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## CITB ANALYSIS

# Construction demand and skills analysis for Essex



An analysis of the opportunities presented by the construction landscape in Essex for the Essex Employment & Skills Board  
February 2019



## EXECUTIVE SUMMARY

Essex can expect sustained spending on new construction projects of more than £1.9 billion per year for the foreseeable future. To meet this anticipated demand a peak construction workforce of around 65,720 people is required in 2019 increasing to more than 67,000 in 2022.

Although it appears that the total construction workforce available is sufficient to meet Essex's needs this belies a number of factors that are critical in understanding Essex's circumstances and the risks the construction landscape is facing. There is huge construction demand from London as well as other areas close by, that will apply a significant draw on Essex's workforce. With an aging workforce it is likely that workers will move into less strenuous roles or retire, diminishing the skills available. And there are also a number of notable construction initiatives that, if they go ahead, will create significant demand for scarce high value skills. And so it appears that there are significant risks that the greater Essex area may not always be able to meet demand for some occupations.

Across the area, infrastructure accounts for a very significant proportion of spend on new projects at 46%. New housing accounts for 24% of anticipated spend on new projects in 2019; with private commercial developments accounting for 13%.

### The Essex Employment & Skills Board area's opportunity

The Skills Board, along with local stakeholders are presented with the continuing opportunities to: support growing businesses; develop a more appropriately skilled and flexible workforce; drive higher level skills, match skills and the local economy and encourage job creation. This will, in turn, support the delivery of infrastructure that will enable further development and ensure that the area is prepared to exploit opportunities as they emerge and deliver the new housing that is needed.

Construction on its own makes up a huge part of the UK economy representing more than 7% of GDP and around 10% of employment. But crucially it is also an enabler. It will create the desperately needed new; has the potential to enhance the environment and create better public spaces and put in place the facilities and infrastructure that open up growth opportunities and the sites for new technologies and manufacturing. Construction opens up opportunities for major social and economic gains.

*"Essex has a huge range of opportunities in construction trades and professions over the coming years. With well-paid, skilled and increasingly technical job opportunities in a wide range of trades and professions, we should be encouraging young people to look at construction as a career of choice with excellent prospects. A skilled workforce will help the area's growth aspirations and leave a legacy for future generations. CITB is working with employers to inspire, attract and train this new talent for these valuable and rewarding careers."*

### High demand occupations

The trades for which there is greatest demand in the greater Essex area are:

- Wood trades and interior fit-out
- Electrical trades and installation
- Plumbing & HVAC Trades
- Labourers (elementary trades)
- Painters & decorators
- Building envelope specialists
- Specialist building operatives
- Bricklayers
- Plasterers & dry liners

### At risk occupations

The occupations at greatest risk of a shortfall in numbers available locally are:

- Civil engineering operatives
- Electrical trades & installation
- Specialist building operatives
- Painters & decorators
- Glaziers
- Construction trades supervisors
- Construction project managers
- Plant mechanics/fitters
- Plant operatives

### Priority occupations

The report identifies occupations for which there is high demand AND a high risk of a shortfall.

- Electrical trades and installation
- Specialist building operatives
- Painters and decorators
- Surveyors

## Occupations in context – the challenge

This report sets out a challenge to the Essex Employment & Skills Board, local authorities, colleges universities, training providers, construction employers and other stakeholders – namely to attract, train, recruit and maintain a high skilled construction workforce that meets anticipated demand.

Construction offers a range of well-paid high skilled jobs for which there is demonstrable demand. The opportunity is to exploit the opportunities to achieve social and economic gains by encouraging people from the area into these roles, providing the associated support and career pathways.

This challenge is set against the backdrop of: concerns about the future availability of skilled workers and demand from other UK regions and major infrastructure projects.

### Essex's geography

Essex's risks of shortages appear less pronounced than for some areas and for fewer occupations; this though needs to be considered in the context of Essex's geography. London is likely to exert a very significant pull on the area's construction workforce. Similarly, CITB has seen significant demand from parts of Cambridgeshire that could also draw of workers, exacerbating shortages in Essex.

### The professions

There is high demand for several professional roles, jobs which require a significant length of training before candidates become qualified. Architects, surveyors and civil engineers require higher level qualifications plus professional accreditation, so the effect of action now will only be felt in five to ten years' time. These are jobs in demand the world over. However, these roles do not need to be permanently on-site so it is likely that some demand may be met by those working outside the region.

There are also opportunities to modernise construction and for Essex Employment & Skills Board to start to encourage and adopt new technologies and new practices like off-site and modular construction to help meet demand.

### Training and education

Around 80 training providers have delivered construction related training (including apprenticeships) over the last five years. A core network of ten providers have delivered around 87% of that.

Construction training starts declined by 9% between 2012/13 and 2016/17, greater than the decline of 5% experienced by the whole of the East of England region. However over the same period, apprenticeship starts within Essex increased by 36%, slightly above the East of England's 34%.

Competence qualifications are considered important and for many occupations achievements fair positively compared with the region. Of these, 75% have been at level 2; Level 3 make up 24% but only 1% are at level 4 and above.

### Recommendations

The report proposes recommendations that include:

1. Strengthen existing, and develop new, collaborative partnerships. With a view to building holistic action plans and encouraging local stakeholders to work together and input to, and take ownership of, the construction skills actions.
2. Review the Essex area construction skills strategy and action plan reporting on progress made since 2016 and identifying new collective actions and solutions that may be required in and across the area.
3. Develop skills and training pathways for current needs and develop future skills. Ensure training is appropriate for local needs and businesses. Develop GREATER ESSEX area construction training so that it is appropriate for the needs of the construction industry and local circumstances, addressing risks of supply shortfalls.
4. Outreach. Build a more positive image of construction locally with young people. Increase recruitment through new entrance points, career changes and reskilling. Emphasise that construction offers high value rewarding careers for all.
5. Use procurement as a lever to enable positive action. Develop smarter approaches to procurement to encourage wider contract award inclusivity of small and medium sized employers. With those tendering for construction and infrastructure contracts or those funding developments to be mandated to include provision for recruitment, training, apprenticeships and outreach.

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# 1. INTRODUCTION

A previous report was produced for the Essex Employment and Skills Board towards the end of 2015 and presented early in 2016. Since then, CITB's methodology has been updated and access to additional relevant statistics have been gained to include additional insight. This means that the two reports are not directly comparable. Two of the significant changes are: to include skills data available from the Education and Skills Funding Agency (ESFA) and demand and risk estimates that now include assumptions based on estimates for smaller construction projects and repair and maintenance in addition to known new build development.

The Essex Employment & Skills Board has in place a construction strategy and action plan to help address the skills challenges the construction industry is facing across the county.

Although it is clear that significant effort has been devoted to supporting construction in Essex, it is the expectation of CITB that this new report will be used as a prompt to assess progress against that construction strategy and the recommendations proposed in the 2016 report as well as in reviewing and responding to the recommendations in this report.

Recommendations made in the 2016 report

## 1.1. RECOMMENDATIONS MADE IN THE 2016 REPORT

- i. Given the demand profile of projects within the pipeline in Greater Essex; particularly in the housing sector, there is a clear need for a wider dedicated Construction Skills Plan. This plan should be aligned with the activities of the existing Employment and Skills Board to strengthen and enable the skills challenges that the Board is committed to act on.
- ii. The evidence base, created to measure demand and the movement of supply, should be updated annually to support and inform decision making. This recommendation aligns itself to the objectives of the Employment and Skills Board in the creation of a robust evidence base.
- iii. The evidence based report should be shared with stakeholders across the business community, on client side and with the range of education providers to enable conversations to be based on information that is current, demand led and consistent.
- iv. Significantly, the evidence base demonstrates that the largest proportion of construction employers in Greater Essex are SMEs and micro size businesses. These organisations are traditionally hard to reach and the Employment and Skills Board needs to ensure that they are represented in discussions relating to construction employment and skills issues.
- v. Additionally, the report highlights that there are six main training providers delivering almost three quarters of construction training in the area and steps should be taken to engage directly with those training providers in relation to understanding the evidence base and ensuring that the future curriculum offer is 'demand led'.
- vi. A number of risks need to be managed and mitigated, particularly regarding the peak demand levels next year (2016). 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 and managed.
- vii. Occupations high-lighted as having potential skills gaps and shortages 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.
- viii. Wider initiatives should be explored such as a Shared Apprenticeship Scheme across Greater Essex which can benefit from employer collaboration and the range of projects on the horizon. There should also be consideration of how commissioning clients can work together to address how procurement good practice can drive employment and skills opportunities and influence the behaviour of suppliers to achieve greater social value. (CITB can advise further in the area as part of the wider construction strategy).

## 1.2. ESSEX EMPLOYMENT & SKILLS BOARD – PROGRESS REPORTED

The Essex Employment and Skills Board (ESB) developed a construction action plan to take forward the recommendations. Engagement with the wider employer community, created effective local partnerships between employers, educators and training providers to ensure skills provision addresses the needs of the sector. The ESB has strived to bring stakeholders together through an active Construction Sector Action Group acting as a prominent voice for the sector locally. The action plan has four elements:

### 1.2.1. Young People

#### Issues:

- Negative perception of sector.
- Too few students pursuing careers in construction.

#### What the Employment and Skills Board has achieved:

- The ESB sponsors an Education and Industry STEM programme, working with educational partners and industry to deliver a range of taster days, mentored projects and activities with schools. This has included facilitating a bridge building competition, hands-on activities delivered by industry and a pilot Institution of Civil Engineers masterclass series.
- The Enterprise Adviser Network is a national programme which is overseen by the Careers and Enterprise Company and is part funded by Essex County Council and the Essex Employment and Skills Board. The programme has been launched to inspire and prepare secondary school students for the world of work. Enterprise Advisers are volunteers from industry who work strategically with the senior leadership team of a school to help sharpen the school's careers strategy and enhance employer engagement.
- By securing external funding, the ESB has worked collaboratively with local industry to develop a new Construction Careers Guide, with copies sent to secondary schools across Greater Essex. The guide introduces young people to a range of diverse roles within the sector, showcasing skillsets required, salaries, local demand and employers, the impact of technology and benefits of working in the sector. The guides have supported the Essex Construction Training Agency to pilot 'lunch and learn' within schools.
- The Board has delivered and is continuing to plan extra curricula events and activities to attract young women into the sector. This has included organising speed networking events to expose young women to local industry. Plans are in the pipeline to continue to attract young women into the sector by proactively engaging the Guiding Association with industry.

### 1.2.2. Further and Higher Education

#### Issues:

- Negative perception of sector.
- Too few students pursuing careers in construction.
- Courses not meeting needs of employers.
- Access to skilled tutors; lecturers and assessors.

#### What the Employment and Skills Board has achieved:

- In conjunction with Essex County Council and the South East Local Enterprise Partnership, the ESB continues to work with FE Colleges and training providers to influence provision and further develop training facilities to deliver the skills needed by the sector. This has included:
  - Investment in a STEM Innovation Campus in Braintree and the Harlow Advanced Manufacturing and Engineering Centre.
  - Support for FE Colleges to purchase specialist training equipment to support enhanced curricula.
  - New provision to support future home design at Harlow College.
  - Support for the development of a specialist construction campus in Clacton.
- The ESB has been working with the Essex Provider Network, Federation of Essex Colleges and the South East LEP to support initiatives to address severe difficulties in recruiting and retaining suitable tutors and assessors. The ESB has helped to fund Golden Hello payments and grants for tutor training as well as delivering continuous professional development initiatives to help address these barriers.



### 1.2.3. Adults

#### Issues:

- Negative image of sector.
- Difficulty to access sector, training and jobs.

#### What the Employment and Skills Board has achieved:

- The ESB has supported two successful bids for on-site training hubs as part of a share of the £22m Construction Skills Fund, administered by CITB. The funding, for an 18 month scheme, forms a part of the Government's modern Industrial Strategy – by helping businesses create jobs across the UK.

Government funding of around £1 million each has been awarded to:

- Harlow College – Public Health England has been granted permission for its proposal to create a 'world leading' science campus and headquarters in Harlow. The proposal is to create a mobile site-based training hub for delivery of apprenticeships, sector work-based academies for job seeking adults, work placements, visits, tasters and school outreach opportunities.
- Southend-on-Sea Borough Council – The proposal is to create three training hubs to provide classroom training and trade training facilities in Southend. There will be three sites across: Southend, Thurrock and Basildon.

The funding will help meet the needs of employers and tackle the construction skills shortage, while also supporting those who want to join the industry, particularly adult learners. It will also help inform future policy and prepare for the introduction of technical (T) levels. The funding in Essex will support over 1,300 new entrants into construction.

- With local job centres, the ESB has supported a number of construction pop-up shops, providing a platform for unemployed, potential career changers and those not in education, employment and training gain insights into the range of roles and responsibilities. Attendees have been able to speak directly to local employers and find out about further training opportunities to help them secure employment.
- The ESB has also helped HMP & YOI Chelmsford to invest in virtual reality software and equipment that will enable prisoners to undertake training in plumbing and electrical trades to help them move into employment upon release. Support has also been provided for roofing training, linked to employment opportunities.
- The ESB has supported the Building Heroes charity to provide skills training to service personnel from the Colchester Garrison, enabling them to progress into the construction sector after leaving the military.

### 1.2.4. The Sector

#### Issues:

- Employers not engaged with skills agenda.
- Procurement and planning not maximising positive impact on skills.
- Difficulties recruiting sufficiently skilled employees.
- An ageing workforce.

#### What the Employment and Skills Board has achieved:

- The ESB's Sector Action Group provides a network to build engagement with the wider employer community, creating effective local partnerships between employers, educators and training providers. In addition, the ESB works closely with other organisations and networks including the Essex Developer's Group, Essex Construction Training Agency, the CIOB and CITB.
- The Board has also been actively promoting the construction industry by trying to dispel common perceptions about the sector. Targeted social media campaigns have been run to inform:
  - Adults about the opportunities the sector can bring, for career changers and the unemployed;
  - Influencers such as parents who play a key role in the options and career and educational pathways their children pursue;
  - Young people about the breadth of opportunity available locally.

### 1.3. THE SCOPE OF THIS REPORT

Figure 1 shows the Essex Employment and skills Board area covered in this report.

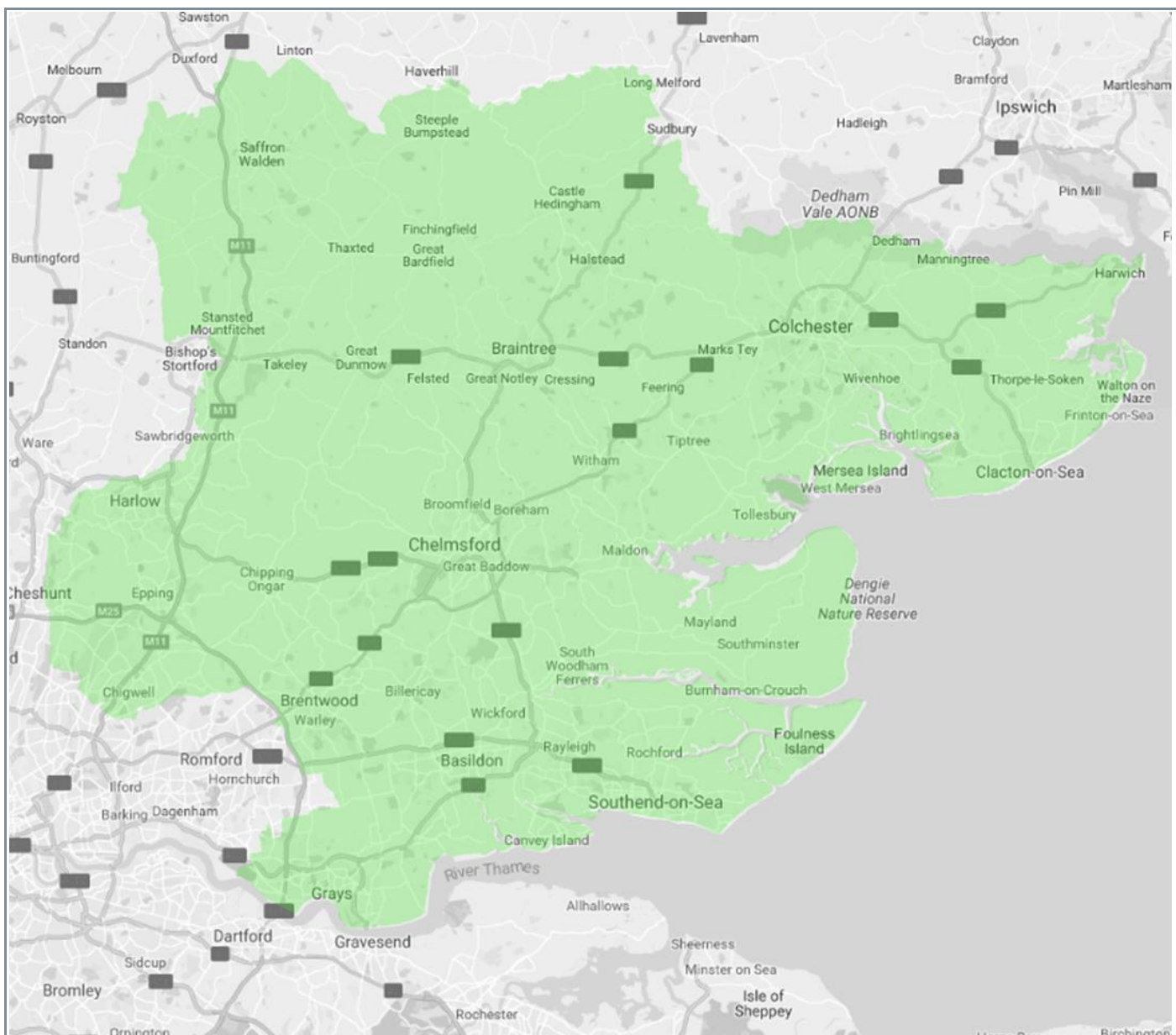


Figure 1: Essex and surrounding areas

Table 1: Local authorities included in the analysis

Essex County Council	Chelmsford	Rochford
Basildon	Colchester	Southend-on-Sea
Braintree	Epping Forest	Tendring
Brentwood	Harlow	Thurrock
Castle Point	Maldon	Uttlesford

## 2. LABOUR DEMAND IN ESSEX

The following sections provide an estimate of the labour demand predicted by our Labour Forecasting Tool that construction investment will create across Essex over the period 2018-2022. The tool and method of analysis are described in Appendix A.

### 2.1. SUMMARY OF DEMAND

- Our estimate of the labour demand in Essex is around 65,720 people in 2018. The projected growth between 2018 and 2022 suggest that the labour demand in 2022 will be around 67,200 people.
- Around 60% of the workforce is employed in skilled trades & operatives, the other 40% are in managerial, professional & office based staff.
- During 2019 the most labour-intensive occupation group is “Non-construction professional, technical, IT, and other office-based staff (excl. managers)” with an annual demand of 8,880 people.
- The skilled trade & operative occupations in greatest demand are:
  - Wood trades and interior fit-out with a requirement for 6,640 people;
  - Electrical trades and installation follow with 5,280 people.
  - Plumbing and heating, ventilation, and air conditioning trades rank third, with a demand of 4,090 people

### 2.2. PIPELINE OF KNOWN PROJECTS

#### 2.2.1. Glenigan pipeline analysis

We have considered projects in the Glenigan database<sup>1</sup> and the National Infrastructure and Construction Pipeline (NICP)<sup>2</sup> as well as incorporating feedback and additional comments from the Employment and Skills Board. These comprise what are referred to as the known projects.

An initial review of the Glenigan database identified 671 projects in Essex. Of the Glenigan projects, 71 were removed due to missing dates. Also excluded were three projects which were clearly identified as consultancy projects. one project was removed because it was a duplicate. Two projects were removed due to them being included in the NICP. A full set of the projects which were omitted from the analysis is provided in Appendix C. The spend in projects which were removed because of missing dates is around 1.7% of the total pipeline value. It is possible that this work will take place at some point in the future but as dates are unknown it is most likely that this will be later in the forecast period. Since dates are not known it is not possible to pinpoint when the labour will be required. However, an assessment of the labour demand from potential additional projects is included in the estimates of other work as outlined in Appendix A. As part of this analysis the initial list of significant projects was issued to the county council for their review. Feedback was incorporated into the final analysis.

The Mean Value Theorem was applied to the remainder of the pipeline to identify the significant projects. The process identified 100 significant projects accounting for 80% 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.

Appendix D provides a full breakdown of the Glenigan significant projects and their construction values. The peak year for the Glenigan spend profile is 2019. The location of the significant projects within the Essex can be seen in Figure 2. The values of the projects are proportional to the sizes of the coloured dots.

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<sup>1</sup> The Glenigan database allows contractors to identify leads and to carry out construction market analysis. It is updated every quarter to provide details of planning applications from local authorities supplemented with additional project-specific data. For the purposes of this analysis we have used the 2018/Q3 cut of data.

<sup>2</sup> The Infrastructure and Projects Authority (formerly Infrastructure UK and Major Projects Authority) compile annually a pipeline of UK infrastructure and construction projects and the associated annual public and private investment. For this report we have used the 2017 which includes details of around 700 projects valued at some £463bn.

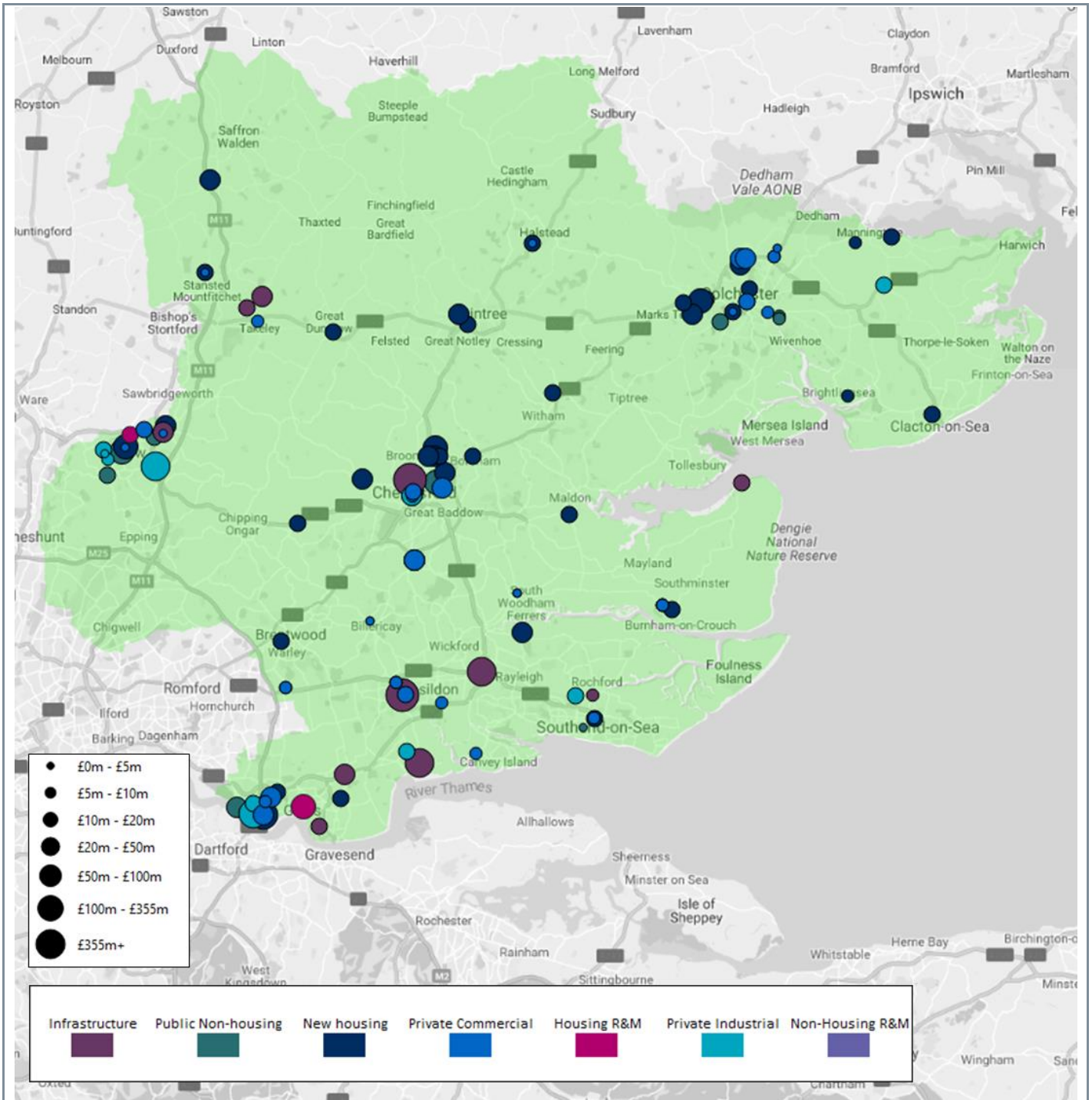


Figure 2: Location of significant Glenigan projects included in the analysis

## 2.2.2. Glenigan & NICP spend analysis

Implementing the methodology outlined in Appendix A leads to the following findings for the peak year for known projects of 2019. The peak year is used because the tail off in the known projects is more likely to be due to a lack of future planning rather than an actual tail off in workload.

Table 2 shows the distribution by project type of new build spend for the total pipeline of known projects.

**Table 2: New-build construction spend by project type in 2019 (total known projects)**

Project type	Construction spend in 2019 (2018 values – £m)	% of total
Infrastructure	884	46%
New housing	461	24%
Private commercial	255	13%
Private industrial	197	10%
Public non-housing	122	6%
<b>Total</b>	<b>1,919</b>	<b>100%</b>

Table 3 shows the infrastructure construction spend from the known projects in 2019 by infrastructure sub-type. 0 provides a full breakdown of the NICP and county council identified projects and their construction values.

**Table 3: Construction spend per infrastructure sub-type in 2019 (total known projects)**

Project type	Construction spend in 2019 (2018 values - £m)	% of total
Transport	453	51%
General infrastructure	247	28%
Water	125	14%
Energy	39	4%
Flooding	19	2%
Mining	1	0%
Communications	-	0%
<b>Total</b>	<b>884</b>	<b>100%</b>

## 2.3. ESTIMATE OF FUTURE TOTAL LABOUR DEMAND

The known project pipeline may not include smaller projects or repair and maintenance work. Figure 3 shows the outcomes of the analysis of future labour demand with the forecast regional employment growth rate applied. The solid purple area shows the labour demand arising from the new build Glenigan and NICP projects. This is projected forward from the peak as shown in green. The R&M (including any in Glenigan or the NICP) is also shown along with the likely total labour demand arising from estimates of other work. [R&M will in many cases account for large numbers of self-employed workers.]

The method for calculating these is provided in Appendix A. The total construction labour demand is around 65,720 people in 2018. The projected growth between 2018 and 2022 suggest that the labour demand in 2022 will be around 67,200. [This will include estimates for self-employed as employed workers.]

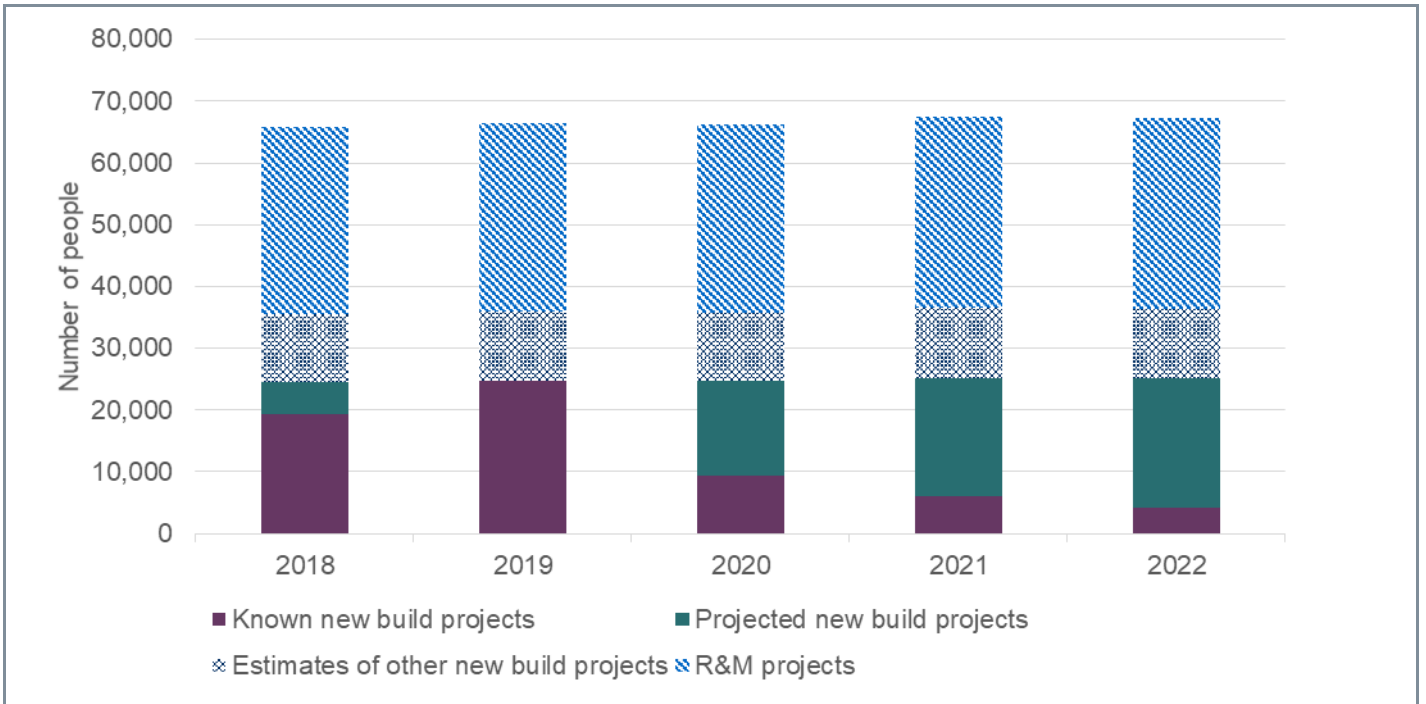


Figure 3: Total construction labour demand including estimates for both R&M and estimates of other work

### 2.3.1. Breakdown of labour demand by occupation

Figure 4 presents the breakdown of labour for skilled trades & operatives and managerial, professional & office based staff. Around 60% of the workforce are in skilled trades & operative occupations.

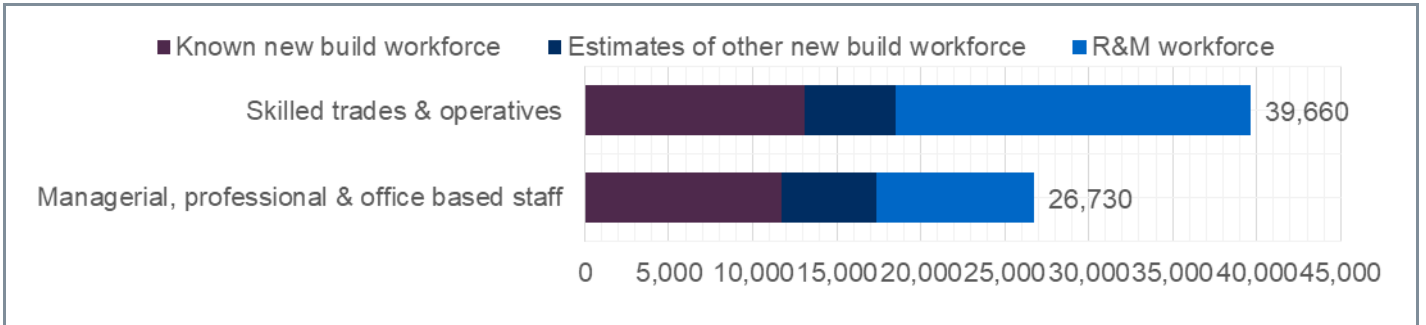
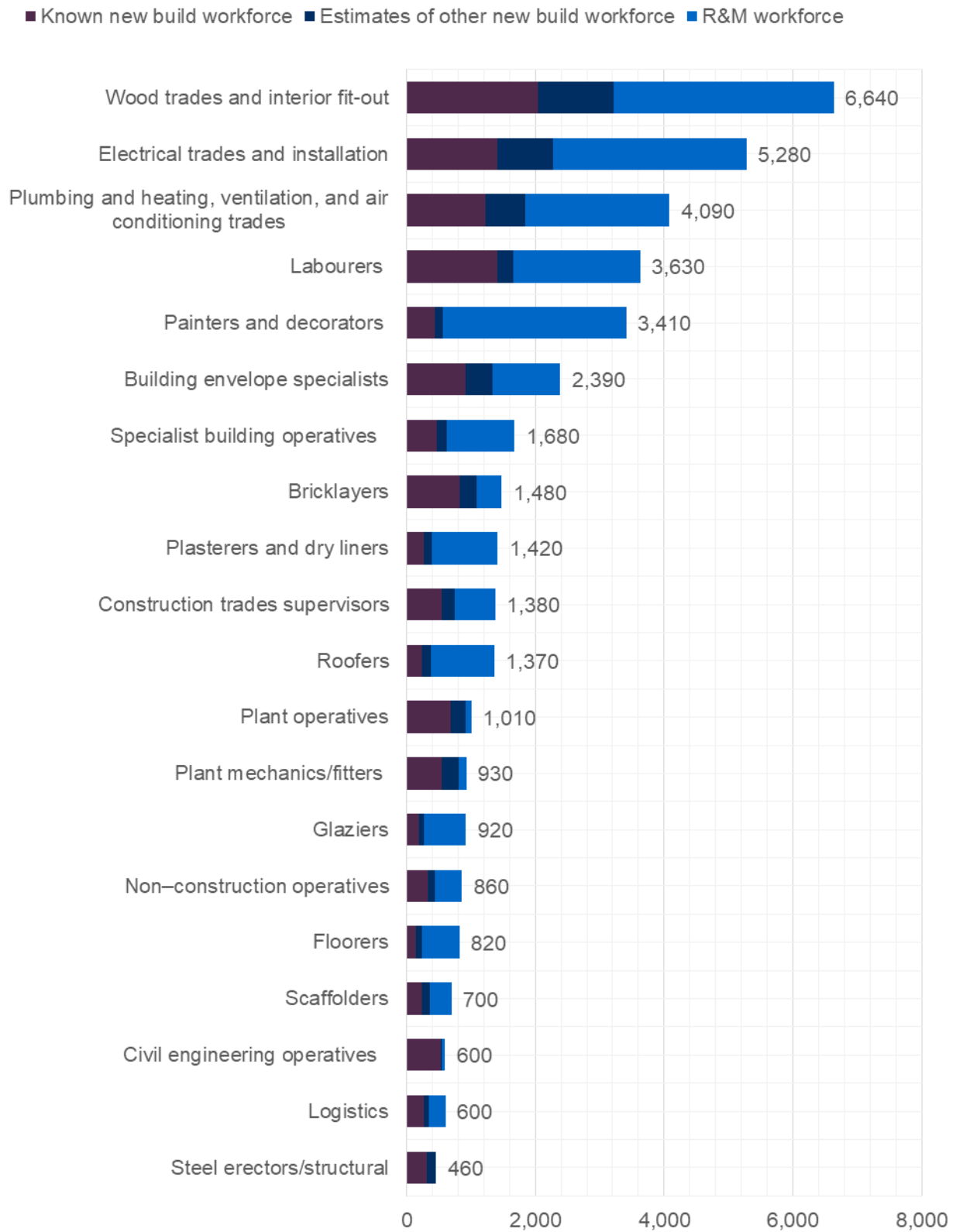


Figure 4: Total construction labour demand for 2019 by broad occupational group

For the peak year in Glenigan of 2019, Figure 5 shows the detailed breakdown for the 20 skilled trade & operative occupational groups for the pipeline of known projects, the estimates of other new-build work and the R&M work. These occupations will be predominately based at or near the location of the work.



**Figure 5: Construction labour demand for skilled trades & operative occupations in the peak year**

Figure 6 shows a breakdown of the managerial, professional & office based occupations. Since it is possible for many of these people to work remotely from the site, they will not necessarily generate a local demand.

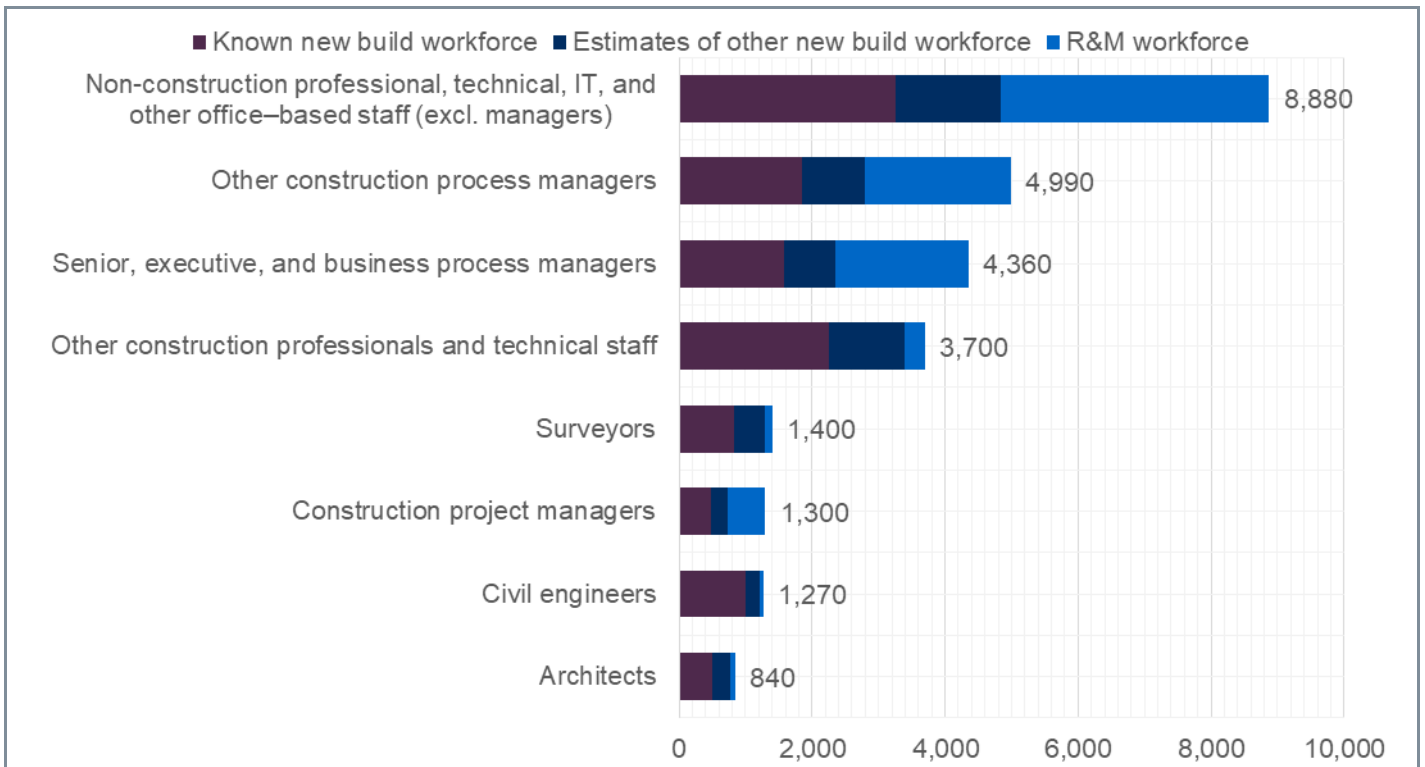


Figure 6: Construction labour demand managerial, professional & office based occupations in the peak year

### 2.3.2. Breakdown of labour demand by project type

Table 4 shows the labour demand generated by the known projects and the estimates of other work in 2019 broken down by project type.

Table 4: Labour demand by project type in 2019

Project type	Known pipeline labour demand in 2019 (people)	Estimates of other work labour demand in 2019 (people)	Total labour demand in 2019 (people)	% of total in 2019
Non-housing R&M	-	22,610	22,610	34%
Private commercial	4,560	11,070	15,630	24%
Infrastructure	8,610	-	8,610	13%
Housing R&M	1,450	6,460	7,910	12%
New housing	5,790	-	5,790	9%
Private industrial	3,580	-	3,580	5%
Public non-housing	2,280	-	2,280	3%
<b>Total</b>	<b>26,270</b>	<b>40,140</b>	<b>66,410</b>	<b>100%</b>



## 2.4. ESSEX'S PROXIMITY TO AREAS OF HIGH DEMAND

This report assesses the demand from Essex construction and compares it with the supply of workers from Essex. However it is important to consider this in the context of the demand, on a very mobile workforce, from areas nearby – most notably London and to some extent Cambridge as well as other areas of high growth nearby.

These are likely to exert a draw on Essex's construction workforce and so give the impression that any risk of shortages are less than they are. By way of illustration of the scale of London's draw, the annual construction output for Greater London (1,500km<sup>2</sup>) is estimated to be around £32bn. In comparison the whole of the East of England region (19,000km<sup>2</sup>) is less than half of this.

The 2018 CITB Construction Skills Network anticipated annual average growth in London's construction output at 1.5% for five years reaching a new peak of £34.87bn. The infrastructure sector is anticipated to see the greatest average annual increases with High Speed 2, in particular, offsetting other projects like Crossrail coming to an end. This should be of interest to Essex that also appears to have high demand for infrastructure and so may be competing for scarce skills.

## 2.5. PROPOSALS FOR MAJOR PROJECTS

### 2.5.1. Bradwell B & Sizewell C new nuclear power stations

In January 2017, the UK Office for Nuclear Regulation started a generic design assessment process for a *Hualong One* design nuclear power station at Bradwell-on-Sea, on the Dengie peninsula of the River Blackwater, Essex. This is adjacent to the site of the partially decommissioned Magnox power station. The technical assessments are being undertaken by China General Nuclear (CGN) and EDF Energy to inform a detailed proposal expected to be completed in 2021. It is expected that CGN and EDF Energy will conduct consultation with stakeholders including the local community, local authorities, and statutory consultees as the plans are progressed.

- [Bradwell B](#)

Sizewell in Suffolk, is 40 miles from the Essex border and so it is likely that there will be a draw on skills from Essex as well as further afield. There may, therefore be opportunities for joint skills planning associated with the two developments along the East Anglian coast.

- [Sizewell C](#)

### 2.5.2. Experience of Hinkley Point C

The experience gained at Hinkley Point C was that even when major ground works had started, main contractors had been unable to publish detailed employment and skills plans

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

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

There will also be large numbers of specialised roles in activities including: planning, surveying and design. In December 2018 it was reported that around 3,200 workers were on-site at Hinkley Point. Earlier estimates were for a peak construction workforce for Hinkley Point C of approximately 4,300 workers.

It is important to note that a build like Bradwell B is unlikely to match the profile of the East of England region construction workforce and while it may not take a significant proportion of the total workforce, it is likely to outstrip provision of specific skills.

### 2.5.3. Lower Thames crossing

Proposals for a Lower Thames Crossing are undergoing consultation. The outline plan is for a 2.4 mile (3.8km) bored tunnel under the Thames to the East of Tilbury in Essex and Gravesend in Kent. The tunnel will form the centre of a 14.5 mile (23km) three-lane carriageway connecting the M2/A2 near Rochester with the M25 between North and South Ockendon in Essex. There will be three junctions: Orsett on the A13, Thong on the A2 and north-bound slip roads on the M25 at junction 29.

Highways England estimates the cost of the project at between £3.5bn – £6.8bn and construction lasting up to five years, including around six months for advance works including ecological protection and utility diversions.

The project is likely to be a significant undertaking involving the construction of what will be the longest road tunnel in the UK and the third-widest bored tunnel in the world. It will also require a significant number of new structures and changes to existing: bridges, buildings, viaducts and utilities including electricity pylons.

It is likely that in addition to tunnelling, the project will require significant numbers of the kind of skills identified as being in need for a nuclear power station (listed above).

#### 2.5.4. High Speed 2

Although High Speed 2 is outside Essex, it is likely to have an impact on UK construction.

High Speed 2 commissioned its own analysis of the demand for construction and the potential impact on the construction industry along the route. In September 2018, High Speed 2 published its [Skills, Employment and Education Strategy](#) available from the HS2 website.

This strategy is linked to the [HS2 labour and skills demand and supply forecasting and analysis](#) also available from the HS2 website.

At its peak in 2021/22, the demand for labour generated by construction will be around 25,600 plus thousands more jobs in rail engineering. A third of the construction jobs are forecast to require skills, at least at NVQ4+ or degree-level so the work represents a significant opportunity to upskill the construction and infrastructure workforce.

HS2 is attempting to address some of these potential gaps with the creation of the new National College for High Speed Rail (NCHSR) and to establish at least 2,000 apprenticeships.

The need for roles will not be evenly spread across the spectrum of construction occupations and it is likely that there will be demand for specialists including: construction supervisors, scaffolders, plant operatives, civil engineers, are forecast to experience particular labour demand pressures.

## 2.6. BREXIT – DEMAND CALCULATIONS AND FORECASTING

Economic forecasts are predicated on the Brexit position at the time data for this report was collated (at the end of 2018).

The baseline forecasts that have informed the Construction Skills Network assumes that a deal will eventually be struck within a four year time horizon and it will include some form of trade access to the single market. As it is unlikely that the terms will be as good as the current situation, we have made a small downgrade to our long term export and investment projections, compared to our pre-Brexit vote baseline. No adjustments have been made to underlying population projections in our base case but downside risks clearly exist on this front from a potential slowdown in EU migration.

At the time of writing the proposals meant that after a proposed Brexit transition period, all migrants planning to live and work in Britain would have to demonstrate they are sufficiently skilled by meeting a minimum salary threshold. That figure has not yet been specified but, at present, non-EU migrants must earn more than £30,000 a year to work in the UK, so the assumption is that it will be a similar figure for EU migrants.

Low skilled people will be able to migrate to the UK but only in limited numbers. For example, the government in October 2018 announced a pilot scheme allowing British farmers to bring in fruit and vegetable pickers for up to six months each year during the harvest season. However, it has ruled out a wider system of sector-by-sector exemptions.

The current negotiations are just on the immediate terms of Brexit, the actual trade deal with the EU will take much longer to finalise, hence our four-year horizon.

### 2.6.1. Indicators of potential impacts on demand from other research

The CITB 2018 Construction Skills Network identifies some potential implications of Brexit as including: “ an impact on the capital’s commercial construction sector with declines anticipated over the coming three years. While there are some significant regeneration schemes in the pipeline, there are expected to be significant declines in demand for offices and retail space.”

## 2.7. HOUSING TARGETS AND GARDEN COMMUNITIES

The method for establishing the demand analysis in this report is described in Appendix A. And Appendix D provides a breakdown of the Glenigan significant projects and their construction values. The location of these significant projects is shown in Figure 2.

For this report the demand analysis is based on activity for which there are defined details and a good level of certainty. However it is understood that the local authorities have ambitious plans for housing growth and estimate the need for housing for a population growth of around 190,000 in North Essex alone by 2050.

Indicative plans have been shared for seven new garden communities. The North Essex Garden Communities is developing proposals for three new communities: for up to 9,000 homes to the East of Colchester; up to 10,000 new homes to the West of Braintree and to the West of Marks Tey for up to 24,000 homes. In addition, garden communities have been proposed for Dunton Hills (2,500 homes) near Brentwood. And the Harlow Gilston Garden Town includes proposals for new developments to the East, West and South of Harlow plus seven new villages to the north that aims to build 16,000 new homes up to 2033 with development continuing beyond that.

These developments will necessarily also need to include transport, water and other utility infrastructure and local access as well as related services such as schools, health centres and public spaces; leisure and commercial developments and integrated green and recreational space. They are likely to place an additional significant demand on an already stretched construction sector.

At the moment it is not clear where the workforce might come from to deliver the hoped for significantly greater housing output.

### 3. CONSTRUCTION LABOUR SUPPLY IN THE ESSEX AREA

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

The first element is to take a view on construction employment in the Essex area (including Southend on Sea and Thurrock) and how this relates to employment across the East region and the UK. Where applicable, the UK data from CITB's Construction Skills Network (CSN) is used along with official Government sources. Employment and employers are considered together as they are intrinsically linked, particularly as a large proportion of construction workers are employed within micro businesses or are self-employed, where the business location is also the home location.

For the second element, whilst training occurs at Further Education (FE) and Higher Education (HE) levels, the main focus of this report is on the FE that takes place. FE tends to be sourced and delivered in a closer proximity to the home and workplace, whereas the length of study time and specialisms for Universities for HE typically give rise to much greater degrees of mobility. Nevertheless, Higher Education in the region is also analysed, but should be considered in the context of the greater mobility levels of the learners at this level.

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

#### 3.1. MAIN POINTS

- Current construction workforce within the Essex area is estimated at around 73,300 workers.
- The local authority areas in Essex with the largest share of the construction workforce are Chelmsford, Basildon, Braintree and Colchester, Thurrock and Epping Forest, accounting for nearly 60% of the total.
- The Essex area (including Southend-on-Sea and Thurrock) currently accounts for around 29.5% of construction employment in East region as a whole
- Since 2012, the number of construction businesses in Essex has increased by 31% to just under 14,600.
- Over the last five years over 80 training providers have delivered construction related training within the Essex area; ten main providers deliver 87% of provision.

#### 3.2. EXISTING WORKFORCE

- The construction workforce in Essex has declined in the last three years but remains above the 2012/13 level.
- 95.6% of Essex construction businesses are micro sized (0-9 employees), similar to the East region as whole.

An analysis of the Annual Population Survey shows that the Essex area (including Southend-on-Sea and Thurrock) currently accounts for around 29.5% of construction employment in East region as a whole. Table 5 applies this percentage share across the CSN occupational breakdown for the East region as a whole to give an estimate of total employment at occupational and industry level in the Essex area. For comparison, the wider East region has been included.

Figure 7 below shows that the construction workforce in Essex grew strongly in the period 2013-15, outperforming the region as a whole. However, it declined somewhat in the three most recent years, underperforming the region as a whole. Nevertheless, at a current level of around 73,300, construction employment in Essex remains 2.4% above the 2012/13 level of 71,600.

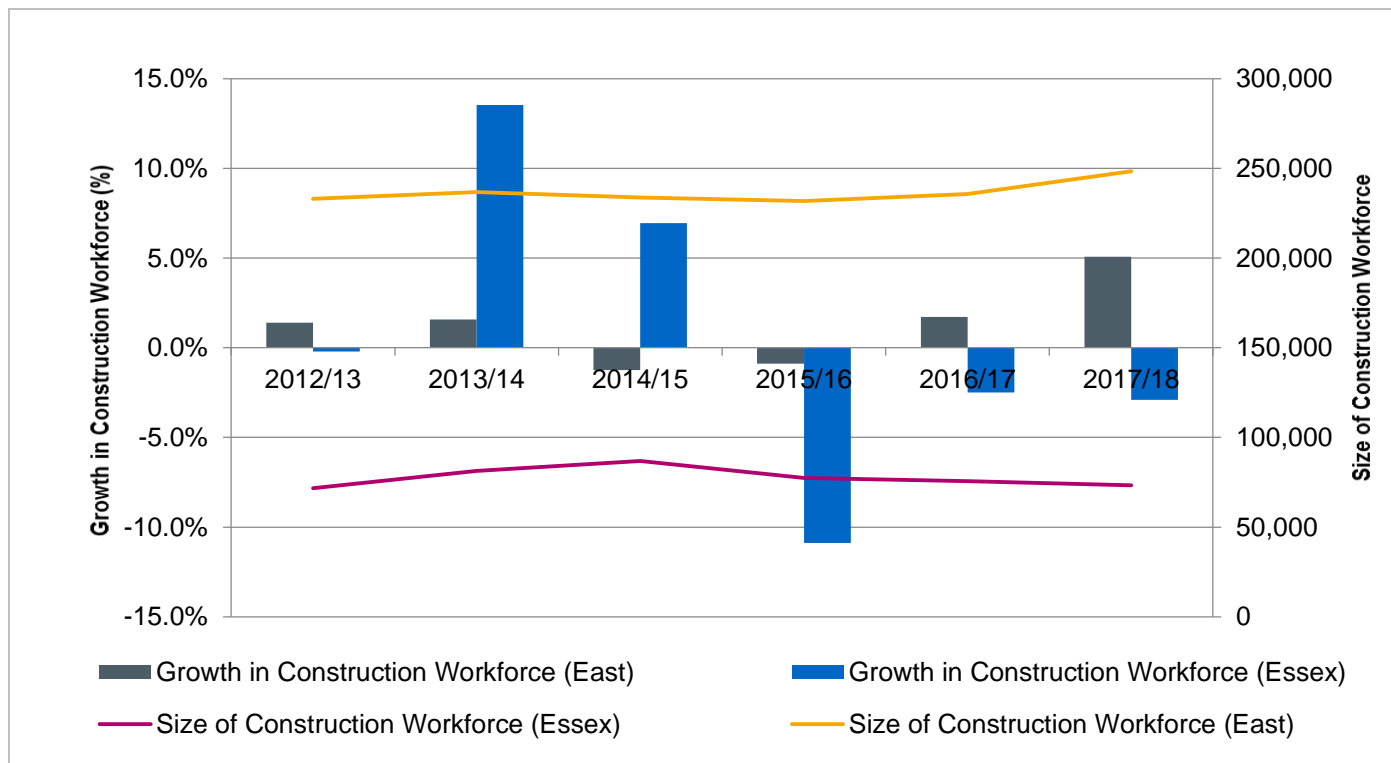


Figure 7: Year on year change in Construction Employment (Experian/CITB & NOMIS 2018)

Figure 8 below shows that growth in the number of construction businesses within Essex has broadly kept pace with the wider East region and the UK, outperforming in 2015 / 16. Since 2012, the number of construction businesses in Essex has increased by 31% to just under 14,600. Overall, Essex has increased its share of regional construction businesses from 34.5% to 36% between 2012 and 2018.

Figure 9: Distribution of construction businesses within Essex (UK Business Count, NOMIS 2018) shows the distribution of construction businesses within Essex and Figure 10 shows the distribution of the construction workforce.

Across many local authority areas, there is little difference between the two distributions. However, Epping Forest has a notably smaller share of the workforce compared to businesses, whilst Chelmsford and Braintree have proportionately larger workforce shares.

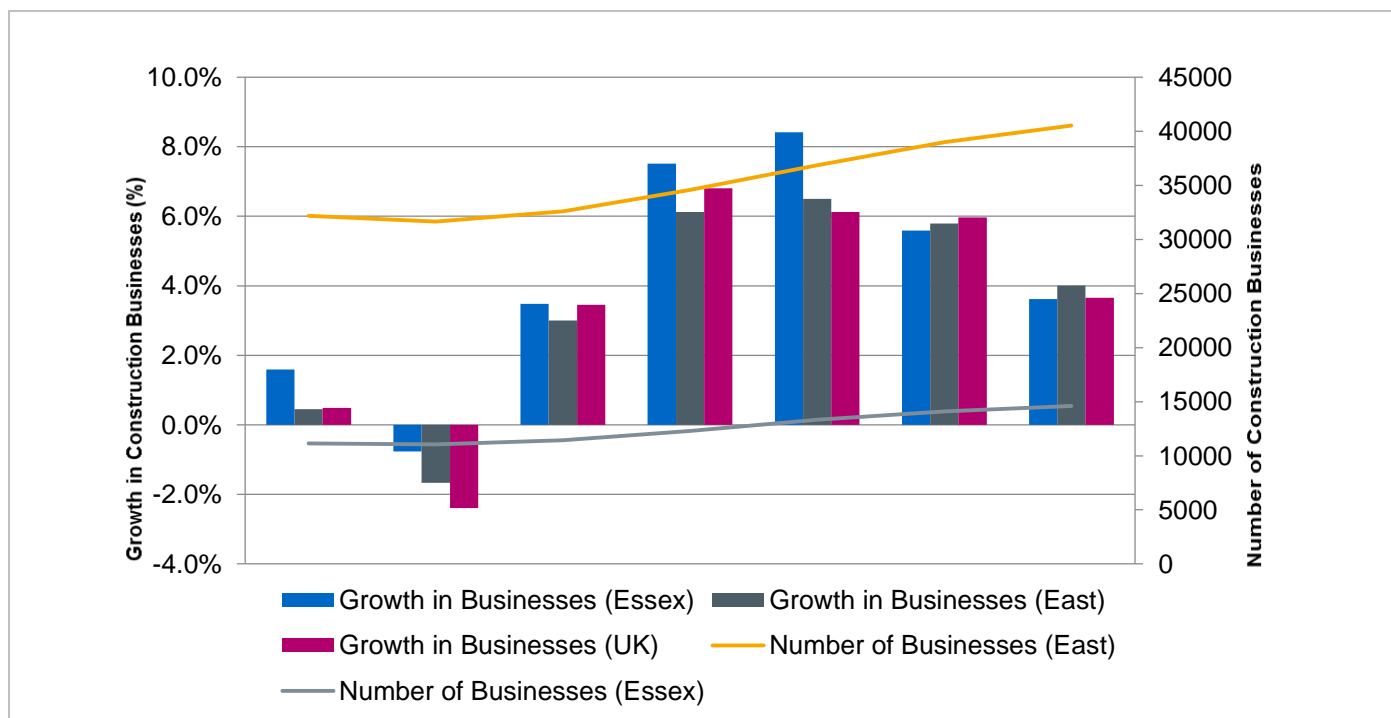


Figure 8: Year on year change in Construction Businesses (UK Business Count, NOMIS 2018)

The local authority areas in Essex with the largest share of the workforce are Chelmsford, Basildon, Braintree and Colchester, Thurrock and Epping Forest, accounting for nearly 60% of the total.

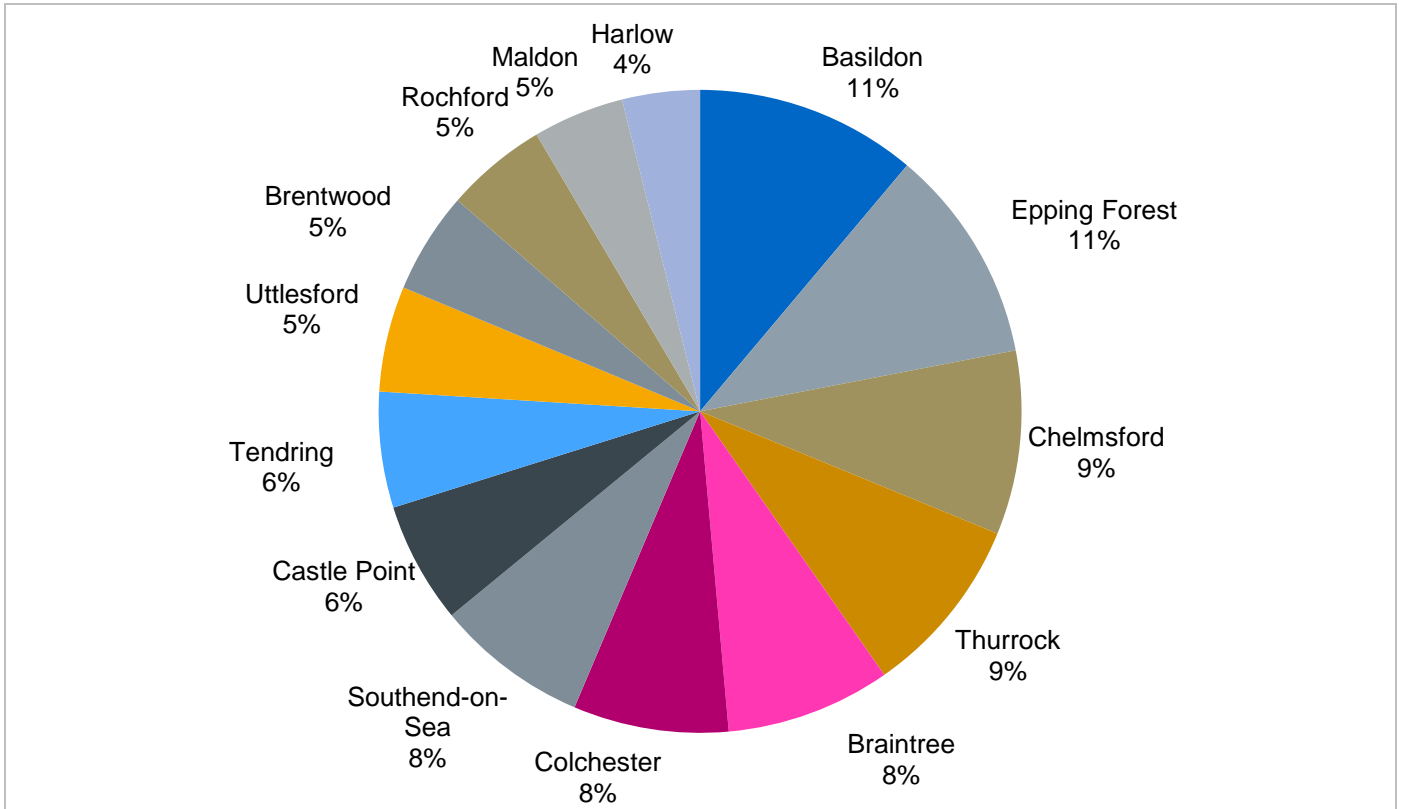


Figure 9: Distribution of construction businesses within Essex (UK Business Count, NOMIS 2018)

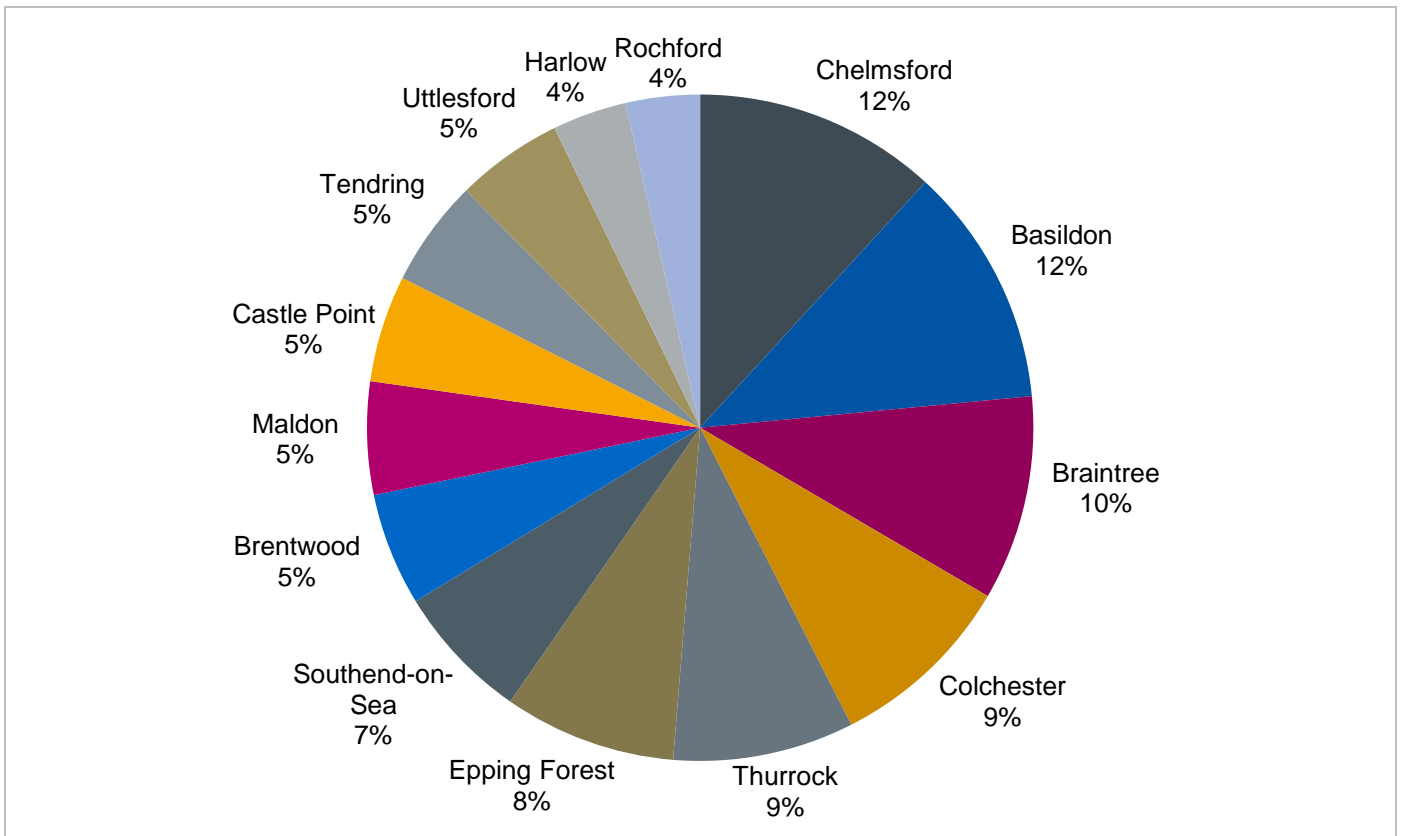


Figure 10: Construction employment by area within Essex (2018, NOMIS)

When assessing the patterns between workforce and number of businesses it is important to note two main factors when looking at the construction sector:

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

The construction sector has high levels of self-employment with around 40% of the UK construction workforce being self-employed. Local proportions are higher: 45% in the East; 46% in Essex.

When looking at business size, Figure 11 below shows that the distribution of companies across the Essex area is on the whole similar to the East, with the majority of companies being micro-sized, (around 95% respectively). In fact, the local distributions are not dissimilar to the United Kingdom, although the local proportion of micro-sized businesses is slightly higher.

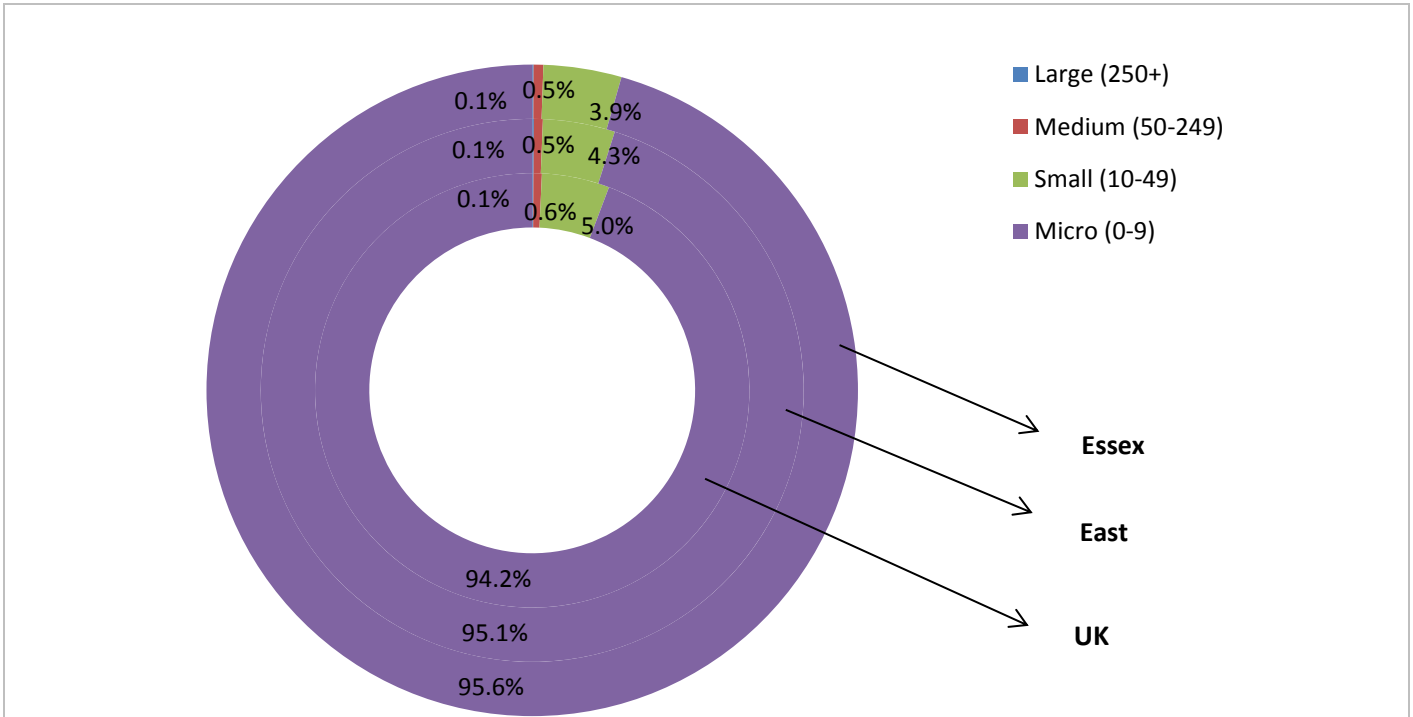


Figure 11: Construction Businesses by Employee Size (UK Business Count, NOMIS 2018)

Table 5: Construction workforce – occupational breakdown, 2017 (Source Experian & CITB)

	Essex	East region
<b>MANAGERIAL, PROFESSIONAL AND OFFICE BASED ROLES</b>		
Other construction professionals and technical staff	4,495	15,223
Other construction process managers	5,244	17,760
Senior, executive, and business process managers	5,106	17,292
Surveyors	1,428	4,835
Construction Project Managers	1,264	4,280
Civil engineers	2,115	7,163
Construction Trades Supervisors	1,304	4,418
Architects	1,263	4,276
Non-construction professional, technical, IT, and other office-based staff	10,517	35,618
Non-construction operatives	621	2,103
<b>SKILLED TRADES</b>		
Wood trades and interior fit-out	7,425	25,147
Electrical trades and installation	4,408	14,930
Plumbing and HVAC Trades	4,695	15,900
Labourers nec*	3,983	13,489
Building envelope specialists	3,102	10,505
Painters and decorators	2,943	9,968
Specialist building operatives nec*	1,442	4,883
Bricklayers	2,270	7,690
Roofers	1,401	4,744
Plasterers	1,838	6,226
Plant mechanics/fitters	931	3,154
Plant operatives	1,021	3,457
Glaziers	846	2,864
Floorers	1,118	3,785
Logistics	874	2,960
Steel erectors/structural fabrication	663	2,246
Scaffolders	735	2,489
Civil engineering operatives nec*	289	977
<b>Total</b>	<b>73,339</b>	<b>248,381</b>

Note: numbers rounded to the nearest 10

Note: nec\*: not elsewhere classified; HVAC: Heating, ventilation and air-conditioning.



## 4. TRAINING PROVISION

### 4.1. MAIN POINTS – TRAINING PROVISION

- Over the last five years over 80 training providers have delivered construction related training within the Essex area; ten main providers deliver 87% of provision.
- Overall, volumes of construction training in the Essex are declining, but numbers of apprenticeship starts are increasing overall.
- Good levels of competence qualifications achievements are found within the following occupations; plumbing trades, plant operatives, specialist building operatives, civil engineering operatives, building envelope specialists, scaffolders, plasterers, construction trade supervisors, plan mechanics /fitters,

Overall, the volume of training in Essex has declined between 2012/13 and 2016/17, with the number of new starters decreasing by 9% over this period. This fall is somewhat greater than, the decline witnessed in the East region as a whole which saw a decline of just 5% over the same period.

CITB analysis of Education and Skills Funding Agency (ESFA) Individualised Learner Records from 2012/13 through to 2016/17 academic years for construction learners shows that:

- The Essex area accounts for 31% of identified construction related training across the East region;
- There has been a reduction in the total number of construction learners starting in the Essex area (-9%); A smaller reduction is found in the East region (-5%).
- Apprenticeship starts within Essex have increased over the period from 2012/13 to 2016/17 by 36%, slightly above the 34% figure for the East region.
- When looking at other Education and Training construction learner starts (i.e. non-Apprenticeship construction qualifications) there has been reductions both in Essex and in the East (-15% and -12% respectively).
- Four areas within Essex have witnessed positive growth in starters comparing 2012/13 to 2016/17: The two areas that have witnessed the largest positive growth in starters are Colchester (89%) and Epping Forest (63%).

“Knowledge” based qualifications describe those qualifications that typically have a theoretical basis so are more likely to be ‘classroom based’. “Competence” based qualifications, in the main, achieve a recognised NVQ and so a link can be made between the qualification 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 shows qualification achievements over the last five years for the identified competence based qualifications, comparing achievement volumes against the overall pattern for the East as a whole. From this analysis there appear to be patterns for particular occupations.

Achievements referred to in Table 6 are at:

- Level 2 (75%),
- Level 3 (24%)
- Level 4 and above (1%).

The percentage comparison with the East region as a whole is used to demonstrate how the provision of training in Essex by occupation is relatively high or low against the regional context.

The first group of occupations to be identified for the main training volumes, which are broadly similar with the overall training pattern seen in the East region. These are:

- Plumbing and HVAC Trades
- Plant operatives
- Wood trades and interior fit-out
- Specialist building operatives (not elsewhere classified)
- Electrical trades and installation

Local qualification achievements for three of these trades represent a higher proportion than the overall share of training being achieved in the East (31%); for two, wood and electrical trades, the proportion is lower. For occupations such as wood trades, the volume of training will be related to their share of employment, 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).

**Table 6: Competence qualification achievements in Essex as a % of total competence qualification achievements in East region as a whole (Source: CITB/ESFA)**

Construction Occupations <sup>3</sup>	12-13	13-14	14-15	15-16	16-17	Total Achievements	Total
<b>Main Occupations</b>							
<b>Plumbing and HVAC Trades</b>	34%	41%	44%	35%	42%	1,410	39%
<b>Plant operatives</b>	32%	71%	57%	44%	7%	1,325	55%
<b>Wood trades and interior fit-out</b>	33%	29%	23%	29%	19%	804	26%
<b>Specialist building operatives nec*</b>	46%	36%	30%	64%	18%	551	41%
<b>Electrical trades and installation</b>	13%	7%	8%	15%	20%	371	12%
<b>Occupations with good provision</b>							
<b>Civil engineering operatives nec*</b>	5%	56%	38%	33%	15%	296	31%
<b>Building envelope specialists</b>	29%	28%	39%	44%	39%	184	34%
<b>Scaffolders</b>	37%	40%	22%	31%	23%	140	31%
<b>Plasterers</b>	51%	53%	44%	31%	6%	116	41%
<b>Construction Trades Supervisors</b>	40%	30%	5%	73%	58%	88	36%
<b>Plant mechanics/fitters</b>	57%	24%	24%	19%	23%	66	32%
<b>Occupations to Monitor</b>							
<b>Bricklayers</b>	27%	37%	30%	27%	11%	279	25%
<b>Floorers</b>	57%	15%	24%	24%	16%	253	29%
<b>Painters and decorators</b>	29%	29%	36%	20%	10%	130	25%
<b>Glaziers</b>	8%	15%	17%	16%	17%	120	13%
<b>Low Overall Learner Volumes</b>							
<b>Roofers</b>	7%	9%	24%	41%	33%	42	17%
<b>Other construction professionals and technical staff</b>	10%	5%	4%	20%	6%	17	9%
<b>Construction Managers</b>	23%	7%	0%	0%	0%	12	22%
<b>Logistics</b>	0%	57%	13%	50%	0%	7	27%
<b>Steel erectors/structural fabrication</b>	0%	25%	0%	0%	0%	<5	25%
<b>Grand Total</b>	<b>30%</b>	<b>38%</b>	<b>30%</b>	<b>30%</b>	<b>24%</b>	<b>6,213</b>	<b>31%</b>

\*not elsewhere classified

<sup>3</sup> The information shown in Table 6 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

There is a second group of occupations with good provision: Local proportional provision for occupations such as plasterers, plant mechanics and construction trade supervisors is at, or above, the overall level relative to the East region.

The third group – occupations to monitor: identifies a small number of occupations where we would expect higher levels of training, again linked to either the occupational size and/or demonstrating competence. This cluster includes bricklayers, floorers, plasterers, painters and decorators: Training happening within Essex is somewhat lower than would be expected. It is possible that individuals within the local area may be travelling outside 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 network 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.

In the Essex area between 2012/13 and 2016/17, 120 different providers have been delivering training. The majority of training (80%) is being delivered by ten main providers, as shown in Table 7 below.

**Table 7: Top ten training providers delivering training to the Essex area by number of starts – excluding apprenticeships (Source: CITB/ESFA)**

Provider	Dec-13	13-14	14-15	15-16	16-17	Total (Learner Aims)	% share of Total Quals	% Quals Ofqual Regulated
Harlow College	886	547	1898	722	1130	5183	16%	100%
Colchester Institute	1,004	852	962	1042	979	4839	15%	97%
Chelmsford College	786	763	812	763	639	3763	11%	84%
South Essex College of Further & Higher Education	1,026	745	475	517	597	3360	10%	86%
A4E Ltd	844	623	577	460	352	2856	9%	43%
Epping Forest College	212	287	365	353	376	1593	5%	100%
The College of Haringey, Enfield & North East London	725	332	341	121	50	1569	5%	100%
Ixion Holdings (Contracts) Limited	45	930	133	41	163	1312	4%	38%
Mpower Training Solutions Ltd			262	483	330	1075	3%	100%
Hertford Regional College	542	117	148	123	120	1050	3%	100%

Not all of the providers are in the Essex area. Providers that are outside the area include: A4E Ltd (based in Sheffield), and Hertford Regional College. The majority of colleges based in the GREATER ESSEX area provide a high percentage of Ofqual registered qualifications (all above 86%). The average for provision for the area as whole is 88%.

This profile is typical of many areas, where a relatively small group of FE colleges deliver 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 of those for whom they provide training. In total this training covers the majority of the main occupations involved in the construction workforce.

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

Local Authority	2012-13	2013-14	2014-15	2015-16	2016-17	% Net change	% Quals at Level 2+
<b>Colchester</b>	620	930	770	1,110	1,170	89%	63
<b>Epping Forest</b>	630	620	880	1,000	1,030	63%	81
<b>Castle Point</b>	140	140	240	190	180	29%	54
<b>Tendring</b>	190	180	450	300	210	11%	34
<b>Thurrock</b>	520	940	650	500	510	-2%	81
<b>Chelmsford</b>	980	1,250	1,200	1,190	950	-3%	54
<b>Braintree</b>	260	210	280	260	250	-4%	58
<b>Uttlesford</b>	100	30	100	40	80	-20%	91
<b>Maldon</b>	40	50	30	130	30	-25%	100
<b>Southend-on-Sea</b>	460	570	480	400	260	-43%	72
<b>Basildon</b>	1,130	820	930	650	580	-49%	46
<b>Harlow</b>	570	610	1,200	360	250	-56%	49
<b>Rochford</b>	130	60	90	60	30	-77%	82
<b>Brentwood</b>	340	110	70	50	60	-82%	53
<b>Grand Total</b>	6,110	6,520	7,370	6,240	5,590	-9%	62

Table 8 above shows that, as a whole, the Essex area has experienced a decrease in the number of construction learner starts of -9% across the five years at a time, whilst the wider East region experienced a smaller decline of -5% over the same period. Nevertheless, four Essex districts, Colchester, Epping Forest, Castle Point and Tendring, showed an increase.

Whilst the college based courses are an important stepping stone or progression route for learners to acquire knowledge, construction employers tend to have a preference for practical or competence based skills, so in the next section, apprenticeships are investigated in more detail.

## 4.2. APPRENTICESHIPS

Whilst overall volumes of construction training in the Essex are declining, numbers of apprenticeship starts are increasing overall. Table below shows that the local authority areas within Essex making the biggest contribution to the increase between 2012/13 and 2016/17 are Castle Point, Colchester, Epping Forest and Brentwood. These four local authority areas saw an increase of 390 apprenticeship starts. A few areas, most notably Southend-on-Sea, have seen a decrease over the same period.

When looking at Essex, the number of apprenticeship starts rose by 36% from 2012/13 to 2016/17, compared to a decrease (-9%) throughout the same time frame for the total number of construction learner starts within the local area. At 36%, the increase in apprenticeships starts within Essex from 2012/13 to 2016/17 was slightly greater than in the East region, which experienced a 34% increase.

**Table 9: Unique apprenticeship starts by Essex authority, construction subjects (Source: CITB/ESFA)**

Local Authority	2012-13	2013-14	2014-15	2015-16	2016-17	Increase/ decrease	% Net Change
Castle Point	30	20	70	90	100	70	233%
Colchester	90	160	180	240	280	190	211%
Epping Forest	70	90	110	150	180	110	157%
Brentwood	30	30	40	40	50	20	67%
Uttlesford	30	20	50	40	40	10	33%
Braintree	60	40	80	70	70	10	17%
Chelmsford	90	110	140	120	100	10	11%
Harlow	70	60	70	70	70	0	0%
Maldon	20	20	30	30	20	0	0%
Thurrock	50	60	80	80	50	0	0%
Rochford	40	40	80	50	30	-10	-25%
Basildon	110	80	190	100	80	-30	-27%
Tendring	30	10	10	30	20	-10	-33%
Southend-on-Sea	140	140	260	130	50	-90	-64%
Grand Total	750	800	1,200	1,040	1,020	270	36%

Table 10 below considers apprenticeship starts by occupation between 2012/13 and 2016/17: The biggest increases in volumes (increases of 10 and higher) have been in plumbing, wood trades, civil engineering operatives, electrical trades, specialist building operatives, other construction professionals, plant mechanics and plasterers. Two occupations, scaffolders and painters / decorators, have experienced a decrease over the same time frame. In 2016/2017, plumbing trades, wood trades and electrical trades have the largest numbers of apprenticeships starts: These trades have had consistently higher apprenticeship start numbers over the five-year time period.

**Table 10: Unique apprenticeship starts by occupation in Essex, construction subjects (Source: CITB/ESFA)**

Occupation	12-13	13-14	14-15	15-16	16-17	Increase / decrease
<b>Plumbing and HVAC Trades</b>	220	180	350	330	320	100
<b>Wood trades and interior fit-out</b>	170	180	270	200	230	60
<b>Civil engineering operatives nec*</b>	0	30	30	20	50	50
<b>Electrical trades and installation</b>	150	190	320	240	190	40
<b>Specialist building operatives nec*</b>	20	40	60	60	60	40
<b>Other construction professionals &amp; technical staff</b>	0	10	10	10	30	30
<b>Plant mechanics/fitters</b>	0	10	10	10	10	10
<b>Plasterers</b>	0	0	10	10	10	10
<b>Bricklayers</b>	40	50	60	60	40	0
<b>Building envelope specialists</b>	10	10	20	10	10	0
<b>Construction Trades Supervisors</b>	20	10	0	0	20	0
<b>Floorers</b>	10	10	10	10	10	0
<b>Glaziers</b>	0	20	0	20	40	0
<b>Plant operatives</b>	0	0	0	0	0	0
<b>Roofers</b>	0	0	0	10	0	0
<b>Scaffolders</b>	30	20	20	20	20	-10
<b>Painters and decorators</b>	40	50	40	20	20	-20

\*not elsewhere classified

Table 11 considers apprenticeship starts by provider. Over 80 different providers in total have delivered apprenticeships in construction for the Essex area between 2012/13 and 2016/17. The bulk of training is being delivered by 10 providers which account for 87% of all provision in the locality, with the top five providers accounting for 70% of provision.

**Table 11: Unique apprenticeship starts by provider in Essex (subjects (Source: CITB/ESFA)**

Local Authority	2012-13	2013-14	2014-15	2015-16	2016-17	Total	% Share
<b>Prospects College of Advanced Technology</b>			488	229	177	894	18.6%
<b>Colchester Institute</b>	117	130	144	220	271	882	18.3%
<b>CITB</b>	116	151	166	187	183	803	16.7%
<b>Prospects Learning Foundation Limited</b>	245	204				449	9.3%
<b>Harlow College</b>	68	77	75	68	49	337	7.0%
<b>JTL</b>	43	47	55	63	40	248	5.2%
<b>Chelmsford College</b>		17	55	48	39	159	3.3%
<b>South Essex College of Further &amp; Higher Education</b>	29	42	42	38		151	3.1%
<b>Hertford Regional College</b>	7	41	30	29	41	148	3.1%
<b>Epping Forest College</b>	8	8	28	23	32	99	2.1%

## 4.3. HIGHER EDUCATION

There are five broad HE qualifications that relate to construction: Architecture, Building, Landscape & garden design, Planning, Civil Engineering, and a small number of other courses linked to architecture, building & planning. All of these courses are offered at universities readily accessible to students in Essex. Of these construction related courses, the three that are most relevant to delivering construction projects are Civil Engineering, Architecture, and Building.

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 Higher Education. 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, when questioned, 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.

### 4.3.1. Local provision

Within the area, relevant higher education is provided by:

- Anglia Ruskin University, the University of Essex and, to a lesser extent, Writtle University College (Landscape / garden design)

Beyond the Essex boundary, but still accessible are

- University of Suffolk, University of Cambridge, University of Hertfordshire; University of Bedfordshire, University of East Anglia, Norwich University of the Arts (Architecture); Cranfield University (post-graduate Civil Engineering)

### 4.3.2. Degree level apprenticeships

Some provision for higher level training for professional roles is available as degree apprenticeship programmes that attract government subsidy and are available to potential students as debt free education.

This is an attractive opportunity that could be highlighted to applicants and employers but that also requires support from employers to recruit at age 18 rather than 21 (graduate). This may help fill some higher level skills gaps earlier as the apprentice can start to make a contribution in their professional roles after one year of study.

## 4.4. CAREER PROGRESSION

Relatively limited information is available to explain any trends in career progression. The complexity of occupations, qualifications and the inability to track individuals make establishing a clear picture extremely difficult.

There is some anecdotal evidence to suggestions that:

- Some more experienced workers are able to move into supervisory roles.
- Some experienced workers take on a greater variety of occupational skills (and are therefore able to say they have experience working in several occupations)
- There is more structured career progression among the professions (backed by professional development / CPD routes through professional chartership, to allow individuals to work progressively towards Member or Fellow status. However not all professionals will be a part of a professional body.)
- The professions are more likely to work to an older age in their chosen field. However this is balanced against professionals tending to start at an older age as a result of the need for higher level education and accreditation.

In December 2016 CITB commissioned a report considering “Career progression in the construction industry”. This identified a number of trends in relation to the Progression of construction workers into teaching and training roles.

Anecdotal evidence suggests that the primary issue, especially amongst full-time teaching staff, is fear about losing touch with one’s professional or vocational background. There is a view that that regular return to industry should be facilitated so that technical teachers could refresh their practical knowledge, skills, and stay abreast of innovation.

Results of a 2010 study into what employers wanted from training and trainers showed that, while they prioritised industry skills and knowledge above education skills and knowledge, a complex mixture of the two was required, which was generally felt to be lacking.

This suggests that initiatives aiming to utilise ‘retirees’ in Vocational Education Training (VET) needs to consider how individuals can keep their skills up-to-date.

In this sense whilst any initiative to engage retirees in training has some benefit in terms of keeping skilled people engaged with the sector it creates another challenge if employers perceive those individuals to have ‘out-dated’ skills.



## 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 a picture of mobility within the workforce. Data specific to the East will be analysed in order to understand how this might impact on future training interventions and the supply of job opportunities for local people.

### 5.1. MAIN POINTS – MOBILITY

- More than a quarter of East of England construction workers have worked in the construction industry for over 20 years (27%) and a total of more than half have worked in the industry for at least 10 years (52%).
- At the time of the research just over half of all construction workers in the East of England were working in the same region/nation in which they were living in when they started their construction career (55%).
- The average (mean) distance from workers' current residence (taking into account temporary residences) to their current site was 27 miles (22 miles is the UK average).
- Three quarters of all East of England construction workers are confident that when they finish their current job their next job will allow them to travel to work from their permanent home on a daily basis (76%).
- Overall two-fifths of all construction workers have only worked on one project type (40%).
- Amongst construction workers under the age of 60 in the East of England, well over a third (38%) believe they will definitely want to be working in the construction sector in five years' time, a further third (33%) believe it is very likely they will, and 10% believe it is quite likely they will. In total over four-fifths of workers in the region aged under 60 believe that it is likely they will still be working in construction in five years' time.

Table 12 below shows the region or nation an employer operates in, compared with the region or nation they were previously working in. This is taken from the CITB survey into Workforce Mobility and Skills and gives an indication of the inter-regional movement of workers.

The East region has a lower proportion of workers who spend some or all of their time in the region compared to most others, implying relatively high mobility. Relatively large percentages have worked in Greater London and the South East, though some have gone further afield.

As some respondents would have indicated that they had worked in more than one region, the totals for percentage figures in the table exceed 100%.

### 5.2. WORK HISTORY

More than a quarter of East of England construction workers have worked in the construction industry for over 20 years (27%) and a total of more than half have worked in the industry for at least 10 years (52%).

The most likely reason for employees working in the East of England region is because their employers sent them there (50% of all workers), this compares to just 36% for the UK as a whole, suggesting a greater reliance on workers from other regions than may be typical in other parts of the UK. Just over two-fifths (43%) of workers in the East state that they work in the region because they grew up there, this compares to 55% across the whole of the UK.

In terms of the regions/nations in which workers' current employer operates, around two-thirds (67%) of workers in the East of England reported that their employer operated within the region they were currently working in (the second lowest figure in the UK after the South East at 65%), while 27% operated in London, 23% in the South East and 16% in the East Midlands.

These figures suggest the workforce in the East is more transitory that might be expected in other regions.

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

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 & 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 Report. BMG Research on behalf of CITB.

Base: All respondents. \*denotes less than 0.5%

### 5.3. WORKER ORIGINS

Workers were asked which region/nation they were living in just before they got their first job in construction in the UK. Overall just over half of all construction workers in the East of England were working in the same region/nation in which they were living in when they started their construction career (55%) the same as for the South East and slightly higher than London at 50%. Workers currently based in the East of England, therefore, are among the least likely to have remained in the same region/nation in which they were based for their first construction job.

In addition, only half of the construction workers in the East of England (50%) have remained in the same region/nation as they did their first qualification/training in. This is the lowest proportion of all the regions/nations in the UK, meaning that workers in the East are the most mobile. Among other regions/nations, the figure ranges from 55% of workers in the South East remaining in the area where they took their first qualification to 96% in Northern Ireland.

### 5.4. TRAVEL TO SITE

Almost two-thirds (63%) of construction workers in the East of England have their current residence in the region, with 37% travelling into the region for work from another region/nation in which their current residence is based. Only the South East had a higher figure for inward travel to work with 42% of workers living outside the region. At the time of the survey 12% of construction workers in the East had travelled into the region from the East Midlands, and a further 12% had travelled in from London.

Workers in the East were asked to indicate the furthest distance they have worked from their permanent or current home in the last 12 months: one in eight construction workers have worked no more than 20 miles away (12%) and a further third have worked between 21 and 50 miles away (34%). This leaves more than half that have worked more than 50 miles away from their permanent home (52%), with more than a quarter that have worked between 51 and 100 miles away (29%). Just under a quarter of construction workers in the East that have worked more than 100 miles away (23%) which is about average for the UK.

## 5.5. SIRE DURATION AND CHANGE

Three in ten construction workers in the East of England (30%) do not expect to work on that site for more than a month, including 7% that only expect to be there for about a week or less. About four in ten anticipated being on site for more than a month, but less than a year (39%), while one in eight expects to stay on that site for a year or longer (13%). In just under one in five cases (18%) 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.

Three quarters of all construction workers in the East of England 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 (70%).

## 5.6. SUB-SECTOR AND SECTOR MOBILITY

All workers were asked which of six types of construction work (New Housing, Housing Repair and Maintenance, Commercial, Private Industrial, Public Non-Housing, or Infrastructure) they have spent periods of at least three months at a time working in.

Overall two fifths of all construction workers have only worked on one project type (40%), compared with a fifth in 2012 (19%), 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 (based on workers' preferences), all workers were asked how likely it is that in five years' time they will still want to be working in construction. Excluding those aged 60 and over (as those over 60 may be assumed to be considering retirement in the next 5 years): 38% believe they will definitely want to be working in the construction sector, 33% believe it is very likely they will want to be working in the construction sector and 10% believe it is quite likely they will want to be working in the construction sector, a total of 81%. Only 5% think that they will not want to be working in the construction sector in five years' time which is less than in 2012 (18%).

Overall the findings from the Mobility survey indicate that the East of England has one of the most mobile construction workforces in the UK. There is evidence of a high degree of movement between neighbouring regions, (specifically nearly one-quarter of the workforce is from either the East Midlands or London).

### 5.7.1. An aging workforce

An analysis of Construction Skills data from the ONS Labour Force Survey over four quarters Autumn 2016 to Spring 2017 indicates an average age for UK construction workers of a little over 42 years. However within this there is significant variation that will be linked to a number of factors including career progression and the different starting ages for professional roles compared with manual occupations. For all non-manual roles the average age is approaching 44; whereas for manual roles it is just over 41. However, 11% of the construction workforce are 60 or over and so likely to retire in the near future. And there are a number of occupations that appear to be disproportionately represented by the over 60s. These include:

- 1122 Production managers and directors in construction – 15%
- 3122 Draughtspersons – 19%
- 2431 Architects – 14%
- 2434 Chartered surveyors – 15%
- 2433 Quantity surveyors – 13%
- 5250 Skilled metal, electrical and electronic trades supervisors – 35%
- 5323 Painters and decorators – 14%
- 8149 Construction operatives nec – 12%
- 5314 Plumbers and heating and ventilating engineers – 11%

It is likely that many individuals will progress during their career from one occupation into supervisory or managerial roles and so this is likely to additionally diminish the workforce in some important occupations.

Other roles are particularly physically challenging, meaning that individuals will need to change career or retire earlier than the norm. Examples of this probably include: (8141) Scaffolders, staggers and riggers for which there are no workers listed in the age ranges above 54.

If new recruits are not encouraged to join the industry the risk is that the available workforce will decline.

## 5.8. ESSEX'S GEOGRAPHY IN CONTEXT

Table 12 above gives an indication of the inter-regional movement of workers but it is important to consider the relative location of Essex within that context. Its coastal position means that there will be no flow of workers and training opportunities to the East. London is likely to have a very significant effect on the construction workforce and is expected to draw significant number of workers from Essex. Table 12 gives a good indication that this is the case with a net movement from the East of England to London and with Essex closest to London the proportions are likely to be more significant than for the whole of the East.

Similarly, CITB has seen significant demand from and shortages within the Greater Cambridge and Greater Peterborough LEP area that shares a large part of Essex. This probably indicates that the demand is centred around Cambridge and may also present a net draw of workers to it from Essex.

[The Greater Cambridge & Greater Peterborough report is available via the CITB website.](#)

## 5.9. THE IMPACT OF BREXIT

While the issue of leaving the EU is of particular interest to the UK construction industry, it is impossible to offer with any certainty predictions of what may happen or how it will affect the local economy and construction, CITB has published a review that considers some potential implications for UK construction.

[Migration in the UK construction industry and built environment sector](#)

The report, published in July 2018, found that while more employers are feeling the impact of Brexit, less than a third have taken action or plan to do so as it approaches. The report updates CITB's previous 2017 migration research.

It is also clear that the UK's migrant construction workforce are not distributed evenly across the UK – with very significantly more migrant workers operating in London and the South East. This may mean that the risk of migrants returning to their country of origin in response to Brexit is likely to have the greatest immediate impact in London and the South East.

## 5.10. BARRIERS AND OPPORTUNITIES FOR PEOPLE ENTERING THE CONSTRUCTION INDUSTRY

Recruiting and retaining a sufficient talent pool has been one of the key challenges for the construction and built environment (CBE) sector for years. The challenge of finding and training the next generation of construction workers is immediate and pressing. CITB's 2017 White Paper considers:

- The value vocational qualifications offer to both individuals and employers in construction
- What happens to those leaving FE after completing a construction related course, and how many end up working in the sector
- The reasons people leave construction jobs or apprenticeships early.

[Achievers and leavers: barriers and opportunities for people entering the construction industry](#)

## 5.11. MODERN METHODS OF CONSTRUCTION AND DIGITAL SKILLS

In initial consultation, the Skills Board enquired about the potential of modern methods of construction, offsite and modular construction to help address the need to build more new housing. Stakeholders have also enquired about the opportunities presented by digital technologies.

Digital technologies are hoped to open up opportunities to simplify and automate some tasks and enhance productivity. However there is no simple description or common understanding of an ever expanding list of new technologies with a multitude of applications. Some have already been adopted and have quickly become normalised – notably in surveying, in design and in the way that smart mobile telecommunications have enabled the sharing of information and enabled remote working. But the benefits have tended to be for professional roles and very large projects.

Building Information Modelling (BIM) is increasingly referred to, and visualisation and design tools are slowly being adopted. Future opportunities may include better analysis and application of data and the integration of multiple technologies. The CITB report [Unlocking construction's digital future: A skills plan for industry](#) goes some way to describe the developing technological landscape and where opportunities may lie.

The report identifies that embracing future skills is initially a matter of enhancing leadership and management skills and more generally instilling competencies and behaviours such as: interpersonal skills, time management; curiosity; communication; problem solving; confidence; creativity; initiative; organisation; resilience; teamwork. (However employers already report that many of these competencies are just as relevant in the workplace now.)

The CITB digital report “Unlocking construction’s digital future...” identifies that the necessary competencies can be considered along two spectrums requiring:

- A flexible mindset, and
- An understanding of digital tools and data.

Future curricula should consider the opportunities to support or develop employees so that they can:

- Think creatively about problems and their solutions: be able to articulate clearly exactly what problem needs solving and thinking beyond what they have to hand about solving it.
- Understand how to use digital tools: have an awareness and some knowledge about a wide range of digital platforms and hardware.
- Assess which tools to use in which circumstances: be able to assess a wide range of options to find a resolution and identify when the right tool isn't available.
- Manage the data that flows to and from the use of these tools: have an understanding of different types of data and what can be collected, how to share this and what implications it has.

While no specific analysis has been undertaken to consider the specific opportunities and limitations associated with Greater Essex, CITB has published a report that provides a timely assessment of how the adoption of offsite is changing the skills and training landscape for construction. This report is available on the CITB website.

### [Faster, Smarter, More Efficient: Building Skills for Offsite Construction](#)

There has in recent years been interest and investment in modular housing and while it represents only a small proportion of UK housing output it may open up opportunities to help address Essex's ambitious housing aspirations. The profile of the workforce required is very different to deliver pre-manufactured housing components that are assembled and finished on site. Many of the traditional roles are relocated into manufacturing sites but there is a need for groundwork and the provision of utilities as well as assembly, likely to require plant operatives that are already in high demand for Essex's significant infrastructure developments.

A broad consensus is that the adoption of new and digital technologies will require a broader range of competencies and attributes that allow individuals to adapt to changes. This is in preference to teaching specific technical skills for which demand may never emerge. And so the opportunity for future curriculum development is to enhance individual's soft skills that allow them to adapt as well as give them the competencies to meet the demands of employers today.

## 6. THE DIFFERENCE BETWEEN DEMAND AND SUPPLY

### 6.1. MAIN POINTS

The occupations for which there appears to be the greatest risk of a shortfall between anticipated peak demand and the estimated supply of workers are:

#### Among skilled trades:

- Civil engineering operatives nec\*
- Electrical trades and installation
- Specialist building operatives nec\*
- Painters and decorators
- Glaziers

#### Among professional and managerial roles:

- Construction Trades Supervisors
- Construction Project Managers

#### Non construction roles

- Non–construction operatives

Before looking at demand for construction compared with supply of construction workers, 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.

It is also important to note that the demand calculations are based on data covering the Essex area, whereas the supply figures are an extrapolation of data for the East region.

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 UK Contractors Group 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 take the longest time whereas lower value work in general, along with work in the industrial sector, is able to get on site quickest.

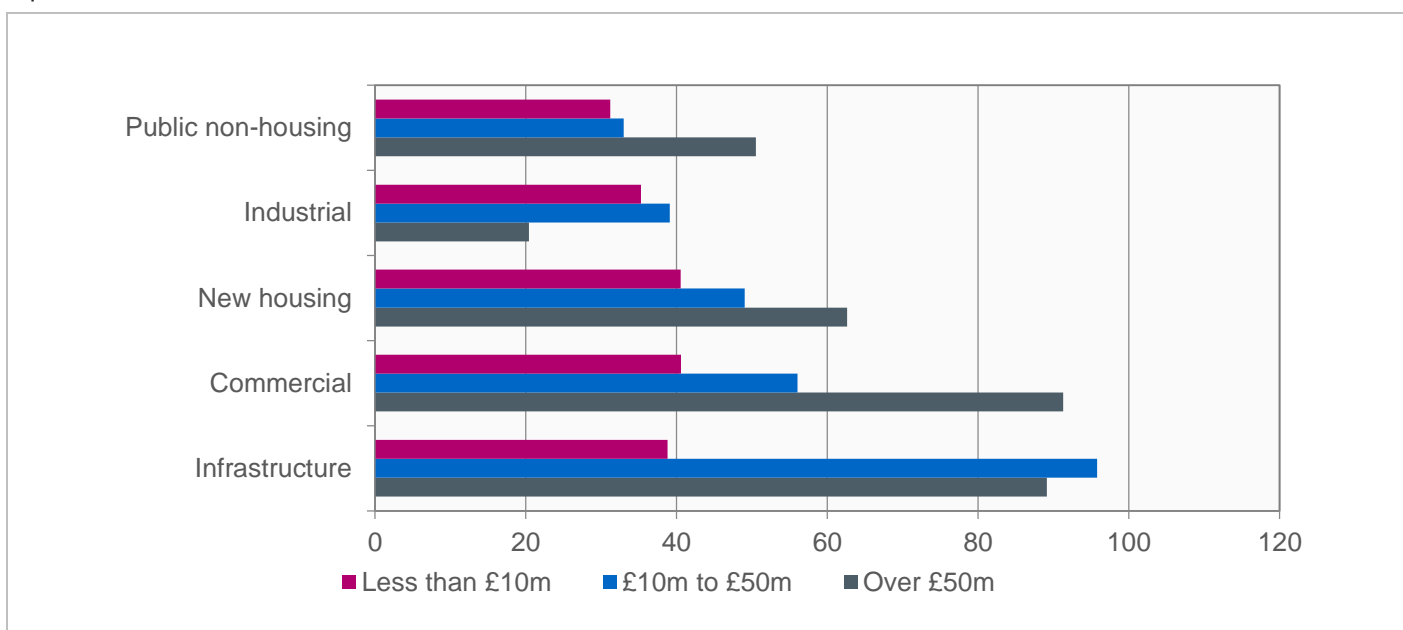


Figure 12: Average number of weeks from planning to work on site, UK 2010-2013 (Source: UKCG/Glenigan)

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 East region indicate that it accounts for 45% of yearly construction output<sup>4</sup>.

Also, whilst 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. Evidence from the 2015 Mobility research shows that the East of England as a region is amongst those least likely to report its' construction workers working on one project type (40% against a UK average of 48%). Occupations such as banksmen and plasterers are most likely to have only worked on one project type, whilst electricians and scaffolders are more likely to have worked on a wider range of projects<sup>5</sup>.

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4 CITB (2018) Construction Skills Network – East of England

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

## 6.2. GAP ANALYSIS

With current construction employment in the Essex area estimated at around 73,300, the identified demand forecast for 2019 accounts for 91% of current employment, before reducing in later years as current visibility for future identified projects decreases. Employment and demand by occupation for 2019 is shown in Table 13.

**Table 13: Occupational breakdown of demand for Essex area against current employment**

Occupation	Essex - Current Employment	Risk: shortfall compared with 2017 employment
<b>SKILLED TRADES</b>		
Civil engineering operatives nec*	289	2.08
Electrical trades and installation	4,408	1.20
Specialist building operatives nec*	1,442	1.17
Painters and decorators	2,943	1.16
Glaziers	846	1.09
Plant mechanics/fitters	931	1.00
Plant operatives	1,021	0.99
Roofers	1,401	0.98
Scaffolders	735	0.95
Labourers nec*	3,983	0.91
Wood trades and interior fit-out	7,425	0.89
Plumbing and HVAC Trades	4,695	0.87
Plasterers	1,838	0.77
Building envelope specialists	3,102	0.77
Floorers	1,118	0.74
Steel erectors/structural fabrication	663	0.70
Logistics	874	0.69
Bricklayers	2,270	0.65
<b>PROFESSIONAL ROLES</b>		
Construction Trades Supervisors	1,304	1.06
Construction Project Managers	1,264	1.03
Surveyors	1,428	0.98
Other construction process managers	5,244	0.95
Senior, executive, and business process managers	5,106	0.85
Other construction professionals and technical staff	4,495	0.82
Architects	1,263	0.67
Civil Engineers	2,115	0.60
<b>NON CONSTRUCTION ROLES</b>		
Non-construction operatives	621	1.38
Non-construction professional, technical, IT, and other office-based staff	10,517	0.84
	73,339	0.91

Source: CITB/WLC

Note: nec\*: not elsewhere classified; HVAC: Heating, ventilation and air-conditioning.

Table 13 indicates that there are some possible disparities where there is a risk that demand will outstrip the current estimates for employment available locally. These occupations show high relative risk of shortage in comparison with other occupations.



The gap analysis compares the number of workers calculated as being required to meet the peak construction demand (as described in the demand section of this report) with the number of workers estimated as being available in the Essex area (as described in the supply section of the report). This gives an indication as to the comparative risk of a shortfall between construction occupations.

Those occupations highlighted:

- **RED** – [Top quartile] are at high risk of an immediate shortfall of workers and are worthy of urgent consideration for action to increase numbers of skilled workers.
- **AMBER** – [Second quartile] appear to be at moderate risk of a shortfall and should be reviewed to determine where opportunities for further training and development exist
- **BLUE** – [Third quartile] do not appear to demonstrate an immediate risk of a shortfall but this may be a reflection of people being based in Essex but meeting demand in neighbouring areas and so should be monitored and tested to compare with local qualitative opinions.
- **GREEN** – [Bottom quartile] appear to be at low risk compared with other occupations. This does not mean changes in construction demand, training provision or the movement of workers will not change this status and so monitoring is recommended.

Those occupations at risk appear most likely to be:

#### **Among skilled trades:**

- Civil engineering operatives nec\*
- Electrical trades and installation
- Specialist building operatives nec\*
- Painters and decorators
- Glaziers
- Plant mechanics/fitters
- Plant operatives
- Roofers
- Scaffolders

#### **Among professional and managerial roles:**

- Construction Trades Supervisors
- Construction Project Managers

#### **Non construction roles**

- Non–construction operatives

### **6.2.1. Construction specific occupations**

As indicated above, there are five trades at greatest risk of supply shortage:

Civil engineering operatives not elsewhere classified (nec) includes road and rail construction operatives and quarry workers. Competence qualification achievements are in line with average levels relative to the east as a whole. In addition, apprenticeship starts are rising. Overall, however, training numbers look insufficient to meet peak demand.

Electrical trades and installation: NVQ L3 Diploma needed, mostly achieved via an apprenticeship. Local qualification provision is well below the regional average; Apprenticeship starts are rising. Again, however, training supply looks insufficient to meet peak demand.

Specialist building operatives nec include a range of workers who undertake tasks such as operating insulating equipment, fixing plasterboard or dry linings to ceilings and walls, helping to construct, maintain, repair and demolish buildings and clean and resurface eroded stonework for example. There are no formal academic entry requirements for this role and training is typically provided on-the-job. Local qualification starts are above the regional average, and apprenticeship starts are rising; Local training provision is probably sufficient

Painters and decorators - Entry to this occupation is normally through work experience, with training such as NVQs offering the quickest way to get qualified with entry levels taking up to a year to complete (of course it can take much longer to become fully skilled and experienced). Local qualification achievements below average; apprenticeship starts falling; training numbers look insufficient to meet peak demand.

Glaziers - Local qualification achievements below average, but apprenticeship starts rising; training shortfall possible. However, skilled workers could also travel from neighbouring regions to meet short-term spikes in demand. In addition, much initial training appears to be done on the job.

## 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.

Around a quarter of: scaffolders, construction project managers and civil engineers work outside construction.

It should also be noted that for some professions workers often have an office location away from the site location and travel between them. And for some, there is anecdotal evidence to suggest that demand is met by provision based in other centres of population.

Construction project managers – In terms of total numbers, the projected supply shortfall, relative to peak demand, is very small in proportionate terms, but local qualification achievements are low in volume and below average as a regional proportion. However, Ofqual data shows that achievement rates across England for relevant qualifications have more than doubled between 2013 and 2017 to over 4,000 per year; well in excess of the UK total recruitment requirement of around 3,000 predicted over the next five years by CITB's Construction Skills Network forecast. Local demand appears likely to be met.

Construction trade supervisors – local qualification achievements are above average, but apprenticeship starts are low and not rising; local supply shortage appears possible.

## 6.2.3. Non-construction roles

Non-construction operatives covers a wide spectrum of activities spanning various processes such as assembly, machining and treatment as well as areas such as security and cleaning. Job-holders tend to 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 East region. Whilst a local shortage appears likely, related training data is not available spanning the diversity of roles involved.

## 6.3. GAP ANALYSIS – TRAINING NEEDS

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

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

Taking the first of these, **'is there the training in the areas of potential demand?'**

Looking at priority occupations, adequate levels of training provision appear to be in place for Specialist Building Operatives nec. In addition, local demand for Construction Project Managers appears likely to be met from national training provision.

However, training numbers look insufficient to meet the peak demand for Civil engineering operatives nec, Electrical trades and Painters and decorators.

For Glaziers, there is some possibility of a local training shortfall, although the relative peak requirement is lower than for the trades just discussed. Similar considerations also apply to Construction trade supervisors.

**Is there the required volume of training across a good spread of occupations?**

For the occupations at moderate risk of a shortfall, training is generally at rates similar to or better than the average against the region. However, local apprenticeship starts for Scaffolders have fallen somewhat in recent years, and overall training of Roofers is below average against the region.

## 7. CONCLUSIONS AND RECOMMENDATIONS

The aim of the Essex Employment and Skills Board should be to achieve progress in addressing the long term and immediate challenges that the construction industry faces in the area. Balancing the supply of construction workers and skills against future demand and ensuring that a well-qualified workforce is in place is likely to be assisted by the Employment Board, the South East Local Enterprise Partnership and local authorities encouraging collaboration between influential local stakeholders. Progress is likely to be the result of a succession of incremental and interlinked actions undertaken by organisations working towards common goals.

There is strong evidence to suggest that the Essex Employment and Skills Board area will suffer a shortage for some construction occupations. While these may be drawn in from others areas, it seems more likely that any net effect will be for workers to move to neighbouring areas. Its coastal position means that there is not a flow of workers and training opportunities to the East. London is likely to have a significant pull on the construction workforce; similarly, there is demand from, and shortages within, Cambridgeshire.

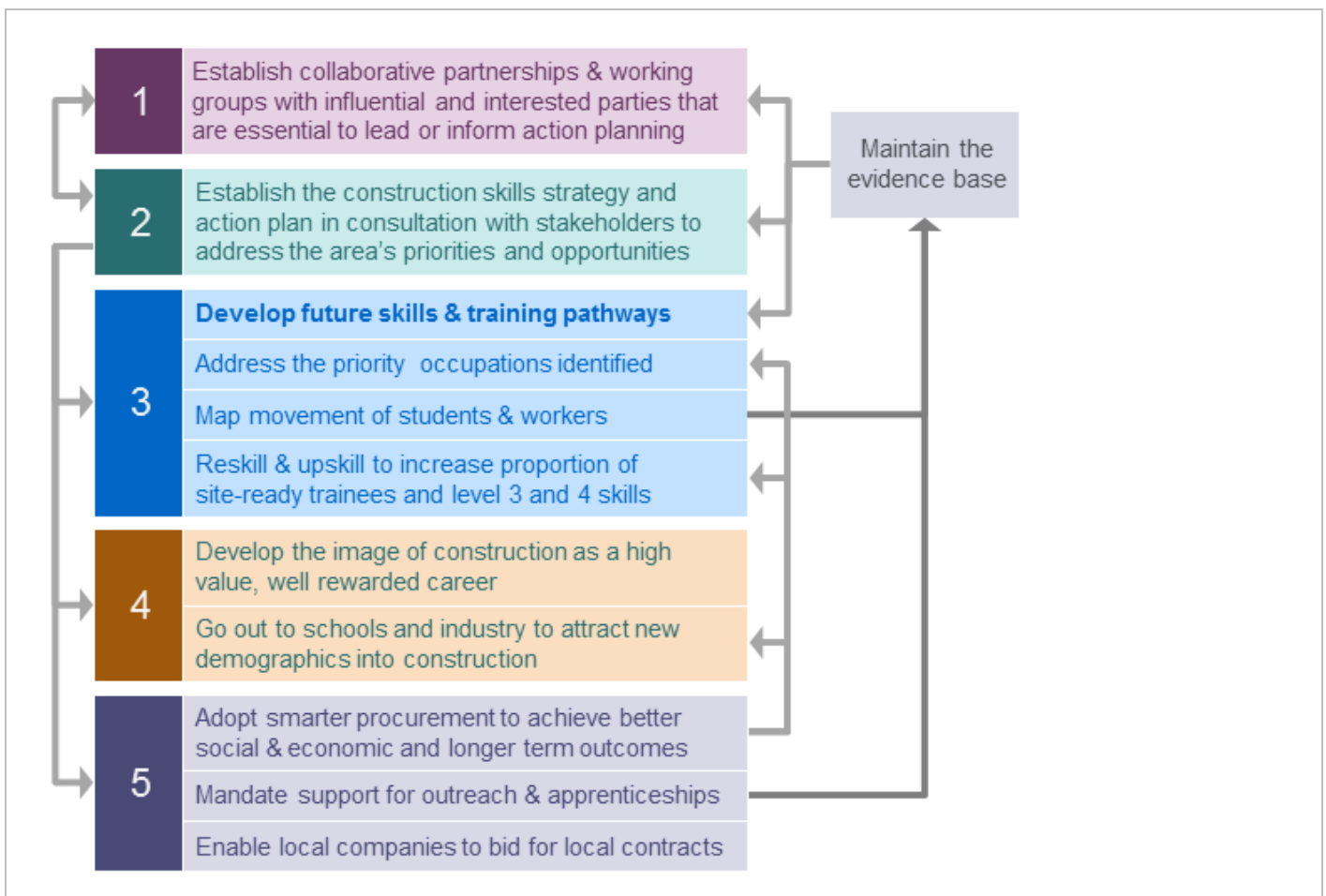
The risk of inadequate local resource is that construction may be delayed or increase in price, inhibiting the achievement of local social and economic goals. In particular it seems likely that future aspirations for new housing may not be met and that several major infrastructure projects will be competing for workers with similar projects across the UK and internationally.

Some significant initial progress has already been made – for example through the skills capital projects the Essex Employment and Skills Board has supported the Advanced Manufacturing & Engineering Hub and the Skills Equipment Fund that are helping address provision for: traineeship and apprenticeships; upskilling; promoting careers in construction and have invested in specialist facilities and training.

### Action planning

It is the responsibility of the Essex Employment and Skills Board with the South East LEP and its influential stakeholders to review the recommendations, update the area's construction skills strategy and agree an action plan to address the challenges and opportunities that exist across Essex. The Skills Board and LEP need not deliver the action plan but should take a leading role in coordinating and overseeing or delegating action and monitoring progress.

There are six integrated recommendations.



## 7.1. COLLABORATIVE PARTNERSHIPS

### 7.1.1. Conclusion

It will be essential to ensure that those interested in construction and with an influence over outputs and construction skills in the Essex Employment and Skills Board area work together.

Some significant initial progress has already been made with a network of colleges and private training establishments, sector specialists and other organisations already working together. However there will be significant opportunities to work together to: align better the training delivered with the needs of construction employers; to find new opportunities for drawing people into construction related careers and to deliver action that addresses the following recommendations.

### 7.1.2. Recommendation

- a. The Essex Employment and Skills Board should ensure that relevant stakeholders and influencers are engaged. Share available evidence with them with a view to building collaborative action plans. Points of common interest should be established to encourage these stakeholders 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. Those stakeholders should include: local construction businesses; major employers; local authorities; developers (especially those interested in housing); housing associations; those responsible for managing infrastructure (transport and utilities); construction training providers, local influencers and universities.
- b. Early on, establish a construction working group comprising those with a remit to develop, or influential in, the built environment in the GREATER ESSEX area and neighbouring areas and task it with delivering outputs that achieve the LEP's desired social and economic outcomes. This should take ownership of 7.2 below.
- c. Longer term projections and the development of scenarios may enable an assessment of the potential impacts of major initiatives that may skew demand (For example: garden communities; Bradwell B, Sizewell C or the Lower Thames Crossing.) Scenario planning and actions around skills pathways and career development should, in response, focus on delivering appropriate levels of high quality training to meet the future demand for site based trades (see related recommendations below).
- d. Identify demographic data available and associate actions with opportunities for target candidates where the greatest potential social and economic impact can be gained by addressing occupational shortfalls or other priorities.
- e. Establish processes whereby those responsible for: setting local regulation and funding developments can agree with construction suppliers holistic outcome-based approaches for tackling social and economic opportunities. This might consider moving towards a balance of awarding contracts based on good value for money and achieving wider benefits linked to: the built environment; training; support for apprenticeships; outreach; etc. This links to requirements outlined in the *Public Services (Social Value) Act*.

## 7.2. SKILLS STRATEGY: ACTION PLANNING AND EXPLOITATION

Establish (or develop) an Essex Employment and Skills Board area construction skills strategy and action plan which recognises collective and potentially unique actions and solutions that may be required across Essex.

### 7.2.1. Conclusions

An ambition to develop construction skills and training pathways should be to match training and development with the needs of employers and the local economy. In support of this ambition, further understanding is needed of where the potential sources of people are to meet the needs of the Essex Employment and Skills Board area and what the end-to-end skills and training pathways are that need to be in place to enable improved flows of people and skills supply to meet demand. These pathways may include localised initiatives supporting training needed by particular groups to enable them to access more formalised elements of training and careers pathways.

In the area around 87% of Further Education (FE) training is provided by ten providers; so the greatest potential impact is through mediated collaboration with and between the FE colleges.

The majority of training provision is at low levels. These may be a necessary introduction to construction in an individual's development but often are insufficient in meeting the needs of employers and so very often do not lead to a career in the occupation for which the individual has received trained. This is supported by an apparent mismatch between training achievements and supply for some occupations.

Also, construction employers have expressed concern that often those newly qualified and having gained site access through a CSCS card or similar are not equipped with the variety of skills required – these might include general competencies such as numeracy, literacy, timekeeping, productivity, interpersonal skills.

This suggests a need to work with colleges, employers and graduating students to help ensure that a greater proportion move into appropriate additional and vocational training and the career for which they have a qualification.

### 7.2.2. Recommendations

- a. Develop the Essex Employment and Skills Board construction skills strategy along with an action plan that ensures that priority is given to trades highlighted in this report as being:
  - In high demand AND at high risk of a shortfall.
  - In high demand
  - At high risk of a shortfall

Priority occupations	High demand occupations	High risk occupations
<p>The report identifies occupations for which there is high demand AND a relatively high risk of a shortfall.</p> <ul style="list-style-type: none"> <li>• Electrical trades &amp; installation</li> <li>• Specialist building operatives</li> <li>• Painters and decorators</li> <li>• Surveyors</li> <li>• Other construction process managers</li> </ul>	<ul style="list-style-type: none"> <li>• Wood trades &amp; interior fit-out</li> <li>• Electrical trades &amp; installation</li> <li>• Other construction process managers</li> <li>• Plumbing and HVAC trades</li> <li>• Labourers</li> <li>• Painters and decorators</li> <li>• Building envelope specialists</li> <li>• Specialist building operatives</li> <li>• Bricklayers</li> </ul>	<p>Trades at immediate risk of a shortage locally</p> <ul style="list-style-type: none"> <li>• Civil engineering operatives</li> <li>• Electrical trades &amp; installation</li> <li>• Specialist building operatives</li> <li>• Painters &amp; decorators</li> <li>• Glaziers</li> <li>• Construction trades supervisors</li> <li>• Construction project managers</li> <li>• Plant mechanics / fitters</li> </ul>

- b. There may be some additional roles, where there is anticipated to be high demand in the future and where there is high demand from neighbouring areas and significant projects. For example: plant operatives; steel fixers and civil engineering operatives.
- c. Most local authorities are under pressure to maintain the provision of new housing but there are apparent shortages in some occupations in demand by house builders. A recommended action is to establish with local construction suppliers whether this trend is likely to continue and if so ensure that training provision addresses future demand for occupations of relevance, in particular site-based roles of relevance to house builders (see below).
- d. An early action plan should assess if employers are facing specific skills shortages or skills wage inflation 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 support delivery of new training interventions.
- e. Early consideration should be given to those occupations that need to be site-based, for which demand cannot be met by office based roles that could be located outside the GREATER ESSEX area.

### Site based roles

While it is important to have sufficient provision of all construction roles locally, it is possible that in some cases the provision can be met from outside the GREATER ESSEX area.

Many professional roles such as architects, surveyors and senior managers may only need to visit the construction site occasionally. There may also be roles that are more mobile that travel to the site for a short duration but can operative over a large area – for example plant or scaffolding

However there are many roles that can only operate on the construction site and for which local provision is essential. Examples of those roles – also particularly relevant in house building include: bricklayers; building envelope specialists; electrical trades and installation; floorers; glaziers; painters and decorators; plasterers & dry liners; plumbing and HVAC trades; roofers; wood trades and interior fit-out. Most of the roles identified as being in high demand or at risk for the Essex Employment and Skills Board area are these site based roles.

- f. Identify demographic data available and associate, as far as possible, relevant skills and training pathways and actions with opportunities for those where the greatest potential social and economic impact can be gained by addressing occupational shortfalls or other priorities.
- g. Develop a co-ordinated approach to training and skills development that, as far as possible, integrates the development of multiple skills to enhance the success rates of initial construction training. (See 7.3 below.)

## 7.3. DEVELOP TRAINING PATHWAYS DEVELOP FUTURE SKILLS

### 7.3.1. Conclusions

It is clear there is high demand for several construction occupations and so there will be continuing demand to train people in essential skills. There are also some apparent gaps between supply and demand where immediate action would help address shortfalls in the near future.

CITB has received anecdotal evidence that in some locations, colleges would like to support the provision of more apprenticeships but that employers are not always providing the opportunities.

Anecdotal feedback indicates that it is often competencies and behaviours that need to be developed as well as construction specific technical skills. This is particularly relevant as new approaches and technologies are introduced and is critical in ensuring individuals develop and progress along a career pathway.

There will also be a developing need for new skills to address new construction methods (e.g. offsite and modular build and the need for BIM applications.) [BIM is Building Information Modelling.]

The CITB report – [‘Faster, Smarter, More Efficient: Building Skills for Offsite Construction’](#) – provides an assessment of how the adoption of offsite is changing the skills and training landscape for construction.

The CITB report [Unlocking construction's digital future: A skills plan for industry](#) goes some way to try and describe the developing technological landscape and where opportunities may be. This highlights a need for new competencies and attributes in addition to specific technical skills.

There is also evidence to suggest that major infrastructure projects will utilise new technologies and require higher level skills and demand more: construction supervisors, scaffolders, plant operatives, civil engineers and civil engineering operatives – increasing labour demand pressures on roles already in short supply across the UK.

### 7.3.2. Recommendations

- a. By working together the major colleges should avoid duplication of effort or share resources, enhance specialisations and explore innovative ways of delivering the curriculum that meets employers' and students' 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. Pilot a range of options incrementally to test validity and effectiveness and achieve the most expedient solutions.
- c. There is national pressure to increase the supply of roles including: construction supervisors, scaffolders, plant operatives, civil engineers and civil engineering operatives. In relation to Essex, in particular, these are likely to be in high demand if the proposed new nuclear projects go ahead at Sizewell and Bradwell and the demand for these skills should provide a guide.
- d. Address any anticipated specific local needs and ensure that training delivers what employers need as part of a complete package of training initiatives.
- e. Identify and facilitate how FE colleges and employers can engage with specialist training providers as well as with major projects, to establish greater provision for priority roles:
- f. This may involve establishing training pathways through which students can complete initial knowledge based training before progressing into vocational training and apprenticeships and gaining site experience (while finishing their training).
- g. Consideration should also be given to building an understanding of the economic and transport inhibitors that may prevent people accessing training and apprenticeships. Are there options for ensuring that training is provided where it is accessible; that those with limited financial support can receive support with the provision of appropriate clothing and equipment or that there is assistance with transport to remote worksites. This is particularly relevant for remote and sparsely populated places which, in Essex present challenges to some potential students
- h. This is also a need to progressively increase provision of individuals with a diverse set of new skills and who have the competencies and attributes to adopt new technologies and working practices. In some cases these 'softer' skills may already be part of education in non-construction activities.
  - For some candidates it may be that training should also incorporate development of greater skills in: numeracy and literacy.

## Future Skills

- i. Action to address future skills needs should be incremental and take into consideration the delivery of training that supports construction industry needs – i.e. establish site ready proficient workers. Emphasis should be on ensuring that initial training leads individuals into more advanced and competency based training and high quality sustainable apprenticeships.
  - For many candidates consideration should be given to enhancing competencies such as: interpersonal skills, time management; curiosity; communication; problem solving; confidence; creativity; initiative; organisation; resilience; teamwork. Many of these competencies are considered essential within what is considered *Future Skills*. However many of these competencies are just as relevant in the workplace now.
- j. The CITB digital report “Unlocking construction’s digital future...” identifies that the necessary competencies can be considered along two spectrums requiring:
  - a flexible mindset, and
  - an understanding of digital tools and data.Future curricula should consider the opportunities to support or develop employees so that they can:
  - *Think creatively about problems and their solutions: be able to articulate clearly exactly what problem needs solving and thinking beyond what they have to hand about solving it.*
  - *Understand how to use digital tools: have an awareness and some knowledge about a wide range of digital platforms and hardware.*
  - *Assess which tools to use in which circumstances: be able to assess a wide range of options to find a resolution and identify when the right tool isn’t available.*
  - *Manage the data that flows to and from the use of these tools: have an understanding of different types of data and what can be collected, how to share this and what implications it has.*
- k. In the longer term there may also be opportunities for the Employment and Skills Board to work with those colleges that offer Higher Education qualifications and Universities to consider how they can attract, train and retain the higher level, advanced and ‘future’ skills for which there appears to be demand and inadequate provision (across the UK). For example that may be in high demand for the many significant projects that are expected to proceed in the Essex Employment and Skills Board area and further afield and that will increasingly need to utilise developing technology e.g. Building Information Modelling (BIM).



## 7.4. OUTREACH: BUILD A MORE POSITIVE IMAGE OF CONSTRUCTION WITH YOUNG PEOPLE. AND INCREASE RECRUITMENT THROUGH NEW ENTRANCE POINTS, CAREER CHANGERS AND RESKILLING.

### 7.4.1. Conclusion

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.

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 as well as during secondary education.

### 7.4.2. Recommendation

- a. With an anticipated long term demand for some skills, the potential exists for a schools outreach programme to build a positive perception of construction as offering high value, rewarding careers and encourages applications for construction skills courses and apprenticeships from a broader spectrum of young people – in particular ethnic minorities and women.
- b. There are further opportunities for outreach with those aged 16 and above, in particular those studying relevant STE(A)M subjects but who have not considered that they lead into interesting and rewarding professions in construction or supporting construction.

*[CITB has supported employers and other stakeholders across the construction and built environment to develop an industry led initiative called Go Construct ([www.goconstruct.org](http://www.goconstruct.org)). This initiative inspires individuals to find out more about the sector, to access an experience with employers from school engagement via the Construction Ambassador scheme and find work experience placements.]*

- c. There may also be more mature audiences that can be encouraged to move into construction careers. This may include people with relevant transferable skills (e.g. from manufacturing or ex-military see *Careers Transition Partnership*) or those where there is a significant social gain by ensuring they are in valuable employment, e.g. ex-offenders and so contact should be made with HM Prison Service and DWP. Targeted intervention should be included within the construction skills action plan. In some cases co-ordinated action may be appropriate to help people into construction who may otherwise have faced barriers.

There is anecdotal evidence to suggest that often ex-offenders have undertaken relevant training but find it difficult to enter the construction industry. Typically many ex-offenders welcome the opportunity to capitalise on new-found skills and tend to be committed and realistic about construction work.

The opportunity is for stakeholders and influencers in Essex to establish provision that brings ex-offenders in to work, to gain experience – giving them the capacity to find employment with local companies.

An example may be available from HMP Highpoint in Suffolk that provides level 2 training in: plumbing, carpentry, fixed interiors, tiling, and street-works (utility groundworks) for around 100 inmates a year. The majority return to London & Essex. But need to gain on-site experience for an NVQ [some mobile CSCS-related testing is provided by HMP, leading to the issue of a Green Labourer's card].

- d. There is an opportunity to maximise Go Construct and introduce other similar employer and local authority led initiatives to raise engagement between the local employers, educators and individuals from all backgrounds (e.g. the Careers and Enterprise Company.)
- e. For the long term, Careers advice should engage very young audiences – i.e. pre-secondary education – to address early on negative stereotypes that may deter some groups from construction careers.
- f. Early on, careers advisors educators and parents should be targeted to change perceptions of construction among significant influencers.

## 7.5. USE PROCUREMENT AND PLANNING REGULATION TO ENABLE SKILLS DEVELOPMENT

### 7.5.1. Conclusion

Construction is delivered through construction employers and suppliers, funded by private developers as well as by local authorities and regulated by local planning authorities. These organisations are better placed to prepare for the future if they have certainty on construction plans and programmes. Small and micro companies, in particular, have limited ability to maintain the processes and people to search for local opportunities or enable collaboration to support larger projects.

Public bodies have a requirement under the Public Services (Social Value) Act to ensure procurement addresses wider social, environmental and economic benefits.

The opportunities for small and micro companies (with limited resources and means) to respond to complex requirements, or invest in delivering services outside a basic construction contract, are severely limited.

Larger suppliers have expressed the view that some problems encountered with section 106 agreements include that: they are poorly thought out in terms of delivering tangible benefits; rarely are developed with contractors and agreed outputs are not measured and reported against.

### 7.5.2. Recommendations

- a. The potential exists through smarter approaches to procurement (including co-ordinated approaches to Section 106 agreements) to encourage those tendering for construction and infrastructure contracts or those funding developments to be mandated to include provision for recruitment, training, apprenticeships and outreach that is co-ordinated across the Local Enterprise Partnership area, to achieve both good value for money and wider social benefits.
- b. Early engagement with employers to discuss any such approach should be adopted as standard to find ways of ensuring that such requirements take into consideration the industry's needs and circumstances. (i.e. discuss wider social gains with potential suppliers well before tender documents are published. Let construction contractors input to sections 106 discussion.).
- c. Provision could be made to hold contractors to account for commitments made. Such an approach could be co-ordinated through the Essex Employment and Skills Board and local authorities and be a requirement of planning applications and local authority and public sector contracts.
- d. 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.
- e. Consideration of the use of smaller lots when procuring schemes and supporting access for small and medium sized employers onto frameworks and supply chains to enable them to grow their businesses which will build further delivery capacity across the Essex Employment and Skills Board area.

## 7.6. MAINTAIN & ENHANCE THE EVIDENCE BASE

Utilise local qualitative knowledge and experience to inform the findings of this report. And use other sources of data available to help inform decision making. CITB publishes a range of research of relevance to the construction industry but other relevant information is also regularly published.

As part of this report, the Essex Employment and Skills Board is given 12 months access to the Labour Forecasting Tool, including the source project data used to compile this report. This should be utilised as part of the action planning process to test scenarios, and to update and check the evidence base that supports decision making as circumstances change.

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 at regular intervals according to the need and capability.

END

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<b>First draft (v3)</b>	December 2018	First draft for consultation
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<b>V5</b>	February 2019	Minor amendments; addition of 1.2

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CITB Analysis

# Construction skills gap analysis for Essex



Appendices to the Construction  
skills gap analysis for Essex  
December 2018



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# APPENDIX A. DEMAND ANALYSIS METHODOLOGY

## Introduction

The Construction Skills Network (CSN) provides labour market intelligence for the construction industry. Developed by Experian on behalf of CITB it forecasts labour demand in each of 12 UK regions and provides forecasts of how the industry will change year on year. It is not designed however to predict labour demand at a sub-regional level. For this purpose, we use our prize-winning Labour Forecasting Tool (LFT) developed on behalf of CITB. Labour demand is calculated by converting the volume of construction activity forecast to take place in any geographical region into forecast labour demand using labour coefficients (the number of person years required to produce £1m of output). For the sake of consistency with ONS terminology the 'volume of activity' is referred to as 'output' throughout this report. The following sections describe:

- the sources of data we use;
- how the output is calculated;
- how we deal with the absence of comprehensive data that is the typical situation beyond the first year or two of our analysis;
- how we reconcile any differences between the results produced by the LFT and those produced by the CSN;
- the steps we take to deal with any shortcomings in the sources of data; and
- how the LFT converts output into labour demand.

## Calculating construction output

### Data sources

There are two principal sources of data: the Glenigan database and the National Infrastructure and Construction Pipeline (NICP).

### Glenigan

The original purpose of the Glenigan database is to allow contractors to identify leads and to carry out construction market analysis. It is updated every quarter to provide details of planning applications from local authorities supplemented with additional project-specific data. Of particular relevance to this report, it provides a description of each project, its name, location, value, and in most cases, projected start and end dates. It contains many tens of thousands of projects. The Glenigan pipeline does not identify every single project in an LEP: projects which are small (typically but not exclusively those less than £250,000 in value), and most that involve repair and maintenance are not included.

We have used the latest available cut of Glenigan data including all the relevant projects which started before 2017 but excluding those which are already complete. We have included in our analysis only those projects shown to be at the following planning stages because there is a reasonable probability that these projects will be realised in practice.

- Planning not required
- Detail plans granted
- Reserved matters granted
- Application for reserved matters
- Plans approved on appeal
- Listed building consent

The values of some infrastructure projects given in the Glenigan database are the total value of construction and engineering works. In these cases, since the scope of this study is limited to the construction sector, 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 are shown in Table A1 below. The construction/engineering proportions have been validated through work we have undertaken for other clients and have been used in the production of Infrastructure UK's National Infrastructure Plan for Skills and the Construction Skills Network forecasts.

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, and that no projects are duplicated. For example "major leads" and "frameworks" may include smaller projects that are separately identified in the database.

Because of the size of the database, it is impossible to review the details of every project. Instead, we identify the small number of projects that represent the greatest value, the so-called significant projects. To do this, we use the Mean Value Theorem developed at the University of Dundee which states that maximum information from any set of data is obtained simply by considering the data whose value is greater than the average. This is a version of the Pareto rule which suggests that 80% of the value in a data set is contained within the 20% of items whose value is the greatest. The significant projects are then thoroughly inspected to make sure that the information reported in the Glenigan database is consistent and accurate as far as can be ascertained. Any anomalies are resolved, if necessary by returning to the source of the data. Since this process typically picks up the projects whose value represents 80% of the total, the scope for any errors in the remaining data to have a significant impact is severely limited.

**Table A1: Proportion of total value related to construction**

Infrastructure type	Sub-type	Construction value as a proportion of total value
<b>Flooding</b>	Flooding	90%
<b>Transport</b>	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%
<b>Water</b>	Water/wastewater treatment works	90%
<b>Communications</b>	Broadband/Digital infrastructure	20%
<b>Energy</b>	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%
<b>Mining</b>	Mining	80%
<b>General infrastructure</b>	General infrastructure	100%

For the significant projects, the project descriptions in the database are assigned the most appropriate project type to be used when the data is input to the LFT (each type is driven by a different underlying model). 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 which may exist within a single project, e.g. mixed developments comprising residential, commercial and industrial buildings. For the non-significant projects, the default project type defined in the Glenigan pipeline is applied.

In order to maintain consistency with the CSN we have limited our forecast to the same time period as the most recently published CSN forecast.

## NICP data

The Infrastructure and Projects Authority (formerly Infrastructure UK and Major Projects Authority) compiles a pipeline of UK infrastructure and construction projects and the associated annual public and private investment.

We examine the NICP data to identify infrastructure projects or programmes of work taking place in the region under consideration that are not included in the Glenigan database. The construction cost is calculated from the total cost reported in the NICP using the percentages in Table A1. Projects in the Glenigan dataset and the NICP are combined (ensuring that there is no double counting) to create a pipeline of 'known' projects for the area. We have only considered those projects which are specifically allocated to the region under consideration in the NICP (i.e. projects at a national level have not been considered).

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

## CSN data

The CSN model produced by Experian also uses Glenigan as a major source of data relating to the volume of construction activity in the UK. Experian supplement the Glenigan data with market intelligence collected by a variety of means including a series of 'Observatories' held every six months in each region, at which representatives of the industry are invited to comment on the validity of Experian's data and findings. In Experian's annual CSN report, their estimate of the output in each of the following sectors is published:

- Public housing
- Private housing
- Infrastructure
- Public non-housing
- Industrial
- Commercial
- Housing repair and maintenance
- Non-housing repair and maintenance

## 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. Considering the government region within which the research area lies, identify only the new build in the known projects by removing all repair and maintenance projects.
2. Compare the output identified in the known projects as new build at the regional level with the CSN new build at the regional level sector by sector e.g. residential, non-residential, infrastructure etc.
3. If in any sector the known new-build regional output for the peak year is more or less than that forecast by the CSN for the same year then the value of each new build known project is factored by the following ratio:

$$\frac{\text{Value of CSN new build at regional level for given sector}}{\text{Value of known new build projects at regional level for given sector}}$$

The outputs calculated in this way are referred to as 'factored new build outputs'

This process takes account of both projects (typically less than £250k in value) not included in the known projects and those whose value or probability of realisation is over-optimistic.



4. To take account of housing repair and maintenance (R&M) at the research greater Essex level, it is assumed that the proportion of the total output represented by housing R&M is the same at the local level as it is at the regional level in the CSN. The Glenigan new build factored housing output is therefore multiplied by the following ratio:

$$\frac{\text{Value of CSN housing R\&M at regional level}}{\text{Value of CSN new build housing at regional level}}$$

to derive the output in housing R&M to be added to the factored new build output

5. The non-housing R&M to be added to the factored new build non-housing output is calculated in a similar way. [This takes account of the work undertaken by self-employed workers.]

## Dealing with the 'cliff edge'

As the time horizon extends there is less clarity on what is planned. As a result, the number of known projects declines the further into the future we look. This apparently declining workload is highly unlikely to reflect the total amount of work that will take place in the future. It is almost certain that there will be additional projects that come on stream which are yet to be identified. To overcome this 'cliff edge' effect we assume, based on an analysis of historical data, 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 consequence of this approach is the implicit assumption that the proportion of people in each occupation in the additional projects remain unchanged year on year.

## Calculating total labour demand

Our Labour Forecasting Tool is used to determine the labour demand generated by the construction outputs in the peak year. The LFT can determine the labour demand generated by a pipeline of construction projects given only the project types, their start and end dates and their locations. It quantifies the month-by-month demand in each of the 28 occupational groups shown in Appendix B. To do this, it uses labour coefficients (person years to produce £1m of output) derived from historical ONS data. The labour coefficients are updated annually as new data becomes available, and indexed to take account of different locations and changes in prices.

There are different labour coefficients for each occupation and for each of the following project types:

- residential
- non-residential
- infrastructure
- residential R&M
- non-residential R&M

Infrastructure projects can be broken down into the types shown in Table A1 **Error! Reference source not found.**

## 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.

**Table A2: Occupation definitions**

Occupations included within construction occupational aggregates (Four-digit codes refer to Office for National Statistics Standard Occupational Classification Codes).	
<b>1 Senior, executive, and business process managers<sup>6</sup></b>	
(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
<b>2 Construction project managers<sup>6</sup></b>	
(2436) Construction project managers and related professionals	
<b>3 Other construction process managers<sup>6</sup></b>	
(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
<b>4 Non-construction professional, technical, IT, and other office-based staff (excl. managers)<sup>6</sup></b>	
(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

<sup>6</sup> Managerial, professional & office based staff

<b>5 Construction trades supervisors<sup>7</sup></b>	
(5250) Skilled metal, electrical and electronic trades supervisors	
(5330) Construction and building trades supervisors	
<b>6 Wood trades and interior fit-out<sup>7</sup></b>	
(5315) Carpenters and joiners	(5442) Furniture makers and other craft woodworkers
(8121) Paper and wood machine operatives	(5319) Construction and building trades nec (25%)
<b>7 Bricklayers<sup>7</sup></b>	
(5312) Bricklayers and masons	
<b>8 Building envelope specialists<sup>7</sup></b>	
(5319) Construction and building trades nec (50%)	
<b>9 Painters and decorators<sup>7</sup></b>	
(5323) Painters and decorators	(5319) Construction and building trades nec (5%)
<b>10 Plasterers<sup>7</sup></b>	
(5321) Plasterers	
<b>11 Roofers<sup>7</sup></b>	
(5313) Roofers, roof tilers and slaters	
<b>12 Floorers<sup>7</sup></b>	
(5322) Floorers and wall tillers	
<b>13 Glaziers<sup>7</sup></b>	
(5316) Glaziers, window fabricators and fitters	(5319) Construction and building trades nec (5%)
<b>14 Specialist building operatives not elsewhere classified (nec)<sup>7</sup></b>	
(8149) Construction operatives nec (100%)	(9132) Industrial cleaning process occupations
(5319) Construction and building trades nec (5%)	(5449) Other skilled trades nec
<b>15 Scaffolders<sup>7</sup></b>	
(8141) Scaffolders, staggers and riggers	
<b>16 Plant operatives<sup>7</sup></b>	
(8221) Crane drivers	(8222) Fork-lift truck drivers
(8129) Plant and machine operatives nec	(8229) Mobile machine drivers and operatives nec
<b>17 Plant mechanics/fitters<sup>7</sup></b>	
(5223) Metal working production and maintenance fitters	(9139) Elementary process plant occupations nec
(5224) Precision instrument makers and repairers	(5222) Tool makers, tool fitters and markers-out
(5231) Vehicle technicians, mechanics and electricians	(5232) Vehicle body builders and repairers
<b>18 Steel erectors/structural fabrication<sup>7</sup></b>	
(5311) Steel erectors	(5319) Construction and building trades nec (5%)
(5215) Welding trades	(5211) Smiths and forge workers
(5214) Metal plate workers, and riveters	(5221) Metal machining setters and setter-operators
<b>19 Labourers nec<sup>7</sup></b>	
(9120) Elementary construction occupations (100%)	
<b>20 Electrical trades and installation<sup>7</sup></b>	
(5241) Electricians and electrical fitters	(5242) Telecommunications engineers
(5249) Electrical and electronic trades nec	
<b>21 Plumbing and heating, ventilation, and air conditioning trades<sup>7</sup></b>	
(5314) Plumbers and heating and ventilating engineers	(5319) Construction and building trades nec (5%)
(5216) Pipe fitters	(5225) Air-conditioning and refrigeration engineers
<b>22 Logistics<sup>7</sup></b>	
(8211) Large goods vehicle drivers	(3541) Buyers and purchasing officers (50%)
(8212) Van drivers	(4134) Transport and distribution clerks and assistants
(9260) Elementary storage occupations	

<sup>7</sup> Skilled trades & operatives

<b>23 Civil engineering operatives not elsewhere classified (nec)<sup>7</sup></b>	
(8142) Road construction operatives	(8123) Quarry workers and related operatives
(8143) Rail construction and maintenance operatives	
<b>24 Non-construction operatives<sup>7</sup></b>	
(8117) Metal making and treating process operatives	(9249) Elementary security occupations nec
(8119) Process operatives nec	(9233) Cleaners and domestics
(8125) Metal working machine operatives	(9232) Street cleaners
(8126) Water and sewerage plant operatives	(5113) Gardeners and landscape gardeners
(8132) Assemblers (vehicles and metal goods)	(6232) Caretakers
(8133) Routine inspectors and testers	(9241) Security guards and related occupations
(8139) Assemblers and routine operatives nec	(3319) Protective service associate professionals nec
<b>25 Civil engineers<sup>6</sup></b>	
(2121) Civil engineers	
<b>26 Other construction professionals and technical staff<sup>6</sup></b>	
(2122) Mechanical engineers	(3119) Science, engineering and production technicians nec
(2123) Electrical engineers	(3121) Architectural and town planning technicians
(2126) Design and development engineers	(3122) Draughtspersons
(2127) Production and process engineers	(3115) Quality assurance technicians
(2461) Quality control and planning engineers	(2432) Town planning officers
(2129) Engineering professionals nec	(2124) Electronics engineers
(3112) Electrical and electronics technicians	(2435) Chartered architectural technologists
(3113) Engineering technicians	(3531) Estimators, valuers and assessors
(3114) Building and civil engineering technicians	(3116) Planning, process and production technicians
<b>27 Architects<sup>6</sup></b>	
(2431) Architects	
<b>28 Surveyors<sup>6</sup></b>	
(2433) Quantity surveyors	
(2434) Chartered surveyors	

## APPENDIX C. GLENIGAN PROJECTS REMOVED FROM ESSEX

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

**Table A3: Removed Glenigan projects from Essex**

	Heading	Local authority	Value (£m)	Start date	End date	Reason for omission
1	Housing (Refurbishment)	Southend-on-Sea	0.3			Missing dates
2	Community Hall (New/Alterations)	Harlow	0.4			Missing dates
3	2 Storage Buildings	Braintree	0.5			Missing dates
4	Care Home (Conversion/Extension)	Colchester	0.5			Missing dates
5	Supermarket (Extension/Alterations)	Tendring	0.5			Missing dates
6	Light Industrial Unit (Extension)	Southend-On-Sea	0.5			Missing dates
7	Small Boat Harbour Development	Tendring	0.5			Missing dates
8	Church Hall	Castle Point	0.5			Missing dates
9	8 Flats & 2 Commercial Units	Southend-On-Sea	0.5			Missing dates
10	Hospital (Refurbishment)	Colchester	0.5			Missing dates
11	Care Home (Extension)	Braintree	0.5			Missing dates
12	2 Industrial Buildings	Maldon	0.6			Missing dates
13	Industrial Units	Maldon	0.6			Missing dates
14	Business Park (Extension/Alterations)	Basildon	0.6			Missing dates
15	Car Showroom (Refurb)	Brentwood	0.6			Missing dates
16	Office/Industry/Warehouse Unit	Colchester	0.6			Missing dates
17	Church Hall	Rochford	0.6			Missing dates
18	Sailing Club Building (Extension)	Maldon	0.6			Missing dates
19	Convenience Store	Chelmsford	0.6			Missing dates
20	10 Houses	Maldon	0.8			Missing dates
21	12 Houses	Colchester	0.9			Missing dates
22	Offices (New/Conversion)	Basildon	0.9			Missing dates
23	Vehicle Repair & Maintenance Centre	Epping Forest	1.0			Missing dates
24	Museum (Alterations)	Braintree	1.0			Missing dates
25	Cricket Club Youth Academy	Tendring	1.0			Missing dates
26	Footway/Cycle Bridge	Basildon	1.0			Missing dates
27	14 Sheltered Flats	Braintree	1.0			Missing dates
28	7 Houses & 3 Bungalows	Chelmsford	1.0			Missing dates
29	Spa (Extension/Refurbishment)	Braintree	1.0			Missing dates
30	Flood Defence	Colchester	1.0			Missing dates
31	2 Flats & 1 Retail Unit	Basildon	1.0			Missing dates
32	Offices (Refurbishment)	Braintree	1.0			Missing dates
33	2 Retail Units (Extension/Alterations)	Basildon	1.0			Missing dates
34	Coast Guard Station (Extension)	Rochford	1.2			Missing dates
35	23 Flats & 1 Storage Building (Conversion)	Braintree	1.2			Missing dates

	Heading	Local authority	Value (£m)	Start date	End date	Reason for omission
36	8 Warehouse & Office Units	Braintree	1.3			Missing dates
37	Office Building	Colchester	1.4			Missing dates
38	24 Flats/2 Retail Units/1 Community Centre	Southend-On-Sea	1.4			Missing dates
39	Health Centre (New/Extension)	Colchester	1.5			Missing dates
40	Builders Merchants Building	Tendring	1.7			Missing dates
41	13 Houses	Uttlesford	1.7			Missing dates
42	Community Centre	Epping Forest	1.7			Missing dates
43	26 Flats & 10 Restaurant/Retail Units (Conversion)	Colchester	1.8			Missing dates
44	Container Terminal	Tendring	2.0			Missing dates
45	Enabling Works	Uttlesford	2.0			Missing dates
46	Office/Industrial Unit & Storage	Braintree	2.1			Missing dates
47	School Science & Technology Block (Extension)	Southend-On-Sea	2.1			Missing dates
48	Sports Hall	Thurrock	2.2			Missing dates
49	Church	Brentwood	2.3			Missing dates
50	32 Houses	Colchester	2.4			Missing dates
51	Taxiway Link	Uttlesford	2.5			Missing dates
52	Hotel (Extension)	Epping Forest	2.5			Missing dates
53	School (Extension/Alterations)	Southend-On-Sea	2.5			Missing dates
54	Care Home	Braintree	3.0			Missing dates
55	Hospital (Extension/Refurbishment)	Harlow	3.0			Missing dates
56	30 Houses/24 Flats & 1 Shop (New/Alterations)	Tendring	3.3			Missing dates
57	Industrial Warehouse/Offices	Colchester	3.4			Missing dates
58	2 Offices	Uttlesford	3.5			Missing dates
59	77 Student Flats	Colchester	3.6			Missing dates
60	47 Houses	Basildon	3.6			Missing dates
61	Multi Storey Car Park	Southend-On-Sea	4.7			Missing dates
62	Warehouse	Tendring	4.7			Missing dates
63	Solar Photovoltaic Farm	Uttlesford	5.0			Missing dates
64	Hospital (Extension)	Southend-On-Sea	5.1			Missing dates
65	106 Elderly Persons Flats	Epping Forest	5.4			Missing dates
66	72 Houses	Tendring	5.4			Missing dates
67	81 Retirement Bungalows/Houses	Tendring	6.1			Missing dates
68	College Building (New/Extension)	Thurrock	6.8			Missing dates
69	Cafe & Offices (New/Extension)	Basildon	7.6			Missing dates
70	105 Houses & 20 Flats	Uttlesford	9.0			Missing dates
71	100 Extra Care Flats	Braintree	20.0			Missing dates
72	Design & Consultancy Framework	Thurrock	60.0	06/10/2014	29/10/2018	Consultancy
73	Design Consultancy Services	Basildon	1.3	01/03/2017	27/07/2022	Consultancy
74	National Framework Agreement	Uttlesford	20.0	23/08/2016	23/08/2020	Consultancy
75	Arrivals Building	Uttlesford	150.0	28/11/2018	07/02/2022	In NICP

	Heading	Local authority	Value (£m)	Start date	End date	Reason for omission
<b>76</b>	Small/Medium Construction Works Framework	Uttlesford	180.0	05/11/2018	02/11/2026	In NICP
<b>77</b>	307 Houses & Flats	Rochford	15.0	16/08/2016	21/06/2019	Duplicate

## APPENDIX D. SIGNIFICANT GLENIGAN PROJECTS IN ESSEX

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

**Table A4: Significant Glenigan projects in Essex**

	Description	Local authority	Value (£m)	Start date	End date	Project type
1	Highways & Transportation Services	Chelmsford	955.1	01/04/2012	01/07/2020	Infrastructure
2	Asset Development Framework	Brentwood	846.5	01/04/2019	31/03/2049	New housing, Private Commercial
3	Public Realm Works	Basildon	483.3	03/09/2018	22/04/2019	Infrastructure
4	Highway Works	Chelmsford	250.2	27/01/2023	24/01/2025	Infrastructure
5	Repair & Maintenance Services	Basildon	242.4	01/07/2016	04/07/2031	Housing R&M, Public Non-housing
6	Junction (Improvements)	Brentwood	238.8	09/11/2020	07/11/2022	Infrastructure
7	Junction (Improvements)	Colchester	238.8	31/03/2020	31/03/2023	Infrastructure
8	Residential Units/ Commercial Units	Thurrock	156.8	17/07/2017	17/07/2027	New housing, Private Commercial
9	Gas Fired Power Station	Basildon	143.3	02/03/2020	27/02/2023	Infrastructure
10	Fairglen Interchange	Castle Point	143.3	11/01/2021	11/12/2023	Infrastructure
11	Science Park	Harlow	107.0	01/06/2016	02/06/2021	Private Industrial
12	Car Storage Building	Thurrock	101.8	25/02/2019	02/09/2019	Private Industrial
13	Junction (Improvements)	Brentwood	95.5	06/04/2021	06/12/2022	Infrastructure
14	Live/Work Charity Headquarters	Chelmsford	91.3	19/01/2015	22/10/2018	New housing, Private Commercial, Public Non-housing, Infrastructure
15	Highways Contract	Southend-on-Sea	88.8	01/04/2015	02/04/2025	Infrastructure
16	Housing Response, Repair & Maintenance Works	Thurrock	70.0	15/02/2016	08/02/2021	Housing R&M
17	5 Commercial Units & 1 Multi Storey Car Park	Colchester	65.8	18/03/2019	28/10/2019	Private Commercial, Infrastructure
18	Laboratory Building (Refurbishment)	Harlow	61.6	06/01/2020	30/01/2023	Public Non-housing
19	Stadium & Residential (New/Refurb)	Chelmsford	58.4	26/06/2017	26/06/2020	Private Industrial, New housing, Private Commercial, Infrastructure
20	346 Houses/12 Flats	Colchester	55.4	09/02/2015	09/02/2020	New housing
21	Design & Build Framework	Chelmsford	54.3	01/03/2016	03/03/2020	Public Non-housing
22	Motorway Junction & Road Works	Harlow	47.8	03/06/2019	01/06/2020	Infrastructure
23	Shopping Centre (Extension/Alterations)	Thurrock	43.8	29/08/2017	03/12/2018	Private Commercial, Infrastructure, Public Non-housing
24	Road Improvements	Thurrock	43.0	20/07/2018	17/09/2020	Infrastructure
25	205 Affordable Housing Units	Harlow	37.4	08/02/2016	08/02/2019	New housing
26	240 Residential Units	Chelmsford	36.7	08/01/2018	06/12/2021	New housing
27	112 Residential Units & 1 Commercial Unit	Chelmsford	35.8	28/02/2019	28/12/2021	New housing, Private Commercial
28	230 Houses & 26 Flats	Chelmsford	32.2	28/11/2016	01/07/2020	New housing
29	649 Houses & 81 Flats	Colchester	27.7	19/10/2016	19/06/2019	New housing
30	168 Houses & 16 Flats	Chelmsford	27.7	01/03/2015	30/11/2018	New housing
31	191 Houses & 73 Flats	Chelmsford	27.0	01/12/2017	30/07/2021	New housing



	Description	Local authority	Value (£m)	Start date	End date	Project type
32	Leisure Centre & Ice Rink Building (New/Alterations)	Chelmsford	26.0	07/08/2017	30/06/2019	Private Commercial
33	Multi-Storey Car Park	Uttlesford	24.8	02/07/2018	20/05/2019	Infrastructure
34	500 Houses/Flats	Rochford	24.6	29/04/2019	29/04/2021	New housing
35	464 Houses/252 Flats & 1 Community Building	Harlow	23.2	05/02/2018	30/08/2019	New housing, Public Non-housing
36	Restaurants & Hotel	Colchester	22.7	14/01/2019	27/03/2020	Private Commercial
37	175 Houses/56 Flats & 1 Hospice/1 Office	Southend-On-Sea	21.4	01/04/2016	01/07/2019	New housing, Private Commercial, Public Non-housing
38	6 Restaurants & 1 Cinema	Basildon	20.0	04/02/2019	26/08/2019	Private Commercial
39	Student Accommodation / Hotel / Commercial Units	Colchester	19.7	05/11/2018	05/12/2019	Public Non-housing, Private Commercial
40	335 Residential / Care Home / School / Nursery / Commercial Units	Maldon	17.9	24/12/2018	21/12/2020	New housing, Public Non-housing, Private Industrial, Private Commercial
41	92 Residential Units	Colchester	17.3	27/02/2017	27/02/2019	New housing
42	Retirement Village	Uttlesford	16.6	12/02/2018	05/08/2019	New housing
43	108 Houses & 55 Flats	Chelmsford	16.4	01/02/2018	31/07/2020	New housing
44	468 Flats & 1 Retail Unit	Harlow	16.2	28/02/2019	28/04/2020	New housing, Private Commercial
45	Reactor Weather Envelope Building	Maldon	16.0	03/12/2018	09/09/2019	Infrastructure
46	107 Houses/18 Flats & 2 Bungalows	Braintree	15.6	12/03/2018	13/03/2020	New housing
47	School Building	Thurrock	13.8	01/03/2018	16/08/2019	Public Non-housing
48	191 Houses & 73 Flats	Chelmsford	13.7	08/01/2018	31/01/2020	New housing
49	48 Assisted Living Extra Care Flats & Retail Unit	Colchester	12.5	03/03/2018	03/05/2019	New housing, Private Commercial
50	195 Houses & 1 Sports Pavilion	Harlow	12.3	29/11/2017	02/01/2019	New housing, Private Commercial, Infrastructure
51	250 Flats (Conversion)	Harlow	12.2	14/08/2017	14/12/2018	Housing R&M
52	College & Employment/Retail Units	Basildon	11.8	04/12/2018	08/09/2019	Private Commercial, Private Industrial, Public Non-housing
53	Aircraft Hangars (Extension)	Uttlesford	11.7	12/02/2018	05/10/2018	Infrastructure
54	School & Hostel	Colchester	11.4	01/07/2018	01/09/2019	Public Non-housing
55	96 Houses & 3 Flats	Uttlesford	11.3	03/04/2017	03/04/2019	New housing
56	153 Houses & 62 Flats	Braintree	11.2	19/11/2018	16/12/2019	New housing
57	118 Houses & 96 Flats	Thurrock	10.9	25/03/2019	20/04/2020	New housing
58	Office/Industrial & Warehouse	Brentwood	10.6	21/05/2018	13/12/2019	Private Commercial, Private Industrial
59	Office Building	Harlow	10.5	10/09/2018	05/07/2019	Private Commercial
60	30 Residential Units	Epping Forest	10.4	30/07/2019	25/08/2020	New housing
61	200 Houses & Flats	Maldon	10.2	24/10/2018	24/11/2019	New housing
62	183 Residential Units & 1 Convenience Store	Braintree	10.1	23/04/2018	20/05/2019	New housing, Private Commercial
63	Flood Prevention Works	Thurrock	9.6	30/03/2019	30/05/2020	Infrastructure
64	180 Houses	Maldon	9.4	26/06/2017	25/12/2018	New housing
65	162 Flats & 110 Houses	Colchester	9.2	03/12/2018	30/12/2019	New housing
66	144 Houses & 32 Flats	Colchester	9.1	21/01/2019	16/03/2020	New housing
67	School	Colchester	8.6	12/03/2018	08/07/2019	Public Non-housing

	Description	Local authority	Value (£m)	Start date	End date	Project type
68	Supermarket & Health Centre/Petrol Filling Station	Chelmsford	8.6	07/05/2018	30/11/2018	Private Commercial, Infrastructure, Public Non-housing
69	31 Houses & 22 Flats	Thurrock	8.3	22/10/2018	21/10/2019	New housing
70	239 Flats & 1 Doctors Surgery	Thurrock	8.3	10/06/2019	06/07/2020	New housing, Public Non-housing
71	Industry/Storage/Distribution & Bus Depot	Tendring	8.3	28/11/2018	28/05/2019	Private Industrial
72	139 Houses & 24 Flats	Braintree	8.3	04/03/2019	30/03/2020	New housing
73	School (Extension)	Harlow	8.0	10/12/2018	09/12/2019	Public Non-housing
74	147 Houses/Bungalows/Flats & 1 Office Building	Uttlesford	8.0	14/08/2017	18/01/2019	New housing, Private Commercial
75	45 Flats	Brentwood	8.0	19/02/2018	04/07/2019	New housing
76	Supermarket & 2 Restaurants	Thurrock	7.9	05/11/2018	10/06/2019	Private Commercial
77	91 Commercial Units & 5 Office Blocks	Tendring	7.9	18/03/2019	23/09/2019	Private Industrial, Private Commercial
78	Supermarket (Conversion)	Colchester	7.8	08/10/2018	15/04/2019	Private Commercial
79	60 Care Flats	Tendring	7.6	17/12/2018	16/09/2019	New housing
80	Flour Mill & Packaging Plant/Warehouse	Harlow	7.5	13/05/2019	18/11/2019	Private Industrial
81	Supermarket (Extension)	Basildon	7.5	03/09/2018	08/11/2018	Private Commercial
82	145 Houses	Chelmsford	7.4	07/07/2019	03/08/2020	New housing
83	5 Retail Units & 1 Restaurant	Castle Point	7.2	26/03/2018	31/10/2018	Private Commercial
84	135 Houses & 1 Health Care/House	Tendring	7.0	12/02/2018	11/02/2019	New housing
85	Office Building	Uttlesford	6.9	18/03/2019	16/12/2019	Private Commercial
86	School	Essex County Council	6.8	13/08/2018	01/04/2019	Public Non-housing
87	Office/Restaurant/Leisure Centre	Basildon	6.8	26/12/2018	26/09/2019	New housing, Private Commercial
88	Airport Improvements	Rochford	6.7	10/12/2018	06/05/2019	Infrastructure
89	Industrial Unit	Rochford	6.7	07/01/2019	07/10/2019	Private Industrial
90	Warehouse (Extension/Alterations)	Thurrock	6.4	24/09/2018	18/10/2019	Private Industrial
91	120 Houses/Bungalows	Tendring	6.2	13/02/2019	11/03/2020	New housing
92	University Innovation Centre (Extension)	Colchester	6.2	05/02/2018	14/01/2019	Public Non-housing
93	90 Houses/20 Flats & 5 Bungalows	Tendring	6.0	10/10/2018	10/11/2019	New housing
94	Warehouse Building	Thurrock	5.5	04/09/2018	12/03/2019	Private Industrial
95	7 Office Cabins & 2 Workshops	Tendring	5.4	05/11/2018	05/07/2019	Private Commercial, Private Industrial
96	2 Production Facilities Buildings	Chelmsford	4.7	09/04/2018	17/05/2019	Private Industrial
97	Student Accommodation (Refurbishment)	Colchester	3.7	08/10/2018	12/07/2019	Public Non-housing
98	Warehouse	Harlow	3.3	05/02/2019	15/10/2019	Private Industrial
99	Warehouse & Distribution /Industrial Unit (Extension)	Harlow	2.3	18/10/2018	25/04/2019	Private Industrial
100	Dental Surgery	Southend-On-Sea	2.2	26/12/2018	26/05/2019	Public Non-housing

## APPENDIX E. NICP AND COUNTY COUNCIL SUBMITTED PROJECTS IN GREATER ESSEX

This appendix provides a list of all the NICP and projects analysed. The projects appear in the order they were put into the LFT.

**Table A5: Appendix Table 1: NICP and county council submitted projects in greater Essex**

	Name	Value (£m)	Start date	End date	Source
1	Stansted Transformation	315.3	01/04/2018	31/03/2021	NICP
2	Anglian Water: Wastewater Service AMP6	155.3	01/04/2018	31/03/2020	NICP
3	Stansted Airport Maintenance and Growth Investment (not including major Transformation Programme).	95.3	01/04/2018	31/03/2021	NICP
4	Highways Maintenance Block Funding (SR10 allocation)	86.4	01/04/2018	31/03/2021	NICP
5	Anglian Water: Water Service AMP6	84.1	01/04/2018	31/03/2020	NICP
6	UK Power Networks - East (EPN) RIIO	50.3	01/04/2018	31/03/2021	NICP
7	Local Authority Major Schemes - Committed and Approved - East of England	45.2	01/04/2018	31/03/2021	NICP
8	Local Enterprise Partnerships Allocation for Transport in Strategic Economic Plans - East of England	35.1	01/04/2018	31/03/2021	NICP
9	New all through school- Colchester	29.5	01/06/2020	02/08/2023	LEP
10	Integrated Transport Block	24.5	01/04/2018	31/03/2021	NICP
11	East of England Development programme	23.4	01/04/2018	31/03/2021	NICP
12	New secondary school	17.5	01/06/2020	02/08/2021	LEP
13	National Productivity Investment Fund Round 1 East	14.0	01/04/2019	31/03/2021	NICP
14	New special schools- Chelmsford	13.8	01/06/2020	02/08/2021	LEP
15	New primary school	12.5	31/05/2021	01/08/2023	LEP
16	Extension of secondary school	12.0	01/06/2020	02/08/2021	LEP
17	New special school	5.2	01/06/2019	01/08/2020	LEP
18	Anglia Traction Power Supply Upgrade	3.9	01/04/2018	31/03/2019	NICP
19	Challenge Fund Tranche 1 - East of England	3.4	01/04/2018	31/03/2019	NICP
20	Challenge Fund - Tranche 2A East of England	1.7	01/04/2018	31/03/2019	NICP
21	East of England Construction programme	0.5	01/04/2018	31/03/2021	NICP
22	East Anglia	0.1	01/04/2018	31/03/2021	NICP

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Version	Date	Details of modifications
<b>First draft (v3)</b>	December 2018	First draft for consultation
<b>Second draft (v4.1)</b>	February 2019	Additions to main text in response to initial feedback

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