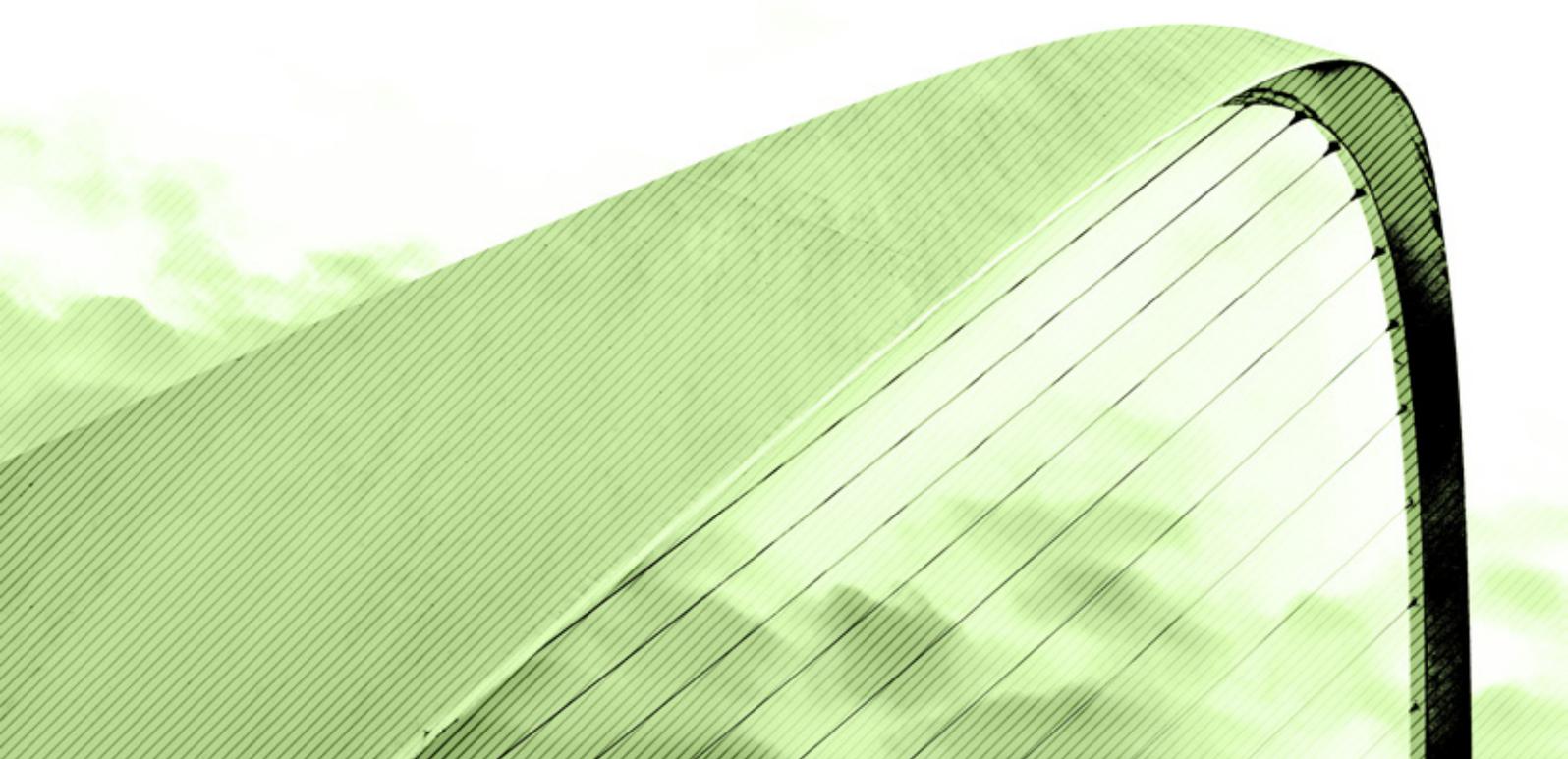




INDUSTRY INSIGHTS

Construction Skills Network
Forecasts 2017–2021



NORTH 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 – NORTH EAST

The region's total construction output is forecast to stagnate over the next five years. In contrast, overall UK output is likely to grow by an annual average of 1.7%. The North East's construction employment is anticipated to decrease by an average yearly rate of 0.6% although at 1.3% of base 2017 employment, the region's annual recruitment requirement (ARR) is similar to the UK rate of 1.4%.

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

8.2%

Employment is forecast to decline by

0.6%

a year on average

The North East has an ARR of

1,270

KEY FINDINGS

With an annual average decline of 0.1% over the five years to 2021, the North East's total construction output is predicted to experience stagnation. This is one of the weakest outlooks across the UK regions and devolved nations.

The infrastructure sector is expected to grow strongly in the short term, by over 8% a year on average in 2017 and 2018 due to the start of main works on MGT Power's £650m Tees Renewable Energy Plant. However the outlook for the sector is poor in the second half of the forecast period as at present there aren't any sizeable schemes in the pipeline post 2018.

In the five years to 2021 the commercial market is likely to experience annual average expansion of 1.5%. This sector is believed to be the most vulnerable to the impact of the referendum vote over the near term. Survey evidence continues to suggest that investment intentions have been hit following the EU referendum vote and this is likely to translate into cuts in business investment over the coming quarters. However, as the dust settles and there is more certainty around what Brexit will actually look like, confidence is likely to return. Thus, growth is predicted from 2019 onwards.

The industrial sector is projected to grow by an annual average of 1.4% over the next five years. Brexit uncertainties are also likely to adversely impact industrial output over the next couple

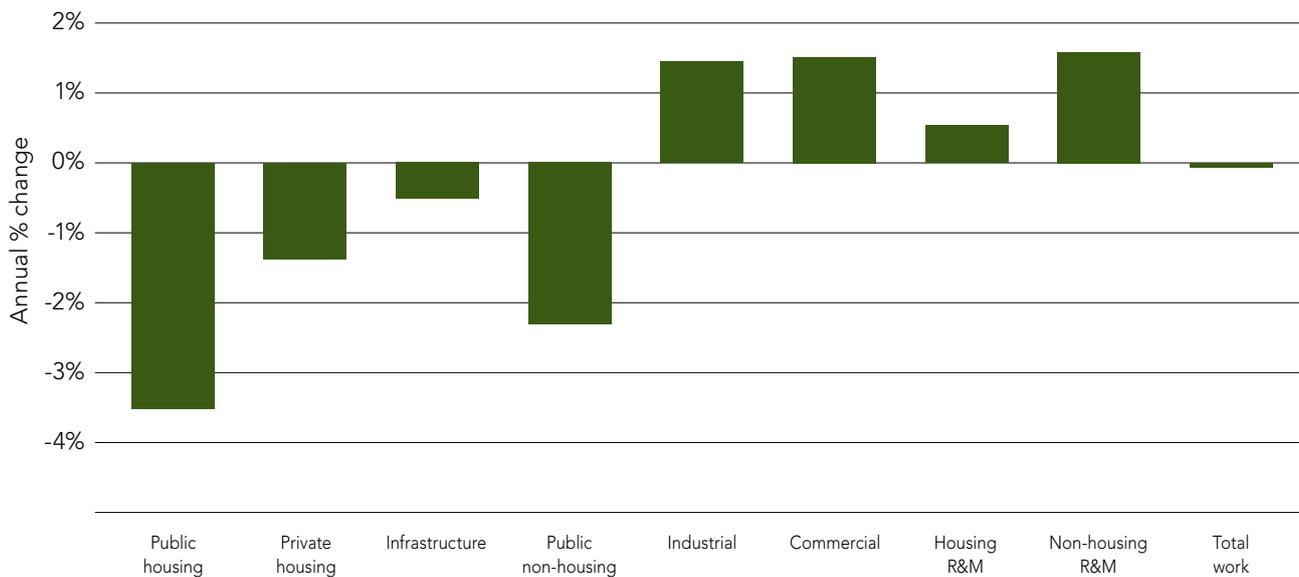
of years. However, like the commercial market, expansion is expected post 2018.

An average yearly fall of 1.3% is projected for the private housing sector. During this heightened period of uncertainty consumer confidence is likely to suffer. This together with a slowdown in earnings and a weakening labour market does not bode well for the sector. By 2021 private housing output is predicted to be around 94% of its 2016 peak.

In 2015 the North East accounted for around 4% of UK construction employment. Over the next five years construction employment in the region is likely to fall by 0.6% per year on average in the region, the second weakest rate compared with other regions and devolved nations and below the UK's average yearly growth rate of 0.6%. However, not all occupational categories are predicted to see declines, with the managerial/supervisory and professional ones faring better than the trades.

At 1,270 extra recruits required per year over the forecast period, the region's ARR is 1.3% of base 2017 employment, similar to the UK rate of 1.4%. Significant net outflows of the construction workforce in the region keeps the ARR ratio close to the UK one despite the difference in employment growth rates. There are five occupational categories that have an ARR between 2.6% and 5%.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2021 – NORTH 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.

▀▀ The infrastructure sector will grow strongly in the short term, by over 8% a year on average. ▀▀

THE OUTLOOK FOR CONSTRUCTION IN THE NORTH EAST

CONSTRUCTION OUTPUT IN THE NORTH EAST – OVERVIEW

In 2015 total construction output increased for the third consecutive year, by 2% to £4.68bn, around 83% of its 2008 peak. While the new work sector experienced growth of 2%, expansion in the repair and maintenance (R&M) one was stronger at 5%. Of the new work sectors, private housing output increased by 47% to £1.07bn while the infrastructure one also saw double digit growth of 26% to £998m.

INDUSTRY STRUCTURE

The Construction Industry structure 2015 – UK vs North East graphic, illustrates the sector breakdown of construction in the North 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 three quarters of total construction output, much higher than the national share of 64%.

The structure of the North East's construction industry has some big differences compared to the UK. The region's infrastructure sector is much more important than in the UK (21% vs. 15%) whilst more emphasis is also placed on the private housing market (23% vs. 18%). In contrast, the shares for the commercial (14% vs. 18%), housing R&M (11% vs. 18%) and non-housing R&M (13% vs. 17%) sectors were smaller compared with the UK. At 4%, the North

East's share of the public housing sector was identical to the nation as a whole while the shares for the public non-housing and industrial ones were similar to the national average.

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 North East rose for the sixth consecutive year, by 0.7% to £46.31bn in 2012 prices. However, this lagged UK expansion, of 2.3%, quite considerably.

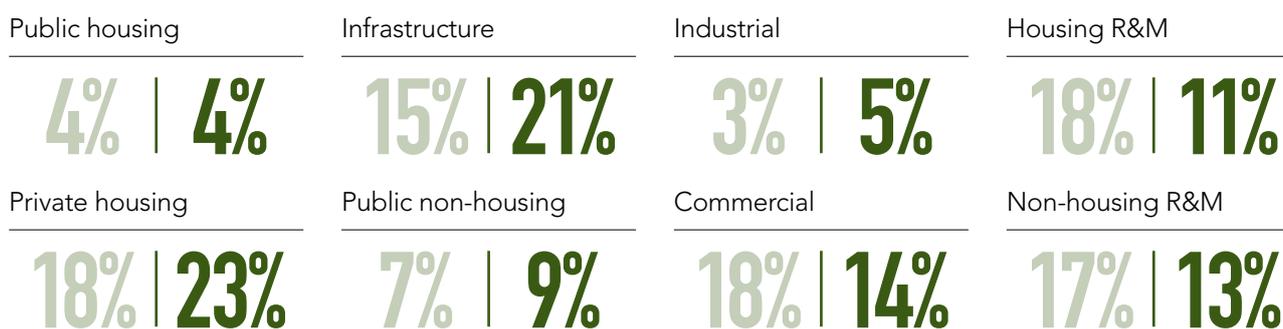
ECONOMIC STRUCTURE

In terms of the region's industrial structure public services accounted for the biggest share of GVA at 25.7%, whilst professional and other private services came in second at 22.3%. The manufacturing (14.3%) and wholesale and retail (10.8%) sectors were ranked third and fourth respectively, while at 4.8%, information and communication was the fifth largest market.

The North East has a higher than average exposure to the manufacturing and public services sectors whilst others such as professional and other private services and finance and insurance are underrepresented compared to the UK as a whole.



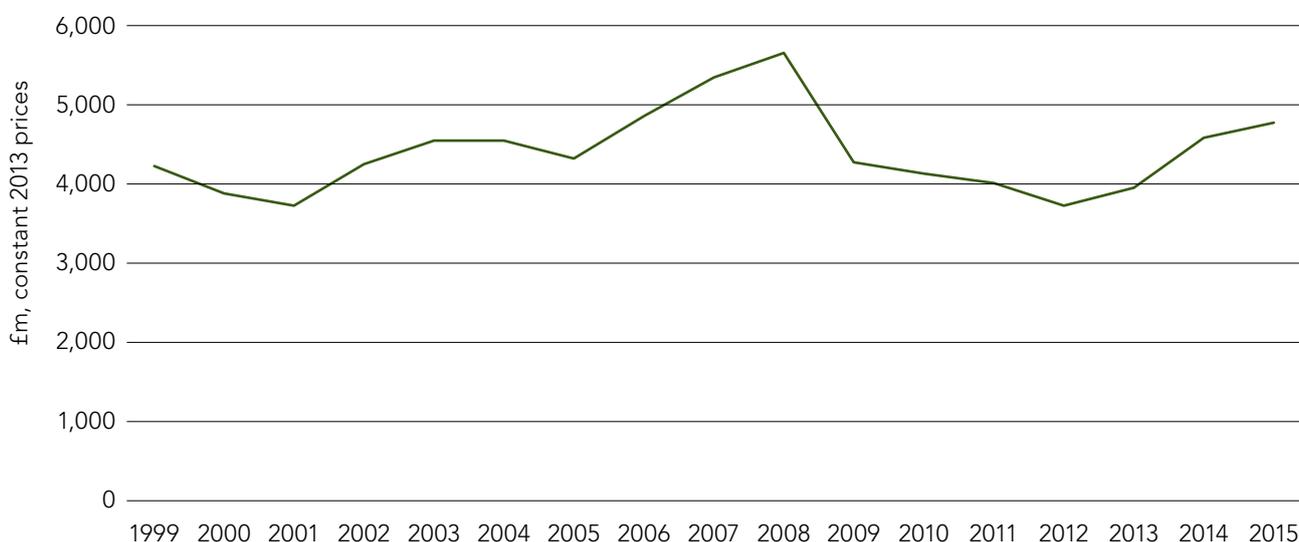
CONSTRUCTION INDUSTRY STRUCTURE 2015 – UK VS NORTH EAST



Source: ONS, Experian.

■ UK ■ North East

CONSTRUCTION OUTPUT 1999-2015 – NORTH EAST



Source: ONS.
Ref: CSN Explained.

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

	Actual	Forecast (Annual % change, real terms)					
	2015	2016	2017	2018	2019	2020	2021
Public Services	11.9	1.1	0.3	0.7	1.5	2.2	2.3
Professional & Other Private Services	10.3	2.7	1.3	1.2	1.7	1.9	1.9
Manufacturing	6.6	-0.1	0.1	1.5	1.3	1.1	1.1
Wholesale & Retail	5.0	4.7	1.6	1.5	2.0	2.1	2.2
Information & Communication	2.2	3.9	1.6	1.8	2.0	2.1	2.0
Total Gross Value Added (GVA)	46.3	1.8	0.8	1.2	1.6	1.8	1.9

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 1.5%, lower than the national rate of 1.8%.

Of the top five sectors, the information and communication and wholesale and retail sectors are expected to see the biggest annual average increases of 1.9%, whilst the largest sector, public services, is projected to experience weaker average yearly growth of 1.4%.

Real household disposable income is expected to rise by an annual average of 1.1% over the forecast period, lower than the UK rate of 1.5%.

In 2015 the region's working age population was around 1.64m which accounted for just 4% of the UK total. Over the forecast period, the North East's working age population as a share of the total population is expected to remain around 62%.

The region's unemployment rate stood at 8.1% in 2015. Over the near term the unemployment rate is likely to rise, partly due to Brexit uncertainties. However it should begin to fall post 2018 and by 2021 the North East's unemployment rate is predicted to be around 7.5%.

Overall, expansion across the UK is projected 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 construction orders declined, by 4% to £2.52bn (current prices), around 83% of their 2007 peak. Across the new work sectors there was a mixed picture. Orders in the infrastructure one registered the strongest increase of 20% to £719m – a new high, while the private housing market experienced a rise of 16% to £810m. In contrast, the greatest decrease of 48% to £190m was recorded in the industrial sector whilst heavy declines of 38% and 20% were posted in the public housing (£44m) and public non-housing (£314m) ones respectively. The commercial sector saw the smallest fall, of 13% to £440m, taking it to just a third of its 2005 peak.

NEW CONSTRUCTION ORDERS – CURRENT SITUATION

In the first nine months of last year new orders dropped by 17% to £1.57bn on an annual basis. Industrial orders experienced the greatest jump of 72% to £287m whilst the commercial sector saw an increase of 35% to £331m. In contrast, the public housing one posted the biggest decline of 64% to £13m whereas a fall of 56% to £130m was registered for the public non-housing sector. Double digit decreases of 39% and 18% were also recorded for private housing (£395m) and infrastructure (£410m) orders respectively.

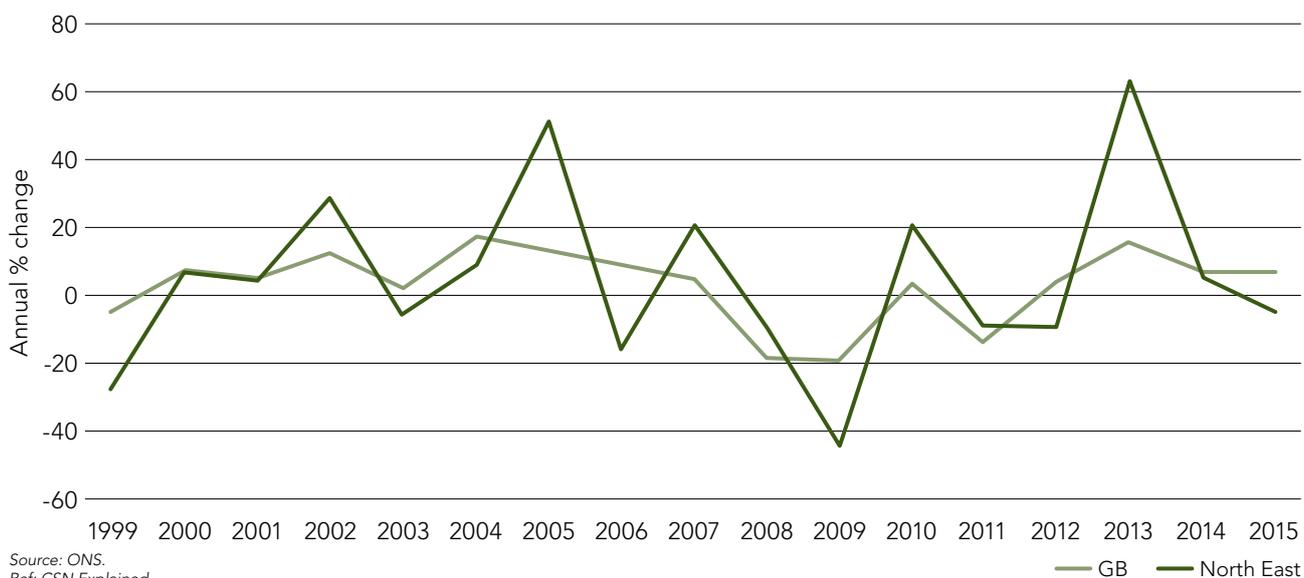


ECONOMIC INDICATORS – NORTH EAST (£ BILLION, CURRENT PRICES – UNLESS OTHERWISE STATED)

	Actual	Forecast (Annual % change, real terms)					
	2015	2016	2017	2018	2019	2020	2021
Real household disposable income (2012 prices)	40.2	2.2	-0.5	1.0	1.2	1.7	2.1
Household spending (2012 prices)	43.0	1.9	1.3	0.4	1.3	1.7	1.8
Working age population (000s and as % of all)	1,638	62.5%	62.4%	62.3%	62.3%	62.7%	62.6%
House prices (£)	121,583	1.6	0.5	0.5	1.5	1.8	2.2
LFS unemployment (millions)	0.1	-5.5	2.7	0.9	-0.7	-1.0	-1.7

Source: ONS, DCLG, Experian.

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



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

	Actual	Annual % change				
	2015	2011	2012	2013	2014	2015
Public housing	44	-90.1	60.0	825.0	-68.0	-38.0
Private housing	810	-66.0	169.8	-13.5	55.4	16.4
Infrastructure	719	209.3	-75.3	384.3	-11.9	20.4
Public non-housing	314	-16.8	-30.6	42.4	19.8	-20.3
Industrial	190	38.1	20.7	32.6	57.8	-48.1
Commercial	440	0.5	3.8	38.0	-17.0	-12.7
Total new work	2,517	-8.2	-8.8	64.7	4.3	-4.1

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 £3.84bn (current prices) compared with the same period a year earlier. Of the new work sectors, the private housing market saw the largest growth of 16% to £969m while smaller expansion of 8% and 5% was posted in the commercial (£601m) and industrial (£200m) sectors respectively. The public housing sector recorded the greatest decline of 47% to £79m while the infrastructure one also registered a double digit fall, of 15% to £690m. The public non-housing sector dropped by 9% to £296m.

In 2016 total construction output in the region is estimated to have increased by 2% in real terms to £4.75bn in 2013 prices. Output is expected to rise by an annual average of 1.4% over the next two years. Growth is forecast to be stronger in the new work sector compared with the R&M one (1.6% vs. 0.7%).

The best performing sector is projected to be the infrastructure one with annual average expansion of 8.2%. After seven years of planning MGT Power has finally confirmed funding for its £650m Tees Renewable Energy Plant. The facility, at Teesport between Redcar and Middlesbrough, will be one of the world's largest biomass power stations, generating around 299MW of electricity. The plant is likely to be fuelled by wood chips and pellets from abroad and will supply enough electricity for around 600,000 homes. Main construction work is expected to start in early 2017. In August work started on a new £75m triple decker roundabout which involves lowering part of the A19 underneath the A1058 Coast Road in Tyneside. The existing embankment will also be replaced as will the adjacent bridges across the roundabout. The project, which is on the main route to and from the Tyne Tunnel, will alleviate queuing at the roundabout.

Commercial construction output is likely to stagnate over the next new couple of years as this sector is believed to be the most vulnerable to the impact of the referendum vote. Investors are likely to be more cautious when it comes to funding new sizeable developments during a prolonged period of uncertainty. There is however some small-scale work in the pipeline. Gateshead Jewish Girls Primary School has been given the green light for a three storey extension. There will be a new two storey building above ground and one below ground which will include 20 new classrooms. In October the Newcastle Eagles basketball team received planning permission for a new basketball arena. The 2,800 seat stadium will be located on the site of the former Riverside Dene tower blocks, allowing the team to have their own home. The club's community operation and outreach programmes work will also be carried out from the new facility which in addition will be used for handball, netball, volleyball and disabled basketball. The project also includes plans for a new car park.

Annual average declines of 2.1% are predicted for the private housing market. Last year output reached a record high of £1.17bn, but a slowdown in real earnings growth and worsening labour market conditions are likely to reduce buyer demand over the short term. Demographic pressures are also relatively weak in the North East thus there is less requirement to increase housing stock.

The public housing sector is projected to see the greatest annual average falls of 4.4% over the short term. The extension of Right to Buy to housing associations and the annual rent reductions imposed on them by government over the next five years are inevitably going to impact on balance sheets and make them less attractive to investors. Given the difficult operating environment that the sector finds itself in it's no surprise that output is expected to shrink. The fall in public housing output over the forecast period is common across most English regions whilst the pattern is likely to be different for devolved nations as they have their own set of housing programmes. However, 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.

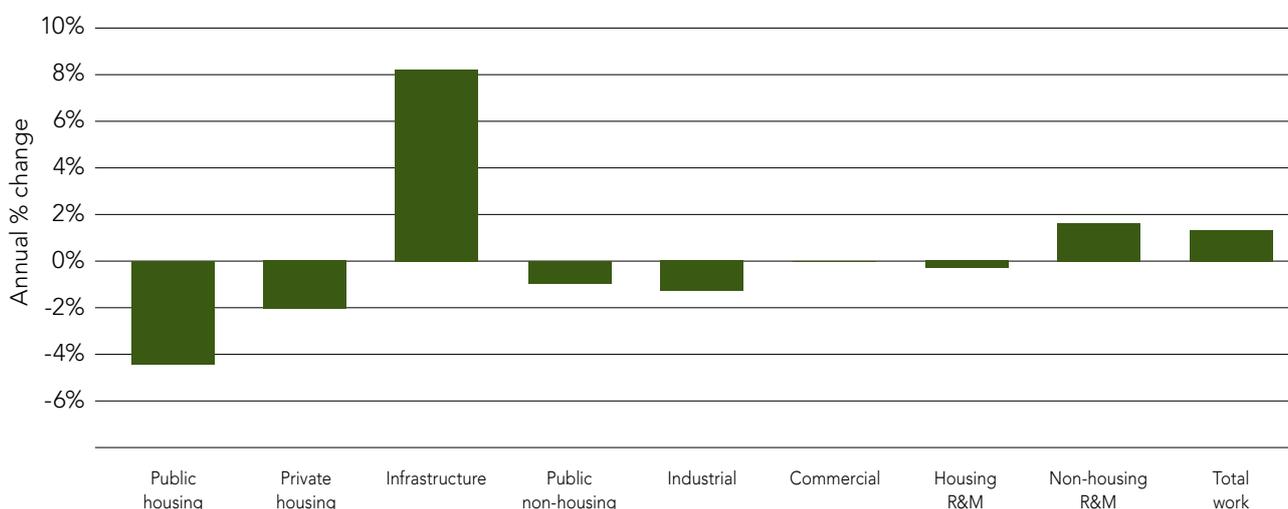


CONSTRUCTION OUTPUT – NORTH EAST (£ MILLION, 2013 PRICES)

	Actual	Forecast annual % change			Annual average
	2015	2016	2017	2018	2017-2018
Public housing	175	-51%	-8%	-1%	-4.4%
Private housing	1,072	9%	-3%	-1%	-2.1%
Infrastructure	998	7%	14%	3%	8.2%
Public non-housing	398	-4%	0%	-1%	-0.9%
Industrial	211	-3%	-2%	-1%	-1.2%
Commercial	667	1%	0%	0%	0.0%
New work	3,522	2%	3%	0%	1.6%
Housing R&M	527	0%	-1%	0%	-0.2%
Non-housing R&M	627	2%	0%	3%	1.5%
Total R&M	1,155	1%	0%	2%	0.7%
Total work	4,677	2%	2%	1%	1.4%

Source: Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2018 – NORTH EAST



Source: Experian.
Ref: CSN Explained.

■ ■ The region's annual recruitment requirement (ARR) is similar to the UK rate of 1.4%. ■ ■

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

The North East's construction industry is projected to stagnate in the five years to 2021. In contrast, the UK as a whole is projected to experience annual average expansion of 1.7%. While the region's new work sector is likely to see annual average declines of 0.5% between 2017 and 2021, the R&M one is expected to grow, by an average of 1.1% per annum.

Over the next five years the commercial market is predicted to be the best performing sector with average yearly growth of 1.5%. Whilst stagnation is projected for the short term, expansion should kick in from 2019 onwards as uncertainty surrounding Brexit subsides. Growth in the region's professional and other private services sector is a good indicator of demand for office premises whilst expansion of the wholesale and retail sector is indicative of demand for retail facilities. The annual average increases in both sectors are now lower than they were a year ago mainly due to the EU referendum result. However, commercial construction output in the region is currently at the sort of low levels last seen in the early 1990s recession, thus some expansion is felt likely as long as the UK economy continues to grow. By the end of the forecast period, commercial output is expected to be just over half its 2008 peak.

The UK's future exit from the European Union is also likely to have a notable impact on industrial construction activity. Much of the weakness is predicated on a significant reduction in anticipated investment over the short term, coupled with an even softer global economic backdrop. While a weaker pound should boost demand for exports the effect isn't expected to be significant enough to offset the anticipated downturn in domestic demand and investment. However, growth in industrial construction output should pick up in the latter half of the forecast period as there becomes more clarity on what Brexit will actually look like. Overall, average yearly expansion of 1.4% is anticipated for the sector.

The infrastructure sector is expected to see annual average declines of 0.4% over the next five years. The largest project due to take place is MGT's £650m power station

however, as there are a lack of other sizeable schemes coming into the pipeline, the prospects for the second half of the forecast period are poor. However, there should be work that is being carried out on small and medium sized projects. By 2021, output is predicted to be around 84% of its 2018 peak.

Annual average falls of 1.3% have been projected for the private housing market. Given a lack of sizeable projects in the pipeline it is difficult to predict a better outlook for the sector. However, Adderstone Group recently revealed plans for three housing schemes in Newcastle which require investment of over £100m. The housing sites are to be located in Gosforth, Quayside and Ouseburn. Should these developments start over the next five years, the prospects for private housing output could be better.

Whilst there is work going on in the North East's public non-housing sector, it is of small value and therefore this alone is not enough to add any meaningful growth to the sector. As a result, annual average falls of 2.2% have been projected for the sector over the next five years. The decision to leave the EU means that there are no guarantees on the North East's £800m of EU funding. It is thought some of this would have been assigned to projects in the construction industry. At present no final decision on the matter has been made. Gateshead Council is under further financial pressure as it has now been obliged to find £92m of savings by 2022. By 2018, it is estimated that the council's funding from government will have been cut by 46%, equivalent to £800 per household. Under this difficult operating environment the council will inevitably struggle to invest in construction schemes.

BEYOND 2021

According to the latest National Infrastructure Pipeline, around £292m worth of work will be undertaken in 2021/22 and beyond, the majority in the electricity sub-sector. Feasibility studies have been completed on further improvements to the A1 in Newcastle and to the north of the city and it is believed that this work will form part of Highways England's next road investment strategy for the period to 2025.

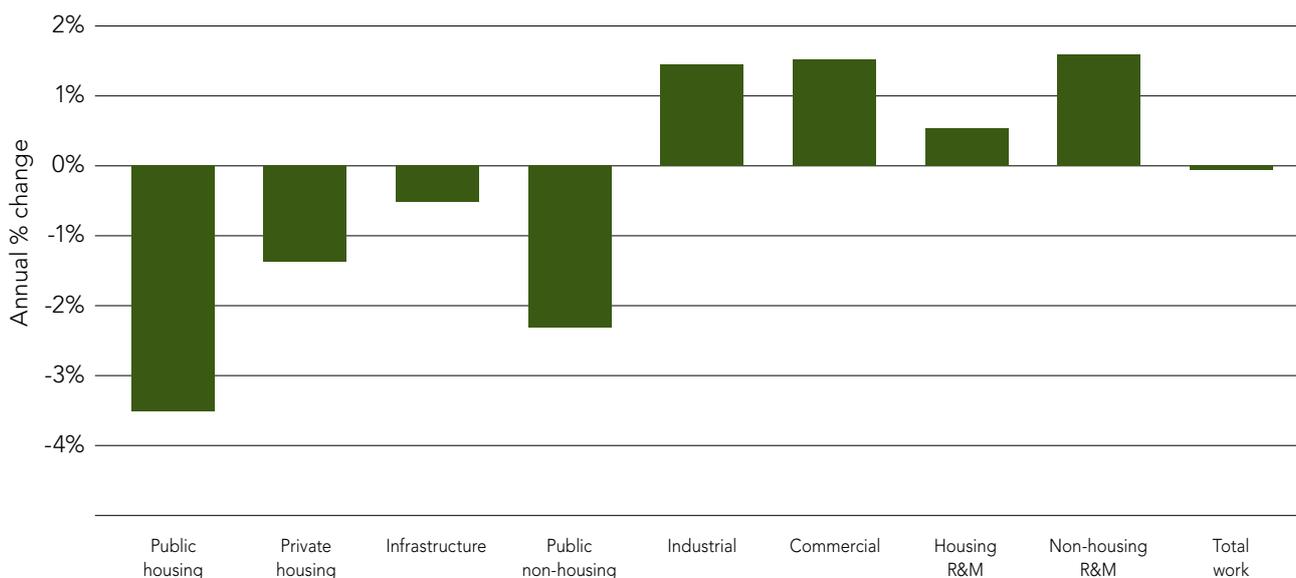


CONSTRUCTION OUTPUT – NORTH EAST (£ MILLION, 2013 PRICES)

	Estimate	Forecast annual % change					Annual average
	2016	2017	2018	2019	2020	2021	2017-2021
Public housing	86	-8%	-1%	2%	-8%	-3%	-3.6%
Private housing	1,171	-3%	-1%	1%	1%	-4%	-1.3%
Infrastructure	1,066	14%	3%	-4%	-13%	1%	-0.4%
Public non-housing	383	0%	-1%	-1%	-10%	2%	-2.2%
Industrial	206	-2%	-1%	4%	3%	3%	1.4%
Commercial	672	0%	0%	3%	3%	1%	1.5%
New work	3,583	3%	0%	0%	-4%	-1%	-0.5%
Housing R&M	529	-1%	0%	2%	2%	-1%	0.5%
Non-housing R&M	640	0%	3%	4%	1%	0%	1.6%
R&M	1,169	0%	2%	3%	1%	0%	1.1%
Total work	4,753	2%	1%	1%	-3%	0%	-0.1%

Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2021 – NORTH EAST



Source: CSN, Experian.
Ref: CSN Explained.

CONSTRUCTION EMPLOYMENT FORECASTS FOR THE NORTH EAST

TOTAL CONSTRUCTION EMPLOYMENT FORECASTS BY OCCUPATION

The table presents actual construction employment (SICs 41-43, 71.1 and 74.9) in the North 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 region is projected to decline by an annual average of 0.6% over the next five years, a percentage point lower than the UK's forecast average yearly growth rate of 0.6%. Employment in the region is expected to fall by around 2,840 to 91,130 over the five years to 2021, around 82% of its 2008 peak.

Annual average declines are predicted for the majority of the 28 occupational categories, with plant mechanics/fitters and plumbing and HVAC trades projected to see the strongest annual average contraction of 3.5%.

Construction trade supervisors are expected to see the greatest average yearly growth of 3.4% and by the end of the forecast period employment in this occupation is likely to be around 88% of its 2009 peak.

In 2021, wood trades and interior fit out, labourers nec. and electrical trades and installation are all anticipated to be the largest trade occupations, each accounting for around 7% of the total workforce.

In general, the managerial/supervisory and professional occupations are expected to fare better than the trades, a pattern which is in line with the overall UK outlook.



TOTAL EMPLOYMENT BY OCCUPATION – NORTH EAST

	Actual	Estimate	Forecast	
	2015	2016	2017	2021
Senior, executive, and business process managers	4,540	4,630	4,540	4,350
Construction project managers	1,490	1,440	1,430	1,570
Other construction process managers	6,100	6,020	6,040	6,720
Non-construction professional, technical, IT, and other office-based staff	11,060	10,930	10,670	10,130
Construction trades supervisors	3,360	3,430	3,400	4,050
Wood trades and interior fit-out	6,950	7,010	6,910	5,990
Bricklayers	3,050	3,040	3,110	2,730
Building envelope specialists	2,240	2,280	2,360	2,140
Painters and decorators	2,250	2,300	2,330	2,130
Plasterers	2,620	2,450	2,460	2,180
Roofers	2,230	2,230	2,300	2,060
Floorers	2,300	2,300	2,520	2,310
Glaziers	720	720	720	650
Specialist building operatives nec*	3,790	3,480	3,530	2,990
Scaffolders	1,280	1,410	1,410	1,550
Plant operatives	2,530	2,520	2,520	2,670
Plant mechanics/fitters	2,440	2,470	2,470	2,060
Steel erectors/structural fabrication	1,490	1,540	1,600	1,490
Labourers nec*	6,970	6,530	6,430	6,400
Electrical trades and installation	7,420	7,380	7,510	6,510
Plumbing and HVAC Trades	5,930	6,210	6,270	5,190
Logistics	490	490	480	470
Civil engineering operatives nec*	1,180	1,210	1,220	1,380
Non-construction operatives	560	560	550	570
Civil engineers	1,510	1,510	1,540	1,740
Other construction professionals and technical staff	8,460	8,160	8,370	9,260
Architects	340	370	370	330
Surveyors	1,380	1,330	1,360	1,510
Total (SIC 41-43)	82,990	82,580	82,780	78,290
Total (SIC 41-43, 71.1, 74.9)	94,680	93,950	94,420	91,130

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 North East has a green light indicating that there is a low requirement for extra recruits during the forecast period. The region's ARR, at 1,270, represents 1.3% of base 2017 employment, similar to the UK rate of 1.4%.

The traffic lights suggest that the occupations under some pressure are likely to be construction trade supervisors, roofers, specialist building operatives nec., scaffolders and steel erectors/structural fabrication 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 ongoing 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.

Please note that all of the ARRs 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 – NORTH EAST

	2017-2021
Senior, executive, and business process managers	110
Construction project managers	<50
Other construction process managers	–
Non-construction professional, technical, IT, and other office-based staff	200
Construction trades supervisors	150
Wood trades and interior fit-out	70
Bricklayers	–
Building envelope specialists	–
Painters and decorators	50
Plasterers	–
Roofers	70
Floorers	60
Glaziers	–
Specialist building operatives nec*	110
Scaffolders	50
Plant operatives	50
Plant mechanics/fitters	–
Steel erectors/structural fabrication	50
Labourers nec*	90
Electrical trades and installation	<50
Plumbing and HVAC Trades	–
Logistics	–
Civil engineering operatives nec*	<50
Civil engineers	<50
Other construction professionals and technical staff	110
Architects	–
Surveyors	–
Total (SIC 41-43)	1,130
Total (SIC 41-43, 71.1, 74.9)	1,270

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 lack 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

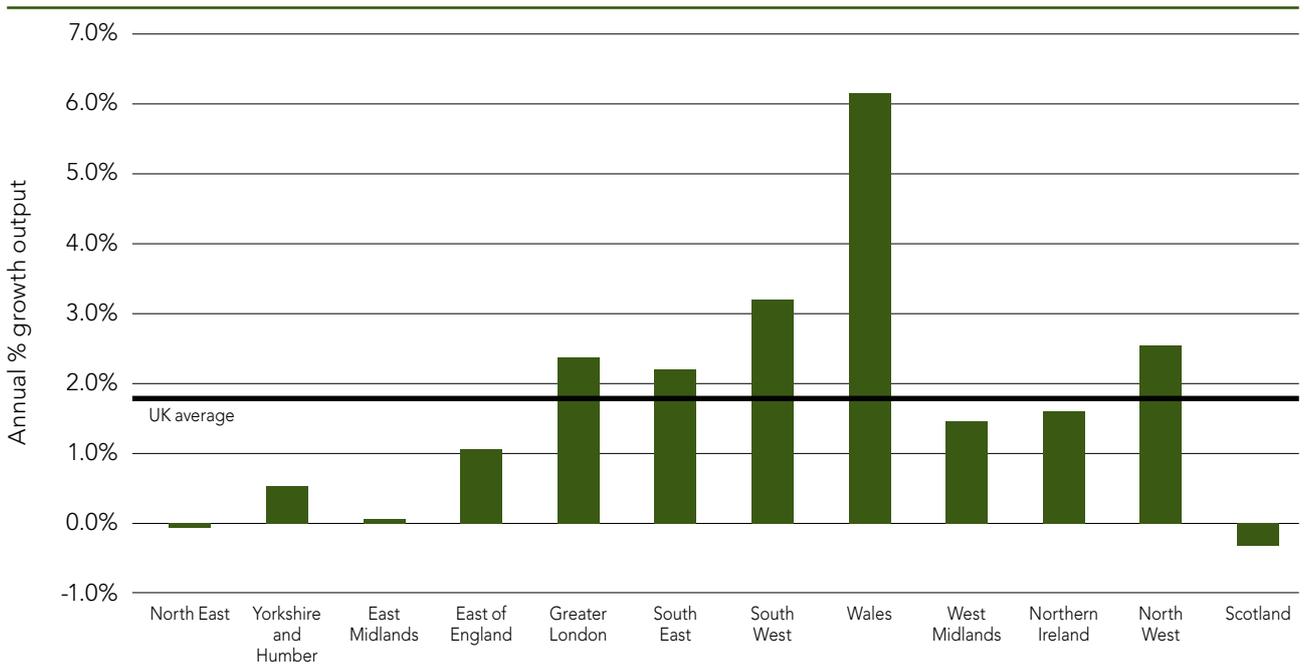
high of 2.7% in Wales to a low of -0.8% in Scotland, against a UK rate of 0.6%.

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.

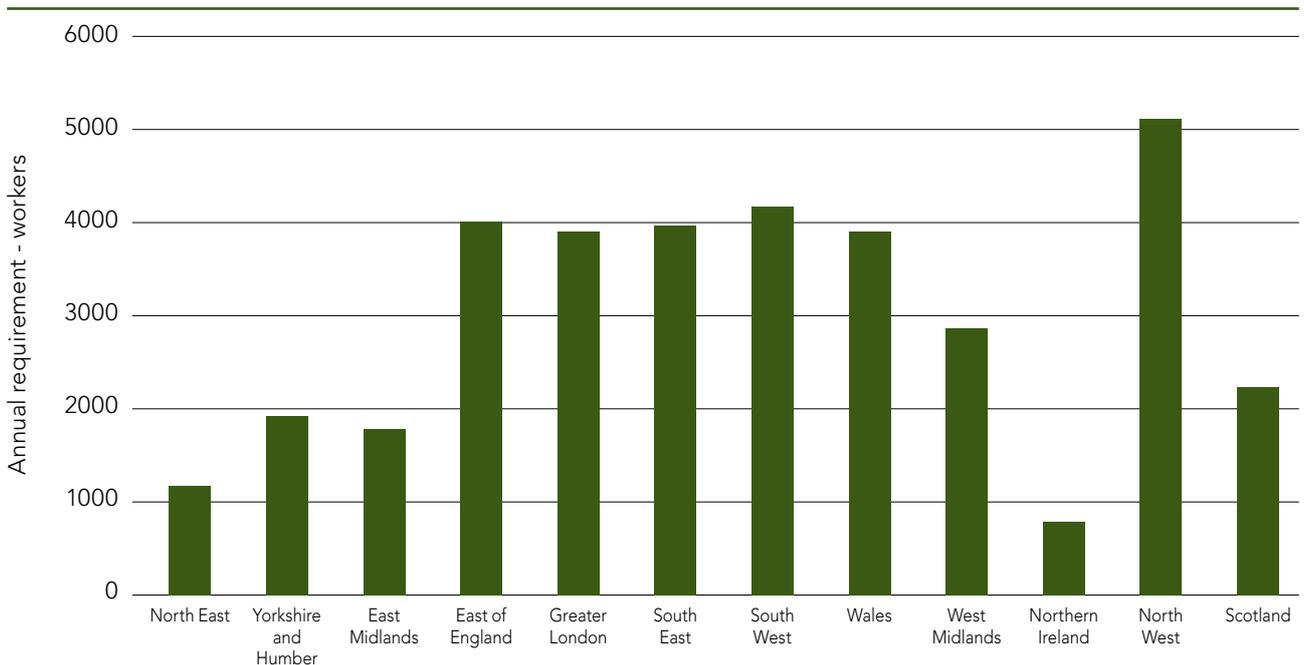
The pattern of annual recruitment requirements can look significantly different to the profile of output and employment, as some regions and devolved nations have historically strong net inflows and some suffer from large net outflows. Thus, Greater London's ARR represents just 0.9% of base 2017 employment, 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.

Construction trade supervisors are expected to see the greatest average yearly growth.

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:

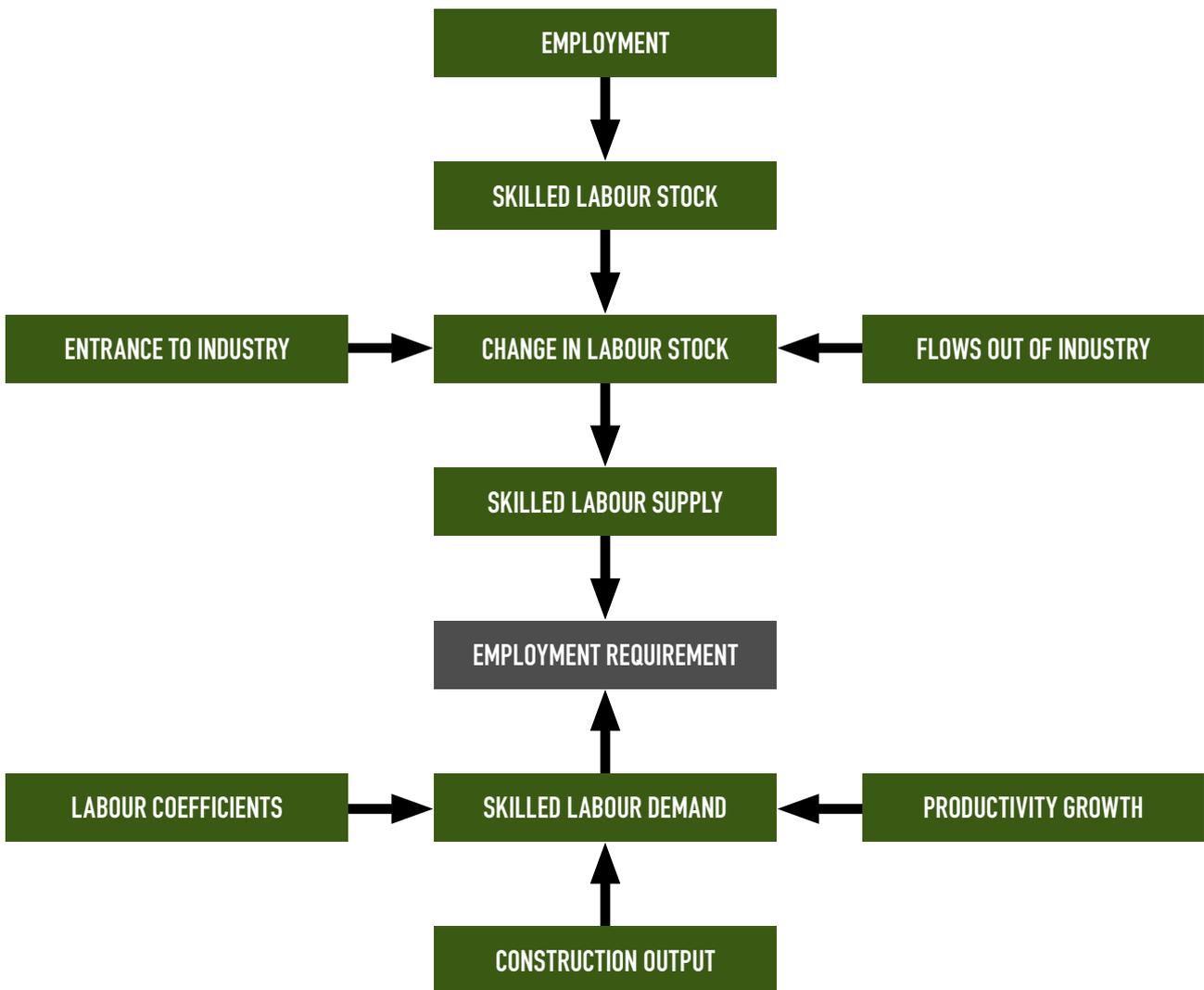
- Transfers to other industries
- International/domestic out migration
- Permanent retirements (including permanent sickness)
- Outflow to temporary sickness and home duties.

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

**For more information about the
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In association with

