



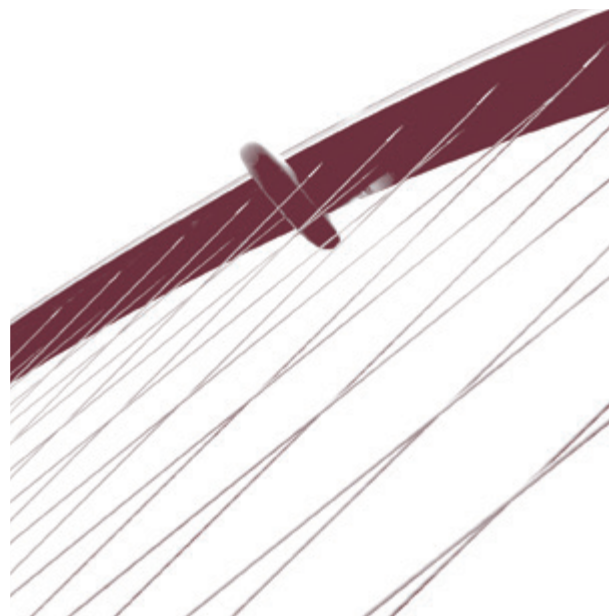
CITB RESEARCH

INDUSTRY INSIGHTS

YORKSHIRE AND HUMBER



Construction
Skills Network
Labour Market
Intelligence
2018-2022



About CITB

CITB is the Industrial Training Board (ITB) for the construction industry in Great Britain (Scotland, England and Wales). CITB uses its research and labour market intelligence to understand the sector's skills needs, and works with industry and government to make sure construction has the right skills, now and for the future.

CITB is modernising its funding approach to invest in areas that will deliver the best returns for industry, and enable the sector to attract and train talented people to build a better Britain.

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.

CITB is tasked by Government to ensure the UK's construction industry has the skilled workforce it requires. Working with Government, training providers and employers, it is responsible for ensuring that the industry has enough qualified new entrants and that the existing workforce is fully skilled and qualified, as well as for improving the performance of the industry and the companies within it. These materials, together with all of the intellectual property rights contained within them, belong to the Construction Industry Training Board (CITB). Copyright 2018 ("CITB") and should not be copied, reproduced nor passed to a third party without CITB's prior written agreement. These materials are created using data and information provided to CITB and/or EXPERIAN Limited ("Experian") by third parties of which EXPERIAN or CITB are not able to control or verify the accuracy. Accordingly neither EXPERIAN nor CITB give any warranty about the accuracy or fitness for any particular purpose of these materials. Furthermore, these materials do not constitute advice and should not be used as the sole basis for any business decision and as such neither EXPERIAN nor CITB shall be liable for any decisions taken on the basis of the same. You acknowledge that materials which use empirical data and/or statistical data and/or data modelling and/or forecasting techniques to provide indicative and/or predictive data cannot be taken as a guarantee of any particular result or outcome.

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SUMMARY – YORKSHIRE AND HUMBER

The region's total construction output is forecast to rise by annual average of 0.8% over the next five years, below the UK average of 1.3%. New work is expected to perform better than repair & maintenance (R&M) (1.2% vs. 0.2%). Construction employment growth in Yorkshire and Humber is expected to be marginal at 0.2% a year on average, while annual average expansion of 0.5% is likely for the UK. The region's annual average recruitment requirement (ARR) is estimated at 2,010, which represents 1% of base 2018 employment, a little lower than the UK rate of 1.2%.

KEY FINDINGS

Growth is expected to focus on the industrial sector in the long term, by

3.9%

Employment is forecast to grow by

0.2%

a year on average

Yorkshire and Humber has an ARR of

2,010

Yorkshire and Humber is expected to see annual average growth of 0.8% in total construction output over the next five years. By 2022, output is projected to be just short of its 2004 peak.

Over both the short and long term the industrial sector is likely to see the biggest average increases per annum. Decent expansion is predicted for 2018 due to several small and medium sized projects in the pipeline. A slowdown in activity is predicted thereafter before it begins to rise again towards the end of the forecast period on the back of a better economic environment.

Public non-housing output is predicted to rise by an annual average of 1.5% over the next five years. It has been a while since the sector has seen any large-scale developments take place, and until it does, expansion is likely to be minimal. Currently the largest scheme in the pipeline is Leeds University's £100m investment at Woodhouse Lane, due to start this year. However, large university projects tend to take place over a long time frame therefore any effect on growth is diluted.

The private housing sector is projected to see small average yearly growth of 0.6% in the five years to 2022. There are projects expected to take place over the forecast period however they are of a small nature. Nonetheless, by 2022 private housing output is anticipated to reach a new high of £2.34bn (2015 prices).

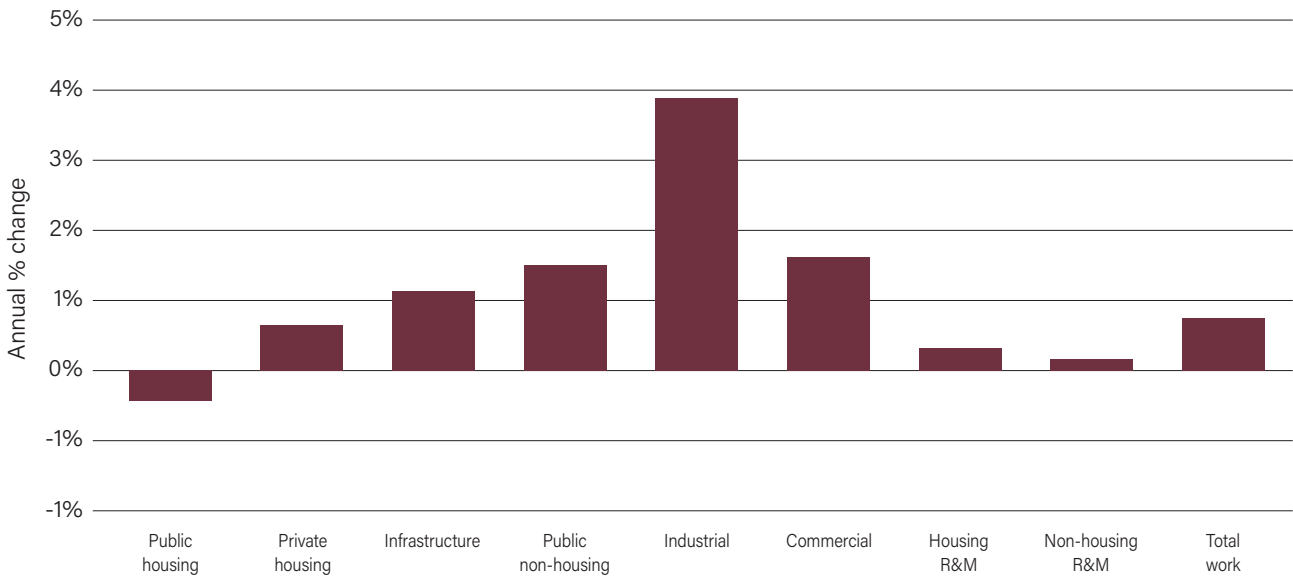
An annual average increase of 1.5% is predicted for the commercial sector between 2018 and 2022. Modest expansion is likely for 2018, but as

uncertain economic times created as a result of Brexit impacts investor confidence, growth is expected to stall during the middle of the forecast period. As the terms of Brexit become clearer, confidence should increase in the economy. This in turn is likely to lead to growth in commercial output from 2021.

In 2016 Yorkshire and Humber accounted for around 7.8% of UK construction employment. Between 2018 and 2022 the region's construction employment is likely to see only marginal growth, reaching a little under 200,000 by the latter year. As is the case across the UK, managerial/administrative and professional occupations are projected to fare better generally than the trades/manual ones.

With 2,010 extra recruits required per year over the five years to 2022, the region's ARR is 1% of base 2018 employment, a little lower than the UK rate of 1.2%. Despite the regions low ARR, there is a high requirement for plant operatives and logistics personnel, both of which have ARR ratios above 5%. In addition to this, surveyors are likely to be under some pressure with an ARR ratio between 2.6% and 5%.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 - YORKSHIRE AND HUMBER



Source: CSN, Experian.
Ref: CSN Explained.

REGIONAL COMPARISON 2018-2022

	Annual average % change in output	Change in total employment	Total ARR
North East	-0.8%	-7,830	840
Yorkshire and Humber	0.8%	2,100	2,010
East Midlands	0.5%	-2,220	1,720
East of England	1.3%	2,530	4,540
Greater London	1.5%	4,020	2,010
South East	1.1%	16,550	2,250
South West	2.0%	11,520	4,480
Wales	4.6%	12,110	2,450
West Midlands	1.8%	9,660	3,390
Northern Ireland	0.5%	-1,240	310
North West	2.0%	26,720	5,470
Scotland	0.1%	-8,280	2,130
UK	1.3%	65,640	31,600

Source: CSN, Experian.
Ref: CSN Explained.

Construction in Yorkshire and Humber needs to attract an extra 2,010 new workers per year to meet future work demands.

THE OUTLOOK FOR CONSTRUCTION IN YORKSHIRE AND HUMBER

CONSTRUCTION OUTPUT IN YORKSHIRE AND HUMBER – OVERVIEW

In 2016, total construction output in the region rose by 10% to £10.43bn in 2015 prices. Expansion was largely driven by the R&M and private housing sectors. Non-housing R&M jumped by 57% to £2.28bn while housing R&M grew by 22% to £2.1bn and Private housing output increased by 10% to £2.15bn.

INDUSTRY STRUCTURE

The diagram, Construction Industry structure 2016 – UK vs. Yorkshire and Humber, illustrates the sector breakdown of construction in Yorkshire and Humber, compared to that in the UK. Effectively, the percentages for each sector illustrate what proportion of total output each sector accounts for.

In 2016, new work accounted for 58% of total output in the region compared with 64% nationwide, highlighting some of the structural differences between Yorkshire and Humber's construction industry and the UK's.

In 2016, the non-housing R&M sector was proportionally larger in the region than the UK (22% vs. 17%). In contrast, Yorkshire and Humber's infrastructure (9% vs. 12%), and commercial (15% vs. 19%) sectors were less important. At 3%, the share for the public housing one was identical to the national average while the shares for the remaining sectors were similar to that of the UK as a whole.

ECONOMIC OVERVIEW

The expected performance of a regional or national economy over the forecast period (2018–2022) provides an indication of the construction sectors in which demand is likely to be strongest.

In 2016, Yorkshire and Humber's Gross Value Added (GVA) rose for the seventh consecutive year, by 1.9% to £109.9bn in 2013 prices, a slightly better performance than the UK as a whole (1.8%).

The wholesale and retail and accommodation, food services and recreation sectors posted very good growth, of 5.4% and 4.9% respectively. The large professional and other private services sector managed expansion of 2.6%, and even public services GVA rose, albeit by a more modest 0.6%. The only disappointments were a flat profile in the manufacturing sector and a marginal fall in the transport and storage one.

ECONOMIC STRUCTURE

In terms of the region's industrial structure, professional and other private services was the biggest sector in 2016, accounting for 24% of the region's GVA, while public services took the next largest share, at 21.5%. The manufacturing (13.9%) and wholesale and retail (12.6%) sectors were ranked third and fourth respectively while finance and insurance (5%) was the fifth largest market.

The region has a higher than average exposure to the low value added manufacturing and public services sectors, with both taking around a 4% larger share of total GVA in Yorkshire and Humber than the UK. Conversely, the main private sector, professional and other private services is nearly the same percentage smaller in the region. One of the fastest growing sectors in recent years has been the information and communications one, but it only accounted for 3.7% of GVA in Yorkshire and Humber compared with 6.5% in the UK in 2016.

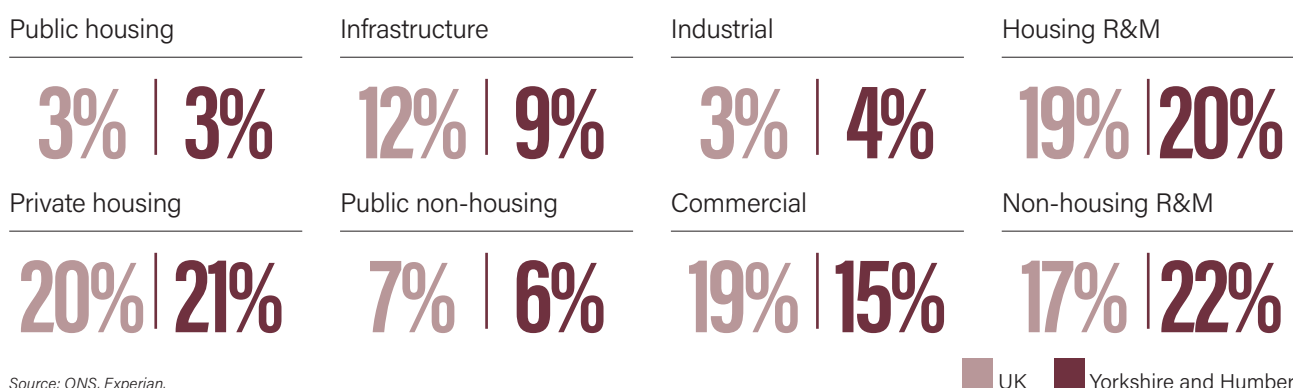


CONSTRUCTION OUTPUT 2000-2016 - YORKSHIRE AND HUMBER



Source: ONS.
Ref: CSN Explained.

CONSTRUCTION INDUSTRY STRUCTURE 2016 - UK VS YORKSHIRE AND HUMBER



Source: ONS, Experian.

ECONOMIC STRUCTURE - YORKSHIRE AND HUMBER (£ BILLION, 2013 PRICES)

	Actual	Forecast (Annual % change, real terms)					
	2016	2017	2018	2019	2020	2021	2022
Professional & Other Private Services	26.3	1.8	1.3	1.7	1.8	2.1	2.6
Public Services	23.7	1.1	0.9	1.5	1.8	2.0	2.4
Manufacturing	15.2	0.9	0.7	1.1	0.6	0.7	1.0
Wholesale & Retail	13.9	2.0	1.3	1.7	1.8	2.3	2.8
Finance & Insurance	5.5	0.9	1.0	1.6	2.4	3.0	3.9
Total Gross Value Added (GVA)	109.9	1.5	1.1	1.6	1.7	2.0	2.4

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

FORWARD LOOKING ECONOMIC INDICATORS

GVA growth in Yorkshire and Humber in 2017 is estimated at 1.5%, a slowdown from the previous year and marginally below the UK rate of 1.6%.

In the five years to 2022 GVA in the region is projected to grow by an annual average rate of 1.8%, lower than the UK rate of 2%. Historically, Yorkshire and Humber has trailed the UK average in terms of GVA and employment growth and going forwards this trajectory is set to continue, largely due to the different economic structure set out in the Outlook for Construction section.

Of the top five sectors, the finance and insurance one, the fifth largest, is likely to experience the highest annual average growth of 2.4% while the biggest sector, professional and other private services, is predicted to experience an average yearly rise of 1.9%. The third largest one, manufacturing, is anticipated to see the smallest rise of 0.8% on average per annum. The lack of progress in terms of devolution could place Yorkshire and Humber in a weaker long term position relative to other city regions. Added to this will be a weaker demographic profile.

The sharp fall in the value of sterling directly after the EU Referendum vote has since led to a rising profile of consumer price inflation against a backdrop of low earnings growth. This has put real household disposable incomes under increasing pressure and combined with low levels of savings and a tighter lending regime, has led to a more cautious attitude towards spending by consumers. However, as average earnings growth starts to rise back above inflation from the middle of 2018 and with inflation subsiding towards 2% by 2020, we expect Yorkshire and Humber's real household disposable incomes to see stronger increases towards the end of the forecast period. In turn, household spending will also begin to accelerate.

The unemployment rate in the region stood at 5.7% in 2016, significantly higher than the UK rate of 4.9%. The differential is estimated to have narrowed last year, on a falling profile both regionally and nationally (5% vs. 4.6%). However, the rate is projected to tick up over the next three years to a peak of 5.2% in 2020 before subsiding again thereafter. This is the same trend as that expected nationally.

NEW CONSTRUCTION ORDERS - OVERVIEW

In 2016 total orders increased by 3% to £4.02bn (current prices), around 56% of their 2007 peak.

There was a mixed performance across new work. Infrastructure saw the biggest rise of 54% to £930m while the commercial sector experienced the next largest increase of 18% to £1.05bn and public housing orders (£113m) registered a growth rate of 10%. In contrast, industrial orders dropped by 40% to £332m while the public non-housing ones declined by 22% to £413m. Orders in the private housing sector edged down by just over 2% to £1.18bn.

NEW CONSTRUCTION ORDERS - CURRENT SITUATION

In the first three quarters of 2017 total orders edged down by 2% to £3.32bn compared with the corresponding period in the preceding year. Public non-housing orders saw the greatest rise of 51% to £415m while the industrial ones went up by 24% to £350m. The private housing and commercial sectors also saw increases, of 23% and 5% respectively. In contrast, infrastructure orders dropped by 57% to £385m while a fall of 17% to £77m was seen for public housing.

Taking 2016 and the first three quarters of 2017 together there has been little overall increase in new orders in the region.

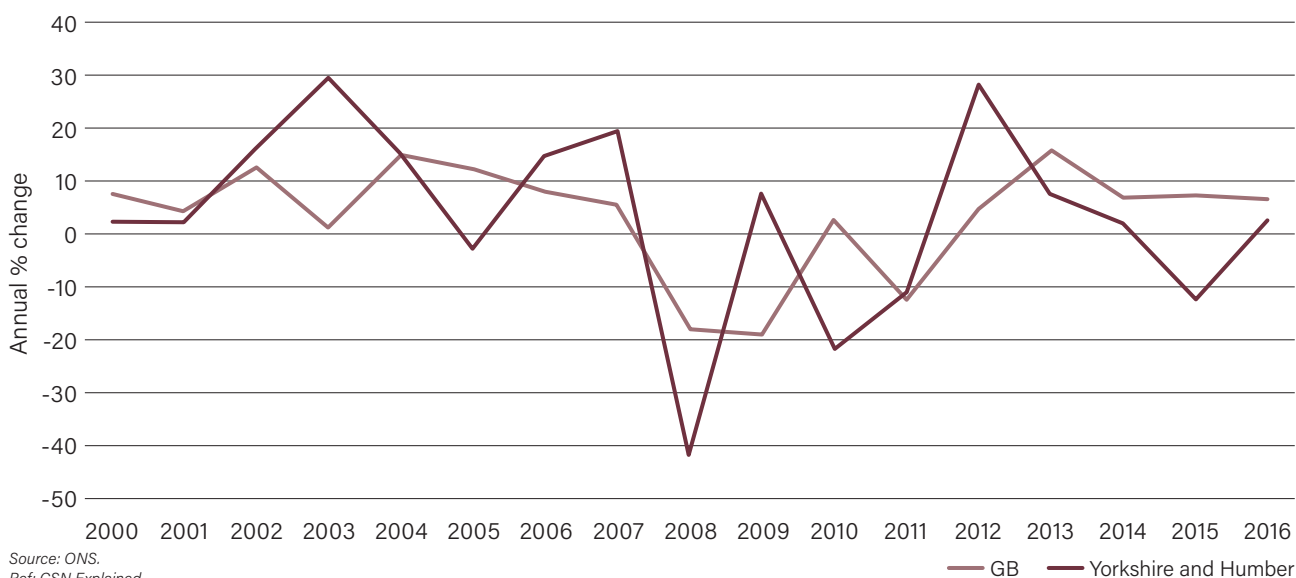


ECONOMIC INDICATORS - YORKSHIRE AND HUMBER (£ BILLION, CURRENT PRICES - UNLESS OTHERWISE STATED)

	Actual	Forecast (Annual % change, real terms)					
	2016	2017	2018	2019	2020	2021	2022
Real household disposable income (2013 prices)	88.3	-0.4	0.9	1.1	1.4	1.6	1.9
Household spending (2013 prices)	94.1	2.0	0.6	1.3	1.9	2.0	2.0
Working age population (000s and as % of all)	3,378	62.3%	62.2%	62.3%	62.7%	62.6%	62.4%
House prices (£)	149,000	3.6	1.9	2.0	1.9	2.1	3.3
LFS unemployment (millions)	0.15	-13.5	0.4	4.1	2.9	-0.5	-4.3

Source: ONS, DCLG, Experian.

NEW CONSTRUCTION ORDERS GROWTH 2000-2016 - YORKSHIRE AND HUMBER VS. GB



NEW WORK CONSTRUCTION ORDERS - YORKSHIRE AND HUMBER (£ MILLION, CURRENT PRICES)

	Actual	Annual % change				
	2016	2012	2013	2014	2015	2016
Public housing	113	-62.3	105.8	62.1	-64.1	9.7
Private housing	1,176	15.7	44.2	16.4	-4.4	-2.5
Infrastructure	930	242.1	-15.5	-38.4	-10.1	53.7
Public non-housing	413	-11.0	-36.2	15.3	-0.4	-22.4
Industrial	332	212.2	-47.6	69.4	35.6	-40.3
Commercial	1,054	-25.2	80.8	-0.6	-27.3	17.5
Total new work	4,018	27.7	7.3	2.4	-11.4	3.0

Source: ONS.
Ref: CSN Explained.

CONSTRUCTION OUTPUT - SHORT-TERM FORECASTS (2018-2019)

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 2017.

In the first three quarters of 2017 construction output in Yorkshire and Humber rose by 5% to £8.14bn (current prices) compared with the corresponding period in the preceding year. Commercial output saw the largest rise of 21% to £1.47bn as work got underway on projects such as the £480m Sheffield retail quarter. The infrastructure and public housing sectors both posted expansion of 5% while private housing saw the smallest increase of 3% to £1.69bn. Industrial and public non-housing output registered declines of 38% and 13% respectively. Overall, the region's total construction output is estimated to go up, by 7% to £11.12bn (2015 prices) in 2017.

Total construction output is expected to remain steady over the next two years. While the new work sector is predicted to see a modest increase of 1% per annum, the R&M sector is projected to fall by an average of 1.2%.

An average increase of 1.7% per annum is expected for the public housing sector, with an agglomeration of smallish projects driving growth. Leeds Federated Housing Association has been given the green light to build 45 affordable homes in Gipton, east Leeds. The homes will be a mixture of 2,3 and 4 bedrooms. Work is expected to start in early 2018 with completion in late 2019. Housing Association, Shoreline Housing Partnership is going to provide 23 affordable homes on two run-down garage sites in Grimsby. There are going to be 15 two bedroom homes in East Marsh and 8 in Bradley Park, with projects due to be complete in summer 2018.

The region's largest new work sector, private housing, is expected to experience only marginal growth over the next two years. Currently, there are no large residential developments in the pipeline and until there are, growth is likely to be slow and steady at best. In October plans were submitted for a build to rent scheme in Leeds city centre. The Flax Place/Marsh Lane site will include two tower blocks, one of 8-10 storeys and the other 12-14 storeys. Around 260,000 square feet of residential accommodation will be available once the project is complete.

The infrastructure sector is predicted to grow by an annual average of 1.8%. There are several developments in the pipeline for the near term, the largest of which is the Hornsea 1 windfarm.

In terms of other schemes, work to improve a section of the A63 Castle Street in Hull is scheduled to begin in 2018/19. The cost is estimated at between £100m-£250m. This year, Yorkshire Water is spending £386m on improvement projects including upgrading water treatment works, sewers and pumping stations. Flagship schemes include drinking water quality improvement contracts at Rivelin (£24m), and at Irton (£17m) where commissioning is planned to be complete by summer 2018, the £72m Knostrop sludge and energy project, and £25m each at Dronfield and Beverley sewage works.

Industrial output is predicted to rise by an annual average of 4.2% over the next two years. There are several small and medium sized factory and warehouse projects which should feed into output growth this year. In September, work started on Boeing's new 6,200 square metre production facility in Sheffield. Once complete in late 2018 the site will allow Boeing to produce components for the next generation of 737, 737 Max and 777 aeroplanes. September 2017 also saw the start of construction work on Lidl's new £70m distribution centre at iPort. Work on the project is anticipated to finish by spring 2019.

The public non-housing sector is projected to experience an average rise of 2.4% per annum over the short term. There are several projects currently taking place. For example, in July work started on a new £57m Leeds City College campus. The site will be home to digital and creative arts and health and social sciences. Work is predicted to take two years with an expected opening date in the 2019/2020 academic year. Tees, Esk and Wear Valleys NHS Foundation Trust has appointed Wates for a new mental hospital at York. The new hospital will provide 72 beds in total and work is expected to be complete in 2019.

In the commercial sector, output is expected to grow at a modest annual average rate of 0.4%. The largest scheme taking place is the £480m Sheffield retail quarter which is set to transform the area around Pinstone Street, Barkers Pool and Moorhead in the city centre. The development will cover space of around 900,000 square feet, of which around 200,000 square feet will be assigned to residential and new office space. The project is estimated to be complete by 2021.

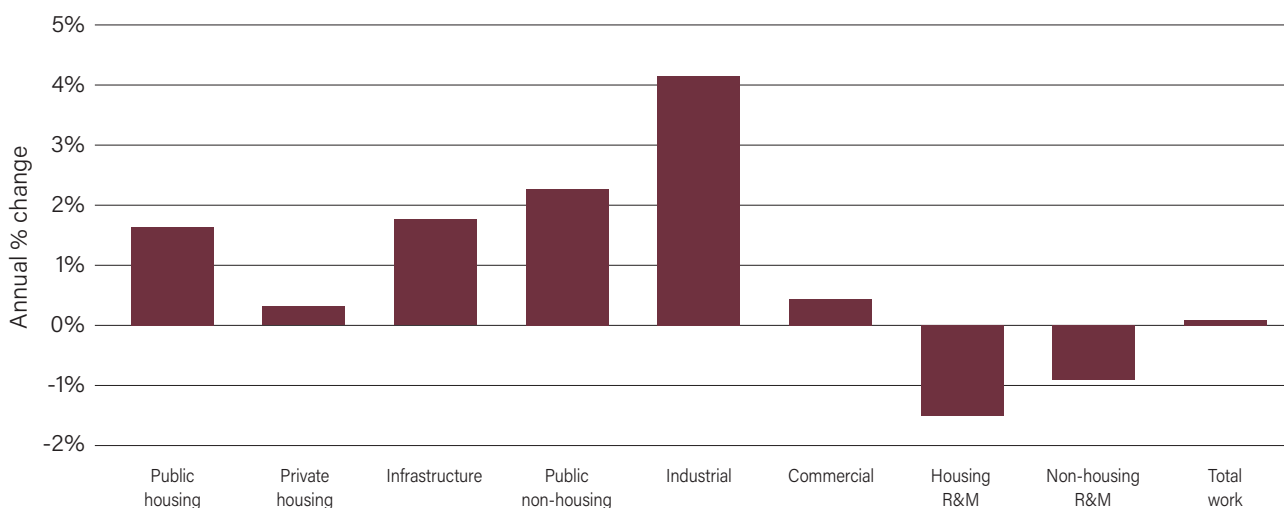
In 2016, non-housing R&M grew by 57%, driven largely by work taking place under infrastructure R&M. Going forwards we do not believe this rate of expansion is sustainable and therefore an overall annual average fall of 0.9% has been forecast. However, should work on infrastructure R&M continue at a robust pace, growth prospects for the sector would improve.

CONSTRUCTION OUTPUT - YORKSHIRE AND HUMBER (£ MILLION, 2015 PRICES)

	Actual	Forecast (Annual % change)			Annual average
	2016	2017	2018	2019	2018-2019
Public housing	320	8%	2%	2%	1.7%
Private housing	2,151	6%	1%	0%	0.3%
Infrastructure	953	10%	12%	-8%	1.8%
Public non-housing	631	3%	5%	0%	2.4%
Industrial	421	-29%	7%	1%	4.2%
Commercial	1,578	20%	3%	-2%	0.4%
New work	6,054	7%	4%	-2%	1.0%
Housing R&M	2,102	-2%	-3%	0%	-1.6%
Non-housing R&M	2,277	12%	-2%	1%	-0.9%
Total R&M	4,378	5%	-3%	0%	-1.2%
Total work	10,433	7%	1%	-1%	0.1%

Source: Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2019 - YORKSHIRE AND HUMBER



Source: Experian.
Ref: CSN Explained.

Output growth is forecast to increase slightly over the next five years (0.8% average annual growth 2018-2022).

CONSTRUCTION OUTPUT - LONG-TERM FORECASTS (2018-2022)

Between 2018 and 2022, total construction output is expected to rise by a modest annual average rate of 0.8%. Like the short term, over the next five years, the new work sector is projected to perform better than the R&M one (1.2% vs. 0.2%).

The industrial sector is predicted to see the largest annual average expansion rate of 3.9% in the five years to 2022. After little growth in 2019, it should pick up thereafter as GVA in the region begins to rise, bringing more confidence and investment to the sector. Yorkshire and Humber's manufacturing sector is predicted to grow by an annual average of 0.8% over the next five years. By the end of the forecast period output in the region's manufacturing sector is likely to be around 95% of its 2007 peak. The region's transport and storage sector is expected to experience annual average growth of 2% over the next five years and by 2022 output in the sector is likely to be at a new high, suggesting there should be some overall demand for new warehouse space over the long term.

Public non-housing output is predicted to rise by a yearly average of 1.5%. Expansion is likely to be the strongest in the near term. Currently the largest development in the pipeline is Leeds University £100m investment at Woodhouse Lane, its largest ever project. The development will include a new six storey building, a connecting atrium and refurbishment of the Old Mining Building. Work is scheduled to begin in March and finish in summer 2020.

Commercial output is forecast to grow at an annual average rate of 1.5% between 2018 and 2022. Growth is projected to be reasonably good across the sectors that drive demand for commercial space, with both the information and communication and finance and insurance ones seeing average annual expansion well in excess of 2%, with the remaining sectors, including the large professional and other private services one, seeing rises around that level. As Brexit uncertainties recede, investors and developers should start to bring more projects forward, bolstering growth towards the end of the forecast period.

Lidl, the discount supermarket, has significant expansion plans across the UK and is currently taking forward new stores in Rotherham and Ecclehill, near Bradford. The green light has been given to the £175m mixed-use West Bar Square development in Sheffield. The office-led scheme will also include restaurants, shops and a hotel. Planning permission has been granted for a £300m extension to the Meadowhall shopping centre in Sheffield, with work due to start this year and complete in 2021.

The region's private housing output is predicted to grow on average by a modest 0.6% per annum over the longer term, below the UK rate of 2.2%. Yorkshire and Humber doesn't experience the same level of demographic pressures that some other regions such as Greater London do, ultimately leading to lower investment in private housing in the region. Despite this, by 2022 output is anticipated to reach a new high of £2.34bn. That is not to say there aren't projects in the pipeline. Plans are

shortly to be re-submitted for 228 apartments on the site of an old tannery near Leeds city centre.

Infrastructure output is projected to rise by a yearly average of 1.1%. There are various sizeable Hornsea windfarm developments on site or in the pipeline over the medium term. While the total costs of these projects run into the billions, their construction element is relatively low, assuming that the turbine itself is classified as a manufactured item. By 2022, infrastructure output is likely to be around 60% of its 2013 peak.

Plans have been made public for the East Leeds Orbital Route which will run from the Outer Ring Road at Red Hall around the east side of Leeds to Thorpe Park. There will also be a link to the M1. The project is estimated to be worth in the region of £130m. There are also significant flood defence improvement plans for York, Leeds and along the river Hull, which will deliver work over the next five years.

Unlike the UK, the relationship between disposable income, consumer spending and housing R&M expenditure seems to have held true in the region, with a decline or weaker growth in these variables resulting in a small fall in output of 2% in the sector in 2017. Growth is expected to return towards the end of the forecast period as pressures on disposable incomes ease and consumer spending growth accelerates again. The impact of these factors should also be boosted by the quieter housing market that has prevailed across the UK since the 2008/09 recession, with people moving less and being prepared to spend more on improvements.

BEYOND 2022

According to Highways England, work on the M1/M62 Lofthouse interchange will begin in 2021 and complete in 2025. Due to its location, the Lofthouse interchange is one of the busiest roads with both East-West and North-South travel. It therefore suffers from delays and congestion. It is hoped improvements to this section of the road will help to alleviate this.

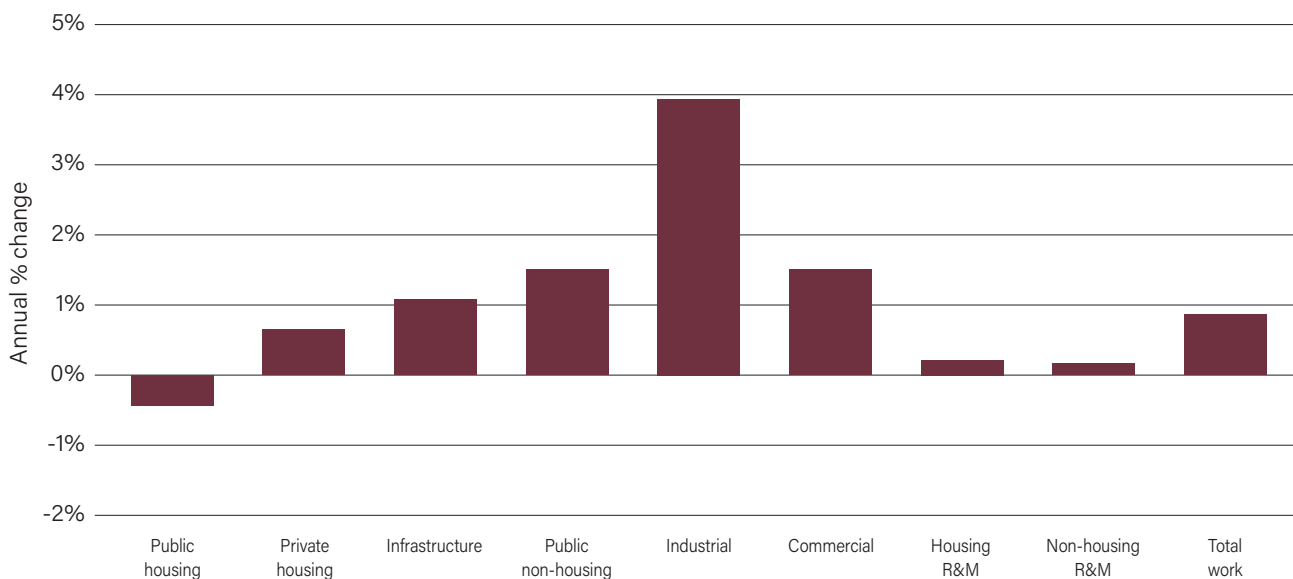
High Speed 2's phase 2b confirmed route has been published. This reveals the eastern leg of the route which will run through Birmingham to Leeds. Leeds will also see a new station built. The government is consulting on a new location for the Eastern Leg Rolling Stock Depot and it has been proposed this should be on a site east of Leeds in the Aire Valley. The latest timeline states phase 2b should be operational by 2033.

CONSTRUCTION OUTPUT - YORKSHIRE AND HUMBER (£ MILLION, 2015 PRICES)

	Estimate	Forecast (Annual % change)					Annual average
	2017	2018	2019	2020	2021	2022	2018-22
Public housing	345	2%	2%	-6%	0%	1%	-0.5%
Private housing	2,270	1%	0%	0%	0%	3%	0.6%
Infrastructure	1,050	12%	-8%	10%	-4%	-3%	1.1%
Public non-housing	647	5%	0%	0%	2%	1%	1.5%
Industrial	301	7%	1%	3%	4%	5%	3.9%
Commercial	1,888	3%	-2%	0%	3%	4%	1.5%
New work	6,501	4%	-2%	1%	0%	2%	1.2%
Housing R&M	2,062	-3%	0%	1%	2%	2%	0.3%
Non-housing R&M	2,555	-2%	1%	2%	1%	0%	0.2%
Total R&M	4,617	-3%	0%	1%	2%	1%	0.2%
Total work	11,118	1%	-1%	1%	1%	1%	0.8%

Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 - YORKSHIRE AND HUMBER



Source: CSN, Experian.
Ref: CSN Explained.

CONSTRUCTION EMPLOYMENT FORECASTS FOR YORKSHIRE AND HUMBER

TOTAL CONSTRUCTION EMPLOYMENT FORECASTS BY OCCUPATION

The table presents actual construction employment (SICs 41-43, 71.1, and 74.9) in Yorkshire and Humber for 2016, the estimated total employment across 28 occupational categories in 2017 and forecasts for the industry for 2018 to 2022. A full breakdown of occupational groups is provided in the CSN Explained section.

Construction employment in Yorkshire and Humber in 2017 is at 197,350, 7.3% of the UK total. Over the next five years employment is projected to experience a modest average annual increase of 0.2%. The corresponding rate for the UK is higher, at 0.5%. On this prognosis employment in the region will reach 199,400 by 2022, still 8% below its 2008 peak.

Over the forecast period, just over half of the region's occupational categories are expected to see growth. Of

the construction-specific categories, construction trade supervisors and labourers nec are projected to see the strongest annual average increases of 3.2%. By 2022, employment in both occupations is likely to reach new highs.

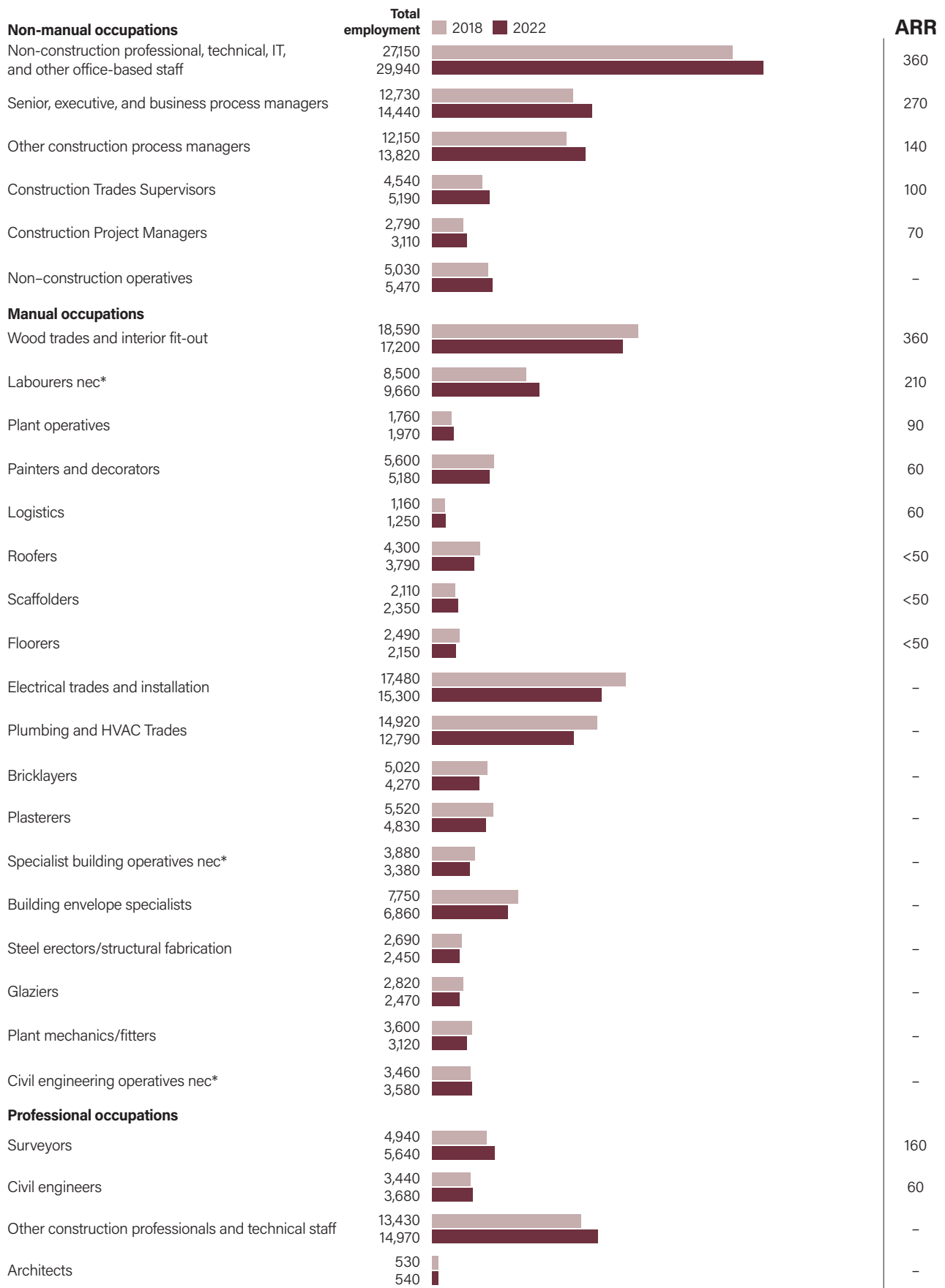
In 2022, the largest construction trade occupation in the region is predicted to be wood trades and interior fit out, accounting for around 9% of the total workforce. By the end of the forecast period this occupation is likely to be around 73% of its 2008 peak. At 8%, electrical trades and installation is anticipated to be the second biggest construction trade occupation. By 2022, employment in this category is projected to be around 81% of its 2008 peak.

Generally speaking, managerial/administrative and professional occupations are expected to fare better than trades/manual ones in growth terms in the region, the same pattern as seen in the UK as a whole.



TOTAL EMPLOYMENT BY OCCUPATION - YORKSHIRE AND HUMBER

Annual recruitment requirement (ARR) by occupation



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

ANNUAL RECRUITMENT REQUIREMENTS (ARR) BY OCCUPATION

The annual recruitment requirement provides an indication of the number of additional workers that would need to be recruited into construction each year in order to realise forecast output. The recruitment requirement takes into account existing flows into and out of construction, such as the movement of people between industries, migration, sickness, and retirement, it is therefore the number of extra new workers the sector needs to attract on top of those flows.

At 2,010, Yorkshire and Humber's annual average recruitment requirement, represents 1% of base 2018 employment. The corresponding ARR rate for the UK is 1.2%. Over the five-year forecasting period, this represents over 10,000 new entrants required for the industry in the region, over and above normal flows.

There is expected to be a high requirement for plant operatives and logistics personnel, both of which have ARR ratios above 5%. With an ARR ratio between 2.6% and 5%, surveyors are likely to be under some pressure. However, we can only say that this might be an indication of future skills shortages and would need monitoring.

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 - YORKSHIRE AND HUMBER

	2018-2022
Non-manual occupations	
Non-construction professional, technical, IT, and other office-based staff	360
Other construction process managers	140
Senior, executive, and business process managers	270
Construction trades supervisors	100
Construction project managers	70
Manual occupations	
Wood trades and interior fit-out	360
Labourers nec*	210
Electrical trades and installation	-
Painters and decorators	60
Plumbing and HVAC Trades	-
Bricklayers	-
Plant operatives	90
Logistics	60
Plasterers	-
Roofers	<50
Scaffolders	<50
Specialist building operatives nec*	-
Building envelope specialists	-
Steel erectors/structural fabrication	-
Glaziers	-
Plant mechanics/fitters	-
Floorers	<50
Civil engineering operatives nec*	-
Professional occupations	
Other construction professionals and technical staff	-
Civil engineers	60
Surveyors	160
Architects	-
Total (SIC 41-43)	1,790
Total (SIC 41-43, 71.1, 74.9)	2,010

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

COMPARISONS ACROSS THE UK

It remains the case that the strongest economic growth will be in the south-east corner of England – Greater London, the South East and the East of England – which are the only three regions projected to see higher GVA growth than the UK rate of 2% a year on average to 2022.

The picture is more mixed across the regions and devolved nations in construction terms, although generally overall economic performance tends to drive stronger construction growth in the south-east corner of England, except where major infrastructure schemes have an impact.

Construction output growth is projected to be strongest in Wales, averaging 4.6% a year over the 2018 to 2022 period. The Welsh construction market is the third smallest in the UK, at an estimated £5.7bn (2015 prices) in 2017, thus the start of work on the Wylfa nuclear power station will have a major impact on output levels in the devolved nation. However, growth is not entirely reliant on this project, with others, such as the M4 upgrade around Newport and the commitment to build 20,000 new affordable homes by 2020/21 making significant contributions.

Construction output in Scotland is likely to remain largely static over the 2018 to 2022 period as further falls in infrastructure output from its very high peak in 2015 is counteracted by good growth in the housing sectors, with Scotland's target for affordable homes set at 50,000. The new Queensferry Crossing is now complete, as are the major motorway upgrades, with the Aberdeen Western Peripheral Route due to finish by spring 2018. There are other sizeable infrastructure projects ongoing, such as the dualling of the A9 between Perth and Inverness, but work on these will be spread over a long time period, thus their impact on growth is diluted.

Northern Ireland has experienced something of a boom in commercial construction activity over the past few years, driven in large part by a substantial expansion of hotel provision in Belfast. However, this may be slackening, while the current political impasse in the devolved nation is likely to impact negatively the timing of new infrastructure and other public projects, leading to relatively modest total output growth of 0.5% a year.

It is the case across the English regions that growth in the construction sector will tend to reflect expansion in the wider economy, unless the region benefits from the siting of major infrastructure projects. Both the South West and North West, which lead the English region growth rankings with 2% a year on average, will benefit from new nuclear build, at Hinkley Point in the case of the former and Moorside in the case of the latter. Enabling works at Hinkley Point have been ongoing for some time while some work at Moorside is projected to begin in 2022. London, and the East Midlands and West Midlands will also see good growth in infrastructure activity as work on High Speed 2 builds up over the forecast period. The strong infrastructure growth in the West Midlands should enable it

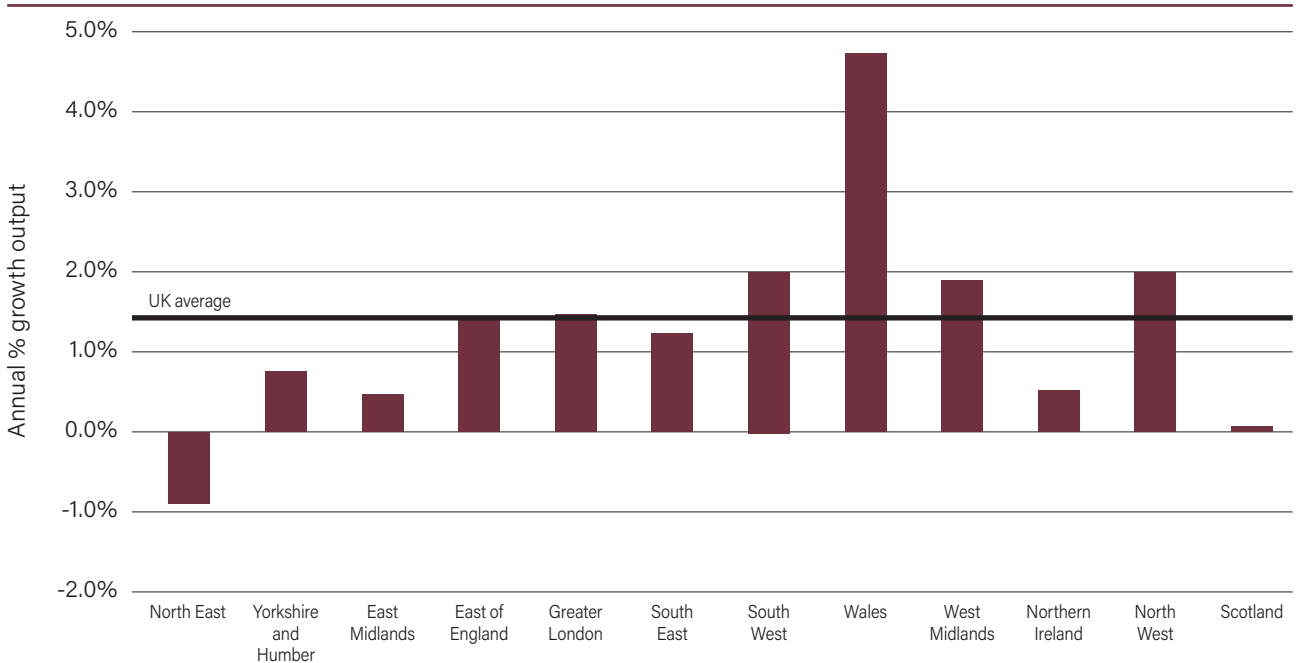
to experience annual average expansion in total construction output of 1.8%, just behind the South West and North West.

London only manages average yearly growth of 1.5%, as while it benefits from strong infrastructure growth and above average expansion in the housing sectors, commercial construction in the capital is the most vulnerable to a more cautious attitude from investors and developers due to Brexit uncertainty.

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 2.1% in Wales to a low of -1.6% in the North East, against a UK rate of 0.5%.

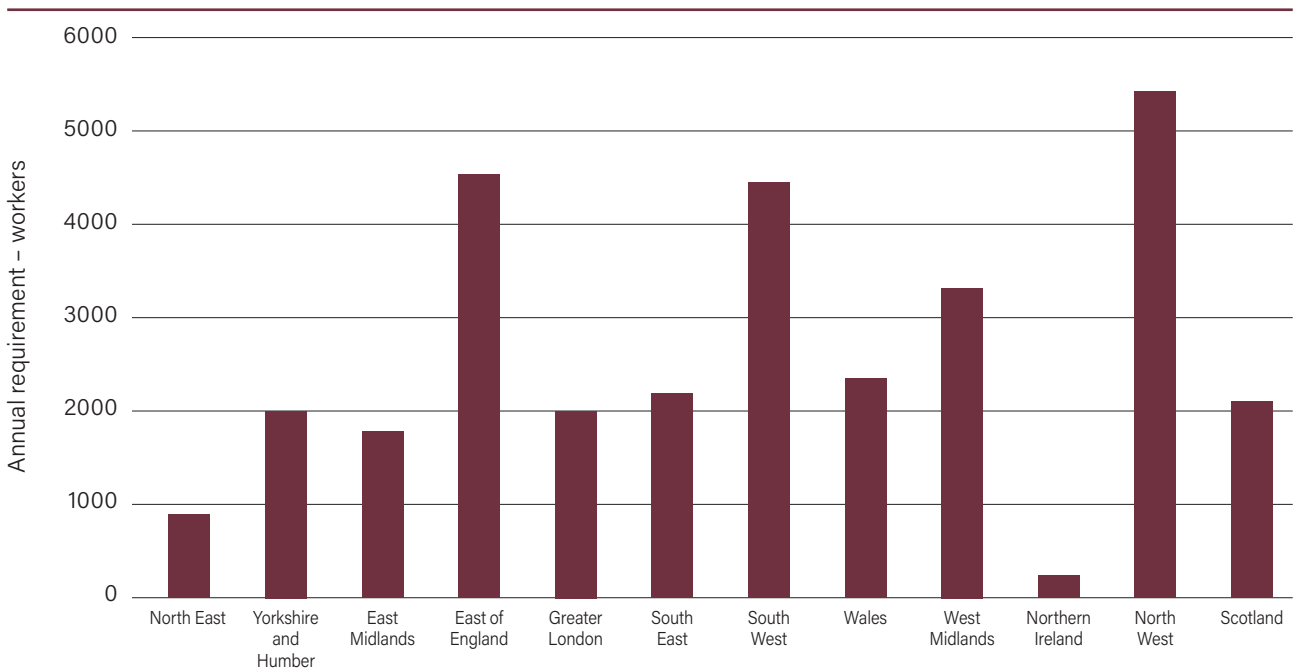
As the annual recruitment requirement (ARR) takes into account known supply-side factors, such as intra-regional labour movements and movements between other industries and construction, the pattern can look significantly different to the profile of output and employment, as some regions and devolved nations have historically strong net inflows and some suffer from large net outflows. For the 2018 to 2022 period, the largest absolute ARR's are for the North West (5,470), the East of England (4,540) and the South West (4,480). However, relative to base employment, Wales has the largest ARR (2.2%), followed by the South West and North West (1.9%). London is the biggest region for construction employment, but has a relatively low ARR at 2,010, just 0.5% of base 2018 employment, as the capital tends to act as a magnet for the workforce from other regions and internationally anyway.

ANNUAL AVERAGE OUTPUT GROWTH BY REGION 2018-2022



Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL RECRUITMENT REQUIREMENT (ARR) BY REGION 2018-2022



Source: CSN, Experian.

Private housebuilding to hit new high value by 2022, with output forecasted at over £2.3bn (2015 prices).

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 of 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 that lie with a Sector Skills Council (SSC) or Sector Bodies.

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

OCCUPATION 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 representatives from industry, Government, education and other SSCs and Sector Bodies. This Group convenes twice a year and sets the national scene, effectively 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. Thus, 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 upon 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:

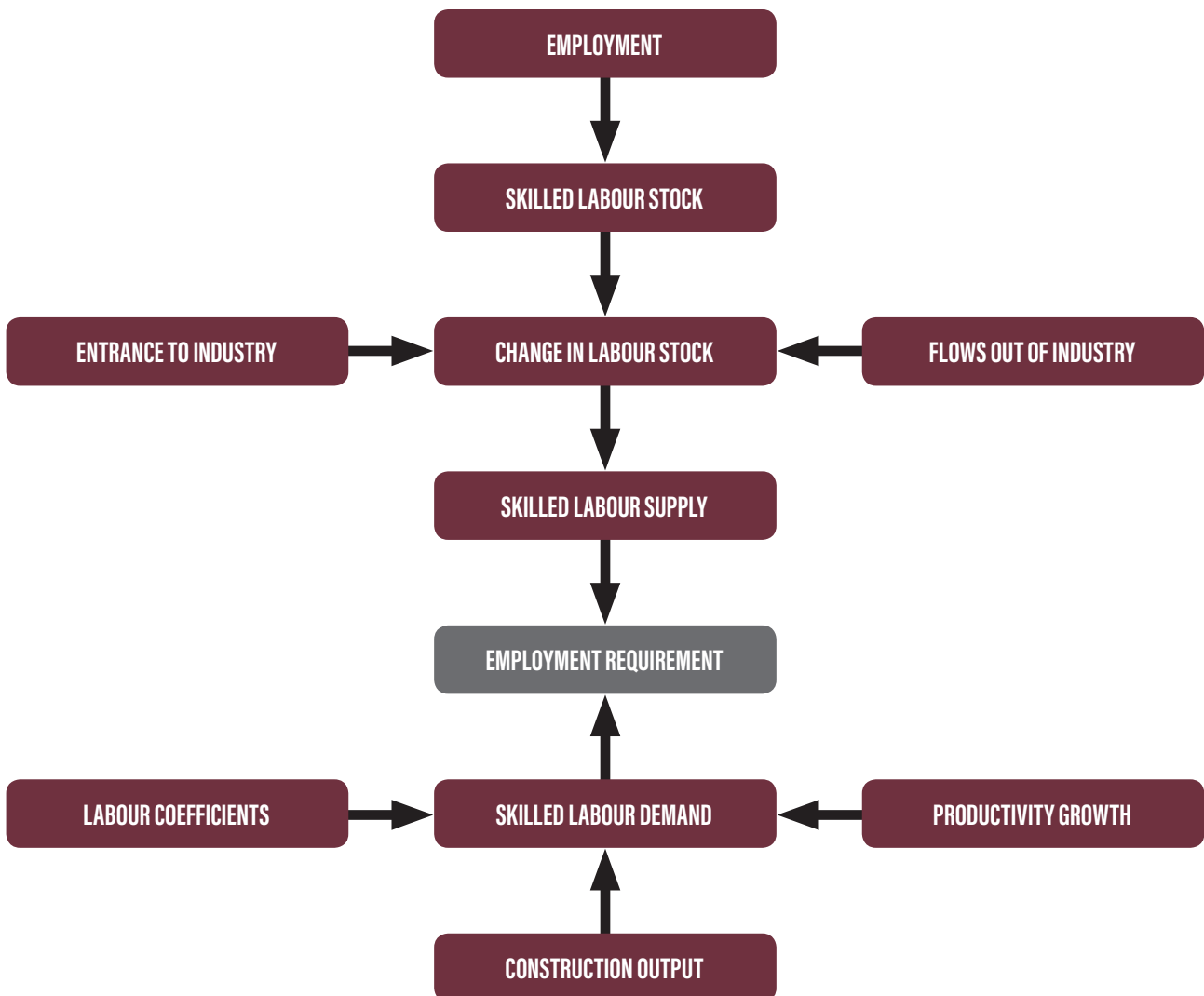
- Transfers to other industries
- International/domestic out migration
- Permanent retirements (Including permanent sickness)
- Outflow to temporary sickness and home duties.

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 flowchart.



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. $GDP = GVA \text{ plus taxes on products minus subsidies on products.}$

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. 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 SIC41-43 and SIC41-43, 71.1 and 74.9. The total for SIC41-43 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 SIC41-43, 71.1 and 74.9 includes all occupations.



FOOTPRINTS FOR THE 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 four 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	Management consultants and business analysts	2423
Financial managers and directors	1131	Receptionists	4216
Marketing and sales directors	1132	Typists and related keyboard occupations	4217
Purchasing managers and directors	1133	Business sales executives	3542
Human resource managers and directors	1135	Bookkeepers, payroll managers and wages clerks	4122
Property, housing and estate managers	1251	Records clerks and assistants	4131
Information technology and telecommunications directors	1136	Stock control clerks and assistants	4133
Research and development managers	2150	Telephonists	7213
Managers and directors in storage and warehousing	1162	Communication operators	7214
Managers and proprietors in other services nec*	1259	Personal assistants and other secretaries	4215
Functional managers and directors nec*	1139	Sales and retail assistants	7111
IT specialist managers	2133	Telephone salespersons	7113
IT project and programme managers	2134	Buyers and procurement officers	3541
Financial accounts managers	3538	Human resources and industrial relations officers	3562
Sales accounts and business development managers	3545	Credit controllers	4121
Construction project managers		Company secretaries	4214
Construction project managers and related professionals	2436	Sales related occupations nec*	7129
Other construction process managers		Call and contact centre occupations	7211
Production managers and directors in manufacturing	1121	Customer service occupations nec*	7219
Production managers and directors in construction	1122	Elementary administration occupations nec*	9219
Managers and directors in transport and distribution	1161	Chemical scientists	2111
Waste disposal and environmental services managers	1255	Biological scientists and biochemists	2112
Health and safety officers	3567	Physical scientists	2113
Conservation and environmental associate professionals	3550	Laboratory technicians	3111
Non-construction professional, technical, IT, and other office-based staff (excl. managers)		Graphic designers	3421
IT operations technicians	3131	Environmental health professionals	2463
IT user support technicians	3132	IT business analysts, architects and systems designers	2135
Finance and investment analysts and advisers	3534	Conservation professionals	2141
Taxation experts	3535	Environment professionals	2142
Financial and accounting technicians	3537	Actuaries, economists and statisticians	2425
Vocational and industrial trainers and instructors	3563	Business and related research professionals	2426
Business and related associate professionals nec*	3539	Finance officers	4124
Legal associate professionals	3520	Financial administrative occupations nec*	4129
Inspectors of standards and regulations	3565	Human resources administrative occupations	4138
Programmers and software development professionals	2136	Sales administrators	4151
Information technology and telecommunications professionals nec*	2139	Other administrative occupations nec*	4159
Estate agents and auctioneers	3544	Office supervisors	4162
Solicitors	2413	Sales supervisors	7130
Legal professionals nec*	2419	Customer service managers and supervisors	7220
Chartered and certified accountants	2421	Office managers	4161
Business and financial project management professionals	2424	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		Air-conditioning and refrigeration engineers	5225
Bricklayers and masons	5312	Logistics	
Building envelope specialists		Large goods vehicle drivers	8211
Construction and building trades nec* (50%)	5319	Van drivers	8212
Painters and decorators		Elementary storage occupations	9260
Painters and decorators	5323	Buyers and purchasing officers (50%)	3541
Construction and building trades nec* (5%)	5319	Transport and distribution clerks and assistants	4134
Plasterers		Civil engineering operatives not elsewhere classified (nec*)	
Plasterers	5321	Road construction operatives	8142
Roofers		Rail construction and maintenance operatives	8143
Roofers, roof tilers and slaters	5313	Quarry workers and related operatives	8123
Floorers		Non-construction operatives	
Floorers and wall tilers	5322	Metal making and treating process operatives	8117
Glaziers		Process operatives nec*	8119
Glaziers, window fabricators and fitters	5316	Metalworking machine operatives	8125
Construction and building trades nec* (5%)	5319	Water and sewerage plant operatives	8126
Specialist building operatives not elsewhere classified (nec*)		Assemblers (vehicles and metal goods)	8132
Construction operatives nec* (100%)	8149	Routine inspectors and testers	8133
Construction and building trades nec* (5%)	5319	Assemblers and routine operatives nec*	8139
Industrial cleaning process occupations	9132	Elementary security occupations nec*	9249
Other skilled trades nec*	5449	Cleaners and domestics*	9233
Scaffolders		Street cleaners	9232
Scaffolders, staggers and riggers	8141	Gardeners and landscape gardeners	5113
Plant operatives		Caretakers	6232
Crane drivers	8221	Security guards and related occupations	9241
Plant and machine operatives nec*	8129	Protective service associate professionals nec*	3319
Fork-lift truck drivers	8222	Civil engineers	
Mobile machine drivers and operatives nec*	8229	Civil engineers	2121
Plant mechanics/fitters		Other construction professionals and technical staff	
Metalworking production and maintenance fitters	5223	Mechanical engineers	2122
Precision instrument makers and repairers	5224	Electrical engineers	2123
Vehicle technicians, mechanics and electricians	5231	Design and development engineers	2126
Elementary process plant occupations nec*	9139	Production and process engineers	2127
Tool makers, tool fitters and markers-out	5222	Quality control and planning engineers	2461
Vehicle body builders and repairers	5232	Engineering professionals nec*	2129
Steel erectors/structural fabrication		Electrical and electronics technicians	3112
Steel erectors	5311	Engineering technicians	3113
Welding trades	5215	Building and civil engineering technicians	3114
Metal plate workers and riveters	5214	Science, engineering and production technicians nec*	3119
Construction and building trades nec* (5%)	5319	Architectural and town planning technicians*	3121
Smiths and forge workers	5211	Draughtspersons	3122
Metal machining setters and setter-operators	5221	Quality assurance technicians	3115
Labourers nec*		Town planning officers	2432
Elementary construction occupations (100%)	9120	Electronics engineers	2124
Electrical trades and installation		Chartered architectural technologists	2435
Electricians and electrical fitters	5241	Estimators, valuers and assessors	3531
Electrical and electronic trades nec*	5249	Planning, process and production technicians	3116
Telecommunications engineers	5242	Architects	
Plumbing and heating, ventilation, and air conditioning trades		Architects	2431
Plumbers and heating and ventilating engineers	5314	Surveyors	
Pipe fitters	5216	Quantity surveyors	2433
Construction and building trades nec* (5%)	5319	Chartered surveyors	2434
		*Not elsewhere classified	

CITB RESEARCH

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