31%). This leaves half that have worked more than 50 miles away from their permanent home (51%), with a quarter that have worked between 51 and 100 miles away (26%) and a quarter that have worked more than 100 miles away (25%). Workers in the South West were amongst those most likely to have travelled more than 100 miles from their home to their site in the last 12 months.

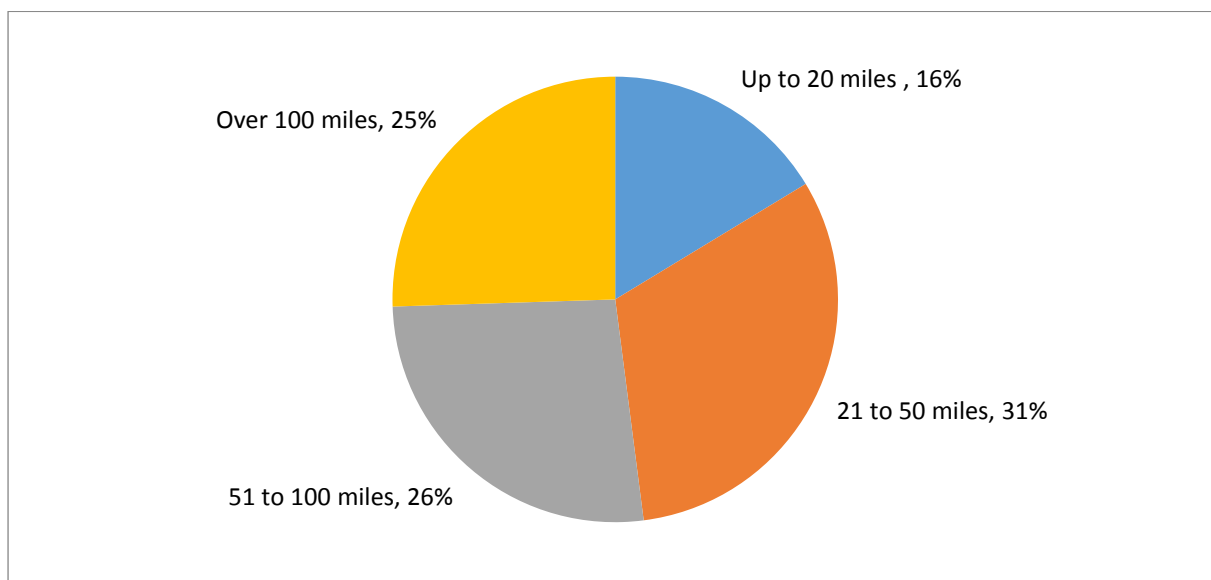


Figure 10: Furthest distance worked in past 12 months (CITB, 2015)

However within the South West, the average distance from workers current home to their current site was 24.1 miles. This compares to an average of 21.9 miles across the UK.

5.5. Site duration and change

In order to get a measure of workplace stability, workers were asked to indicate how long in total they expect to work at that specific site during this phase.

A quarter of all construction workers in the South West (24% cf. 23% in 2012) do not expect to work on that site for more than a month, including 6% that only expect to be there for about a week or less. A further quarter anticipated being on site for more than a month, but less than a year (24%), compared with a significantly higher proportion in 2012 (40%). Another quarter expect to stay on that site for a year or longer (27%), which is a significant increase compared with 2012 (17%), suggesting more stable employment than in 2012. However in the remaining quarter of cases (24%) workers did not know how much longer they could expect to be on site, indicating that a significant minority of temporary workers are living with a certain amount of uncertainty and insecurity.

The youngest workers, aged 16-19 are most likely to be unsure of how much longer they can expect to work for (35% don't know).

Almost three quarters of all construction workers in the South West are confident that when they finish this job they will get a job that allows them to travel from their permanent home to work on a daily basis (73%).

5.6. Sub-sector and sector mobility

All workers were asked which types of construction work they have spent periods of at least three months at a time working in.

Compared with 2012 there has been an increase in the proportion of construction workers that have been working on new housing within the South West; up from 76% to 83%. For all other types of projects the proportion of construction workers that have worked on them has fallen since 2012; public non-housing from 52% to 33%; private industrial work from 48% to 30%; commercial work from 51% to 34%; infrastructure projects from 35% to 23%; housing repair from 46% to 36%.

Overall nearly half of all construction workers have only worked on one project type (47%), compared with closer to a quarter in 2012 (28%), which again suggests a pattern of increased stability in the sector.

5.7. Leaving the sector

In order to assess the potential outflow from the sector in the next five years (led by worker preference), all workers were asked how likely it is that in 5 years-time they will still want to be working in construction. Within the South West, almost half of the construction workers say they definitely will be (48%); a further 38% think it is very or quite likely; 5% consider it unlikely; just 2% say they definitely won't be and a further 3% hope to be retired by then, while 4% don't know.

Excluding those aged 60 and over (as those over 60 may be assumed to be considering retirement in the next 5 years): 49% believe they will definitely want to be working in the construction sector, 25% believe it is very likely they will want to be working in the construction sector and 14% believe it is quite likely they will want to be working in the construction sector. Only 8% think on any level that they will not want to be working in the construction sector in 5 years-time which is less than in 2012 (13%).

Overall the findings from the Mobility Study indicate a stable, well established workforce across the South West. There is some evidence of movement between other regions/nations specifically the South East. However on the whole the workforce have grown up in the region, undertaken their

initial construction training in the region and have stayed there for the majority of their working life. Additionally optimism across the workforce is high with a majority expecting to still be in the construction industry in five years' time.

Setting the Mobility Study research against the overall workforce and business patterns noted earlier indicated that whilst the South West as a whole region has a stable workforce, workers within the West of England will not be limited to working only within the area – they may travel to work in other areas of the South West outside of the West of England. Likewise, workers in other areas of the South West will also be travelling to work within the West of England area.

6. Demand against supply

6.1. Main points

Before looking at demand against supply, it should be noted that the Glenigan dataset used to produce the demand view is based on projects that are picked up at various stages of the planning process. As such there will be projects in the pipeline that may not go ahead or be subject to delay; additionally there will be newer projects that will be added to the list. In this respect the view is essentially a snapshot of what potential work could look like.

When looking forward, there will be less visibility on future projects for work that requires shorter planning times. Research carried out by CITB on behalf of UKCG showed that the lead time from planning to work starting on site varied by the type of work and value. Large scale infrastructure and commercial projects took the longest time whereas lower value work in general, along with work in the industrial sector, was able to get on site quickest.

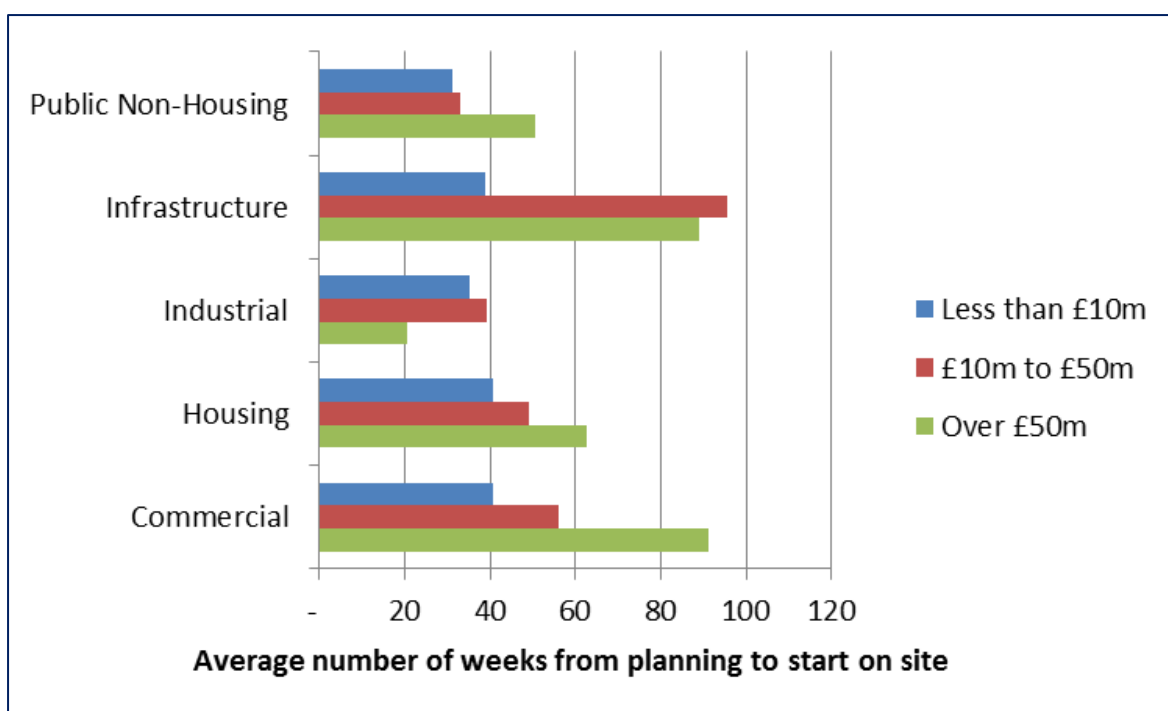


Figure 11: Average number of weeks from planning to work on site, UK 2010 -2013 (Source: UKCG/Glennigan0)

There will also be work carried out that does not require planning permission for example household repair and maintenance (R&M) work, and this can account for a significant share of work in the construction sector. Current estimates for R&M work in the South West indicate that it accounts for 23% of yearly construction output⁴

⁴ 2017-2021 Construction Skills Network – South West

Also different types of projects can be categorised by their type of build, such as housing, commercial or industrial, the workforce skills required are less easy to categorise in the same way as some occupations will be able to apply their skills across a number of sectors. For example, evidence from the 2015 mobility shows that occupations such as banksmen/bankspersons, dryliners and bricklayers are most likely to have only worked on one project type, while scaffolder, plant mechanics, roofers, painters and decorators and electrician are more likely to have worked on a wide range of projects⁵

6.2. Gap Analysis

With current construction employment in the West of England area estimated at just over 52,000 the identified demand forecast from Glenigan accounts for just over 57% of current employment in 2017 before reducing as the identified projects visibility decreases. Ref: Table 9.

⁵ CITB (2015) Workforce Mobility and Skills in the UK Construction Sector – South West

Table 9: Occupational breakdown of demand for the West of England area against current employment (Source CITB/WLC)

Occupations	West of England area	Risk of 2017 shortfall compared with 2016 employment
Construction Project Managers	602	0.80
Other construction process managers	2,679	0.78
Civil engineers	611	0.73
Construction Trades Supervisors	749	0.72
Architects	643	0.70
Senior, executive, and business process managers	3433	0.56
Other construction professionals and technical staff	3,478	0.55
Surveyors	1,498	0.50
Floorers	296	1.40
Logistics	216	1.35
Specialist building operatives nec*	920	0.84
Labourers nec*	1,981	0.77
Plant mechanics/fitters	499	0.70
Glaziers	635	0.62
Painters and decorators	2,557	0.60
Plasterers	1,145	0.59
Roofers	1,033	0.56
Electrical trades and installation	3,670	0.56
Wood trades and interior fit-out	6,350	0.49
Bricklayers	1,767	0.47
Plumbing and HVAC Trades	4,249	0.46
Building envelope specialists	2,799	0.46
Plant operatives	889	0.45
Steel erectors/structural fabrication	559	0.45
Scaffolders	852	0.32
Civil engineering operatives nec*	542	0.31
Non-construction operatives	424	0.91
Non-construction professional, technical, IT, and office-based	7,059	0.59
Total	52,136	0.58

KEY

Manager/Professional Role
Skilled Trades
Office-based Staff

Note:

nec* =not elsewhere classified

HVCA = Heating, ventilation and air-conditioning

Table 9 shows that there are some possible disparities where demand is likely to outstrip or get very close to current employment estimates for a number of occupations. These occupations show a high relative gap in comparison with other occupations

Among professional and managerial roles:

- Construction Project Management

Among Skilled trades

- Logistics
- Labourers
- Floorers.

There also appears to be a relatively high demand for Non-construction operatives. While some of these occupations are construction specific, others have cross-sector implications

6.2.1. Construction specific

Professionally qualified occupations, which tend to require degree qualifications, will require at least three years of education and training before becoming qualified plus years more to gain experience. Therefore if new candidates are to be encouraged to join the professions it is likely that encouragement is required some years before they start training.

It is therefore highly likely that the short term demand increase identified would require workers to be drawn into the West of England area from the wider region and possibly beyond

6.2.2. Cross sector occupations

As skills in these occupations can be used in other sectors, the degree to which demand can be met will be influenced by factors other than construction demand.

Non-construction operatives move between construction and other sectors such as manufacturing, and wholesale/distribution. It is possible that experienced workers could be required by other sectors as well as across the broader South West region.

Logistics skills also have an element of cross over, particularly with retail and transport sectors, which could mitigate potential demand. When compared to other occupational groups it is also lower in actual numbers which magnifies percentage changes.

In addition to the major projects identified in the Glenigan Pipeline, there will always be other work carried out in the West of England area that is captured within the demand analysis where additional workers will be required. This additional work includes projects that are less than £250,000, as well as repair and maintenance work that does require planning consent, and as noted earlier this is expected to mean a total workforce of just over 46,000 between 2017 and 2019.

This is quite a static level of future work that would account for around 60% of current employment, which indicated that future employment demand in most cases will be focused on replacing the current workforce levels and equipping them with appropriate skills, rather than an overall increase in demand.

6.3. Gap Analysis – Long Term

When looking at the longer term past 2017, the amount of known work in the area decreases. To give a view on the on the gap analysis across the wider range of work and over the longer term, the annual Average Recruitment Requirement (ARR) details within the South West CSN 2017-2021 can be used, bearing in mind that West of England has consistently related to around 23% of regional employment in recent years. With this relative share, it is fair to assume that the West of England area will face similar long term demands to those of the South West as a whole

Table 10: Occupational breakdown of ARR for South West as a whole

Occupations	2016 Employment Forecast South West	ARR 2017-2021 South West	ARR as % of 2016 Employment Forecasts
Non-construction professional, technical, IT & other office	30,693	1,080	3.5%
Senior, executive, and business process managers	14,925	380	2.6%
Wood trades and interior fit-out	27,608	370	1.3%
Plasterers	4,979	270	5.4%
Bricklayers	7,684	250	3.2%
Surveyors	6,512	250	3.8%
Painters and decorators	11,116	240	2.2%
Electrical trades and installation	15,958	240	1.5%
Roofers	4,493	230	5.1%
Plumbing and HVAC Trades	18,474	210	1.1%
Other construction process managers	11,649	190	1.6%
Glaziers	2,762	130	4.7%
Building envelope specialists	12,168	70	0.6%
Construction project managers	2,619	60	2.3%
Construction trades supervisors	3,256	50	1.5%
Floorers	1,287		0.0%
Specialist building operatives nec*	4,001		0.0%
Scaffolders	3,702		0.0%
Plant operatives	3,867		0.0%
Plant mechanics/fitters	2,169		0.0%
Steel erectors/structural fabrication	2,431		0.0%
Labourers nec*	8,613		0.0%
Logistics	940		0.0%
Civil engineering operatives nec*	2,355		0.0%
Civil engineers	2,656		0.0%
Other construction professionals and technical staff	15,121		0.0%
Architects	2,795		0.0%
Total	224,835	4,180	1.9%

Key

Managers /Professional occupations	Skilled Trades	Office based
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The CSN analysis showed that over the longer term there could be requirement for the following occupations:

- Non-construction professional, technical, IT and other office based staff
- Plasterers
- Bricklayers
- Surveyors
- Roofers
- Glaziers

Non-construction professional, technical IT and other office based staff are likely to have skills that can be transferred over a range of industries so there will be a wider pool of potential recruitment to draw from in this instance

Surveyors whilst analysis of the ARR does indicate a potential shortage for surveyors, this is a role that could have an office location away from the site location and travel between them and therefore this requirement could well be met by provision based in other regions.

Plasterers, Bricklayers, Roofers and Glaziers, the ARR as a percentage of current employment for these occupations is notably above the regional average which indicates potential occupational pressure to meet forecasted demand.

6.4. Gap Analysis – Training Needs

Looking at future demand against current competence based training, there are two aspects

- Is there training in the areas of potential demand?
- Is there volume of training required across the spread of occupations?

Taking the first of these *'is there the training in the areas of potential demand? The demand'* the demand analysis identified in the short term possible demand for Construction project management, logistics, labourers floorers and in the longer term non-construction professional, technical IT and other office based staff, plasterers, bricklayers and glaziers.

As covered earlier non-construction professionals, technical IT and other office based staff and logistics are not construction specific and we would anticipate supply and demand to be more influenced by retail/warehouse/transport demands. Construction project managers would be typically met by graduate level recruitment which would not be restricted to supply from within the West of England area. With the wider impacts on these occupations, a training needs analysis specific to the West of England area is unlikely to give credible views.

The West of England area, like the wider region, already delivers a significant number of bricklayers and floorers

The second question *'is there the volume of training required across the spread of occupations?'* is possible mixed in response. There would appear to be:

- Provision for training across the range of occupations
- A core of providers who deliver the majority of training
- Good provision of competence qualifications for certain occupations most notably Building Envelope Specialists, Floorers, Plant Mechanics and Scaffolders.

However:

- There are occupations such as Glaziers, Roofers Plasterers, Steel Erectors where the levels of competence based training either needs further monitoring or appears to be slightly low.

Although limited, the growth that is occurring in Education and training within the West of England appears to be within practical competence based qualifications that employers have a preference for, as opposed to the “knowledge/theory” based qualifications

7. Recommendations

As part of the West of England construction skills strategy, the evidence in this report should be tested with local stakeholders regarding construction occupations appeared to have:

- High demand,
- High gap,
- Relatively low levels of skills achievements with local stakeholders.

That construction skills strategy should be reviewed and developed with a view to ensuring that any gap between demand and skills provision for high demand or priority professions and trades does not become a problem.

There is also an opportunity to ensure that the workforce is not just trained but “well trained” (typically above average and with skills likely to be of significance and in demand in the future), moving more training and apprenticeships to be delivered at levels 3, 4 and 5. It is also appropriate to ensure that there is a consistent approach to managing skills development so that local authorities operate the same model. This will help avoid confusion and conflict for training providers and employers.

The following recommendations make reference to relevant local skills objectives.

West of England Skills objective

Improving alignment of knowledge and skills supply with existing and future employer demands to enable individuals to succeed and businesses to grow. Of relevance is Recommendation 1.

7.1. Recommendation 1

Develop the future curriculum, the provision and appropriateness of construction skills training.

An ambition of the developing construction skills curriculum should be to match training and development with the needs of employers and the local economy. It appears from some evidence gathered in this report that training provision has not always matched demand or skills gaps.

- a) As the bulk of training is delivered by just four of the larger colleges, the greatest potential impact is through mediated collaboration, between the FE colleges. By working together the major colleges can avoid duplication of effort or share resources, enhance specialisations and explore innovative ways of delivering the curriculum that meets employer needs.
- b) The aims of this should be to: reduce the provision of under-subscribed courses; add provision for over-subscribed courses; add additional or enhance specialist courses to reflect the potential need for new construction skills and balance the provision of training with anticipated demand from the construction contractors locally. A starting point may be consider first those occupations where there appears to be high demand or high risk of a shortfall of workers.
- c) An opportunity may be to identify and facilitate how FE colleges and employers can engage with specialist training providers as well as with major projects, to establish greater provision to address:
 - The need for technical education that meets employers’ needs.
 - Career progression pathways for construction that lead into higher level education.
 - Specialist skills to ensure more individuals are equipped for some of the West of England’s specific needs like housing. This will become critical for Hinkley Point C.

- A common complaint of construction employers is that new starters are not often enough 'site ready' so a curriculum might include working with employers to enhance new starters' site readiness and behaviours.
- d) An early action plan should be to compare the findings of this report with employers to establish if they are facing specific skills shortages and what short-term interventions can be activated to address them. If issues are identified, consideration should be given to pursuing funding that can be utilised to pump-prime training interventions.
- e) CITB has received anecdotal evidence (not included in this report) that in some cases, FE courses are completed but that students do not go on to a career in the occupation for which they are trained. This suggestion is supported by an apparent mismatch for some occupations between training achievements and occupational supply. An opportunity may exist to work with colleges and graduating students to help ensure that a greater proportion move into the career for which they have a qualification.

West of England Skills objective

Develop an integrated employment, education and skills system that is engaged and responsive to employer needs and provides clear routes into employment and to more sustainable and rewarding careers. Of relevance is Recommendation 2.

7.2. Recommendation 2

Collaborative partnerships

Identify potential partners within the WECA & LEP area where they have an interest in construction outputs and construction skills and share analysis with them with a view to engaging them in contributing to building collaborative holistic action plans.

Those stakeholders include: local construction businesses; major employers; local authorities; those responsible for managing infrastructure (transport and utilities); construction training providers, local stakeholders and influencers and universities.

The momentum gained from the successes achieved since the 2015 report should be maintained with continuing engagement with those (and new) stakeholders, with them encouraged to input to and take ownership of the construction skills actions. This will maintain a sense of shared ownership of the challenges, priorities and solutions. (However it may also require compromise.)

The WECA & LEP has greater than ever economic and political significance and influence and should use this influence considerably to leverage others to work together to achieve positive prioritised and co-ordinated action. This may in particular include establishing immediately, closer working relationships with the largest projects taking place across the region (that will have disproportionate significance) in developing and supporting the skills strategy.

West of England Skills objective

Develop innovative ways to provide local people with appropriate support, information, advice and guidance to unlock their career potential and thrive in a modern economy. Of relevance are Recommendations 3 and 4.

7.3. Recommendation 3

Reskilling and upskilling construction workers and those from other sectors

A holistic construction skills plan may also benefit from identifying cross-sectoral occupational impacts on labour requirements and opportunities.

This may benefit from considering the West of England construction economy in the context of the wider economy and other sectors. And this can address initiatives of major importance such as Hinkley Point and the need to establish new proposals to increase the stock of affordable housing.

Although the West of England appears to have less of a shortfall of construction workers compared with some regions, changes in UK employment as a result of the UK leaving the European Union may have an impact that should be monitored. The proportion of migrant workers in the West of England is significantly lower than in London. However, it is possible that if London loses construction workers, these could be replaced by more workers travelling to London from the regions.

It may be that there is greater potential value in helping West of England residents to take up high value construction opportunities rather than move into other sectors.

This may also include recognising the potential demand for “non-construction professionals...” and the opportunity to support the development of career progression opportunities that upskill construction workers to take on more supervisory, senior and managerial and affiliated roles. Such an approach would need to be matched with the recruitment and development of construction skills – so as not to create a shortage of trades by encouraging them to move into managerial roles.

It also appears that a significant proportion of construction training delivered is at level two, as well as at level one. However there may be an opportunity to develop a curriculum that moves workers up through the skills levels and develops more training at levels three, four and above and in specialisms likely to be in demand in the longer term.

Addressing replacement demand

It can be assumed that a typical working career is 40 years and so it is likely that each year around 2.5% of workers from any occupational group will retire. That means that in a steady state of consistent demand, 2.5% of the numbers given for each occupation will need to be recruited and trained.

7.4. Recommendation 4

Outreach

**Continue with efforts to build a more positive image of construction with young people.
Continue with efforts to build a positive image of construction with under-represented groups.
And increase recruitment through new entrance points, career changes and reskilling.**

Construction is sometimes associated with negative and inaccurate stereotypes that deter potential recruits, with education choices and career decisions often influenced in school and sometimes at a very early age. With an anticipated long term demand for some skills, the potential exists to continue with outreach programmes and to develop them further. The greatest potential value may be in encouraging applications for construction skills courses and apprenticeships from a broader spectrum of young people – in particular ethnic minorities and women.

It is increasingly clear that influences and preferences are established early in childhood and so it may be appropriate to build a positive profile of construction with children before the age of 11.

It is clear that Go Construct (www.goconstruct.org), the initiative to encourage and guide individuals to find out more about the sector, has already been used in schools engagement and with Construction Ambassadors. This should continue.

West of England Skills objective

Supporting and stimulating business, including SMEs, to attract and develop the talent they need to improve productivity. Of relevance is Recommendation 5.

7.5. Recommendation 5

a) Use procurement as a lever to enable skills development

The potential exists through smarter approaches to procurement to encourage those bidding for construction and infrastructure contracts to be mandated to include provision for co-ordinated recruitment, training, apprenticeships and outreach within their responses to tender. Provision would also be required to hold contractors to account for commitments made. Such an approach could be co-ordinated through the WECA and be a requirement of planning applications and local authority and public sector contracts.

It may also be possible to encourage major contracting businesses to follow such an approach in support of the area's skills and economic development. Early engagement with employers to discuss any such approach is recommended.

Similarly procurement of major contracts, or conditions of planning consent could mandate the sharing of supply and sub-contracting through a locally managed portal available to businesses based within the region.

b) Procurement and supply opportunities co-ordinated through the Combined Authority

Establish, as far as possible, processes and communication that help enable local companies to compete for, or be involved, with projects undertaken within the WECA & LEP area. Doing so will help create a more stable and sustainable local construction economy and may give local companies greater confidence to invest in recruitment and training.

Opportunities might include establishing a process whereby, once major construction contracts are awarded, details of the primary contractors are published locally in order to allow discussions to take place around meeting emerging skills needs and establishing collaborative opportunities in the West of England.

Better awareness of who to speak with in relation to providing services to major contractors may enable local sub-contractors to shift a greater proportion of their work and resources within the West of England so improving their efficiency (by reducing distance to site), and benefitting the local economy.

Business information providers are available that provide a wealth of detail on the construction market, projects and contracts – that have the potential to be of benefit to firms in the local supply chain. The WECA & LEP could put in place a contract to share such data with local firms.

7.6. Maintaining & enhancing the evidence base

Utilise the licence to use the CITB Labour Forecasting Tool to regularly update the evidence base that supports decision making as circumstances change and to demonstrate construction pipeline opportunities. Ensuring that pipeline visibility assists the local industry in reducing risks such as economic instability or maintaining sustainable employment. The demand forecasts produced using data from Glenigan are the result of a snapshot at a moment in time and so it is wise to update demand forecasts on a regular basis – six monthly is suggested.

APPENDICES

Appendix A. Demand analysis methodology

A.1.1. Introduction

Labour demand depends on the expected level and type of construction activity within a defined geographical area. This commission involves a mixture of projects with different types of work (e.g. housing, infrastructure) happening at different times. Our analysis derives as complete a picture as possible of the type and timings of projects within an area. Once this picture has been determined the labour demand for each project is estimated using our Labour Forecasting Tool (LFT). To produce the demand forecast we have drawn on the following.

- **Labour Forecasting Tool:** CITB's Labour Forecasting Tool is an online application that can forecast labour needs for a range of construction projects using labour coefficients derived from data provided by the Office for National Statistics (ONS). The LFT forecasts monthly skills and employment needs from a project's value and start/completion dates.
- **Construction Skills Network:** The Construction Skills Network (CSN) provides market intelligence for the UK construction industry. The data it produces highlights trends and how the industry will change year-on-year, allowing businesses to understand the current climate and plan ahead for the future.
- **Glenigan Pipeline:** Glenigan produce a pipeline of forthcoming projects within each local authority of the UK. These are collated to allow contractors to identify leads and to carry out construction market analysis.
- **National Infrastructure and Construction Pipeline (NICP):** The Infrastructure and Projects Authority (formerly Infrastructure UK and Major Projects Authority compile a pipeline of UK infrastructure and construction projects and the associated annual public and private investment⁶). The autumn 2016 NICP includes details of the annual spend on each of around 720 items valued at some £500bn to 2020 and beyond.

A.1.2. About labour forecasting

Our work in labour forecasting is underpinned by the award winning Labour Forecasting Tool (LFT). The tool is used to develop a profile of estimated labour requirements in the local authority area by creating a bottom-up approach to skills forecasting which aggregates the employment from individual projects to create an area-wide profile. The Labour Forecasting Tool can predict labour requirements (i.e. number of operatives and managers) on a month-by-month and trade-by-trade basis given no more than the type of project, its value or gross floor area where appropriate, its location and its start and end dates. The LFT produces an indication of the total construction labour demand arising for that project in each of the 28 occupations listed in Appendix B. The results are presented at the trade, craft and professional levels. The labour for the project may or may not come from the immediate vicinity. In some cases (e.g. professionals) it may be based in another part of the country. The question of supply is addressed in subsequent parts of the report.

⁶ The Autumn 2016 pipeline includes both construction and infrastructure projects but for the purposes of this analysis we have solely used projects which are clearly defined specific projects rather than regional programmes of work.. This reduces the risk of double counting with data in Glenigan.

The LFT has a number of specific models to which each project is assigned. There are five standard models covering:

- New Housing
- New non-housing buildings (including private commercial, private industrial and public non-residential)
- Infrastructure
- Housing Repair & Maintenance
- Non-housing Repair & Maintenance.

Infrastructure is disaggregated into twelve more detailed models covering project types such as road, rail and water projects.

The Construction Skills Network (CSN) forecasts labour requirements for the next five years. For consistency we have presented the demand forecasts for the five-year period 2017-21 used in the CSN model. Labour demand figures have been rounded to the nearest 50.

The LFT produces an estimate of the labour demand on a monthly basis. It should be noted that the workforce will only peak for a relatively short period of time. The ramp up and ramp down to that peak may be quite large and is likely to be smoothed by local contracting markets. In light of that we have presented the average workforce during the year of the peak.

A.1.3. Pipeline analysis

To allow the labour demand to be estimated by the LFT we first need to determine the pipeline of work in an area.

A.1.3.1. Analysis of the Glenigan pipeline

Our principal source of pipeline data is provided by Glenigan. The Glenigan data provides details of planning applications from local authorities supplemented by Glenigan with additional project-specific data. The Glenigan pipeline does not identify every single project in an area as some small projects (typically but not exclusively those less than £250,000 in value) and most repair and maintenance are not included.

The Glenigan pipeline is an extensive list of all of the projects taking place in an area. We have used the Mean Value Theorem to simplify its analysis. The Mean Value Theorem states that most information is obtained for least effort simply by considering only those data whose annual construction spend is higher than the mean. This approach is used to identify the significant projects that account for the largest amount of expenditure. Typically, this is around 20% of the projects accounting for about 80% of the value of the pipeline. These are the projects which we refer to as the significant projects.

Project values (£m) given in the Glenigan pipeline are the total value of construction and engineering works. The scope of this study is limited to the construction sector and for infrastructure projects an estimate of the engineering value has been calculated and subtracted from the total value. This provides what we have termed the construction value. The percentages applied to the total value of each infrastructure project type to derive the construction value can be seen in Table 11. The construction/engineering proportions have been validated through work we have undertaken for other clients.

An initial review of the projects in the pipeline is carried out to ensure that only projects which have (a) a defined value and (b) defined start and end dates, are considered in the analysis.

Table 11: Proportion of total value related to construction

Infrastructure type	Sub-type	Construction value as a proportion of total value
Flooding	Flooding	90%
Transport	Bridges	100%
	Road Tunnel	100%
	Roads	100%
	Air Traffic Control	100%
	Airports	100%
	Ports	90%
	Stations (Underground/Network rail)	80%
	Mixed Rail	55%
	Electrification	35%
	Underground/DLR (not incl. Stations)	35%
	Rail maintenance	10%
	Trams	55%
	Contactless Ticketing	20%
Water	Water/Wastewater Treatment Works	90%
Communications	Broadband/Digital infrastructure	20%
Energy	Photovoltaics	80%
	Generation (Biomass)	50%
	Generation (Energy from Waste)	50%
	Generation (Nuclear)	50%
	Undefined Electricity Generation	40%
	Generation (Fossil fuel)	25%
	Generation (Renewables - Offshore)	20%
	Generation (Renewables - Onshore)	10%
	Gas Transmission/distribution	30%
	Electricity transmission/distribution	25%
	Interconnectors	20%
	Nuclear Decommissioning	60%
	Smart Meters	0%
Oil and Gas	10%	
Mining	Mining	80%
General infrastructure	General infrastructure	100%

We include those projects in the Glenigan database shown to be at the following planning stages as these are considered to have the highest degree of confidence that they will take place:

- Planning Not Required
- Detail Plans Granted
- Reserved Matters Granted
- Application for Reserved Matters
- Plans Approved on Appeal
- Listed Building Consent

The following input data is used to produce the forecasts from the Glenigan pipeline:

- The value of each project provided in the Glenigan pipeline for all projects excluding infrastructure.
- For infrastructure projects, the value used is a percentage of the value in the Glenigan pipeline, representing the construction portion of the value, excluding engineering construction.
- Start and end dates of each project provided in the Glenigan pipeline.
- For the significant projects, the project descriptions in the database enable us to assign the most appropriate project type (each type is driven by a different underlying model) to each forecast that is run through the LFT. Cases where a project consists of more than one type are broken down into multiple forecasts which are assigned specific project types to more closely predict the labour demand. This takes account of the different types of work within a single project, e.g. mixed developments comprising housing, commercial and industrial.
- For the rest of the projects (i.e. non-significant), the default project type allocation as defined in the Glenigan pipeline is applied, except for the infrastructure projects which are individually allocated to the most appropriate type from the available LFT infrastructure types.

A.1.4. Supplementing with additional data

Data from the National Infrastructure and Construction Pipeline is used to supplement the Glenigan data. The NICP data is examined to identify infrastructure projects or programmes of work taking place in the areas analysed that are not included in the Glenigan database. The NICP data can be broken down into expenditure in each fiscal year. The construction cost is calculated from the total cost reported in the NICP using the percentages in Table 11. Projects in the Glenigan dataset and the NICP are combined (ensuring that there is no double counting) to create a pipeline of defined projects for the area.

We have only considered those projects which are specifically allocated to a region in the NICP (i.e. projects at a National level have not been considered).

We have also consulted with the LEP on the significant Glenigan Projects. Feedback from the LEP has been incorporated into the defined pipeline.

A.1.5. Dealing with “cliff edges” in pipelines

The data from the defined projects presents a picture of the forthcoming projects. As the time horizon extends there is less clarity on what is planned. For instance, in some cases a small number of projects are due to complete in the 2020s. The small workload shown by the demand profile is highly unlikely to reflect the total amount of work that will take place at that time. It is almost

certain that there will be additional projects that come on stream which have not yet been considered. To overcome this “activity gap”, we assume that the future workforce is approximately equal to the peak. It should be noted that the peak labour demand refers to the current “snapshot” of the scheduled construction spend. It is prudent to expect that, should the investment in future years follow the same pattern, the peak labour demand figures are likely to be roughly similar assuming the mix of projects remains consistent. The peak has, therefore, been projected forwards and backcast to create a more likely scenario of the ongoing workforce. The employment growth rate is based on the CSN employment forecast for the whole region under consideration.

A.1.6. Aligning the Glenigan pipeline with CSN output

The following process is undertaken to ensure that the value of work in the Glenigan pipeline is aligned with output as measured by the CSN.

1. Consider only Glenigan new-build by removing repair and maintenance. Compare Glenigan new build at the regional level with the CSN new build at the regional level sector by sector.
2. If in any sector the Glenigan new-build regional output for the peak year more than from the CSN regional new-build output for the same year then **each new build project** in the Glenigan database at the LEP level for that sector is capped by factoring by the following ratio.

$$\frac{\text{CSN New build at regional level for given sector}}{\text{Glenigan new build at regional level for given sector}}$$

3. If in any sector the Glenigan new-build regional output for the peak year is less than the CSN regional new-build output for the same year then **the total Glenigan new-build** at the LEP level for that sector is factored by the following ratio to create an additional element of work (referred to as the new-build supplement) in that sector.

$$\frac{\text{CSN New build at regional level for given sector}}{\text{Glenigan new build at regional level for given sector}}$$

4. To take account of repair and maintenance in Glenigan at the LEP level the Glenigan new build value is multiplied by the ratio below. This is repeated separately for housing and non-housing.

$$\frac{\text{CSN R\&M at regional level}}{\text{CSN New build at regional level}}$$

A.1.7. Calculating total labour demand

The process outlined above is used to produce the total value of work within the LEP. Using the value of work defined in the pipeline we use the Labour Forecasting Tool to estimate the total labour demand for both the defined pipeline, factored as necessary, and the estimates of additional work.

Appendix B. **Occupational definitions**

Reference is made in this report to a range of occupational aggregates for construction occupations. This appendix contains details of the 166 individual occupations which are aggregated into 28 occupational aggregates.

Occupations included within construction occupational aggregates (Four-digit codes refer to Office for National Statistics Standard Occupational Classification Codes).

1 Senior, executive, and business process managers

(1115) Chief executives and senior officials
 (1131) Financial managers and directors
 (1132) Marketing and sales directors
 (1133) Purchasing managers and directors
 (1135) Human resource managers and directors
 (1251) Property, housing and estate managers
 (1136) Information technology and telecommunications directors
 (2150) Research and development managers
 (1162) Managers and directors in storage and warehousing
 (1259) Managers and proprietors in other services nec
 (1139) Functional managers and directors nec
 (2133) IT specialist managers
 (2134) IT project and programme managers
 (3538) Financial accounts managers
 (3545) Sales accounts and business development managers

2 Construction project managers

(2436) Construction project managers and related professionals

3 Other construction process managers

(1121) Production managers and directors in manufacturing
 (1122) Production managers and directors in construction
 (1161) Managers and directors in transport and distribution
 (1255) Waste disposal and environmental services managers
 (3567) Health and safety officers
 (3550) Conservation and environmental associate professionals

4 Non-construction professional, technical, IT, and other office-based staff (excl. managers)

(3131) IT operations technicians
 (3132) IT user support technicians
 (3534) Finance and investment analysts and advisers
 (3535) Taxation experts
 (3537) Financial and accounting technicians
 (3563) Vocational and industrial trainers and instructors
 (3539) Business and related associate professionals nec
 (3520) Legal associate professionals
 (3565) Inspectors of standards and regulations
 (2136) Programmers and software development professionals
 (2139) Information technology and telecommunications professionals nec
 (3544) Estate agents and auctioneers
 (2413) Solicitors
 (2419) Legal professionals nec
 (2421) Chartered and certified accountants
 (2424) Business and financial project management professionals
 (2423) Management consultants and business analysts
 (4216) Receptionists
 (4217) Typists and related keyboard occupations

	(3542) Business sales executives (4122) Book-keepers, payroll managers and wages clerks (4131) Records clerks and assistants (4133) Stock control clerks and assistants (7213) Telephonists (7214) Communication operators (4215) Personal assistants and other secretaries (7111) Sales and retail assistants (7113) Telephone salespersons (3541) Buyers and procurement officers (3562) Human resources and industrial relations officers (4121) Credit controllers (4214) Company secretaries (7129) Sales related occupations nec (7211) Call and contact centre occupations (7219) Customer service occupations nec (9219) Elementary administration occupations nec (2111) Chemical scientists (2112) Biological scientists and biochemists (2113) Physical scientists (3111) Laboratory technicians (3421) Graphic designers (2463) Environmental health professionals (2135) IT business analysts, architects and systems designers (2141) Conservation professionals (2142) Environment professionals (2425) Actuaries, economists and statisticians (2426) Business and related research professionals (4124) Finance officers (4129) Financial administrative occupations nec (4138) Human resources administrative occupations (4151) Sales administrators (4159) Other administrative occupations nec (4162) Office supervisors (7130) Sales supervisors (7220) Customer service managers and supervisors (4161) Office managers
	5 Construction trades supervisors
	(5250) Skilled metal, electrical and electronic trades supervisors (5330) Construction and building trades supervisors
	6 Wood trades and interior fit-out
	(5315) Carpenters and joiners (8121) Paper and wood machine operatives (5442) Furniture makers and other craft woodworkers (5319) Construction and building trades nec (25%)
	7 Bricklayers
	(5312) Bricklayers and masons

8 Building envelope specialists	
	(5319) Construction and building trades nec (50%)
9 Painters and decorators	
	(5323) Painters and decorators (5319) Construction and building trades nec (5%)
10 Plasterers	
	(5321) Plasterers
11 Roofers	
	(5313) Roofers, roof tilers and slaters
12 Floorers	
	(5322) Floorers and wall tillers
13 Glaziers	
	(5316) Glaziers, window fabricators and fitters (5319) Construction and building trades nec (5%)
14 Specialist building operatives not elsewhere classified (nec)	
	(8149) Construction operatives nec (100%) (5319) Construction and building trades nec (5%) (9132) Industrial cleaning process occupations (5449) Other skilled trades nec
15 Scaffolders	
	(8141) Scaffolders, staggers and riggers
16 Plant operatives	
	(8221) Crane drivers (8129) Plant and machine operatives nec (8222) Fork-lift truck drivers (8229) Mobile machine drivers and operatives nec
17 Plant mechanics/fitters	
	(5223) Metal working production and maintenance fitters (5224) Precision instrument makers and repairers (5231) Vehicle technicians, mechanics and electricians (9139) Elementary process plant occupations nec (5222) Tool makers, tool fitters and markers-out (5232) Vehicle body builders and repairers
18 Steel erectors/structural fabrication	
	(5311) Steel erectors (5215) Welding trades (5214) Metal plate workers, and riveters (5319) Construction and building trades nec (5%) (5211) Smiths and forge workers (5221) Metal machining setters and setter-operators
19 Labourers nec	
	(9120) Elementary construction occupations (100%)
20 Electrical trades and installation	
	(5241) Electricians and electrical fitters

	(5249) Electrical and electronic trades nec (5242) Telecommunications engineers
21 Plumbing and heating, ventilation, and air conditioning trades	
	(5314) Plumbers and heating and ventilating engineers (5216) Pipe fitters (5319) Construction and building trades nec (5%) (5225) Air-conditioning and refrigeration engineers
22 Logistics	
	(8211) Large goods vehicle drivers (8212) Van drivers (9260) Elementary storage occupations (3541) Buyers and purchasing officers (50%) (4134) Transport and distribution clerks and assistants
23 Civil engineering operatives not elsewhere classified (nec)	
	(8142) Road construction operatives (8143) Rail construction and maintenance operatives (8123) Quarry workers and related operatives
24 Non-construction operatives	
	(8117) Metal making and treating process operatives (8119) Process operatives nec (8125) Metal working machine operatives (8126) Water and sewerage plant operatives (8132) Assemblers (vehicles and metal goods) (8133) Routine inspectors and testers (8139) Assemblers and routine operatives nec (9249) Elementary security occupations nec (9233) Cleaners and domestics (9232) Street cleaners (5113) Gardeners and landscape gardeners (6232) Caretakers (9241) Security guards and related occupations (3319) Protective service associate professionals nec
25 Civil engineers	
	(2121) Civil engineers
26 Other construction professionals and technical staff	
	(2122) Mechanical engineers (2123) Electrical engineers (2126) Design and development engineers (2127) Production and process engineers (2461) Quality control and planning engineers (2129) Engineering professionals nec (3112) Electrical and electronics technicians (3113) Engineering technicians (3114) Building and civil engineering technicians (3119) Science, engineering and production technicians nec (3121) Architectural and town planning technicians

	(3122) Draughtspersons (3115) Quality assurance technicians (2432) Town planning officers (2124) Electronics engineers (2435) Chartered architectural technologists (3531) Estimators, valuers and assessors (3116) Planning, process and production technicians
27 Architects	
	(2431) Architects
28 Surveyors	
	(2433) Quantity surveyors (2434) Chartered surveyors

Appendix C. **Glenigan projects removed from the West of England area**

This section contains a list of all the Glenigan projects removed from the analysis, stating the reason for their exclusion.

Number	Heading	Local Authority	Value (£m)	Start Date	End Date	Reason
1	Supermarket (Extension)	Bristol	0.0	24/11/2017	23/06/2018	Missing Values
2	Residential Development	Bristol	1.0			Missing dates
3	Light Industry/Research/Warehouse Units	Bristol	3.6			Missing dates
4	3 Commercial Units	Bristol	1.0			Missing dates
5	Swimming Pool	Bristol	6.2			Missing dates
6	Hotel Building	Bristol	0.5			Missing dates
7	13 Houses	Bristol	1.0			Missing dates
8	400 Residential & Retail Units	Bristol	26.8			Missing dates
9	72 Houses	Radstock	5.3			Missing dates
10	70 Residential Units	Bristol	5.1			Missing dates
11	Park Improvements & Pavilions	Bristol	1.0			Missing dates
12	Commercial Unit	Bristol	3.8			Missing dates
13	22 Houses	Bristol	1.7			Missing dates
14	Public House	Bristol	1.6			Missing dates
15	15 Houses	Bath	1.2			Missing dates
16	6 Flats & 5 Houses	Bristol	0.8			Missing dates
17	43 Flats/8 Live/Work Units/3 Offices	Bristol	2.4			Missing dates
18	Hotel (Conversion/Extension)	Bristol	3.0			Missing dates
19	Concert Hall (Redevelopment)	Bristol	45.0			Missing dates
20	2 Office/Industrial Test Facility Buildings	Bristol	5.7			Missing dates
21	Food Industrial Unit	Bristol	1.8			Missing dates
22	Vehicle Workshop	Bath	0.7			Missing dates
23	Builders Merchant	Bath	0.4			Missing dates
24	9 Flats & 3 Shops	Bristol	0.7			Missing dates
25	Dementia Care Home	Bristol	0.5			Missing dates

26	Warehouse (Extension)	Bristol	1.2			Missing dates
27	490 Homes & 1 Health/Social Care Centre/1 School	Bristol	32.0			Missing dates
28	100 Student Flats (Conversion/Extension)	Bristol	1.3			Missing dates
29	Bridge (Resurfacing)	Bristol	3.0			Missing dates
30	20 Luxury Houses	Wotton-Under-Edge	1.6			Missing dates
31	188 Flats/Commercial Units	Bristol	23.0			Missing dates
32	Artificial Surfing Lake/Campsite	Bristol	6.0			Missing dates
33	Car Showroom	Clevedon	0.3			Missing dates
34	Anaerobic Digestion Facility	Bristol	2.3			Missing dates
35	8 Bungalows & 7 Houses	Bristol	1.1			Missing dates
36	Care Home	Bristol	6.9			Missing dates
37	250 Residential & Commercial	Bristol	175.0			Missing dates
38	Vehicle Workshop	Bath	1.5			Missing dates
39	18 Houses	Bristol	1.4			Missing dates
40	151 Flats/Commercial Units (New/Extension)	Bristol	7.6			Missing dates
41	2 Offices/Research & Development Units	Weston-Super-Mare	1.7			Missing dates
42	Supermarket	Bristol	2.9			Missing dates
43	Visitors Building	Bristol	1.6			Missing dates
44	4 Flats & 1 Retail/Fitness Studio (Conversion/Extension)	Bristol	0.3			Missing dates
45	Railway Station Renewal	Bristol	25.0			Missing dates
46	4 Office Units	Bristol	1.5			Missing dates
47	Retail Building & Substation	Weston-Super-Mare	0.9			Missing dates
48	Leisure Dome	Weston-Super-Mare	50.0			Missing dates

49	Warehouse	Bristol	1.1			Missing dates
50	Student Accommodation	Bristol	4.6			Missing dates
51	89 Residential Units	Bristol	3.0	01/12/2015	30/03/2017	Consultancy
52	Professional Services Framework	Bristol	7.5	05/09/2016	07/09/2020	Consultancy
53	Consultancy Framework	Weston-Super-Mare	2.0	19/12/2012	19/12/2016	Consultancy
54	Estates Consultants Framework	Bath	1.0	09/01/2017	09/01/2021	Consultancy
55	Consultancy Framework	Bristol	5.0	01/10/2014	01/03/2018	Consultancy
56	Framework Agreements/Contracts/Consultants	Bath	8.0	01/10/2015	04/10/2018	Consultancy
57	Flood Risk Consultancy Framework	Bristol	1.6	08/02/2016	10/02/2020	Consultancy
58	Architectural Design Services	Bristol	5.0	06/03/2017	07/03/2022	Consultancy
59	Architectural and Associated Services (New/Refurb)	Weston-Super-Mare	0.8	31/07/2014	26/07/2018	Consultancy
60	200 Flats, Office & Leisure Units	Bristol	100.0	05/02/2018	03/02/2020	Duplicate
61	Rapidly Emplaced Mobile Military Bridging	Bristol	300.0	03/08/2018	02/08/2019	Duplicate
62	School	Bristol	8.4	04/02/2016	20/03/2017	Duplicate
63	Bridge/Road Works	Weston-Super-Mare	1.0	17/07/2017	02/04/2018	Duplicate
64	260 Homes	Bristol	50.0	31/07/2017	31/07/2019	Duplicate
65	35 Residential Units	Radstock	2.7	04/12/2017	08/03/2019	Duplicate
66	Hospital Building (Extension)	Bristol	1.5	24/06/2017	29/03/2018	Duplicate
67	Commercial & Residential	Bristol	28.4	22/05/2017	22/05/2019	Duplicate
68	Rail Network (Improvements)	Bristol	103.0	26/09/2016	21/09/2020	Duplicate
69	50 Houses(Conversion)	Bristol	3.8	09/07/2018	05/08/2019	Duplicate
70	93 Student Flats (Conversion/Extension)	Bristol	1.0	05/07/2017	16/08/2018	Duplicate
71	180 Houses	Bristol	13.5	02/11/2017	30/11/2018	Duplicate
72	School (Extension)	Radstock	0.3	14/03/2016	30/12/2016	Duplicate

73	Supermarket (Extension/Conversion)	Weston-Super-Mare	0.6	28/10/2017	27/05/2018	Duplicate
74	Residential Development	Bristol	5.4	01/07/2017	01/08/2018	Duplicate
75	Distribution Centre	Bristol	12.0	16/01/2017	16/09/2017	Duplicate
76	7 Flats/3 Houses& Commercial/Community Units	Bristol	0.5	08/12/2017	05/01/2019	Duplicate
77	12 Flats (Conversion)	Bristol	0.5	04/01/2017	04/09/2017	Duplicate
78	24 Houses/Flats	Bristol	1.8	14/09/2017	12/10/2018	Duplicate
79	358 Student Accommodations & 1 Office/1 Education building	Bath	42.2	08/10/2018	18/11/2019	Duplicate
80	274 Flats & 4 Commercial Units	Bristol	20.9	02/03/2017	30/03/2018	Duplicate
81	Land Reclamation	Bristol	1.0	26/08/2017	16/05/2018	Duplicate
82	2 Warehouse/Distribution Units	Bristol	11.7	26/06/2017	06/01/2018	Duplicate
83	140 Houses	Wotton-Under-Edge	9.9	14/07/2016	10/08/2017	Duplicate
84	500 Houses	Bristol	35.0	02/11/2015	30/06/2019	Duplicate
85	Waste Transfer Station	Weston-Super-Mare	1.0	26/03/2018	31/12/2018	Duplicate
86	10 Houses	Bristol	0.8	18/03/2017	15/04/2018	Duplicate
87	145 Houses	Weston-Super-Mare	10.9	01/07/2017	01/08/2018	Duplicate
88	10 Houses(Conversion)	Bristol	0.8	02/10/2017	26/10/2018	Duplicate
89	Sewage Pumping Station	Radstock	1.0	05/11/2017	14/08/2018	Duplicate
90	Demolition	Bristol	0.5	14/11/2016	14/01/2017	Duplicate
91	Lifeboat Station	Weston-Super-Mare	0.5	04/06/2018	18/03/2019	Duplicate
92	115 Residential Units & Hotel/Gym/Offices/Creche/Cafe	Weston-Super-Mare	8.7	09/04/2017	07/05/2018	Duplicate
93	15 Flats (Conversion)	Bristol	0.8	06/12/2017	03/01/2019	Duplicate

94	6 Restaurant/Cafe Units & 1 Warehouse	Bristol	2.6	17/11/2016	30/05/2017	Duplicate
95	12 Houses	Bristol	0.9	29/07/2017	26/08/2018	Duplicate
96	50 Houses& Flats	Bristol	3.8	08/02/2017	08/03/2018	Duplicate
97	4 Industry/Warehouse Units	Bristol	1.0	23/06/2017	03/01/2018	Duplicate
98	Concrete Batching Plant	Bristol	0.7	14/04/2017	25/10/2017	Duplicate
99	298 Houses/29 Flats & 1 School/1 Nursery	Bristol	24.7	11/11/2017	09/12/2018	Duplicate
100	2,550 Residential Units & Employment Space	Bristol	236.2	26/06/2014	26/06/2018	Duplicate
101	Hospital (Extension)	Bristol	2.5	12/08/2017	17/05/2018	Duplicate
102	91 Flats/47 Houses& Commercial Units	Bristol	6.9	28/11/2016	25/12/2017	Duplicate
103	350 Homes/70 Elderly Care & Commercial Units	Bristol	31.5	05/03/2018	26/04/2019	Duplicate
104	77 Houses & 18 Flats/1 School	Bath	7.2	13/10/2016	10/11/2017	Duplicate
105	82 Flats	Bristol	4.1	07/07/2017	04/08/2018	Duplicate
106	33 Flats & 1 Restaurant/Cafe	Bristol	1.7	11/08/2017	08/09/2018	Duplicate
107	18 Flats (Conversion)	Weston-Super-Mare	0.9	02/07/2018	29/07/2019	Duplicate
108	Biomass Power Station	Bristol	300.0	02/10/2017	09/07/2018	Duplicate
109	School (Extension)	Weston-Super-Mare	1.4	07/06/2017	01/03/2018	Duplicate
110	Care Home (Extension)	Bristol	1.1	26/08/2017	31/05/2018	Duplicate
111	82 Flats/Student Accommodation/Hotel/Commercial Units	Bristol	4.1	01/07/2017	01/08/2018	Duplicate
112	Multi Storey Car Park	Bristol	0.9	21/11/2017	11/08/2018	Duplicate
113	113 Houses& 5 Flats/1 Community Hall	Winscombe	8.9	01/07/2017	01/08/2018	Duplicate
114	320 Homes	Bristol	35.0	06/02/2017	04/02/2019	Duplicate
115	School Remodelling	Bristol	5.0	08/08/2016	03/04/2017	Duplicate
116	46 Houses	Bristol	3.5	04/01/2017	04/02/2018	Duplicate
117	16 Industry/Warehouse Units	Bristol	13.7	30/06/2017	10/01/2018	Duplicate

118	1664 Residential & Commercial Units	Banwell	96.1	01/07/2017	01/05/2028	Duplicate
119	10 Flats	Bristol	0.5	04/01/2017	04/02/2018	Duplicate
120	17 Houses& 3 Flats	Bristol	1.5	27/04/2017	25/05/2018	Duplicate
121	2,400 Residential/Commercial Units	Bristol	146.4	01/07/2017	01/07/2021	Duplicate
122	239 Flats/Commercial Units (New/Extension)	Bristol	12.0	25/11/2016	23/12/2017	Duplicate
123	17 Houses	Bristol	1.3	01/11/2017	29/11/2018	Duplicate
124	19 Flats & 10 Houses/3 Workshop Units	Bristol	1.6	03/07/2017	27/07/2018	Duplicate
125	Waste Transfer Station	Bristol	1.9	03/02/2018	12/11/2018	Duplicate
126	83 Houses	Bristol	6.2	04/01/2017	04/01/2018	Duplicate
127	Hotel	Bristol	10.0	20/03/2017	20/04/2018	Duplicate
128	88 Houses& 12 flats	Bristol	7.5	10/12/2016	07/01/2018	Duplicate
129	90 Houses& 10 Flats	Bristol	7.5	09/07/2017	06/08/2018	Duplicate
130	Storage Silos	Bristol	0.3	07/05/2018	11/02/2019	Duplicate
131	Hotel	Bristol	0.8	13/09/2017	26/04/2018	Duplicate
132	1,002 Residential/Commercial Development	Bristol	56.5	20/01/2014	18/01/2017	Duplicate
133	625 Homes, Shops, Hotel & Office	Bristol	46.9	01/07/2017	01/07/2022	Duplicate
134	55 Houses/Live Work Units	Radstock	4.2	23/10/2017	20/11/2018	Duplicate
135	83 Flats & 78 Houses	Bristol	12.1	02/04/2018	08/04/2022	Duplicate
136	15 Industrial/Office/Storage Units	Bristol	3.1	04/01/2017	04/07/2017	Duplicate
137	210 Residential/Retail/Office Units/Community Centre	Radstock	10.4	01/07/2017	01/09/2021	Duplicate
138	200 Extra Care Housing Units & Nursing Home	Bristol	65.1	03/04/2017	04/04/2022	Duplicate
139	50 Houses& 4 Flats	Bristol	4.1	01/07/2017	01/08/2018	Duplicate
140	30 Houses	Bristol	2.3	21/08/2017	22/10/2018	Duplicate
141	Residential & Commercial Units	Bristol	50.0	23/01/2017	23/01/2021	Duplicate
142	12 Flats & 2 Houses(Conversion/Alterations)	Bristol	0.7	04/01/2017	04/02/2018	Duplicate
143	53 Houses	Radstock	4.0	01/07/2017	01/08/2018	Duplicate

144	170 Houses	Bristol	12.8	04/09/2017	01/10/2018	Duplicate
145	Affordable Homes	Bristol	50.0	01/07/2017	01/07/2021	Duplicate
146	1003 Homes & Community Facilities	Bristol	57.7	01/07/2017	01/07/2020	Duplicate
147	Nuclear Power Station	Bristol	7500.0	14/06/2021	10/09/2029	Duplicate
148	Shopping Centre (Extension)	Bristol	300.0	13/02/2017	13/02/2021	Duplicate
149	700 Residential Units/Commercial/Retail/Education	Bath	52.5	01/07/2017	01/07/2021	Duplicate
150	Leisure Centre (Extension/Alterations)	Bristol	20.0	02/01/2017	06/01/2020	Duplicate
151	4 Houses& 1 Light Industry	Bristol	0.4	09/01/2017	19/06/2017	Duplicate
152	School	Bristol	7.2	27/02/2017	26/02/2018	Duplicate
153	School	Bristol	7.2	20/02/2017	19/02/2018	Duplicate
154	166 Residential/Commercial Units	Bristol	8.3	17/07/2017	06/07/2018	Duplicate
155	11 Flats	Bristol	0.6	04/01/2017	04/02/2018	Duplicate
156	Gas Fired Power Station	Bristol	1400.0	30/07/2018	26/07/2021	Duplicate
157	110 Houses	Bristol	8.3	01/09/2016	01/03/2017	Duplicate
158	School	Bristol	7.2	20/02/2017	19/02/2018	Duplicate
159	66 Houses/32 Town Houses/22 Flats & 1 Office/Retail Units	Bristol	9.1	01/07/2017	01/08/2018	Duplicate
160	School (Extension/Alterations)	Bristol	3.2	04/01/2017	04/09/2017	Duplicate
161	19 Houses	Bristol	1.4	01/07/2017	01/08/2018	Duplicate
162	2690 Houses/Flats & Schools/Retail/Commercial Units	Bristol	201.8	01/03/2016	24/02/2026	Duplicate
163	87 Houses	Bath	6.5	27/03/2017	29/04/2019	Duplicate

Appendix D. **Significant Glenigan projects in the West of England area**

This appendix provides a list of all the significant projects analysed. The projects appear in the following as they were put into the LFT.

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
WoE498	Housing (Energy Efficiency Framework)	Bristol	500.0	04/11/2013	02/12/2018	Housing R&M
WoE277	2,281 Homes, School & Commercial	Bath & N E Somerset	460.5	04/07/2016	29/06/2026	New housing, Private Commercial, Public Non-housing
WoE803	Construction Contractors Framework	Bath & N E Somerset	281.6	02/02/2015	02/02/2019	New housing
WoE306	Mixed Use Development	North Somerset	175.1	02/05/2016	29/04/2019	Private Commercial
WoE252	5000 Residential Units & School/Office Development	North Somerset	146.2	21/05/2018	17/06/2019	New housing
WoE365	Container Terminal Expansion	Bath & N E Somerset	138.0	28/10/2019	28/10/2023	Infrastructure
WoE053	3,010 Residential/Commercial Units	South Gloucestershire	113.2	01/07/2017	01/07/2021	New housing
WoE070	Road Improvement Works	Bristol	88.9	06/02/2017	06/02/2021	Infrastructure
WoE393	Office Accommodation	South Gloucestershire	70.9	05/06/2017	02/11/2018	Private Commercial
WoE685	Residential (Refurbishment)	Bristol	65.8	21/08/2017	20/05/2019	Housing R&M
WoE755	Bus Rapid Transit System	Bristol	60.4	06/01/2015	06/11/2017	Infrastructure
WoE095	1110 Residential/Retail Units	Bath & N E Somerset	59.3	11/01/2016	01/06/2023	New housing, Private Commercial
WoE611	2,500 Affordable Homes Framework	Bristol	59.3	07/09/2016	02/09/2020	New housing
WoE676	Material Recycling Facility	Bristol	55.2	10/04/2017	08/04/2019	Infrastructure
WoE383	2000 Houses/Flats & 1 School	South Gloucestershire	50.5	07/07/2014	07/07/2024	New housing, Public Non-housing
WoE528	Airport (Framework)	Bristol	46.0	01/04/2013	01/04/2017	Infrastructure
WoE176	Office/Retail Development	Bristol	43.3	04/06/2018	04/03/2019	Private Commercial
WoE724	Business Park (Masterplan)	North Somerset	42.5	02/06/2018	02/06/2021	Private Commercial
WoE123	Planned Refurbishment Works	North Somerset	42.0	07/02/2014	07/02/2017	Housing R&M

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
WoE281	Distribution Development	Bristol	40.4	06/03/2012	01/03/2022	Private Industrial
WoE444	1294 Homes/Care Facility/Retail/Office/Restaurant Units	South Gloucestershire	37.8	02/11/2017	30/11/2018	New housing
WoE804	Housing Refurbishment Framework	Bristol	35.0	01/04/2014	01/04/2018	Housing R&M
WoE595	Highway Maintenance Works	Bristol	33.7	01/04/2017	31/03/2021	Infrastructure
WoE581	151 Care Village Units & 3 Office/Medical Centre & Retail Units	Bath & N E Somerset	29.7	07/09/2015	07/09/2017	Public Non-housing, Private Commercial
WoE170	Office Building	Bath & N E Somerset	28.7	07/11/2016	06/11/2017	Private Commercial
WoE201	1101 Residential & 6 Commercial Units	South Gloucestershire	28.4	14/11/2016	11/11/2019	New housing
WoE080	Highway Operations & Maintenance Work	Bristol	27.9	02/07/2012	02/07/2017	Infrastructure
WoE646	Network Maintenance Services	Bristol	27.6	01/10/2014	01/10/2019	Infrastructure
WoE357	200 Extra Care Housing Units & 1 School	North Somerset	25.4	11/09/2017	08/10/2018	New housing
WoE178	Housing & Commercial (Refurb)	0	24.0	06/02/2017	04/02/2019	Private Commercial, Private Commercial, Private Commercial
WoE187	Hotel & Restaurant/Pub/Take Away	Bristol	23.5	06/08/2018	18/03/2019	Private Commercial
WoE166	National Capital Works (Framework)	Bristol	23.2	16/12/2013	16/12/2017	Public Non-housing
WoE820	700 Houses, School & Commercial Units	Bath & N E Somerset	23.0	29/04/2014	29/06/2018	New housing, Private Commercial, Public Non-housing
WoE779	Building/Stuctures/Rail Renewals	Bristol	21.9	04/08/2014	05/08/2019	Infrastructure
WoE132	Hotel	Bath & N E Somerset	21.3	09/11/2015	24/07/2017	Private Commercial
WoE417	433 Residential/260 Extra Care Units & 1 Nursery	South Gloucestershire	20.3	15/08/2016	11/09/2017	New housing
WoE074	140 Flats (Conversion/Alterations)	Bristol	18.5	09/11/2015	09/11/2016	Housing R&M

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
WoE047	Highways (Framework)	Bristol	18.4	07/05/2013	07/05/2017	Infrastructure
WoE243	Office/Retail Unit	Bristol	17.7	18/01/2016	28/08/2017	Private Commercial
WoE790	3 Office/Shop/Restaurant/Café Units	Bristol	17.7	13/02/2017	13/11/2017	Private Commercial
WoE728	4 Student Accommodation Commercial Units	Bristol	17.0	18/08/2014	14/08/2017	Public Non-housing, Private Commercial
WoE450	Distribution Centre	South Gloucestershire	16.9	04/07/2016	07/07/2017	Infrastructure
WoE101	260 Extra Care Facilities	South Gloucestershire	16.8	03/05/2016	26/10/2018	New housing
WoE067	Housing (New/Refurbishment)	Bristol	16.5	10/04/2017	12/04/2021	New housing
WoE295	Hotel & Business Park	South Gloucestershire	15.6	10/10/2016	15/01/2018	Private Commercial
WoE113	Luxury Apartments (Conversion/Alterations)	Bristol	15.0	01/07/2017	01/07/2018	Housing R&M
WoE103	Research Building	South Gloucestershire	14.2	14/11/2016	13/11/2017	Private Commercial
WoE784	University Building Contractors Framework	Bristol	14.2	01/08/2016	31/07/2020	Public Non-housing
WoE800	Junction (Improvements)	Bristol	13.8	08/10/2018	07/10/2019	Infrastructure
WoE484	171 Flats & 1 Retail Unit	Bath & N E Somerset	13.7	06/03/2017	06/09/2018	New housing, Private Commercial
WoE662	Link Road (Refurbishment)	North Somerset	13.2	07/04/2015	04/04/2017	Infrastructure
WoE071	450 Residential Units	North Somerset	13.2	15/01/2018	11/02/2019	New housing
WoE220	Supermarket/Retail Warehouse/Restaurant/Pub/Leisure Centre	South Gloucestershire	13.0	14/11/2016	12/06/2017	Private Commercial

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
WoE580	Office (Alterations)	Bristol	12.0	07/11/2016	06/11/2017	Non-housing R&M
WoE134	400 Residential Units	North Somerset	11.7	16/09/2016	14/10/2017	New housing
WoE503	334 Houses/40 Flats	South Gloucestershire	10.9	11/03/2017	08/04/2018	New housing
WoE278	Church (Extension/Refurbishment)	Bristol	10.6	04/09/2017	04/09/2018	Private Commercial
WoE075	5 Retail Unit/Car Showroom/Hotel & Commercial Units	South Gloucestershire	10.3	05/02/2017	04/09/2017	Private Commercial
WoE219	350 Residential Units	North Somerset	10.2	10/06/2017	08/07/2018	New housing
WoE575	128 Residential Units	South Gloucestershire	10.1	28/06/2016	28/06/2018	New housing
WoE620	Offices	Bristol	10.1	12/10/2017	08/11/2018	Private Commercial
WoE821	130 Student Flats & 1 Café	Bristol	9.9	08/02/2016	28/07/2017	Public Non-housing, Private Commercial
WoE789	University	Bristol	9.9	20/05/2015	28/11/2016	Public Non-housing
WoE766	University (Refurbishment)	Bristol	9.3	15/02/2016	06/10/2017	Public Non-housing
WoE152	Offices & Shops	Bath & N E Somerset	8.9	15/05/2017	15/05/2018	Private Commercial
WoE279	Office Building	Bristol	8.8	23/03/2018	21/12/2018	Private Commercial
WoE202	300 Houses/Flats	North Somerset	8.8	28/09/2017	26/10/2018	New housing
WoE247	165 Houses/Townhouses/133 Flats & Commercial Units/Community Space	Bristol	8.7	15/08/2018	11/09/2019	New housing
WoE756	136 Residential & 4 Retail Units	Bristol	8.6	24/10/2016	24/10/2018	New housing, Infrastructure
WoE275	3 Commercial/Residential Units	Bristol	8.2	09/12/2016	08/12/2017	Private Commercial, New housing
WoE582	Indoor Arena	Bristol	8.2	12/12/2016	02/03/2018	Public Non-housing
WoE142	168 Flats, 138 Houses& 28 Sheltered	Bath & N E Somerset	8.0	04/01/2017	04/01/2019	New housing

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
	Units & Care home					
WoE808	Hotel & Retail Unit	Bristol	7.8	04/01/2016	06/01/2017	Private Commercial
WoE459	Distribution Centre	South Gloucestershire	7.8	07/08/2017	06/08/2018	Private Industrial
WoE778	Junction/Bridge/Drainage/Landscaping Works	North Somerset	7.7	07/04/2015	16/12/2016	Infrastructure
WoE429	Hotel (Extension/Alterations)	Bath & N E Somerset	7.4	23/05/2016	05/06/2017	Private Commercial
WoE442	192 Houses/58 Flats & School	Bath & N E Somerset	7.3	21/05/2017	18/06/2018	New housing
WoE711	251 Residential Units	North Somerset	7.3	04/01/2016	05/01/2018	New housing
WoE705	180 Houses/60 Care Flats & 1 Retail Store	Bath & N E Somerset	7.3	04/01/2016	01/06/2017	New housing, Private Commercial
WoE761	Hotel Building	North Somerset	7.2	04/01/2016	28/11/2016	Private Commercial
WoE177	131 Residential Units	Bristol	7.0	23/06/2017	21/07/2018	Private Commercial
WoE488	160 Houses/Flats & 4 Commercial Units(New/Refurb)	Bristol	6.8	06/08/2017	03/09/2018	New housing, Private Commercial
WoE770	135 Elderly Assisted Living Flats	North Somerset	6.7	28/11/2016	03/12/2018	New housing
WoE112	Hotel (Conversion/Extension)	Bristol	6.4	15/05/2017	15/05/2018	Private Commercial
WoE209	Post Graduate Accommodation building	Bath & N E Somerset	6.2	17/04/2017	17/10/2018	Public Non-housing
WoE133	Warehouse	Bristol	6.1	04/07/2016	28/04/2017	Private Industrial
WoE069	203 Houses/Office/Light Industry/Warehouse Units	North Somerset	5.9	05/03/2018	01/04/2019	New housing
WoE441	200 Residential & 1 Commercial Units (New/Conversion)	Bath & N E Somerset	5.9	04/09/2017	26/10/2018	New housing
WoE353	2 Student Accommodation Blocks	Bath & N E Somerset	5.7	13/03/2017	13/08/2018	Public Non-housing

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
WoE375	Student Accommodation Units	Bristol	5.7	04/01/2016	13/04/2017	Public Non-housing
WoE086	214 Flats & 30 Houses/8 Offices	Bath & N E Somerset	5.6	15/11/2016	15/12/2017	New housing, Private Commercial
WoE251	188 Residential Units & 1 School	Bath & N E Somerset	5.5	09/06/2017	21/07/2018	New housing
WoE521	Highways Term Maintenance 2016-2018	North Somerset	5.5	01/04/2016	01/04/2018	Infrastructure
WoE643	Abbey (Restoration Works)	Bath & N E Somerset	5.5	01/09/2017	01/03/2019	Public Non-housing
WoE289	Office/Industrial/Warehouse Units	North Somerset	5.3	17/10/2016	17/07/2017	Private Commercial
WoE366	180 Residential Units	South Gloucestershire	5.3	04/06/2018	05/07/2019	New housing
WoE241	Industrial/Office/Storage Units	South Gloucestershire	5.2	22/11/2016	11/09/2018	Private Industrial
WoE386	Caravan Production Facility & Office	Bristol	5.2	01/05/2017	29/10/2018	Private Industrial
WoE321	175 Houses	North Somerset	5.1	07/11/2016	04/12/2017	New housing
WoE674	Residential (Alterations)	Bristol	5.0	06/06/2016	02/12/2016	Housing R&M
WoE828	104 Student Flats	Bath & N E Somerset	4.8	24/11/2015	04/11/2016	Public Non-housing
WoE813	164 Houses/Flats	Bath & N E Somerset	4.8	04/04/2016	26/05/2017	New housing
WoE026	University (Extension)	Bristol	4.7	19/10/2015	19/12/2016	Public Non-housing
WoE230	150 Residential Units	North Somerset	4.4	25/03/2017	22/04/2018	New housing
WoE310	150 Houses/Flats	Bristol	4.4	04/01/2017	04/02/2018	New housing
WoE156	Office (Alterations)	Bristol	4.3	27/01/2017	01/05/2017	Private Commercial
WoE139	122 Houses/18 Flats/1 Bungalow & 1 Community Building	North Somerset	4.2	17/10/2016	17/11/2017	New housing
WoE446	Office (Extension/Alterations)	Bristol	4.0	14/03/2016	04/11/2016	Private Commercial
WoE425	200 Flats & 1 Supermarket/Business Units	Bath & N E Somerset	3.9	01/07/2017	01/08/2018	New housing

WLC ID	Heading	Local Authority	Forecast Value (£m)	Start Date	End Date	Project Type
WoE008	210 Care Flats & 1 Business Development	Bath & N E Somerset	3.9	12/03/2018	08/04/2019	New housing
WoE210	200 Residential Units	Bath & N E Somerset	3.9	02/11/2017	30/11/2018	New housing
WoE099	Industrial Unit (Extension)	North Somerset	3.7	16/08/2017	26/02/2018	Private Industrial
WoE173	109 Houses& 16 Flats	South Gloucestershire	3.7	01/07/2017	01/08/2018	New housing
WoE690	Cycleway (Improvements)	Bristol	3.4	13/03/2017	12/03/2018	Infrastructure
WoE048	4 Industrial / Office / Laboratory / Warehouse Units	North Somerset	3.1	01/07/2017	01/01/2019	Private Industrial
WoE189	Apartments	Bristol	3.1	13/08/2018	11/02/2019	Infrastructure

Appendix E. Region employer operates in, compared with working in

Appendix Table 12: Region/nation employer operates in, compared with region/nation working in currently

Region/nation employer operates in	Region/nation currently working in											
	EM %	EE %	GL %	NE %	NW %	NI %	SC %	SE %	SW %	WA %	WM %	YH %
East Midlands	83	16	8	13	3	2	4	12	8	7	24	11
East of England	12	67	15	11	2	1	4	19	8	7	9	6
London	10	27	84	13	4	1	5	27	12	7	9	6
North East	9	9	8	93	3	1	4	6	7	7	8	15
North West	11	9	8	14	93	1	4	6	7	11	11	10
Northern Ireland	3	3	3	2	1	99	3	2	1	3	2	1
Scotland	6	4	6	9	1	2	97	2	4	4	5	4
South East	13	23	27	12	3	*	4	65	21	7	11	6
South West	9	5	7	10	3	*	4	18	83	10	15	5
Wales	6	5	5	8	3	*	4	3	10	96	14	4
West Midlands	21	9	8	12	6	*	4	7	12	9	92	8
Yorkshire and the Humber	15	10	7	19	4	1	5	6	8	8	8	88
Republic of Ireland	1	2	3	*	*	2	1	1	1	2	2	*
Other parts of Europe	*	*	*	1	0	0	0	0	*	0	1	0
Outside Europe	*	1	0	*	0	0	0	0	*	0	*	0
Other / Unsure	1	3	2	3	2	*	1	3	1	*	1	3
<i>Unweighted bases</i>	410	366	452	427	435	274	463	439	494	290	352	369

Source: Workforce Mobility and Skills in the UK Construction Sector 2015, East of England Report. BMG Research on behalf of CITB. Base: All respondents. *denotes less than 0.5%