



CITB RESEARCH

INDUSTRY INSIGHTS

NORTH WEST

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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NORTH WEST

Construction output in the North West is expected to see an annual average increase of 2% over the forecast period. Construction employment is predicted to increase by an annual average rate of 1.9% and it is likely to reach 302,830 by the end of the forecast period. The annual recruitment requirement (ARR) in the region is estimated at 1.9% of base 2018 employment and on average 5,470 extra employees are required on an annual basis.

KEY FINDINGS

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

4.1%

Employment is forecast to grow by

1.9%

a year on average

The North West has an ARR of

5,470

Construction output in the region fell by 2% in real terms in 2016 after three years of expansion. However, growth, estimated at 6% returned in 2017, taking output to £15.35bn in 2015 prices, a new high.

The North West is projected to see average annual growth of 2% in total construction output between 2018 and 2022, outpacing the UK rate of 1.3%.

The best performing sector over the forecast period is likely to be the infrastructure one with an annual average rise of 4.1%. This is driven by some transport projects such as work on the £250m scheme which will see the creation of a three-mile bypass through the Rimrose Valley in the Liverpool area. A new junction, 11a, is being created on the M56, linking to the new Mersey Gateway bridge and providing a more direct route to the M56 from south Runcorn, at a cost of £60m. However, the region may see double-digit growth in the final year of the forecast period if enabling work on the Moorside nuclear power station project begins.

The private housing sector is expected to see the second highest annual average growth rate of 2.9%, although most of the growth is expected to be in the first two years of the forecast period. The project pipeline includes a £300m mixed-use scheme in Manchester with a 40-storey tower that will house 375 residential apartments and a £235m project to develop 756 new homes across four buildings forming part of Manchester's Noma masterplan.

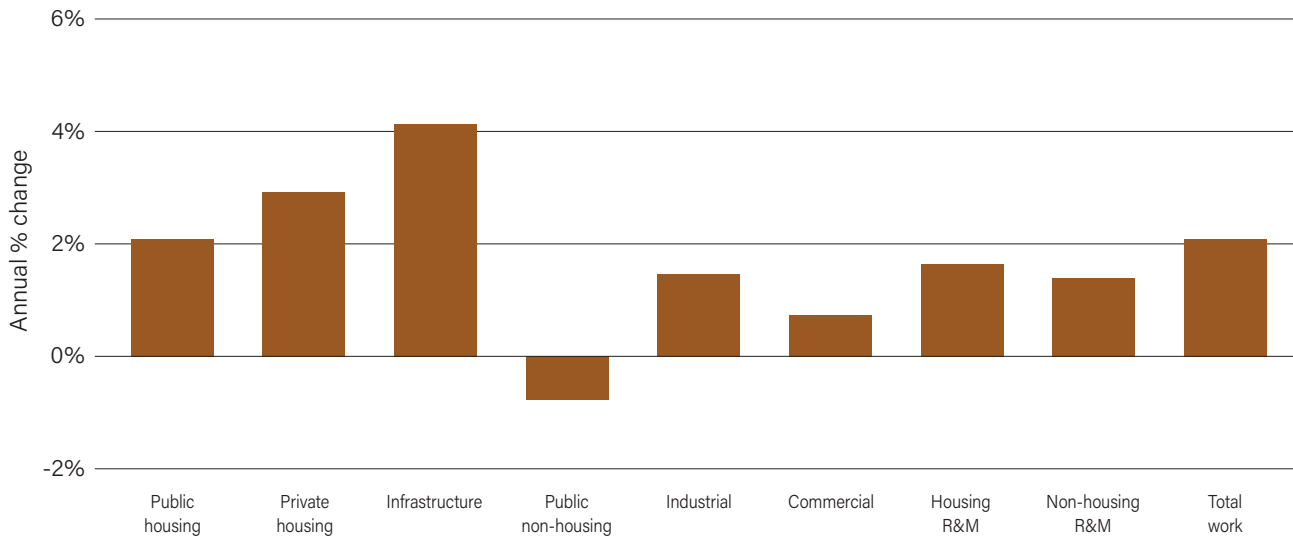
Public housing output is likely to increase by an annual average of 2.1% over the next five years, supported by projects such as the £100m deal signed by Sefton Council to build more than

11,000 new homes by 2030 to tackle local housing shortage, create more jobs and improve the future prosperity of the area. Work on the project is supposed to start later this year and continue to 2032.

The North West is estimated to have accounted for around 10% of UK construction employment in 2017. Over the next five years, construction employment is predicted to rise by an average 1.9% per annum, a higher rate than the national average of 0.5%. Growth is expected to be generally strongest for the professional occupations and weakest for the managerial/administrative ones. This is a somewhat different profile than for the UK as a whole, where growth is projected to be weakest for the trades/manual occupations.

The ARR for the region is estimated at 5,470 which represents 1.9% of base 2018 employment, higher than the UK ratio of 1.2%. While no occupation is flagged up with a high requirement (over 5% of base employment), 11 have a medium requirement (between 2.6% and 5% of base employment).

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 - NORTH WEST



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.

■ ■ The region's annual average output growth over the next five years is forecast to be 2%. ■ ■

THE OUTLOOK FOR CONSTRUCTION IN THE NORTH WEST

CONSTRUCTION OUTPUT IN THE NORTH WEST - OVERVIEW

Following three years of consecutive rises, total construction output fell by 2% in 2016 to £14.4bn (2015 prices), about 3% below its 2004 peak. Both the new work and the repair and maintenance (R&M) sectors contracted, the former by 1% and the latter by 4%.

The private housing sector experienced the greatest growth of 15% to £3.54bn whilst infrastructure output went up by 13% to £1.94bn. The commercial sector saw the smallest rise of 2% to £2.3bn. In contrast the biggest fall of 42% was recorded in the industrial sector (£471m) while declines of 27% and 20% were registered in the public non-housing (£947m) and public housing (£359m) respectively.

INDUSTRY STRUCTURE

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

New work output accounted for around 66% of the region's total construction output in 2016, a slightly larger share compared to the UK (64%).

The structure of the North West's construction industry has some differences compared to the UK. Less emphasis is placed on the region's commercial (16% vs. 19%) and housing R&M sectors (15% vs. 19%) while the private housing one is more important (25% vs. 20%). At 7% the share of the region's public non-housing sector was identical to the national average whilst the shares for the others were either similar or close 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 gross value added (GVA) in the North West increased by 1.1% to £155.3bn in 2013 prices. As a share of the UK, the region accounted for 9% of GVA.

While good growth was seen in the information and communications (6.6%) and wholesale and retail sectors (4.5%), professional and other private services managed less than 1%, while manufacturing output stagnated, and the finance and insurance and public services sectors contracted.

GVA growth in the region for 2017 is estimated at 1.7%, one of the few regions where it is expected to be better than in 2016. The main reason for the better outturn is a better performance from the professional and other private services and public services sectors, which together account for about 44% of the region's GVA.

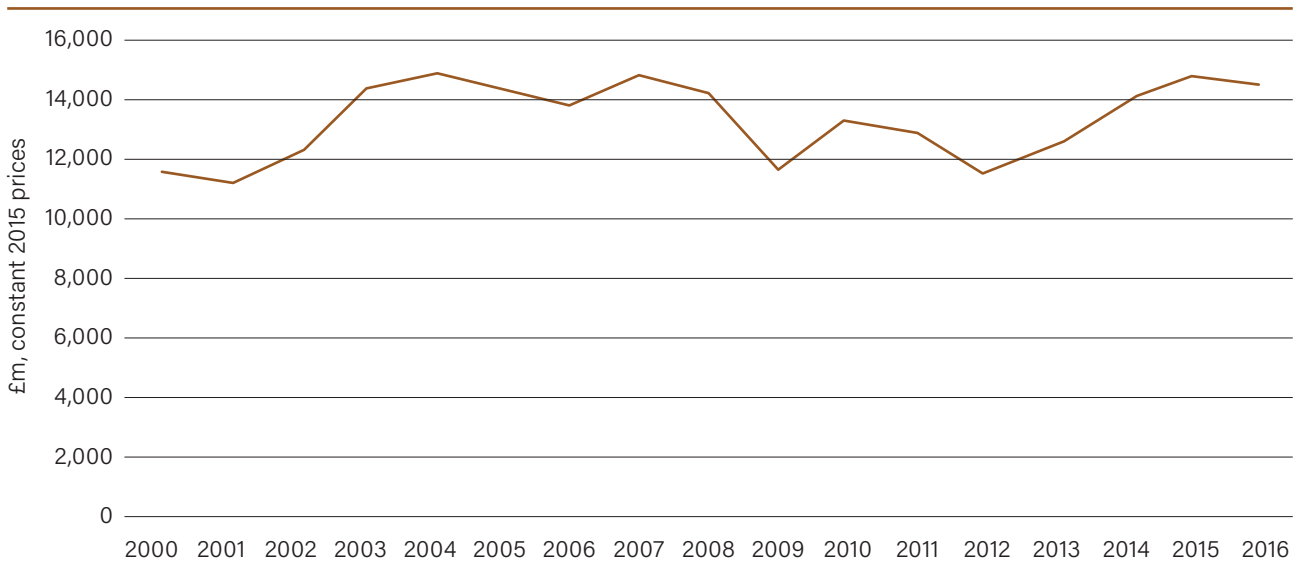
ECONOMIC STRUCTURE

In terms of the region's industrial structure professional and other private services was the largest sector, accounting for 25% of the region's GVA in 2016, while public services took the next biggest share, at 19.2%. Manufacturing (14.9%) and wholesale and retail (12.8%) sectors were ranked third and fourth respectively and information and communication was the fifth largest one, at 5.3%.

The North West has a higher than average exposure to the manufacturing sector, whilst other sectors such as professional and other private services and finance and insurance are underrepresented compared to the UK.

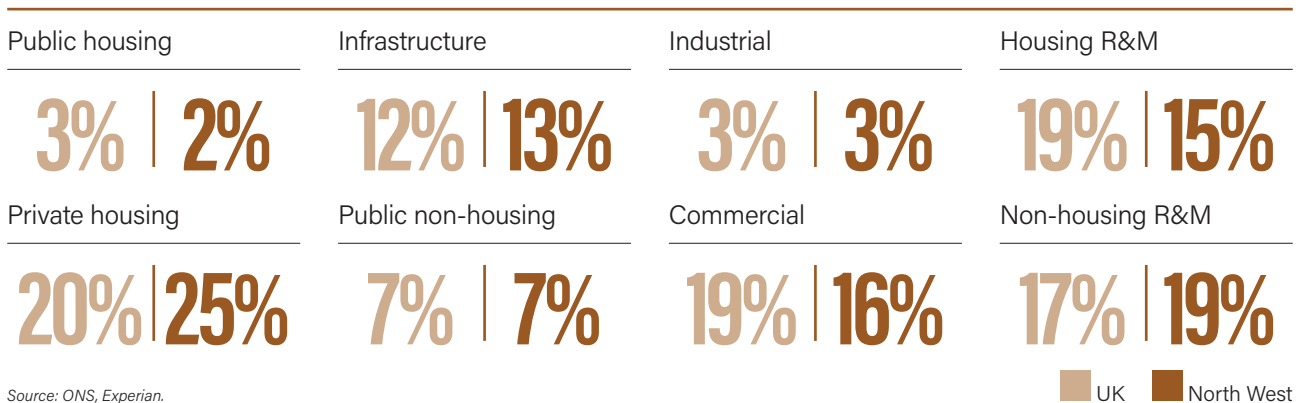


CONSTRUCTION OUTPUT 2000-2016 - NORTH WEST



Source: ONS.
Ref: CSN Explained.

CONSTRUCTION INDUSTRY STRUCTURE 2016 - UK VS NORTH WEST



ECONOMIC STRUCTURE - NORTH WEST (£ BILLION, 2013 PRICES)

| | Actual | Forecast (Annual % change, real terms) | | | | | |
|---------------------------------------|--------------|--|------------|------------|------------|------------|------------|
| | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
| Professional & Other Private Services | 38.8 | 2.1 | 1.5 | 1.6 | 1.7 | 2.0 | 2.4 |
| Public Services | 29.9 | 1.4 | 1.2 | 1.6 | 1.9 | 2.1 | 2.4 |
| Manufacturing | 23.1 | 0.6 | 1.1 | 1.3 | 0.9 | 0.9 | 1.2 |
| Wholesale & Retail | 19.8 | 2.1 | 1.4 | 1.6 | 1.8 | 2.3 | 2.8 |
| Information & Communication | 8.2 | 2.1 | 2.3 | 2.1 | 2.1 | 2.4 | 3.3 |
| Total Gross Value Added (GVA) | 155.3 | 1.7 | 1.3 | 1.6 | 1.7 | 1.9 | 2.3 |

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

FORWARD LOOKING ECONOMIC INDICATORS

In the five years to 2022 the region's GVA is projected to grow at an average yearly rate of 1.8%, slightly lower than the national average of 2%.

Of the top five sectors, information and communication is expected to see the greatest annual average increase of 2.4%, followed by 1.9% expansion in both wholesale and retail and professional and other private services. In contrast, public services is projected to experience lacklustre annual average increases of 1%.

Real household disposable income is predicted to rise by an annual average of 1.4% over the next five years, compared to the UK rate of 1.5% whilst average yearly increases in household spending are also projected to be a little lower (1.6% vs. 1.8%).

In 2015 the region's working age population was around 4.4m which accounted for 11% of the UK total. Over the forecast period, the North West's working age population as a share of the total population is expected to hover around 62%.

The unemployment rate in 2016 in the North West stood at 5.1%, higher than the corresponding UK rate of 4.9%. However, the region's unemployment rate is predicted to decline over the next five years and by 2022, at 4.5%, the North West's unemployment rate is expected to fall below that of the UK's (4.7%).

NEW CONSTRUCTION ORDERS - OVERVIEW

In 2016, total construction orders increased by 6% to £7.2bn (current prices), around 79% of their 2007 peak. The infrastructure sector saw the greatest increase of 58% to £2.45bn whilst public housing (£166m) recorded the second biggest rise of 35%. New orders for private housing (£2.1bn), on the other hand, only went up modestly, by 3%. The largest fall of 51% to £401m was seen in the industrial sector. The public non-housing one also saw a double-digit decrease of 28% to £574m, taking it to around 30% of its 2009 peak.

NEW CONSTRUCTION ORDERS - CURRENT SITUATION

Total new orders in the North West reached £5.57bn in the first three quarters of 2017, 2% down on the same period of 2016.

However, every sector bar the infrastructure one saw a rise, with the growth strongest in the private housing one (51%), followed by industrial new orders (30%) and those for public housing (27%). However, infrastructure new orders dropped by 55%, from over £2bn in the first three quarters of 2016 to under £1bn in the same period of last year.



ECONOMIC INDICATORS - NORTH WEST (£ 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) | 121.3 | -0.7 | 0.9 | 1.0 | 1.4 | 1.6 | 1.9 |
| Household spending (2013 prices) | 125.7 | 1.3 | 0.6 | 1.4 | 1.9 | 2.0 | 2.0 |
| Working age population (000s and as % of all) | 4,480 | 62.2% | 62.1% | 62.2% | 62.5% | 62.4% | 62.2% |
| House prices (£) | 147,333 | 4.1 | 2.0 | 2.0 | 2.1 | 2.3 | 3.5 |
| LFS unemployment (millions) | 0.18 | -13.9 | 2.6 | 5.1 | 3.0 | -0.1 | -4.4 |

Source: ONS, DCLG, Experian.

NEW CONSTRUCTION ORDERS GROWTH 2000-2016 - NORTH WEST VS. GB



Source: ONS.
ref. CSN Explained.

NEW WORK CONSTRUCTION ORDERS - NORTH WEST (£ MILLION, CURRENT PRICES)

| | Actual | Annual % change | | | | |
|-----------------------|--------------|-----------------|-------------|-------------|-------------|------------|
| | 2016 | 2012 | 2013 | 2014 | 2015 | 2016 |
| Public housing | 166 | -0.8 | 9.1 | -23.9 | -41.4 | 35.0 |
| Private housing | 2,079 | 7.4 | 66.9 | 46.0 | 3.6 | 3.3 |
| Infrastructure | 2,451 | 63.5 | 26.8 | -44.4 | 108.2 | 58.2 |
| Public non-housing | 574 | -31.8 | 62.8 | -8.4 | -35.0 | -28.0 |
| Industrial | 401 | 52.7 | 65.8 | 3.4 | 68.8 | -51.2 |
| Commercial | 1,499 | 0.8 | -8.1 | 9.7 | 16.8 | 0.9 |
| Total new work | 7,170 | 4.5 | 32.1 | -0.5 | 15.4 | 5.7 |

Source: ONS.
Ref: tCSN 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.

Construction output in the first three quarters of 2017 totalled £12.3bn in current prices, 14% higher than in the corresponding period of 2016. Growth has been strongest in the infrastructure sector (38%) and in public and private housing (37% and 21% respectively). In contrast, there have been big falls in the public non-housing (27%) and industrial (22%) sectors.

In 2017 total construction output in the North West is estimated to have increased by 6% to £15.4bn in 2015 prices.

Output is forecast to increase by an annual average of 2.5% over the next two years. Growth is expected to be stronger in the new work sector compared to R&M (2.9% vs. 1.7%).

Private housing is expected to be the best performing sector with an annual average growth rate of 6.6%. There is expected to be a range of medium to big sized developments coming into the pipeline which should help keep the sector buoyant, such as the £100m scheme by Forrest to deliver two major residential projects in Manchester over the next two years. Fortis Developments' construction arm, Beaumont Morgan, is starting its 376-home Bridgewater Wharf apartment scheme in the coming months, kicking off a two-year build programme, worth around £67m. Two projects worth £76m have been given the green light by planners in Liverpool. The first project will include a 31-storey tower providing 278 apartments as well as a restaurant and the second one will provide 105 apartments to be available for private rent. The project is expected to be completed over the next two years.

The second best performing sector is expected to be the public housing sector with an average annual increase of 5.1% between 2018 and 2019. Examples of the range of projects in the region include a £10m housing development in Hattersley to build 24 bungalows for the elderly, and 20 two and three-bedroom family houses available for Rent to Buy. This work is the next phase of a dynamic regeneration programme in Hattersley which has seen more than £200m invested by partners Tameside Council, Peak Valley Housing Association, Symphony Housing Group and the Homes and Communities Agency.

Laurus Homes have announced two developments at former education sites in Greater Manchester. The developments will offer a mix of two, three and four-bedroom homes with options for sale and rent, with Help to Buy equity loans and shared ownership available. The project is a joint venture between Trafford Housing Trust, parent company of Laurus Homes, and London housing association L&Q. Work has already commenced on Sefton Council housing project, worth £100m, to build 147 homes on the former Phillips factory in Southport.

The infrastructure sector is likely to see an average rise of 2.8%, supported by various transport and energy work in the region. Knowsley Council has approved a capital investment programme of £32m for improvements to the borough's highways, land and property, with projects to be spread over the next three years. This project is part of the council's five priority areas outlined in its corporate plan for 2017-2020. Work began on a new energy from waste plant at Lostock Gralam Northwich. Once complete the plant will be able to power around 125,000 homes per year. Work to upgrade the M62 between junctions 20-25 is scheduled to start before 2020 at a cost of between £300m to £400m.

Output in the public non-housing sector is expected to stabilise in the short-term, after enduring an estimated 18% contraction in 2017. Oldham Council has approved the relocation of Oldham's Coliseum Theatre to a new venue in the town centre. The new building will have a 550-seat auditorium and a 170-seat studio theatre. Construction is due to start in early 2018 and the facility to open by 2020. The first phase of Lancaster University's 350,000 square feet Health Innovation Campus has started on site and the project has an overall value of £41m. It will provide space for academics, healthcare providers, alongside science & technology firms and SME-focussed business space. Work on the first phase is due to complete in September 2019. Plans have been approved for the University of Central Lancashire to build a new facility which will provide a new reception area, informal learning spaces and a student wellbeing support centre. The cost of the project will be around £200m and will start early this year to be completed by summer 2020.

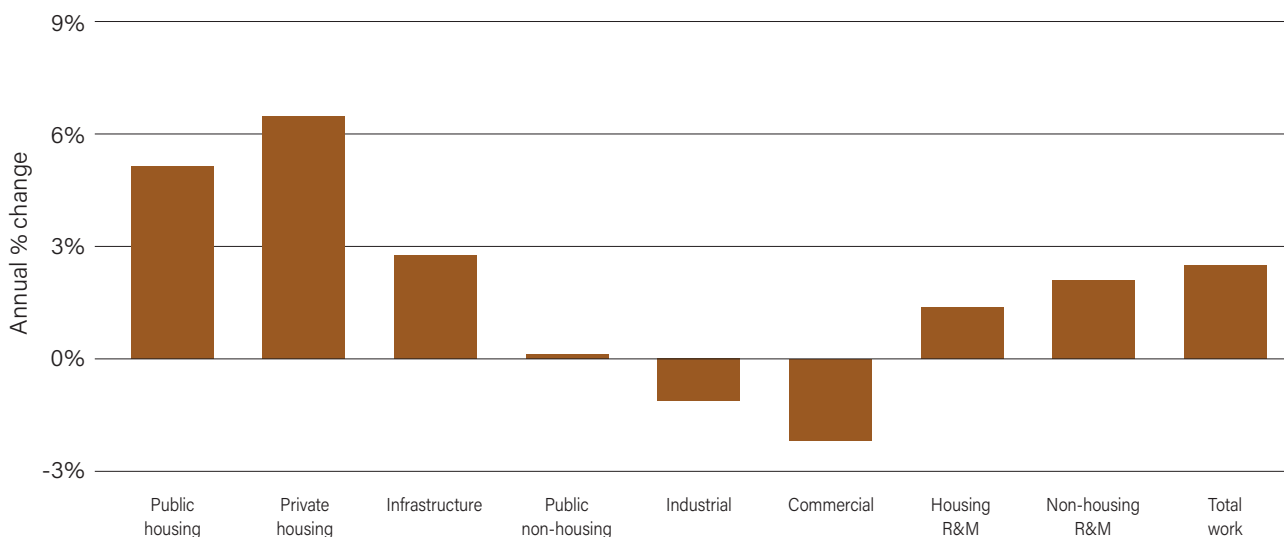
The commercial sector is expected to post a fall of 2.1% in the next two years, mainly due to lack of sizable projects and economic uncertainty influencing confidence and access to finance resulting in fewer projects starting. However, Lancashire firm Warden has won a contract to build Blackpool's first five-star hotel. The hotel will be called the Sands Venue Resort Hotel and will have a gross development value of £18m. The hotel is due for a summer 2019 opening.

CONSTRUCTION OUTPUT - NORTH WEST (£ MILLION, 2015 PRICES)

| | Actual | Forecast (Annual % change) | | | Annual average |
|----------------------|---------------|----------------------------|-----------|-----------|----------------|
| | 2016 | 2017 | 2018 | 2019 | 2018-2019 |
| Public housing | 359 | 17% | 6% | 4% | 5.1% |
| Private housing | 3,537 | 11% | 9% | 4% | 6.6% |
| Infrastructure | 1,943 | 22% | 4% | 2% | 2.8% |
| Public non-housing | 947 | -18% | 0% | 0% | 0.0% |
| Industrial | 471 | -15% | -2% | -1% | -1.2% |
| Commercial | 2,295 | 7% | 1% | -5% | -2.1% |
| New work | 9,552 | 8% | 4% | 1% | 2.9% |
| Housing R&M | 2,178 | 0% | 2% | 1% | 1.4% |
| Non-housing R&M | 2,681 | 5% | 2% | 2% | 2.0% |
| Total R&M | 4,859 | 3% | 2% | 1% | 1.7% |
| Total work | 14,412 | 6% | 4% | 1% | 2.5% |

Source: Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2019 - NORTH WEST



Source: Experian.
Ref: CSN Explained.

■ ■ The infrastructure sector is likely to see the strongest annual average increase of 4.1%. ■ ■

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

The region's annual average output growth over the next five years is forecast to be 2%, outpacing the UK rate of 1.3% but a little lower than its short-term growth rate.

The infrastructure sector is likely to see the strongest annual average increase of 4.1% in the five years to 2022. Most of the projects mentioned in the short-term section will be completed in the next two years or so, thus a sharp fall in output is expected in 2020 before other projects kick in. The region benefits from ongoing work by Highway England on the £250m scheme to create a three-mile bypass through the Rimrose Valley, connecting Princess Way to Broom's Cross Road in the Liverpool area. A new junction, 11a, is being created on the M56, linking to the new Mersey Gateway bridge and providing a more direct route to the M56 from south Runcorn, at a cost of £60m. In addition, the region will benefit from a £300m fund recently announced by the Chancellor for rail investment in the North, alongside a £100m fund for local road schemes, 13 of which are in the North West, 10 in the North East and 10 in Yorkshire and the Humber. The substantial uplift in output forecast for 2022 is predicated on the start of enabling works on the Moorside new nuclear build project.

An average yearly increase of 2.9% is expected for the private housing sector over the next five years. A Hong Kong firm has recently been given the go-ahead for a £235m project to develop 756 new homes across four buildings forming part of Manchester's Noma masterplan. The political capital now being ploughed into addressing the demand/supply mismatch suggests that activity will continue to head generally in an upward direction in the absence of an economic downturn.

Public housing is forecast to increase at an annual average of 2.1% between 2018 and 2022. However, a 5% fall is expected in 2020 as most of the projects listed in the short-term section come to an end, followed by two years of moderate growth. Sefton Council has signed a deal worth £100m to build more than 11,000 new homes by 2030 to tackle local housing shortages, create more jobs and improve the future prosperity of areas including Southport, Bootle, Formby, Maghull and Crosby. Work on the project is supposed to start later this year and continue to 2032.

Public non-housing is the only sector to see an average yearly decline in output, projected at 0.7% over the forecast period, due to lack of big projects to stimulate growth in the sector. After a sharp decline of 6% expected in 2020 the sector output is forecast to stabilise and show some modest growth thereafter, largely driven by the Manchester University campus masterplan, which involves significant investment of £350m across its main campus. The work comprises the relocation of academic accommodation for the Faculty of Engineering and Physical Science from the North Campus to a new site on the South Campus and should be completed in 2022.

BEYOND 2022

Phase two of HS2 between Birmingham and Manchester is considered to be one of the big projects in the North West running after 2020. The chancellor has already announced a £300m package to support connectivity between HS2 stations at Manchester Piccadilly, Manchester airport and Crewe.

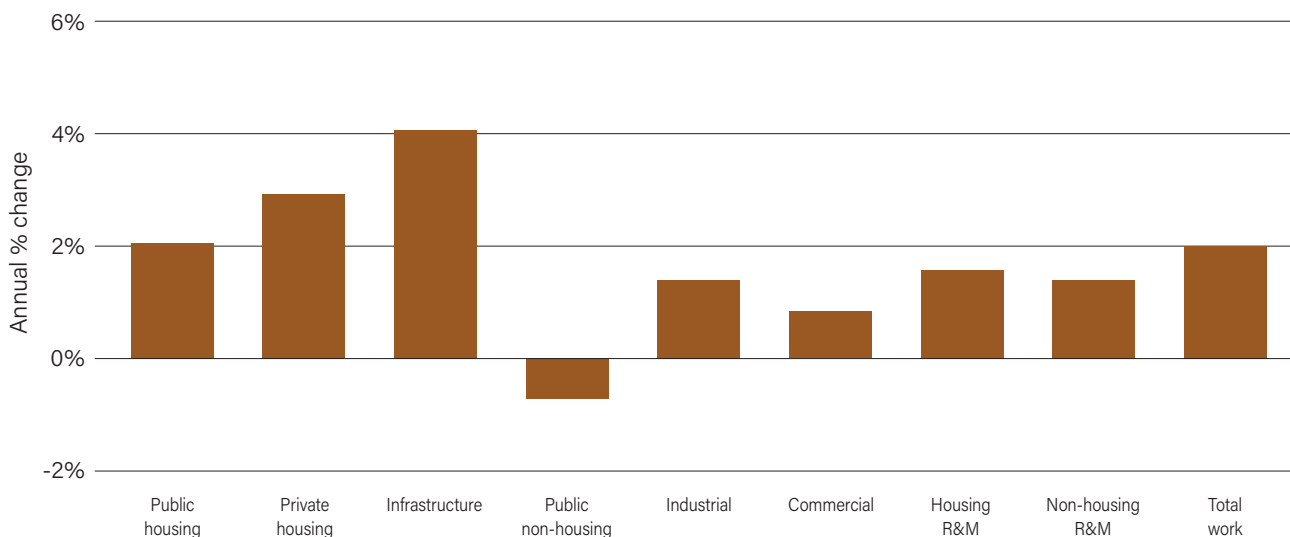
Main works on the first nuclear reactor at Moorside are expected to start in 2025. The start of the project has been delayed due to the financial difficulties that Toshiba has gone through recently.

CONSTRUCTION OUTPUT - NORTH WEST (£ MILLION, 2015 PRICES)

| | Estimate | Forecast (Annual % change) | | | | | Annual average |
|----------------------|---------------|----------------------------|-----------|------------|-----------|-----------|----------------|
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2018-2022 |
| Public housing | 420 | 6% | 4% | -5% | 1% | 5% | 2.1% |
| Private housing | 3,922 | 9% | 4% | 1% | 0% | 1% | 2.9% |
| Infrastructure | 2,378 | 4% | 2% | -10% | 5% | 23% | 4.1% |
| Public non-housing | 775 | 0% | 0% | -6% | 2% | 1% | -0.7% |
| Industrial | 402 | -2% | -1% | 3% | 4% | 3% | 1.4% |
| Commercial | 2,465 | 1% | -5% | 0% | 3% | 5% | 0.7% |
| New work | 10,362 | 4% | 1% | -3% | 2% | 7% | 2.3% |
| Housing R&M | 2,178 | 2% | 1% | 0% | 3% | 2% | 1.4% |
| Non-housing R&M | 2,807 | 2% | 2% | 2% | 1% | 0% | 1.4% |
| Total R&M | 4,986 | 2% | 1% | 1% | 2% | 1% | 1.4% |
| Total work | 15,347 | 4% | 1% | -1% | 2% | 5% | 2.0% |

Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 - NORTH WEST



Source: CSN, Experian.
Ref: CSN Explained.

CONSTRUCTION EMPLOYMENT FORECASTS FOR THE NORTH WEST

TOTAL CONSTRUCTION EMPLOYMENT FORECASTS BY OCCUPATION

The table presents actual construction employment (SICs 41-43, 71.1, and 74.9) in the North West 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.

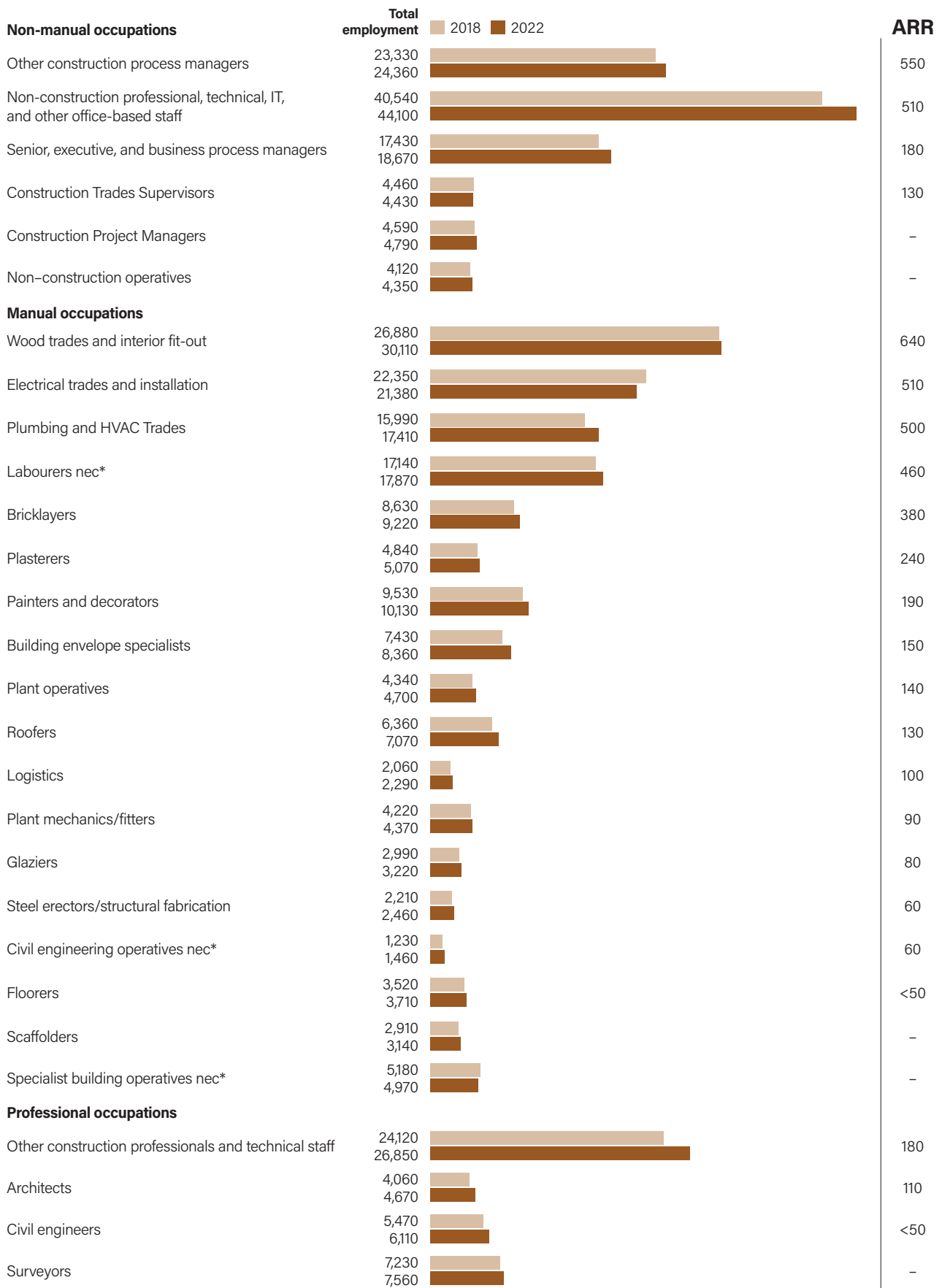
According to the Labour Force Survey (LFS) construction employment in the North West reached 275,470 in 2016, a 2% rise on the previous year and its highest level since 2011. Only marginal growth is expected in 2017, but it is then projected to accelerate to an average annual rate of 1.9% over the next five years outpacing UK growth of 0.5% a year. Over the five years to 2022 this will be the equivalent to an increase of approximately 26,700 in the construction workforce in the North West. Construction employment is predicted to reach 302,830, by 2022, around 97% of its 2008 peak.

Growth is expected across most of the occupations in the region over the next five years with civil engineering operatives nec., and architects predicted to see the largest average yearly growth of 4.6% and 3.8% respectively. Increases are expected to be generally strongest for the professional occupations and weakest for the managerial/administrative ones. This is a somewhat different profile than for the UK as a whole, where growth is projected to be weakest for the trades/manual occupations.



TOTAL EMPLOYMENT BY OCCUPATION - NORTH WEST

Annual recruitment requirement (ARR) by occupation



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

ANNUAL RECRUITMENT REQUIREMENTS (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 estimated ARR for the North West, at 5,470, is the highest absolute requirement across all the regions and devolved nations. On a relative basis, it represents 1.9% of base 2018 employment, higher than the UK average of 1.2%. While no occupation is flagged up with a high requirement (over 5% of base employment), 11 have a medium requirement (between 2.6% and 5% of base employment), including plasterers (5%), logistics personnel and civil engineering operatives nec. (both 4.9%), and bricklayers (4.4%).

In absolute terms the largest requirements for construction-specific occupations are for wood trades and interior fit-out (640 a year on average), other construction process managers (550), and electrical trades and installation trades (510).

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 WEST

2018-2022

| | 2018-2022 |
|--|-------------|
| Non-manual occupations | |
| Non-construction professional, technical, IT, and other office-based staff | 510 |
| Other construction process managers | 550 |
| Senior, executive, and business process managers | 180 |
| Construction trades supervisors | 130 |
| Construction project managers | - |
| Manual occupations | |
| Wood trades and interior fit-out | 640 |
| Labourers nec* | 460 |
| Electrical trades and installation | 510 |
| Painters and decorators | 190 |
| Plumbing and HVAC Trades | 500 |
| Bricklayers | 380 |
| Plant operatives | 140 |
| Logistics | 100 |
| Plasterers | 240 |
| Roofers | 130 |
| Scaffolders | - |
| Specialist building operatives nec* | - |
| Building envelope specialists | 150 |
| Steel erectors/structural fabrication | 60 |
| Glaziers | 80 |
| Plant mechanics/fitters | 90 |
| Floorers | <50 |
| Civil engineering operatives nec* | 60 |
| Professional occupations | |
| Other construction professionals and technical staff | 180 |
| Civil engineers | <50 |
| Surveyors | - |
| Architects | 110 |
| Total (SIC 41-43) | 5140 |
| Total (SIC 41-43, 71.1, 74.9) | 5470 |

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

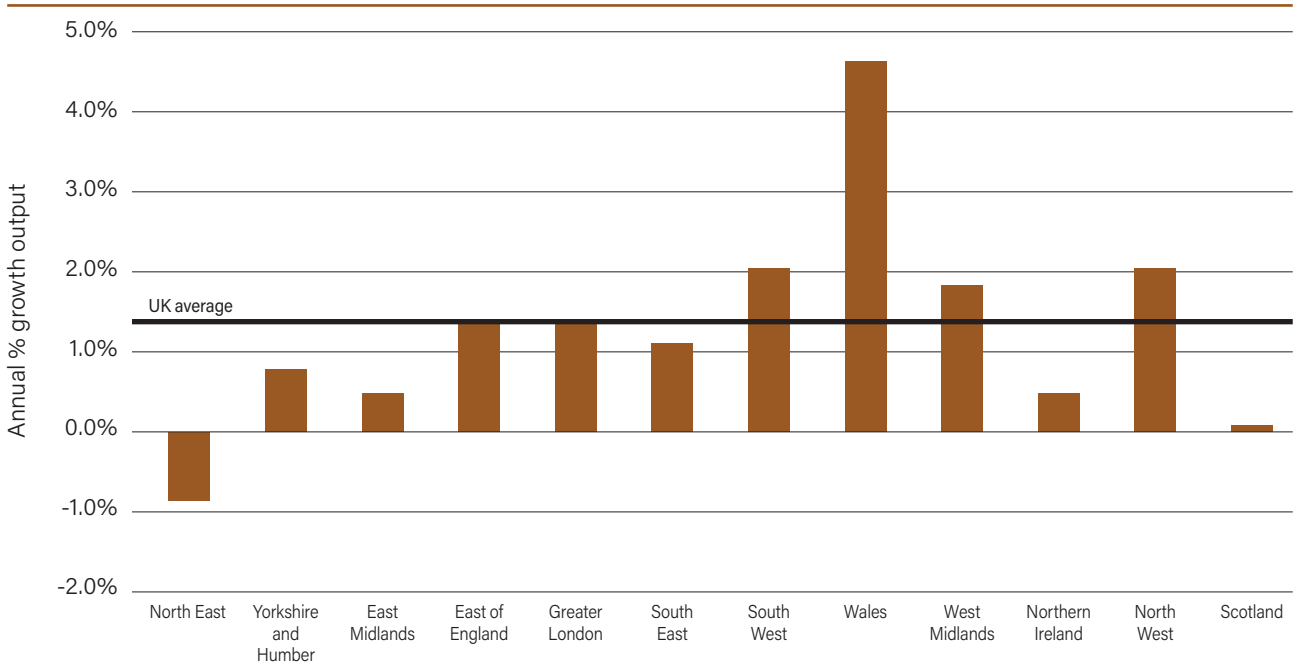
will also see good growth in infrastructure activity as work on High Speed 2 builds up over the forecast period. The strong infrastructure growth in the West Midlands should enable it to experience annual average expansion in total construction output of 1.8%, just behind the South West and North West.

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%.

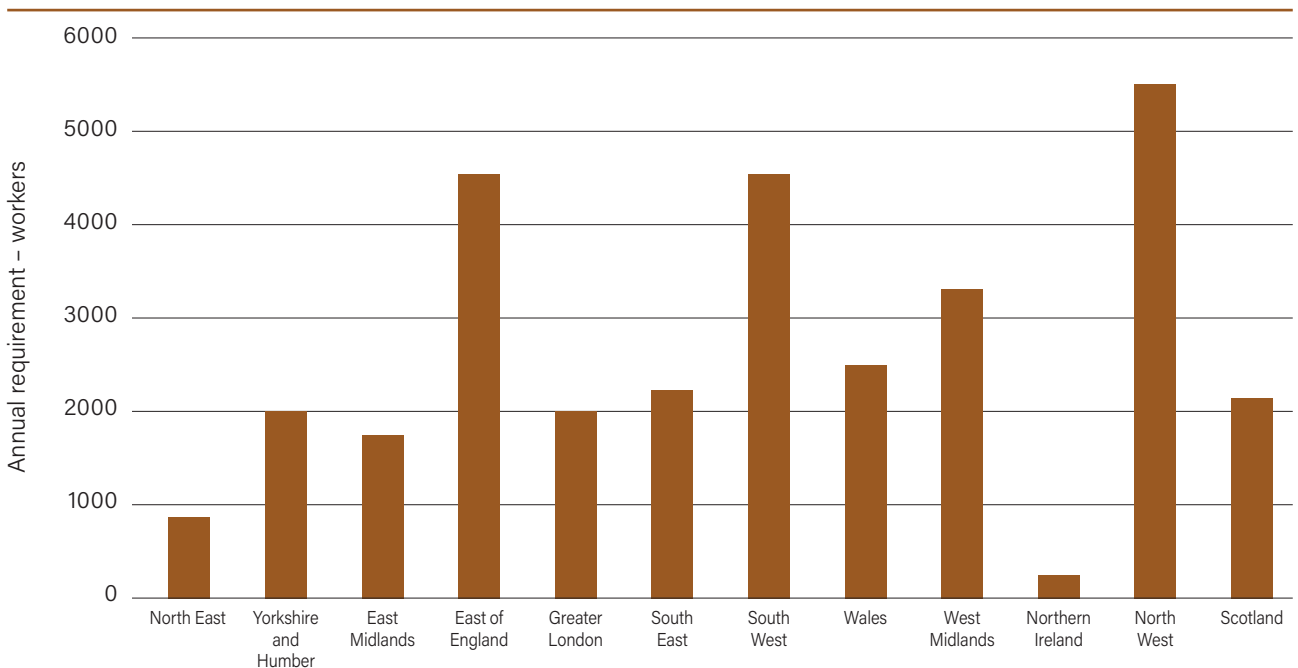
As the annual recruitment requirement (ARR) takes into account known supply-side factors, such as intra-regional labour movements and movements between other industries and construction, the pattern can look significantly different to the profile of output and employment, as some regions and devolved 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.

▮▮ The estimated ARR for the North West, at 5,470, is the highest absolute requirement across all the regions and devolved nations. ▮▮

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:

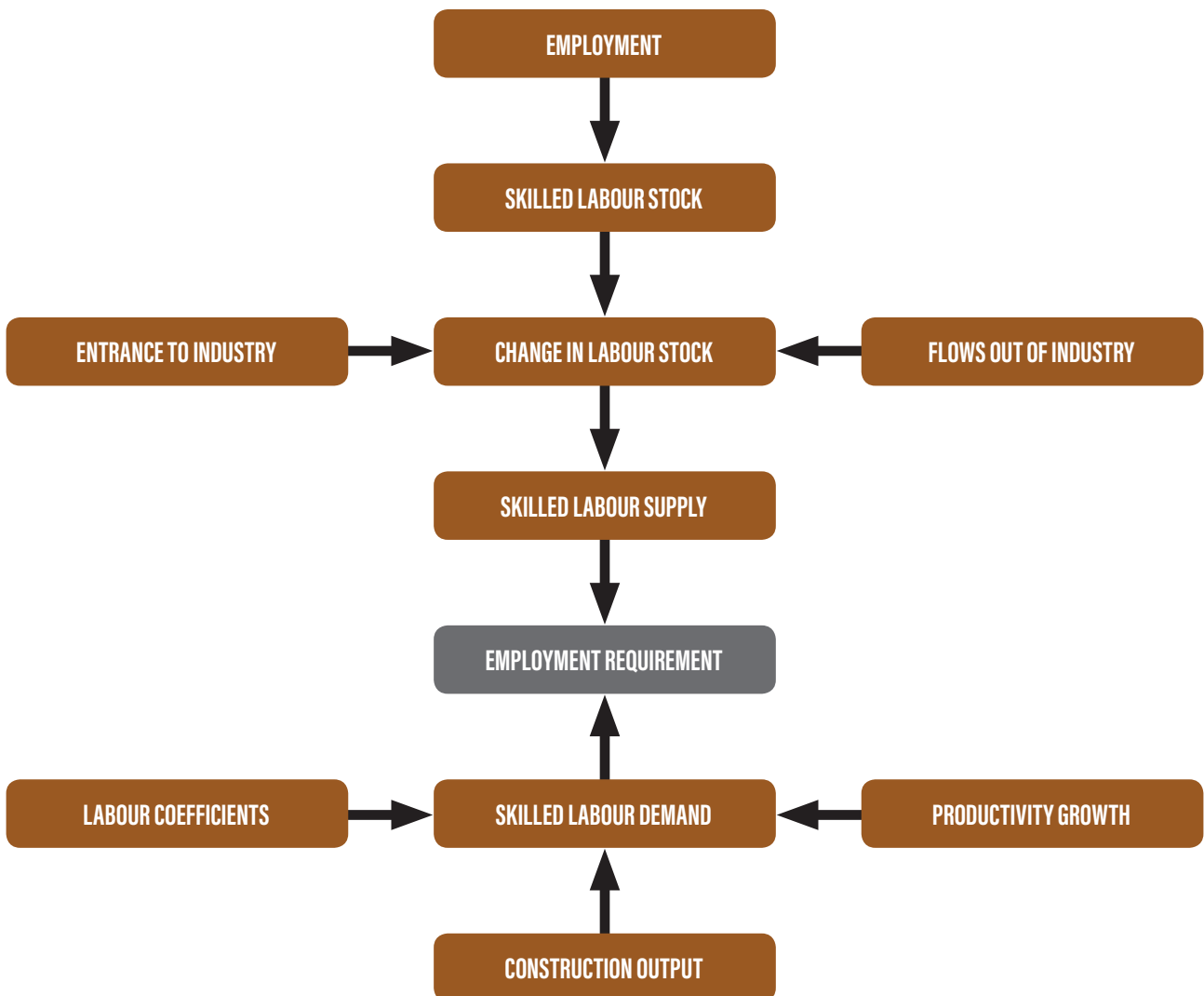
- Transfers to other industries
- International/domestic out migration
- Permanent retirements (Including permanent sickness)
- Outflow to temporary sickness and home duties.

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 |
| 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 |
|---|------|

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 | | 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

**For more information about the
Construction Skills Network, contact:**

Kirsty Woolsey

Research Analyst

0300 456 7807

kirsty.woolsey@citb.co.uk

citb.co.uk/csn

