

INDUSTRY INSIGHTS

Construction Skills Network
Forecasts 2017–2021



SOUTH EAST

About CITB

CITB is the Industrial Training Board (ITB) for the construction industry in Great Britain (England, Scotland and Wales). CITB ensures employers can access the high quality training their workforce needs and supports industry to attract new recruits into successful careers in construction.

Using its evidence base on skills requirements, CITB works with employers to develop standards and qualifications for the skills industry needs now, and in the future. CITB is improving its employer funding to invest in the most needed skills and by making it easier for companies of all sizes to claim grants and support.

About Experian

Experian's Construction Futures team is a leading construction forecasting team in the UK, specialising in the economic analysis of the construction and related industries in the UK and its regions. As such, we have an in-depth understanding of the structure of the construction industry and its drivers of change. The Construction Futures team has collaborated on the Construction Skills Network employment model with the CITB since 2005, manages a monthly survey of contractors' activity as part of the European Commission's harmonised series of business surveys, and a quarterly State-of-Trade survey on behalf of the Federation of Master Builders.

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SUMMARY – SOUTH EAST

The region's total construction output is forecast to rise by an annual average of 2.2% over the next five years, above the UK average of 1.7%. The South East's construction employment is anticipated to increase by an average yearly rate of 1.3%, around double the UK rate (0.6%), but at 1% of base 2017 employment, the region's annual recruitment requirement (ARR) is below the UK rate of 1.4%.

Growth is expected to focus on the Commercial sector in the short term, by

6.5%

Employment is forecast to grow by

1.3%

a year on average

The South East has an ARR of

3,940

KEY FINDINGS

The region's total construction output is projected to see average yearly increases of 2.2% over the next five years, above the UK average of 1.7%.

The infrastructure sector is expected to see the greatest annual average expansion of 6.3% between 2017 and 2021. There are numerous schemes that are likely to be taking place such as £104m worth of work on the M20's new junction 10a and link road to the A2070. The double digit output growth that is predicted for 2019 is mainly driven by work on the High Speed 2 project.

In the five years to 2021 the commercial market is likely to experience annual average expansion of 4.1%. Output growth is anticipated to be the strongest over the near term as work on the £2bn Paramount theme park begins. However, there is a downside risk that any further delays to this project could lead to smaller expansion in the region's commercial construction output over the forecast period.

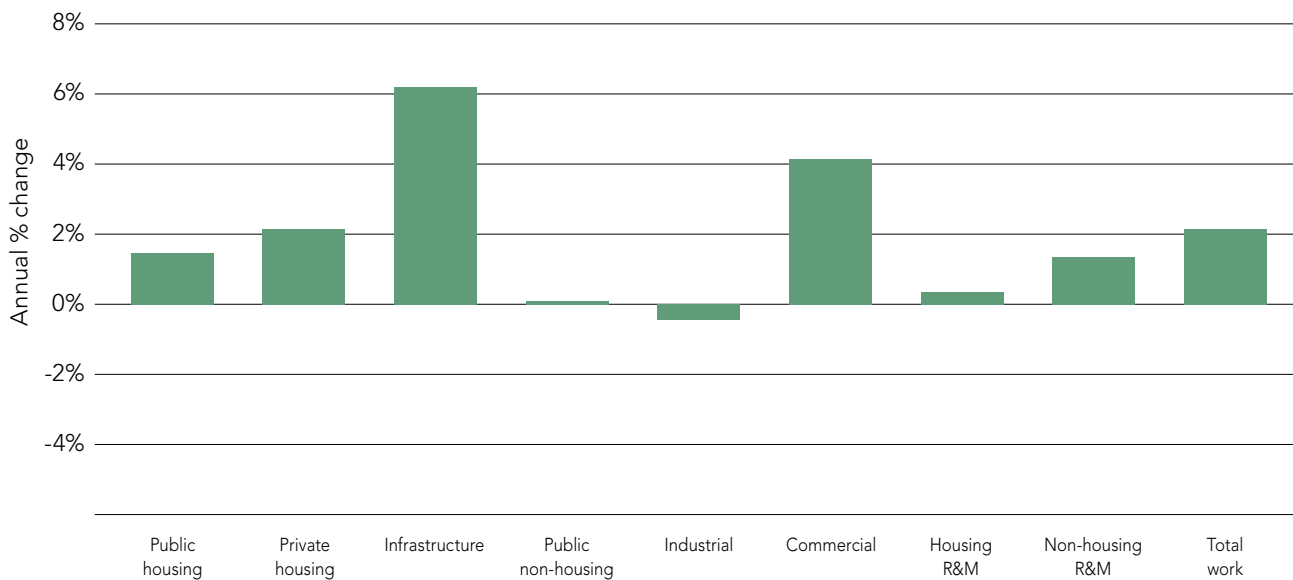
The private housing sector is projected to grow by an annual average of 2.1% over the next five years due to various projects that are either taking place or about to start, the biggest of which is for 10,000 new homes in Horsham. By the end of the forecast period output is likely to have reached a new high of £3.78bn.

The public non-housing sector is projected to stagnate between 2017 and 2021. There is a number of developments in the pipeline such as tourism and visitor information buildings in Devonshire Park, Eastbourne and a new sports and leisure facility at Broadbridge Heath in Horsham. However, these projects are of a small scale and will therefore have a minimal impact on overall output levels.

In 2015, the South East accounted for around 15% of UK construction employment. Over the next five years construction employment in the region is projected to rise by 1.3% per year on average, one of the strongest growth rates compared with other regions and devolved nations and above the UK's average yearly growth rate of 0.6%. As is the case across the UK as a whole, the strongest growth will tend to be in the managerial/supervisory and professional occupations rather than the trades.

At 3,940 extra recruits required per year over the forecast period, the region's ARR is 1% of base 2017 employment, below the UK rate of 1.4%. There are six occupational categories that have an ARR between 2.5% and 5% of base 2017 employment, namely construction project managers, plant operatives, steel erectors/structural fabrication, logistics, civil engineering operatives nec., and architects.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2021 – SOUTH EAST



Source: CSN, Experian.
Ref: CSN Explained.

REGIONAL COMPARISON 2017-2021

	Annual average % change in output	Change in total employment	Total ARR
North East	-0.1%	-2,840	1,270
Yorkshire and Humber	0.5%	-1,300	1,860
East Midlands	0.0%	-2,340	1,770
East of England	1.0%	3,230	3,970
Greater London	2.4%	27,110	3,870
South East	2.2%	25,550	3,940
South West	3.1%	8,240	4,180
Wales	6.2%	16,120	3,890
West Midlands	1.3%	4,280	2,800
Northern Ireland	1.6%	1,430	710
North West	2.5%	14,520	5,140
Scotland	-0.4%	-8,420	2,340
UK	1.7%	85,580	35,740

Source: CSN, Experian.
Ref: CSN Explained.

Construction output in the South East is forecast to rise by an annual average of 2.2% over the next five years, above the UK average of 1.7%.

THE OUTLOOK FOR CONSTRUCTION IN THE SOUTH EAST

CONSTRUCTION OUTPUT IN THE SOUTH EAST – OVERVIEW

In 2015, construction output rose for the second consecutive year, by 4% to £18.65bn (2013 prices). The new work sector increased by 6% to £10.44bn whilst the repair and maintenance (R&M) one went up by 3% to £8.21bn.

The infrastructure sector experienced the greatest growth of 49% to £2.49bn. Double digit expansion of 37% and 14% was also posted in the industrial (£569m) and public non-housing (£1.35bn) ones respectively. The private housing market registered the smallest rise of 4% to £3.06bn. In contrast, the public housing sector dropped by 31% to £380m whilst a fall of 17% was seen in the commercial one (£2.59bn).

INDUSTRY STRUCTURE

The Construction Industry structure 2015 – UK vs South East graphic, illustrates the sector breakdown of construction in the South East, compared to that in the UK. Effectively, the percentages for each sector illustrate what proportion of total output each sector accounts for.

In 2015, the region's new work sector accounted for 56% of total construction output, much lower than the national share of 65%.

The structure of the South East's construction industry has some big differences compared to the UK. The region's housing R&M sector is much more important than in the UK (26% vs 18%). In contrast, the share for the South East's commercial (14% vs 18%), market was smaller. The shares

for the private housing, public housing and infrastructure sectors were similar to the national average, whilst the South East's share of the public non-housing and industrial sectors was identical to the UK as a whole.

ECONOMIC OVERVIEW

The expected performance of a regional or national economy over the forecast period (2017–2021) provides an indication of the construction sectors in which demand is likely to be strongest.

In 2015, gross value added (GVA) in the South East rose for the sixth consecutive year, by 2.2% to £237.1bn in 2012 prices. This growth rate was similar to the UK's of 2.3%.

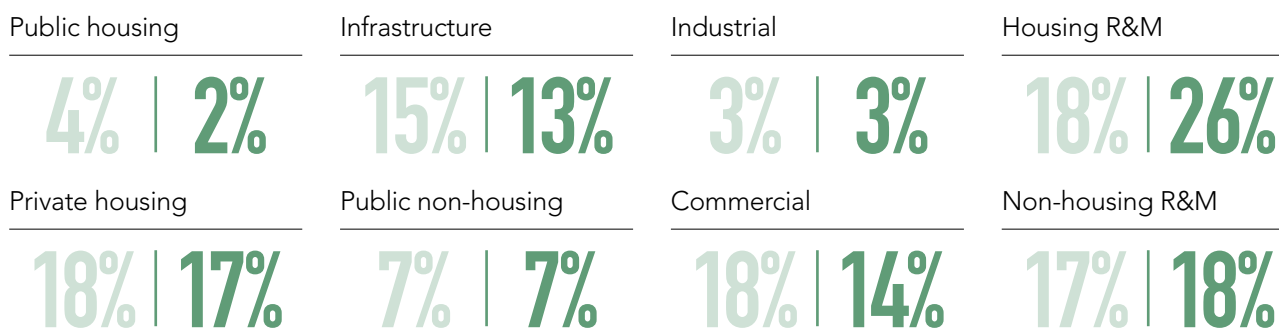
ECONOMIC STRUCTURE

In terms of the region's industrial structure, professional and other private services accounted for the biggest share of GVA at 30.1% in 2015, whilst public services came in second at 16%. The wholesale and retail (13.6%) and information and communication (9.3%) sectors were ranked third and fourth respectively, while at 7.8%, manufacturing was the fifth largest market.

The region has a higher than average exposure to the professional and other private services, information and communication and wholesale and retail sectors whilst others such as public services and manufacturing are under-represented compared to the UK as a whole. Therefore, the region's economy is generally structured towards the faster growing sectors.



CONSTRUCTION INDUSTRY STRUCTURE 2015 – UK VS SOUTH EAST



Source: ONS, Experian.

■ UK ■ South East

CONSTRUCTION OUTPUT 1999-2015 – SOUTH EAST



Source: ONS.
Ref: CSN Explained.

ECONOMIC STRUCTURE – SOUTH EAST (£ BILLION, 2012 PRICES)

	Actual	Forecast (Annual % change, real terms)					
	2015	2016	2017	2018	2019	2020	2021
Professional & Other Private Services	71.4	2.6	1.5	1.8	2.3	2.6	2.8
Public Services	38.0	0.6	0.5	1.0	1.8	2.5	2.6
Wholesale & Retail	32.4	4.4	1.1	2.0	2.5	2.7	2.8
Information & Communication	22.2	6.2	2.3	2.5	2.5	2.5	2.5
Manufacturing	18.5	-0.8	0.0	1.7	1.5	1.4	1.5
Total Gross Value Added (GVA)	237.2	2.1	1.1	1.7	2.1	2.4	2.6

Note: Top 5 sectors, excluding construction.
Source: Experian.
Ref: CSN Explained.

FORWARD LOOKING ECONOMIC INDICATORS

Between 2017 and 2021 the region's GVA is projected to grow at an annual average rate of 2%, higher than the national rate of 1.8%.

Of the top five sectors, the information and communication one is expected to see the biggest annual average increase of 2.5%, whilst the largest sector, professional and other private services, is projected to experience average yearly growth of 2.2%.

Real household disposable income is expected to rise by an annual average of 1.8% over the forecast period, higher than the UK rate of 1.5%.

In 2015, the region's working age population was close to 5.49 million, around 13% of the UK total. Over the forecast period, the South East's working age population as a share of the total population is expected to remain at about 61%.

The region's unemployment rate stood at 4.1% in 2015, lower than the UK rate of 5.4%. In the South East, the number of individuals unemployed is likely to grow over the short term partly due to Brexit uncertainties.

Overall, growth across the UK is anticipated to be slower than predicted a year ago due to rising global uncertainty, not just as a result of the European Union referendum result in the UK, but also linked to the recent U.S. elections and continuing instability in the Middle East.

NEW CONSTRUCTION ORDERS – OVERVIEW

In 2015, new orders rose for the third consecutive year, by 10% to £7.89bn (current prices), around 84% of their 2008 peak. Infrastructure orders saw the biggest jump of 116% to £2.24bn, a new high, probably partly driven by the £1.3bn Rampion wind farm project. Industrial orders grew by 23% to £590m whilst the private housing ones increased by 3% to £2.2bn. In contrast, the public housing sector saw new orders decline by 27% to £127m whilst the public non-housing (£1.08bn) and commercial (£1.64bn) sectors both experienced falls of 18%.

NEW CONSTRUCTION ORDERS – CURRENT SITUATION

In the nine months to September last year, all new orders went down by 4% to £5.94bn year-on-year. Public non-housing orders saw the greatest rise of 56% to £1.28bn whilst double digit increases of 21% and 20% were experienced in the public housing (£119m) and commercial (£1.5bn) sectors respectively. Industrial orders posted the largest decline of 40% to £311m while the infrastructure ones fell by 32% to £1.25bn. The private housing market registered the smallest drop of 10% to £1.49bn.

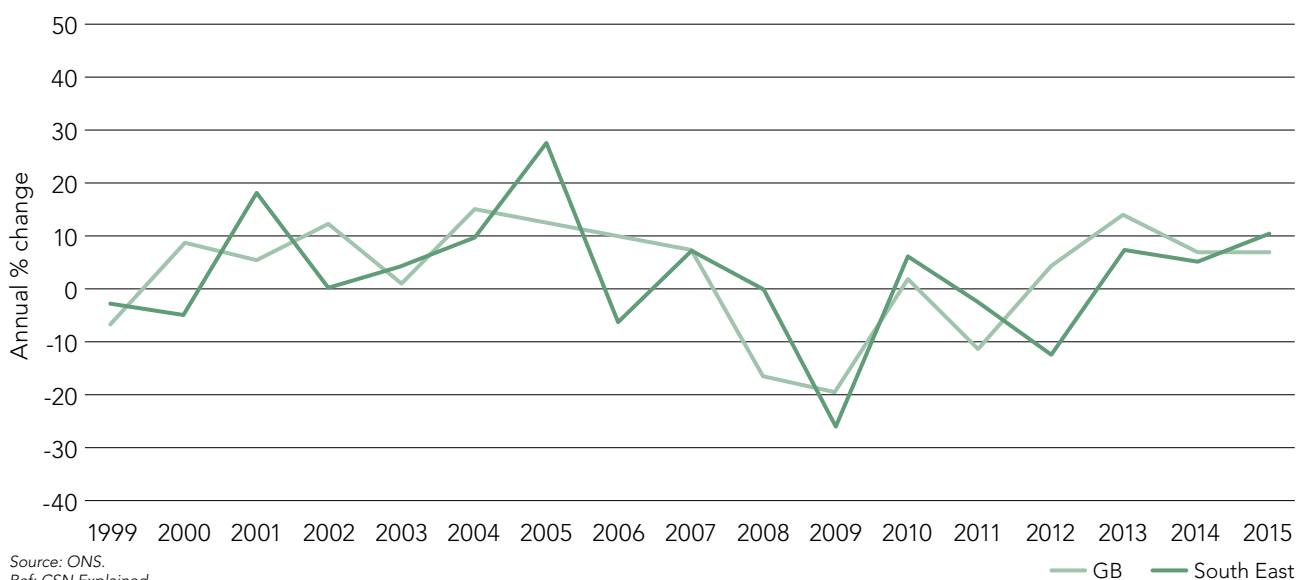


ECONOMIC INDICATORS – SOUTH EAST (£ BILLION, CURRENT PRICES – UNLESS OTHERWISE STATED)

	Actual	Forecast (Annual % change, real terms)					
	2015	2016	2017	2018	2019	2020	2021
Real household disposable income (2012 prices)	189.7	4.1	3.0	3.9	3.4	3.9	3.9
Household spending (2012 prices)	189.3	4.3	4.5	3.0	3.2	4.0	4.0
Working age population (000s and as % of all)	5,486.2	61.5%	61.4%	61.3%	61.4%	61.7%	61.6%
House prices (£)	276,917	8.7	2.1	2.1	2.9	3.4	3.5
LFS unemployment (millions)	0.2	-8.2	15.1	4.9	3.2	1.4	-0.4

Source: ONS, DCLG, Experian.

NEW CONSTRUCTION ORDERS GROWTH 1999-2015 – SOUTH EAST VS GB



NEW WORK CONSTRUCTION ORDERS – SOUTH EAST (£ MILLION, CURRENT PRICES)

Selected sectors	Actual	Annual % change				
	2015	2011	2012	2013	2014	2015
Public housing	127	-21.7	-1.4	8.9	-55.6	-27.0
Private housing	2,204	22.5	-16.1	9.7	6.7	3.3
Infrastructure	2,237	-37.3	16.4	-2.1	-16.2	115.7
Public non-housing	1,083	-7.5	-26.9	2.9	26.5	-18.2
Industrial	590	58.3	17.5	19.7	19.7	22.9
Commercial	1,644	14.0	-22.4	11.1	14.5	-18.3
Total new work	7,885	-1.4	-13.1	7.1	4.7	10.2

Source: ONS.
Ref: CSN Explained.

CONSTRUCTION OUTPUT – SHORT-TERM FORECASTS (2017–2018)

Regional Office for National Statistics (ONS) output statistics are published in current prices and are thus inclusive of any inflationary effect. At the time of writing, regional ONS construction output statistics were only available for the first three quarters of 2016.

In the first nine months of 2016 total construction output went up by 2% to £15.26bn (current prices) compared with the same period a year earlier. Of the new work sectors, the public non-housing one saw the largest growth of 21% to £1.32bn, while smaller expansion of 18% and 7% was posted in the private housing (£2.87bn) and commercial (£2.32bn) sectors respectively. The industrial market recorded the greatest decline of 26% to £350m while the public housing one also registered a double digit fall, of 12% to £272m. The infrastructure sector dropped by 7% to £1.78bn.

In 2016, total construction output in the region is estimated to have edged down by 1% in real terms to £18.45bn in 2013 prices. Output is expected to rise by an annual average of 1.2% over the next two years. Growth of 2.2% per annum is forecast for the new work sector whereas the R&M one is expected to stagnate.

Over the next two years the commercial market is projected to be the best performing one with average yearly increases of 6.5%. Double digit expansion is expected in 2018 as work on the £2bn Paramount theme park begins. There are also other smaller-scale developments that should take place. Plans have been approved for a £70m extension to Royal Victoria Place shopping centre in Tunbridge Wells. Over 140,000 square feet of space will be added which will house new retail stores, restaurants and a cinema. Growth in the region's professional and other private services sector is a good indicator of demand of office premises whilst expansion of the wholesale and retail sector is indicative of demand for retail facilities. The annual average increase in both sectors is now lower than it was a year ago mainly due to the impact of the EU referendum result.

The infrastructure sector is predicted to see average yearly expansion of 2.4% over the near term. Moderate growth is predicted for this year as a number of projects take place. For example, a disused power plant in Slough is to be demolished soon, making way for a new multi-fuel power station. The new £50m facility will generate 50MW of electricity once complete. Construction is underway on the £130m contract to build a new lorry park off the M20 in Kent with work targeted for completion in summer 2017. Work on turning the M4 into a smart motorway from Junction 3 to 12 is set to start in March 2017. The aim of the project is to reduce congestion by monitoring traffic flow and setting the speed limits accordingly. The scheme is valued between £590m and £860m and it is likely to be completed in spring 2022.

Annual average growth of 1.3% is anticipated for the private housing market. In terms of projects, work is soon to commence on a new housing scheme in north west Bicester. The £135m development will contain approximately 1,700 new one- to five-bedroom homes. A new £750m housing project is due to start in the second half of 2018. Around 10,000 homes are to be built in Horsham, West Sussex and as part of the development a new school and shops will also be provided. A 250-acre site at Court Lodge Farm in Ashford has been earmarked for 950 new homes. The homes will be built in phases with around 70 per year. This scheme follows plans to build 6,000 new residential properties in Chilmington Green, which will be Ashford's biggest housing development to date.

The public housing sector is projected to experience average yearly increases of 1.8%. Since the referendum result, there have been calls to provide more funding for truly affordable housing and if this does actually happen, the prospects for the sector could be better. In August, Maidstone Borough Council granted planning permission for the development of a new mixed use scheme. As part of the project, up to 240 affordable homes will be built.

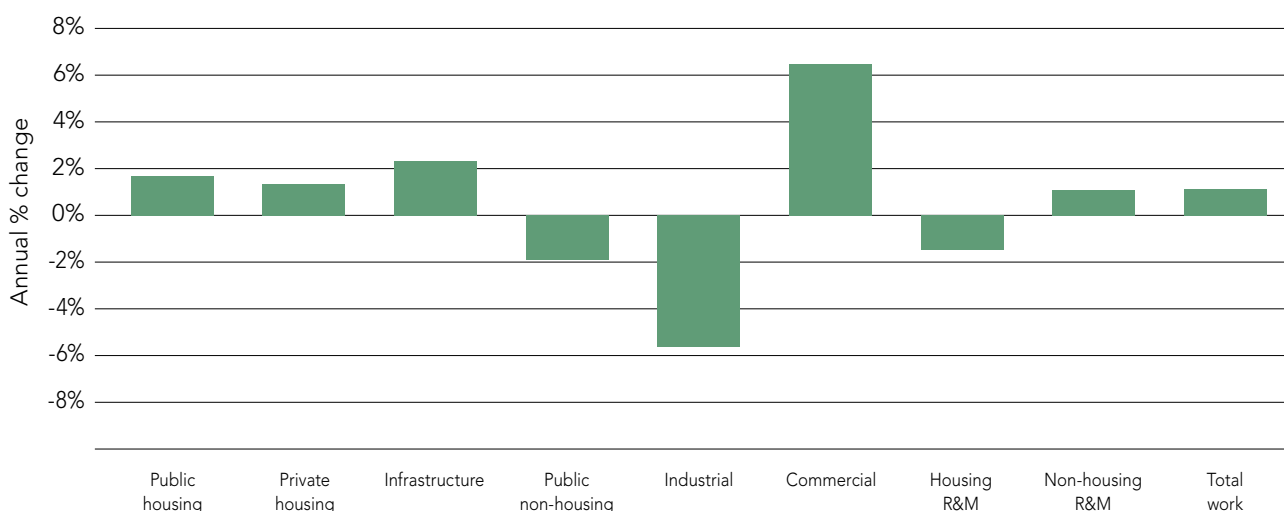


CONSTRUCTION OUTPUT – SOUTH EAST (£ MILLION, 2013 PRICES)

	Actual	Forecast annual % change			Annual average
	2015	2016	2017	2018	2017-2018
Public housing	380	-7%	4%	-1%	1.8%
Private housing	3,061	11%	1%	2%	1.3%
Infrastructure	2,490	-6%	8%	-3%	2.4%
Public non-housing	1,349	7%	-1%	-2%	-1.9%
Industrial	569	-22%	-8%	-3%	-5.5%
Commercial	2,591	2%	-2%	15%	6.5%
New work	10,440	2%	1%	3%	2.2%
Housing R&M	4,810	-6%	-3%	0%	-1.2%
Non-housing R&M	3,397	-3%	0%	2%	1.1%
Total R&M	8,207	-5%	-1%	1%	-0.2%
Total work	18,647	-1%	0%	2%	1.2%

Source: Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2018 – SOUTH EAST



Source: Experian.
Ref: CSN Explained.

By 2021 construction employment is forecast to reach over 412,000 above the previous 2008 peak.

CONSTRUCTION OUTPUT – LONG-TERM FORECASTS (2017–2021)

Output in the region's construction industry is expected to rise by an annual average of 2.2% in the five years to 2021, above the UK rate of 1.7%. The region's new work sector is predicted to see stronger average yearly increases compared with the R&M one (3.2% vs 0.7%).

The best performing sector over the next five years is projected to be the infrastructure one with annual average growth of 6.3%. A significant rise in output is expected in 2019 as work on the High Speed 2 project starts in earnest. Under the current forecast period there is also likely to be work taking place on a £1.3bn offshore wind farm dubbed Rampion wind farm; however, only a relatively small part of the value of such projects is classified to the construction sector. More information has been released by Highways England which suggests that work on the M20's new junction 10a and link road to the A2070 will cost £104m. Work is set to start in January 2018 and finish in May 2020. It is hoped that this scheme will increase road safety as well as improving the noise and air quality for properties to the west of the A2070.

Detailed design work on a £120m revamp of Gatwick station has commenced, albeit the complete funding package has still to be agreed. It will include doubling the size of the concourse area and will be delivered alongside a significant increase in capacity on rail services through Gatwick as a result of committed and planned enhancements.

Average yearly increases of 4.1% are expected for the commercial market. The corresponding UK rate is just 1.2%. Good output growth in the South East is mainly due to large expansion in 2018 and 2019, as it has been assumed that work on the £2bn Paramount theme park project in Kent will begin. Should this be delayed the projections for the sector would be far less positive. Work recently got underway on the town centre redevelopment of Sittingbourne in Kent. The plans include a new cinema, retail space and health centre. The £110m scheme should be completed by 2020. A new conference centre has been proposed for Brighton. As part of the development, a department store and a 300-bed hotel will also be built. It is thought the project will be worth around £540m.

Average yearly growth of 2.1% has been predicted for the private housing market. A proposal has been put forward for 3,500 homes in South Oxfordshire. Oxford Science Park is to be expanded using green belt land off Grenoble Road. However, other sites will be considered such as land adjacent to the new Barton Park Estate, land near Thornhill park and ride, Wick farm and Culham, all of which are within the green belt. If work on this development starts over the next five years, private housing output growth could be stronger. By the end of the forecast period, output is anticipated to reach a new high of £3.78bn.

Public non-housing output is projected to be largely static between 2017 and 2021. Whilst there are projects that are likely to take place over the next five years, they are small

in value. Work is set to begin in early 2017 on a series of tourism and visitor information buildings in Devonshire Park, Eastbourne. The £35m development ought to be completed in the first half of 2018. A new sports and leisure facility at Broadbridge Heath in Horsham has been given the green light. The new centre will provide a six-court sports hall, a cycle studio, an 80-station gym, three fitness studios, a climb facility and changing rooms. In addition to this, football pitches and a café will be delivered. It is hoped work will start in early 2017 with the centre opening in spring 2018.

Overall, the industrial sector is likely to see an annual average decline of 0.4% over the next five years. The industrial market is projected to see falls in output during the short term due to the lack of projects coming into the pipeline. However, as the region's prospects improve in the second half of the forecast period, growth should return to the sector. Manufacturing output is predicted to grow by an annual average of 1.2% over the five years to 2021, which is unlikely to be strong enough to drive any general increase in demand for new factory facilities. However, the transport and storage sector is expected to see expansion well in excess of 2% a year over the forecast period, which should mean that demand for distribution and logistics facilities will be stronger.

BEYOND 2021

At the beginning of the year, Medway Council launched a public consultation on its local plan which includes building up to 35,000 residential properties by 2035. At present, it is thought subject to outcomes of an independent examination by a planning inspector, the local plan will be implemented in 2019.

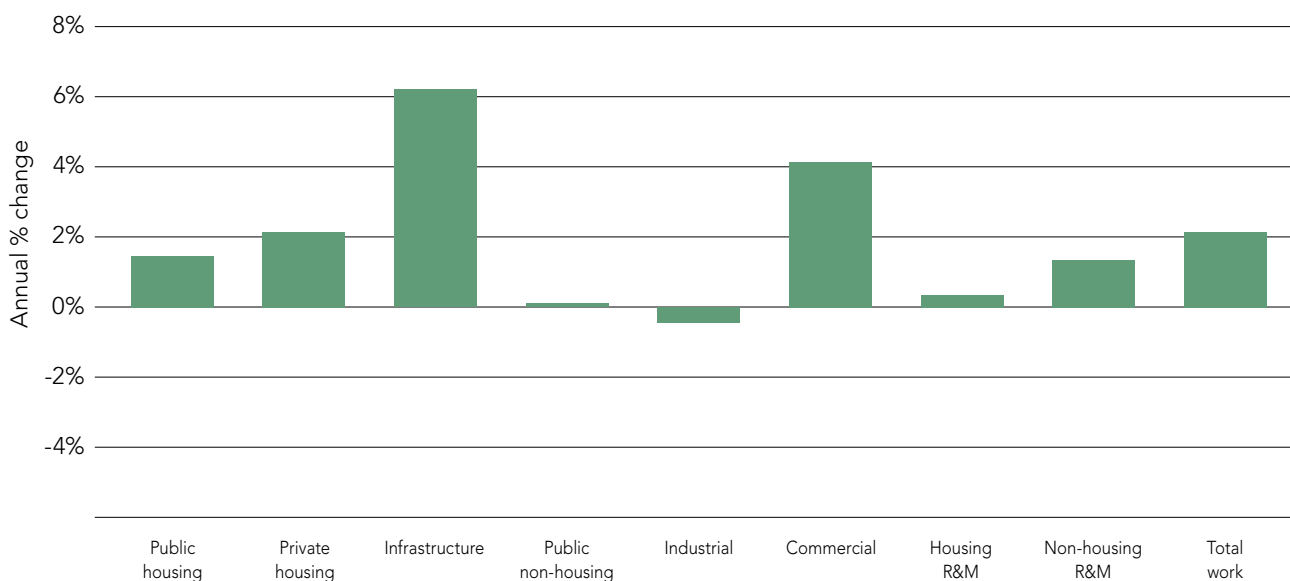
According to the Highways England, there are a couple of projects that are due to start in 2020 which are likely to deliver output streams beyond 2021, such as the A2 Bean and Ebbsfleet junction improvements and the M25 junction 25 improvements. It has also been revealed that work on the two-year A27 Arundel improvement scheme will cost between £100m-£250m and construction is due to begin in 2021. Around £50-£100m worth of work is also planned for the A27 Worthing and Lancing improvement in 2021 with completion in 2023.

CONSTRUCTION OUTPUT – SOUTH EAST (£ MILLION, 2013 PRICES)

	Estimate	Forecast annual % change					Annual average
	2016	2017	2018	2019	2020	2021	2017-2021
Public housing	353	4%	-1%	5%	-5%	4%	1.5%
Private housing	3,405	1%	2%	1%	1%	6%	2.1%
Infrastructure	2,338	8%	-3%	22%	8%	-2%	6.3%
Public non-housing	1,447	-1%	-2%	1%	-1%	4%	0.1%
Industrial	444	-8%	-3%	4%	3%	3%	-0.4%
Commercial	2,639	-2%	15%	13%	0%	-5%	4.1%
New work	10,627	1%	3%	9%	2%	0%	3.2%
Housing R&M	4,530	-3%	0%	2%	2%	0%	0.3%
Non-housing R&M	3,294	0%	2%	1%	2%	1%	1.3%
R&M	7,824	-1%	1%	2%	2%	1%	0.7%
Total work	18,451	0%	2%	6%	2%	1%	2.2%

Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2021 – SOUTH EAST



Source: CSN, Experian.
Ref: CSN Explained.

CONSTRUCTION EMPLOYMENT FORECASTS FOR THE SOUTH EAST

TOTAL CONSTRUCTION EMPLOYMENT FORECASTS BY OCCUPATION

The table presents actual construction employment (SICs 41-43, 71.1 and 74.9) in the South East for 2015, the estimated total employment across 28 occupational categories in 2016 and forecasts for the industry for 2017 to 2021. A full breakdown of occupational groups is provided in Section 5 of CSN Explained.

Employment in the South East is likely to rise by an annual average of 1.3% over the next five years, one of the highest rates compared with other regions and devolved nations and well above the UK rate of 0.6%. Employment in the region is expected to increase by around 25,550 to 412,770 over the five years to 2021, a new high. The South East,

along with Wales, are the only two parts of the UK where employment in 2021 is projected to exceed its previous peak in 2008.

Annual average expansion is predicted for 21 out of the 28 occupational categories, with plant operatives projected to see the strongest annual average growth of 4.4%. By the end of the forecast period, employment in this occupation is likely to be at a new peak of 6,750. Other occupational categories that are predicted to reach record employment levels by 2021 are architects, logistics, steel erectors/structural fabricators and scaffolders.

In 2021, wood trades and interior fit-out, are anticipated to be the largest trade occupation, accounting for around 8% of the total workforce.



TOTAL EMPLOYMENT BY OCCUPATION – SOUTH EAST

	Actual	Estimate	Forecast	
	2015	2016	2017	2021
Senior, executive, and business process managers	28,140	29,110	30,010	33,990
Construction project managers	7,950	7,970	7,960	8,640
Other construction process managers	29,430	30,460	30,180	32,460
Non-construction professional, technical, IT, and other office-based staff	55,600	58,020	58,260	64,310
Construction trades supervisors	6,420	6,870	6,820	7,520
Wood trades and interior fit-out	34,080	34,520	35,110	35,020
Bricklayers	8,250	8,260	8,310	8,060
Building envelope specialists	16,930	17,220	17,330	17,030
Painters and decorators	18,560	19,160	19,770	19,850
Plasterers	5,000	4,980	5,020	4,910
Roofers	7,860	7,570	7,700	7,560
Floorers	3,770	3,940	4,150	4,410
Glaziers	3,970	4,110	4,090	3,850
Specialist building operatives nec*	9,000	8,490	8,480	7,900
Scaffolders	2,570	2,510	2,590	2,820
Plant operatives	5,290	5,450	5,710	6,750
Plant mechanics/fitters	4,520	4,580	4,730	4,760
Steel erectors/structural fabrication	2,590	2,620	2,760	3,040
Labourers nec*	18,640	19,390	19,470	20,840
Electrical trades and installation	25,220	25,640	26,050	25,530
Plumbing and HVAC Trades	23,230	23,200	23,180	21,860
Logistics	3,130	3,250	3,330	3,830
Civil engineering operatives nec*	1,810	1,870	1,870	1,970
Non-construction operatives	2,420	2,540	2,590	2,970
Civil engineers	5,710	5,990	5,940	6,350
Other construction professionals and technical staff	33,260	35,180	35,740	40,600
Architects	5,520	5,810	6,000	7,040
Surveyors	7,940	8,500	8,320	8,900
Total (SIC 41-43)	324,380	331,730	335,470	349,880
Total (SIC 41-43, 71.1, 74.9)	376,810	387,210	391,470	412,770

Source: ONS, CSN, Experian.
Ref: CSN Explained. *Not elsewhere classified.

ANNUAL RECRUITMENT REQUIREMENT (ARR) BY OCCUPATION

The ARR is a gross requirement that takes into account workforce flows into and out of construction, due to factors such as movements between industries, migration, sickness and retirement. However, these flows do not include movements into the industry from training, due to the inconsistency and coverage of supply data. Thus, the annual recruitment requirement provides an indication of the number of new employees that would need to be recruited into construction each year in order to realise forecast output.

The total annual average recruitment requirement for the South East has a green light indicating that there is a low requirement for extra recruits during the forecast period. The region's ARR, at 3,940, represents 1% of base 2017 employment, below the UK rate of 1.4%.

The traffic lights suggest that the occupations under some pressure are likely to be construction project managers, plant operatives, logistics, steel erectors/structural fabrication, civil engineering operatives nec., and architects all with ARR ratios in excess of 2.6% but less than 5%. However, we can only say that this might be an indication of future skills shortages, as inflows from training in the model are set to zero. There is on-going research trying to scope out the number of new entrants to the industry from training and it is hoped in the future to be able to turn this 'switch' on.

Despite employment growth well in excess of the UK average, the region's ARR ratio is lower than the UK one. This is because the South East already benefits from a significant net inflow of construction workers from other regions; thus, its additional requirement is relatively low compared with overall employment levels.

Please note that all of the ARR's presented in this section are employment requirements and not necessarily training requirements. This is because some new entrants to the construction industry, such as skilled migrants or those from other industries where similar skills are already used, will be able to work in the industry without the need for significant retraining.

Non-construction operatives is a diverse occupational group including all of the activities under the SICs 41-43, 71.1 and 74.9 umbrella that cannot be classified elsewhere, such as cleaners, elementary security occupations nec., and routine inspectors and testers. The skills required in these occupations are highly transferable to other industries and forecasting such movement is hazardous given the lack of robust supportive data. Therefore, the ARR for non-construction operatives is not published.



ANNUAL RECRUITMENT REQUIREMENT BY OCCUPATION – SOUTH EAST

	2017-2021
Senior, executive, and business process managers	240
Construction project managers	240
Other construction process managers	430
Non-construction professional, technical, IT, and other office-based staff	350
Construction trades supervisors	170
Wood trades and interior fit-out	220
Bricklayers	–
Building envelope specialists	<50
Painters and decorators	450
Plasterers	–
Roofers	–
Floorers	100
Glaziers	–
Specialist building operatives nec*	–
Scaffolders	–
Plant operatives	190
Plant mechanics/fitters	–
Steel erectors/structural fabrication	130
Labourers nec*	190
Electrical trades and installation	–
Plumbing and HVAC Trades	–
Logistics	150
Civil engineering operatives nec*	80
Civil engineers	–
Other construction professionals and technical staff	650
Architects	170
Surveyors	170
Total (SIC 41-43)	2,950
Total (SIC 41-43, 71.1, 74.9)	3,940

Source: CSN, Experian.
Ref: CSN Explained. *Not elsewhere classified.

COMPARISONS ACROSS THE UK

As is usually the case, the 1.7% annual average output growth rate for the UK as a whole masks considerable differences in the projected rates for individual English regions and the devolved nations, from expansion of over 6% a year on average in Wales to a decline of 0.4% in Scotland on the same measure.

Wales and the South West remain on top of the growth rankings due to the prospective start of new nuclear build at Wylfa Newydd and Hinkley Point respectively in their areas. However, Wales in particular is not necessarily a 'one-hit wonder' with other sizeable projects such as the M4 upgrade around Newport due to start in the forecast period.

The Greater London construction market is more vulnerable than most to a fall in business investment because of the large size of its commercial sector. However, a weak performance here is expected to be more than compensated for by strong growth in infrastructure, driven in part by the start of work on HS2, and private housing, fuelled by strong increases in the capital's population.

The other two regions expected to see annual average output growth in excess of 2% are the North West (2.5%) and the South East (2.2%). Growth in the former will be driven by energy and transport projects, the largest of which is the prospective new nuclear build facility at Moorside. In the latter, new renewable energy facilities should drive growth in the infrastructure sector and the commercial construction sector will benefit from the theme park in north Kent.

For the remainder of the English regions growth is predicted to range between an annual average rate of 1.3% in the West Midlands, which should see some HS2-related work by the end of the forecast period, to a marginal decline of 0.1% in the North East, which will suffer from a dearth of major projects and weak housing demand.

Scotland is projected to be the worst performing of all the regions and devolved nations, with an annual average decline of 0.4%. The primary reason for this is a sharp fall in infrastructure output from its current very high level as a number of large projects, such as the Queensferry Crossing, the M8/M73/M74 motorway upgrade, and the Aberdeen Western Peripheral Route, are completed over the next two years.

Employment growth across the regions and devolved nations tends to mirror that of output, but at a lower level to take account of expected productivity gains and with some minor adjustments depending on whether output growth is in high or low labour-intensive sectors. Annual average employment growth is projected to range from a

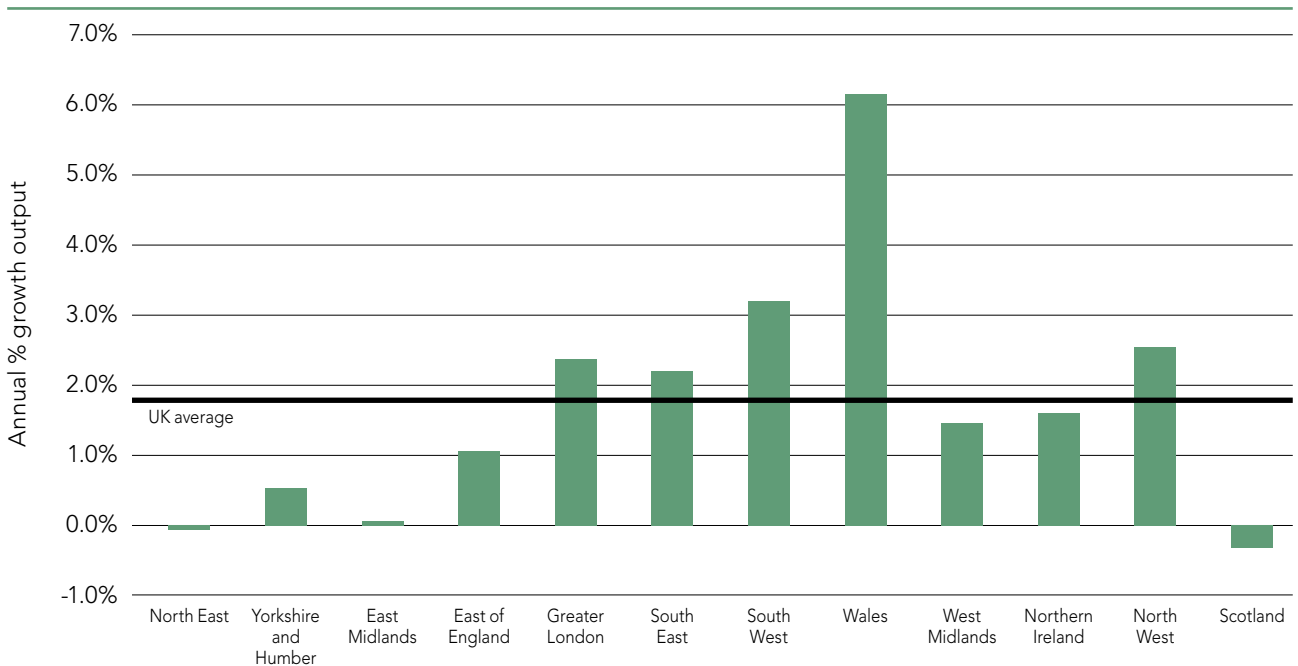
high of 2.7% in Wales to a low of -0.8% in Scotland, against a UK rate of 0.6%.

The impact of new nuclear build on employment in the regions and devolved nations that will host such projects is much less than on output due to its capital rather than labour-intensive nature. However, it still boosts employment growth in Wales quite considerably as it is a very big project in a small market. The impact is smaller in the South West, which has a bigger construction market, and thus contributes less to overall employment growth, which is expected to be around 0.7% a year on average over the five years to 2021.

Output growth in Scotland, the North East, East Midlands, and Yorkshire and Humber will not be strong enough to drive growth in employment; thus, these are all expected to experience some fall in construction employment between 2017 and 2021.

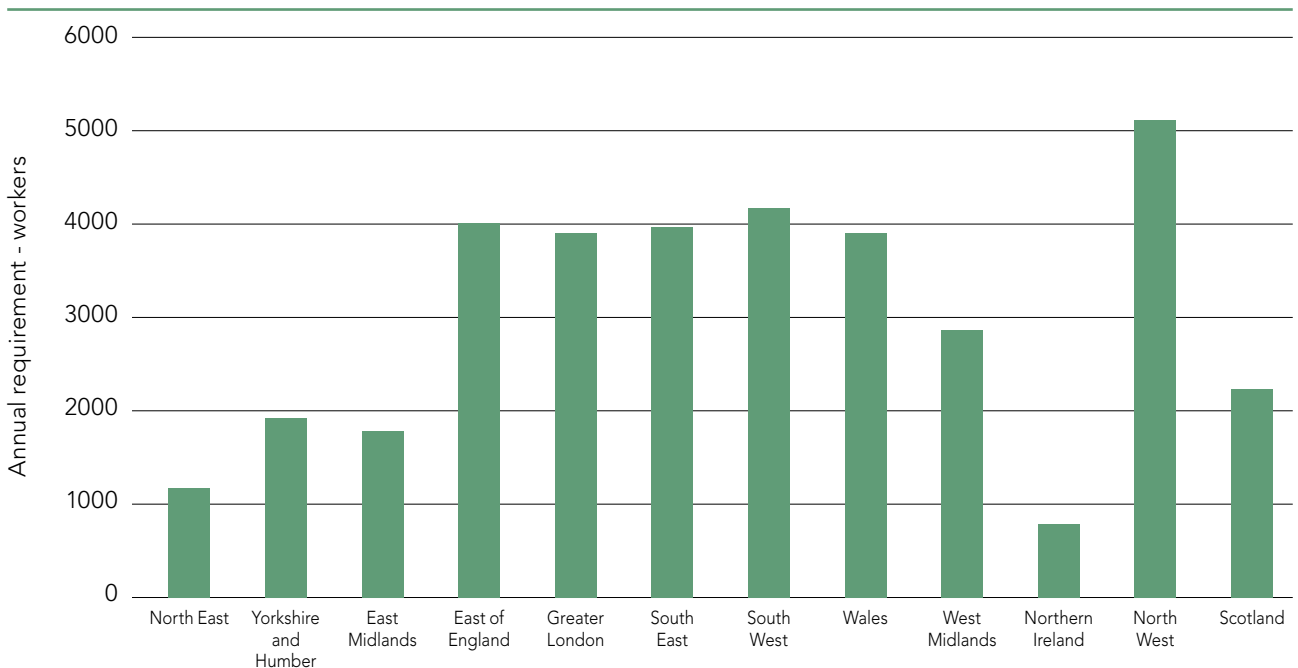
The pattern of annual recruitment requirements can look significantly different to the profile of output and employment, as some regions and devolved nations have historically strong net inflows and some suffer from large net outflows. Thus, Greater London's ARR represents just 0.9% of base 2017 employment, the lowest ratio along with Yorkshire and Humber, despite being high up the rankings in terms of output and employment growth. This is because the capital naturally acts as a magnet for the construction workforce from other parts of the country and from abroad; thus, its additional requirement is relatively small. At the other end of the scale Wales traditionally suffers strong net outflows, in particular to the North West and South West of England and often has the highest ARR ratio as a result of this. The 2017 to 2021 period is no exception, with buoyant output and employment growth and the strong net outflows leading to an ARR ratio of 3.4% of base 2017 employment. The remaining regions and devolved nations have an ARR ratio of between 1% and 1.9% of base 2017 employment.

ANNUAL AVERAGE OUTPUT GROWTH BY REGION 2017-2021



Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL RECRUITMENT REQUIREMENT (ARR) BY REGION 2017-2021



Source: CSN, Experian.

▀▀ The sector forecast for strongest growth in the South East is Infrastructure increasing by an average of 6.3% each year. ▀▀

CSN EXPLAINED

This appendix provides further details and clarification of some of the points covered in the report.

CSN METHODOLOGY gives an overview of the underpinning methods that are used by the CSN, working in partnership with Experian, to produce the suite of reports at a UK, national and regional level.

GLOSSARY provides clarification on some of the terms that are used in the reports.

NOTES has some further information relating to the data sources used for the various charts and tables. This section also outlines what is meant by the term 'footprint', when talking about the areas of responsibility.

DEFINITIONS explains the sector definitions used within the report and provides examples of what is covered in each.

OCCUPATIONAL GROUPS gives a detailed breakdown of the 28 occupational groups into the individual standard occupational classification (SOC) codes that are aggregated to provide the employment and recruitment requirement.

CSN METHODOLOGY

BACKGROUND

The **Construction Skills Network** has been evolving since its conception in 2005, acting as a vehicle for CITB and CITB Northern Ireland to collect and produce information on the future employment and training needs of the industry.

The CSN functions at both a national and regional level. It comprises a National Group, 12 Observatory groups, a forecasting model for each of the regions and countries, and a Technical Reference Group. An Observatory group currently operates in each of the nine English regions and also in Wales, Scotland and Northern Ireland.

Observatory groups currently meet twice a year and consist of key regional stakeholders invited from industry, Government, education and sector bodies, all of whom contribute their local industry knowledge and views on training, skills, recruitment, qualifications and policy. The National Group also includes the same range of representatives and meets twice per year to set the national scheme, forming a backdrop for the Observatories.

At the heart of the CSN are several models that generate forecasts of employment requirements within the industry for a range of occupational groups. The models are designed and managed by Experian under the independent guidance and validation of the Technical Reference Group, which is comprised of statisticians and modelling experts.

The models have evolved over time and will continue to do so, to ensure that they account for new research as it is published, as well as new and improved modelling techniques.

Future changes to the model will only be made after consultation with the Technical Reference Group.

THE MODEL APPROACH

The model approach relies on a combination of primary research and views from the CSN to facilitate it. National data is used as the basis for the assumptions that augment the models, which are then adjusted with the assistance of the Observatories and National Group. Each English region, Wales, Scotland and Northern Ireland has a separate model (although all models are interrelated due to labour movements) and, in addition, there is one national model that acts as a constraint to the individual models and enables best use to be made of the most robust data (which is available at the national level).

The models work by forecasting demand and supply of skilled workers separately. The difference between demand and supply forms the employment requirement. The forecast total employment levels are derived from expectations about construction output and productivity. Essentially, this is based upon the question 'How many people will be needed to produce forecast output, given the assumptions made about productivity?'

The annual recruitment requirement (ARR) is a gross requirement that takes into account workforce flows into and out of construction, due to such factors as movements between industries, migration, sickness and retirement. However, these flows do not include movements into the industry from training, although robust data on training provision is being developed by CITB in partnership with public funding agencies, further education, higher

education and employer representatives. The ARR provides an indication of the number of new employees that would need to be recruited into construction each year in order to realise forecast output.

Estimates of demand are based on the results of discussion groups comprising industry experts, a view of construction output and integrated models relating to wider national and regional economic performance. The models are dynamic and reflect the general UK economic climate at any point in time. To generate the labour demand, the models use a set of specific statistics for each major type of work to determine the employment, by trade, needed to produce the predicted levels of construction output. The labour supply for each type of trade or profession is based upon the previous year's supply (the total stock of employment) combined with flows into and out of the labour market.

The key leakages (outflows) that need to be considered are:

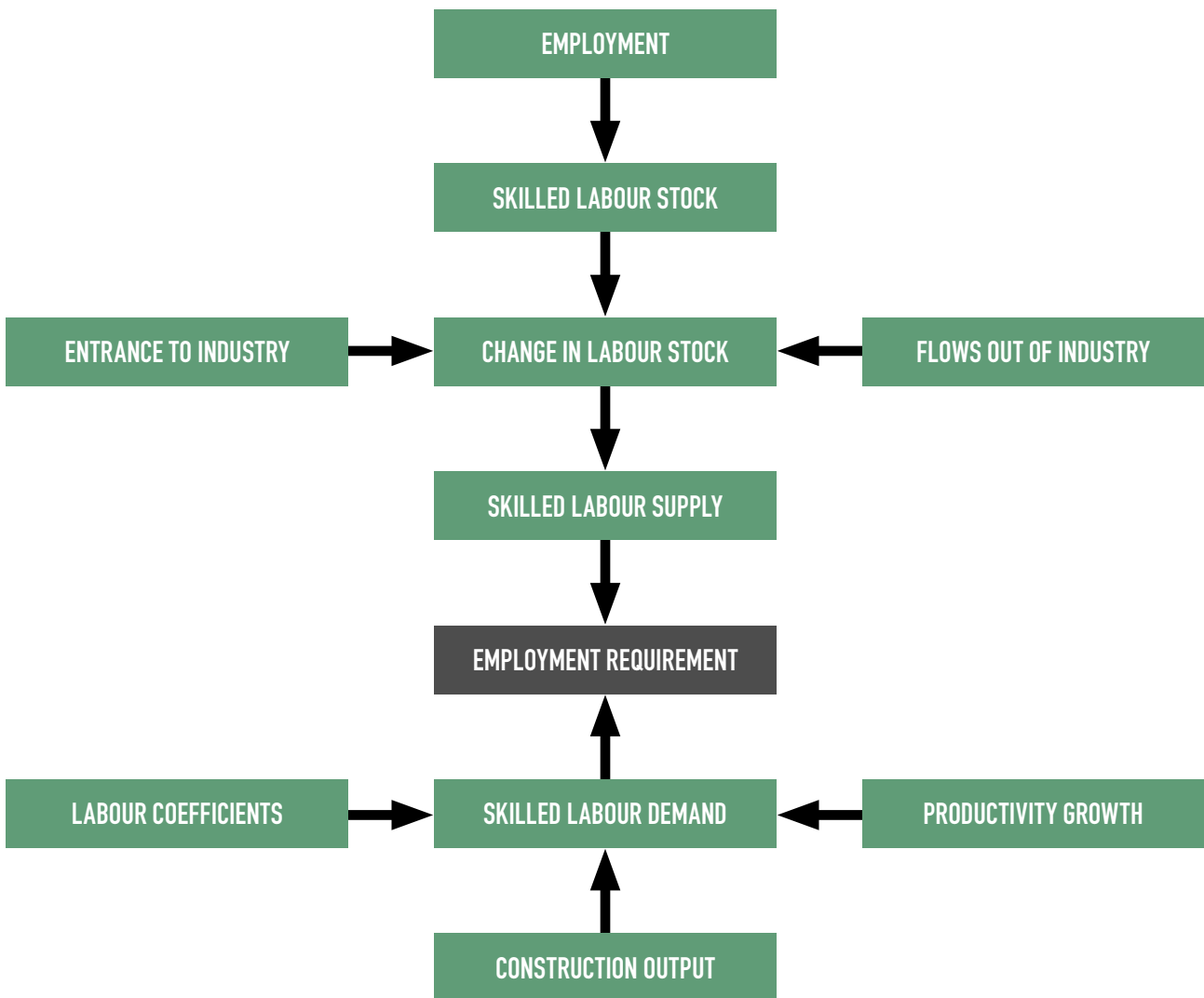
- Transfers to other industries
- International/domestic out migration
- Permanent retirements (including permanent sickness)
- Outflow to temporary sickness and home duties.

The main reason for outflow is likely to be transfer to other industries.

Flows into the labour market include:

- Transfers from other industries
- International/domestic immigration
- Inflow from temporary sickness and home duties.

The most significant inflow is likely to be from other industries. A summary of the model is shown in the flow chart.



GLOSSARY OF TERMS

Building envelope specialists – any trade involved with the external cladding of a building other than bricklaying, e.g. curtain walling.

Demand – this is calculated using construction output data from the Office for National Statistics (ONS) and the Department of Finance and Personnel Northern Ireland (DFP), along with vacancy data from the National Employer Skills Survey, produced by the Department for Education and Skills. These data sets are translated into labour requirements by trade using a series of coefficients to produce figures for labour demand that relate to forecast output levels.

GDP (gross domestic product) – total market value of all final goods and services produced. A measure of national income. $GDP = GVA$ plus taxes on products minus subsidies on products.

GVA (gross value added) – total output minus the value of inputs used in the production process. GVA measures the contribution of the economy as a difference between gross output and intermediate outputs.

Coefficients – to generate the labour demand, the model makes use of a set of specific statistics for each major type of work, to determine employment by trade or profession, based upon the previous year's supply. In essence, this is the number of workers of each occupation or trade needed to produce £1m of output across each sub-sector.

LFS (Labour Force Survey) – a UK household sample survey that collects information on employment, unemployment, flows between sectors and training. Information is collected from around 53,000 households each quarter (the sample totals more than 100,000 people).

LMI (labour market intelligence) – data that is quantitative (numerical) or qualitative (insights and perceptions) on workers, employers, wages, conditions of work, etc.

Macroeconomics – the study of an economy at a national level, including total employment, investment, imports, exports, production and consumption.

Nec – not elsewhere classified, used as a reference in LFS data.

ONS (Office for National Statistics) – organisation producing official statistics on the economy, population and society at both a national and local level.

Output – total value of all goods and services produced in an economy.

Productivity – output per employee. SIC codes (Standard Industrial Classification codes) – from the United Kingdom Standard Industrial Classification of Economic Activities produced by the ONS.

SOC codes (Standard Occupational Classification codes) – from the United Kingdom Standard Occupational Classification produced by the ONS.

Supply – the total stock of employment in a period of time, plus the flows into and out of the labour market. Supply is usually calculated from LFS data.



NOTES

NOTES

- 1 Except for Northern Ireland, output data for the English regions, Scotland and Wales is supplied by the Office for National Statistics (ONS) on a current price basis. Thus, national deflators produced by the ONS have been used to deflate prices to a 2005 constant price basis, so that the effects of inflation have been stripped out.
- 2 The annual average growth rate of output is a compound average growth rate, i.e. the rate at which output would grow each year if it increased steadily over the forecast period.
- 3 Only selected components of gross value added (GVA) are shown in this table and so do not sum to the total.
- 4 For new construction orders, comparison is made with Great Britain rather than the UK, owing to the fact that there are no orders data series for Northern Ireland.
- 5 Employment numbers are rounded to the nearest 10.
- 6 The tables include data relating to plumbers and electricians. As part of SIC 43, plumbers and electricians working in contracting are an integral part of the construction process.
- 7 A reporting minimum of 50 is used for the annual recruitment requirement (ARR). As a result, some region and devolved nation ARR forecasts do not sum to the total UK requirement.
- 8 The Employment and ARR tables show separate totals for SIC 41–43 and SIC 41–43, 71.1 and 74.9. The total for SIC 41–43 covers the first 24 occupational groups on the relevant tables and excludes civil engineers, other construction professionals and technical staff, architects and surveyors. The total for SIC 41–43, 71.1 and 74.9 includes all occupations.



FOOTPRINTS FOR BUILT ENVIRONMENT SECTOR

CITB and CITB Northern Ireland are responsible for SIC 41 Construction of buildings, SIC 42 Civil engineering, SIC 43 Specialised construction activities and SIC 71.1 Architectural and engineering activities and related technical consultancy.

The table summarises the SIC codes (2007) covered by CITB and CITB Northern Ireland:

CITB and CITB Northern Ireland	
SIC Code	Description
41.1	Development of building projects
41.2	Construction of residential and non-residential buildings
42.1	Construction of roads and railways
42.2	Construction of utility projects
42.9	Construction of other civil engineering projects
43.1	Demolition and site preparation
43.3	Building completion and finishing
43.9	Other specialised construction activities nec
71.1	Architectural and engineering activities and related technical consultancy

The CSN's current baseline forecast assumes that a deal between the UK and EU will be agreed within a 4 year time horizon, with some form of trade access to the single market. As it is unlikely that the trade terms will be as favourable as the current situation, the forecast includes a small downgrade to the UK's long term export and investment projections, compared to the pre-Brexit vote baseline. No adjustments have been made to underlying population projections in the base case as it is too early to assess any potential slowdown in EU migration.

DEFINITIONS: TYPES AND EXAMPLES OF CONSTRUCTION WORK

Public sector housing – local authorities and housing associations, new towns and government departments

Housing schemes, care homes for the elderly and the provision within housing sites of roads and services for gas, water, electricity, sewage and drainage.

Private sector housing

All privately owned buildings for residential use, such as houses, flats and maisonettes, bungalows, cottages and the provision of services to new developments.

Infrastructure – public and private

Water

Reservoirs, purification plants, dams, water works, pumping stations, water mains, hydraulic works etc.

Sewerage

Sewage disposal works, laying of sewers and surface drains.

Electricity

Building and civil engineering work for electrical undertakings, such as power stations, dams and other works on hydroelectric schemes, onshore wind farms and decommissioning of nuclear power stations.

Gas, communications, air transport

Gas works, gas mains and gas storage; post offices, sorting offices, telephone exchanges, switching centres etc.; air terminals, runways, hangars, reception halls, radar installations.

Railways

Permanent way, tunnels, bridges, cuttings, stations, engine sheds etc., signalling and other control systems and electrification of both surface and underground railways.

Harbours

All works and buildings directly connected with harbours, wharves, docks, piers, jetties, canals and waterways, sea walls, embankments and water defences.

Roads

Roads, pavements, bridges, footpaths, lighting, tunnels, flyovers, fencing etc.

Public non-residential construction¹

Factories and warehouses

Publicly owned factories, warehouses, skill centres.

Oil, steel, coal

Now restricted to remedial works for public sector residual bodies.

Schools, colleges, universities

State schools and colleges (including technical colleges and institutes of agriculture); universities, including halls of residence, research establishments etc.

Health

Hospitals including medical schools, clinics, welfare centres, adult training centres.

Offices

Local and central Government offices, including town halls, offices for all public bodies except the armed services, police headquarters.

Entertainment

Theatres, restaurants, public swimming baths, caravan sites at holiday resorts, works and buildings at sports grounds, stadiums, racecourses etc. owned by local authorities or other public bodies.

Garages

Buildings for storage, repair and maintenance of road vehicles, transport workshops, bus depots, road goods transport depots and car parks.

Shops

Municipal shopping developments for which the contract has been let by a Local Authority.

Agriculture

Buildings and work on publicly financed horticultural establishments; fen drainage and agricultural drainage, veterinary clinics.

Miscellaneous

All work not clearly covered by any other headings, such as fire stations, police stations, prisons, reformatories, remand homes, civil defence work, UK Atomic Energy Authority work, council depots, museums, libraries.

Private industrial work

Factories, warehouses, wholesale depots, all other works and buildings for the purpose of industrial production or processing, oil refineries, pipelines and terminals, concrete fixed leg oil production platforms (not rigs); private steel work; all new coal mine construction such as sinking shafts, tunnelling etc.

Private commercial work¹

Schools and universities

Schools and colleges in the private sector, financed wholly from private funds.

Health

Private hospitals, nursing homes, clinics.

Offices

Office buildings, banks.

Entertainment

Privately owned theatres, concert halls, cinemas, hotels, public houses, restaurants, cafés, holiday camps, swimming pools, works and buildings at sports grounds, stadiums and other places of sport or recreation, youth hostels.

Garages

Repair garages, petrol filling stations, bus depots, goods transport depots and any other works or buildings for the storage, repair or maintenance of road vehicles, car parks.

Shops

All buildings for retail distribution such as shops, department stores, retail markets, showrooms etc.

Agriculture

All buildings and work on farms, horticultural establishments.

Miscellaneous

All work not clearly covered by any other heading, e.g. exhibitions, caravan sites, churches, church halls.

New work**New housing**

Construction of new houses, flats, bungalows only.

All other types of work

All new construction work and all work that can be referred to as improvement, renovation or refurbishment and which adds to the value of the property.²

Repair and maintenance**Housing**

Any conversion of, or extension to, any existing dwelling and all other work such as improvement, renovation, refurbishment, planned maintenance and any other type of expenditure on repairs or maintenance.

All other sectors:

Repair and maintenance work of all types, including planned and contractual maintenance.³



¹ Where contracts for the construction or improvement of non-residential buildings used for public service provision, such as hospitals, are awarded by private sector holders of contracts awarded under the Private Finance Initiative, the work is classified as 'private commercial'.

² Contractors reporting work may not always be aware of the distinction between improvement or renovation work and repair and maintenance work in the non-residential sectors.

³ Except where stated, mixed development schemes are classified to whichever sector provides the largest share of finance.

OCCUPATIONAL GROUPS

Occupational group

Description, SOC (2010) reference.

Senior, executive, and business process managers

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

Construction project managers

Construction project managers and related professionals	2436
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Other construction process managers

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

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

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

Management consultants and business analysts	2423
Receptionists	4216
Typists and related keyboard occupations	4217
Business sales executives	3542
Bookkeepers, payroll managers and wages clerks	4122
Records clerks and assistants	4131
Stock control clerks and assistants	4133
Telephonists	7213
Communication operators	7214
Personal assistants and other secretaries	4215
Sales and retail assistants	7111
Telephone salespersons	7113
Buyers and procurement officers	3541
Human resources and industrial relations officers	3562
Credit controllers	4121
Company secretaries	4214
Sales related occupations nec*	7129
Call and contact centre occupations	7211
Customer service occupations nec*	7219
Elementary administration occupations nec*	9219
Chemical scientists	2111
Biological scientists and biochemists	2112
Physical scientists	2113
Laboratory technicians	3111
Graphic designers	3421
Environmental health professionals	2463
IT business analysts, architects and systems designers	2135
Conservation professionals	2141
Environment professionals	2142
Actuaries, economists and statisticians	2425
Business and related research professionals	2426
Finance officers	4124
Financial administrative occupations nec*	4129
Human resources administrative occupations	4138
Sales administrators	4151
Other administrative occupations nec*	4159
Office supervisors	4162
Sales supervisors	7130
Customer service managers and supervisors	7220
Office managers	4161
Construction trades supervisors	
Skilled metal, electrical and electronic trades supervisors	5250
Construction and building trades supervisors	5330
Wood trades and interior fit-out	
Carpenters and joiners	5315
Paper and wood machine operatives	8121
Furniture makers and other craft woodworkers	5442
Construction and building trades nec* (25%)	5319
Bricklayers	
Bricklayers and masons	5312

Building envelope specialists			
Construction and building trades nec* (50%)	5319		
Painters and decorators			
Painters and decorators	5323		
Construction and building trades nec* (5%)	5319		
Plasterers			
Plasterers	5321		
Roofers			
Roofers, roof tilers and slaters	5313		
Floorers			
Floorers and wall tilers	5322		
Glaziers			
Glaziers, window fabricators and fitters	5316		
Construction and building trades nec* (5%)	5319		
Specialist building operatives not elsewhere classified (nec*)			
Construction operatives nec* (100%)	8149		
Construction and building trades nec* (5%)	5319		
Industrial cleaning process occupations	9132		
Other skilled trades nec*	5449		
Scaffolders			
Scaffolders, staggers and riggers	8141		
Plant operatives			
Crane drivers	8221		
Plant and machine operatives nec*	8129		
Fork-lift truck drivers	8222		
Mobile machine drivers and operatives nec*	8229		
Plant mechanics/fitters			
Metalworking production and maintenance fitters	5223		
Precision instrument makers and repairers	5224		
Vehicle technicians, mechanics and electricians	5231		
Elementary process plant occupations nec*	9139		
Tool makers, tool fitters and markers-out	5222		
Vehicle body builders and repairers	5232		
Steel erectors/structural fabrication			
Steel erectors	5311		
Welding trades	5215		
Metal plate workers and riveters	5214		
Construction and building trades nec* (5%)	5319		
Smiths and forge workers	5211		
Metal machining setters and setter-operators	5221		
Labourers nec*			
Elementary construction occupations (100%)	9120		
Electrical trades and installation			
Electricians and electrical fitters	5241		
Electrical and electronic trades nec*	5249		
Telecommunications engineers	5242		
Plumbing and heating, ventilation, and air conditioning trades			
Plumbers and heating and ventilating engineers	5314		
Pipe fitters	5216		
Construction and building trades nec* (5%)	5319		
Air-conditioning and refrigeration engineers	5225		
Logistics			
Large goods vehicle drivers		8211	
Van drivers		8212	
Elementary storage occupations		9260	
Buyers and purchasing officers (50%)		3541	
Transport and distribution clerks and assistants		4134	
Civil engineering operatives not elsewhere classified (nec*)			
Road construction operatives		8142	
Rail construction and maintenance operatives		8143	
Quarry workers and related operatives		8123	
Non-construction operatives			
Metal making and treating process operatives		8117	
Process operatives nec*		8119	
Metalworking machine operatives		8125	
Water and sewerage plant operatives		8126	
Assemblers (vehicles and metal goods)		8132	
Routine inspectors and testers		8133	
Assemblers and routine operatives nec*		8139	
Elementary security occupations nec*		9249	
Cleaners and domestics*		9233	
Street cleaners		9232	
Gardeners and landscape gardeners		5113	
Caretakers		6232	
Security guards and related occupations		9241	
Protective service associate professionals nec*		3319	
Civil engineers			
Civil engineers		2121	
Other construction professionals and technical staff			
Mechanical engineers		2122	
Electrical engineers		2123	
Design and development engineers		2126	
Production and process engineers		2127	
Quality control and planning engineers		2461	
Engineering professionals nec*		2129	
Electrical and electronics technicians		3112	
Engineering technicians		3113	
Building and civil engineering technicians		3114	
Science, engineering and production technicians nec*		3119	
Architectural and town planning technicians*		3121	
Draughtspersons		3122	
Quality assurance technicians		3115	
Town planning officers		2432	
Electronics engineers		2124	
Chartered architectural technologists		2435	
Estimators, valuers and assessors		3531	
Planning, process and production technicians		3116	
Architects			
Architects		2431	
Surveyors			
Quantity surveyors		2433	
Chartered surveyors		2434	

*Not elsewhere classified

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