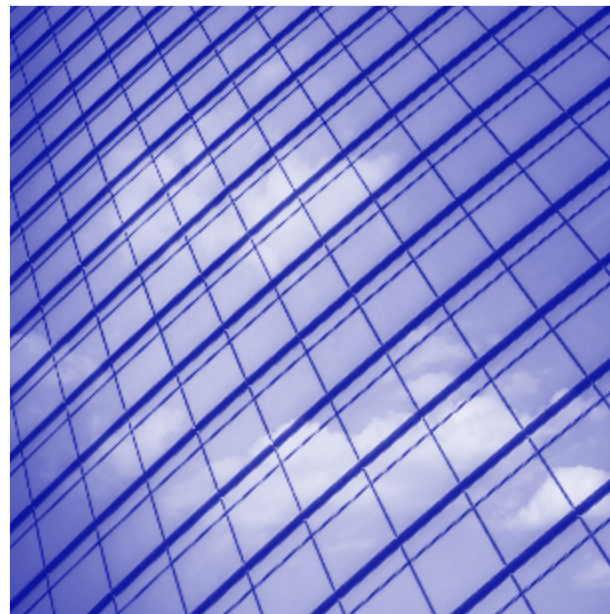




CITB RESEARCH

# INDUSTRY INSIGHTS

Construction  
Skills Network  
**Forecasts**  
**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 UK, specialising in the economic analysis of the construction and related industries in 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 contractor's activity as part of the European Commissions' 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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# FOREWORD

## CITB's Construction Skills Network 2018-2022 forecast shows output and employment growth despite recent political and economic upheavals.

The construction sector faced a range of challenges and uncertainties in 2017.

Industry saw uncertainty arise from Brexit negotiations, in the markets and, crucially, for employers eager to plan ahead. The construction sector has been equally shaken by the liquidation of Carillion, at the start of this year causing additional market unease and most significantly delivering a real blow to the company's thousands of employees and their families, as well as those engaged in the supply chain.

This report shows that despite these problems the UK's construction sector has withstood a tough 12 months of uncertainty, transition and tests. These challenges have led to a national focus on the skills and employment challenges facing both the construction sector and the country.

Construction's continued growth, forecast to average 1.3% over the next five years, along with news that employment will rise for the fourth year running, is encouraging.

However, to recruit the extra 158,000 construction workers required to meet demand by 2022, industry must collaborate on a range of skills and recruitment challenges.

UK construction needs to boost apprenticeships and work placements. It also has to reduce the skills supply gap and accelerate the pace of modernisation. As part of this, CITB needs to reform and modernise swiftly, too, as demonstrated in the feedback during our biggest ever Levy consultation

Turning to the challenges posed by Brexit, industry must refresh its approach to training, focusing on recruiting a UK-based workforce. As Brexit negotiations progress, CITB will lead on developing the evidence base needed to help industry and government make informed skills and investment decisions. We will also coordinate training and make the case to government on what a future migration regime could look like.

Productivity remains a key construction challenge. November's multi-million-pound sector deal was a welcome step forward in this regard. It will see big investment from construction firms and help produce high-skilled workers.

Housing remains an industry priority. In last November's budget the Chancellor pledged to increase the annual rate of house building from 217,000 to 300,000. This report shows that housing output, both public and private, will expand at a reasonably robust rate to 2022.

In my first year as CITB Chief Executive I have seen excellent work to boost skills and employment across the UK.

In Scotland the Modern Apprenticeship (MA) programme continues to go from strength to strength with over 5,000 modern apprentices currently in training.

Meanwhile in 2018, Wales, which has the highest projected growth rate in the UK for the fourth consecutive year, will see the opening of the Construction Wales Innovation Centre, a unique venture which will annually train over 1,000 people.

Since last year's Levy consultation, CITB has a clearly defined path, one directed by industry towards meeting the future skills challenges.

This forecast offers industry room for cautious optimism and evidence to make informed planning decisions. CITB looks forward to collaborating with the sector to supply the skills it needs in the crucial years ahead.

**Sarah Beale**  
Chief Executive



# ECONOMIC OVERVIEW

The dip in UK construction growth and employment outlined in this report was expected.

The UK economy has slowed and complex Brexit negotiations are ongoing.

However, despite the uncertain economic and political climate, this report, the UK's most comprehensive construction forecast, provides room for restrained optimism.

Although construction growth is, at 1.3%, down on the 1.7% we predicted in 2017, the fall is not dramatic when framed by the turbulent 12 months we've seen.

Encouragingly, growth looks more balanced and, vitally, sustainable. Last year, we suggested that construction was flying on one engine with infrastructure delivering most of the growth. This year, although it's still set to grow faster than other sectors, we are now expecting the housing sector to make a greater contribution.

Housing output, both public and private, is expected to grow by an annual average of 2.8% and 2.2% respectively. And the commitment to building significantly more homes and the greater role of building for renting should provide the stability that will give existing and new providers the confidence to do things differently.

And these will be important positive contributions at a time when other aspects of the economic environment are more challenging. For example, a weaker pound, stronger growth elsewhere and uncertainty around Brexit may all make it harder to attract and retain skilled workers from abroad.

Our wider research shows that profitability remains down against the long term trend; KPI data indicates average margins stuck at around 2.0%, and several of the industry's largest contractors booking losses. While the recent, unfortunate liquidation of Carillion is hopefully not the sign of things to come, it illustrates the scale of challenges that construction faces and the importance of progressing the Sector Deal and improving productivity.

Looking further ahead, the terms of Britain's Brexit deal will shape construction growth for many years to come. Since Britain voted to leave the EU, many investors have been understandably cautious about committing to big, long-term projects, preferring to plan to a pre-construction point before releasing funds. This means that when the Brexit deal is complete we may see delayed construction projects given the go-ahead.

The terms of Brexit will also provide clarity on the role overseas workers may play in the long-term.

Forecasting events in the crucial year ahead is an extremely challenging task. The next 12 months may yet see a General Election or even another EU referendum.

For now, the UK construction sector can take reasonable comfort in the fact it has weathered a range of political, economic and market uncertainties in what has been an exceptionally testing period. We can hope that by this time next year we will have more certainty about the UK's economic direction and future. But equally important will be the steps that as an industry, we take to shape our own destiny.

**Steve Radley**  
CITB Director of Policy



## CONSTRUCTION INDUSTRY STRUCTURE 2017

UK

Public housing

3%

Private housing

20%

Infrastructure

12%

Public non-housing

7%

Industrial

3%

Commercial

19%

Housing R&M

19%

Non-housing R&M

17%

Source: ONS, Experian.

## TOTAL EMPLOYMENT BY OCCUPATION - UK

### Annual recruitment requirement (ARR) by occupation

	Total employment	2018	2022	ARR
<b>Non-manual occupations</b>				
Non-construction professional, technical, IT, and other office-based staff	380,190			3,810
Other construction process managers	210,400			2,770
Senior, executive, and business process managers	181,340			1,740
Construction Trades Supervisors	50,240			1,580
Construction Project Managers	47,710			690
Non-construction operatives	36,330			-
	379,400			
<b>Manual occupations</b>				
Wood trades and interior fit-out	263,850			3,070
Labourers nec*	134,070			1,870
Electrical trades and installation	197,200			1,630
Painters and decorators	113,020			1,580
Plumbing and HVAC Trades	168,010			1,340
Bricklayers	71,640			1,240
Plant operatives	39,960			840
Logistics	23,590			800
Plasterers	53,270			650
Roofers	47,430			590
Scaffolders	22,480			470
Specialist building operatives nec*	58,480			440
Building envelope specialists	108,130			370
Steel erectors/structural fabrication	24,550			310
Glaziers	30,150			270
Plant mechanics/fitters	42,750			190
Floorers	26,640			160
Civil engineering operatives nec*	22,150			240
	23,390			
<b>Professional occupations</b>				
Other construction professionals and technical staff	203,190			2,140
Civil engineers	56,820			1,430
Surveyors	74,440			950
Architects	43,340			430
	47,760			

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

# SECTORS

Figures show residential and infrastructure sectors doing well but non-residential building struggling.

**Infrastructure:** Infrastructure is expected to be the strongest sector in output terms, driven by a small number of huge projects, such as High Speed 2 (HS2), and new nuclear build at Hinkley Point and Wylfa. Annual average growth of 3.1% over the five years to 2022 is likely to peak in 2019.

**Residential/Housing:** Housing output, both public and private, is expected to grow by 2.8% and 2.2% respectively, which will considerably reduce the dependence on infrastructure to buoy up the sector.

**Education and health construction:** With the focus on the residential and infrastructure sectors, public expenditure on education and health construction is projected to fall, only in part mitigated by an increase in defence work as part of the Army Basing Plan, although this will complete in 2019.

**Commercial construction:** Office space was the sector identified as the most vulnerable to a more cautious attitude by investors and developers to bringing new projects forward due to Brexit uncertainties. This is proving to be the case with new orders for office construction on a downward trend and output growth weakening significantly.

**Retail construction:** Retail construction continues to be impacted, largely negatively, by the changing shopping habits of British consumers, leaving only leisure construction of the big three components of the commercial sector showing growth in the short term.

**Repair and maintenance (R&M):** Growth across all the new work sectors is projected to average 1.5% a year over the 2018 to 2022 period, with the repair and maintenance sector seeing slightly slower expansion of 1.1% per annum. The prognosis for housing R&M is for significantly stronger than long-term trend growth (1.2%) largely due to the potential rework across the public high rise estate following the Grenfell Tower tragedy.



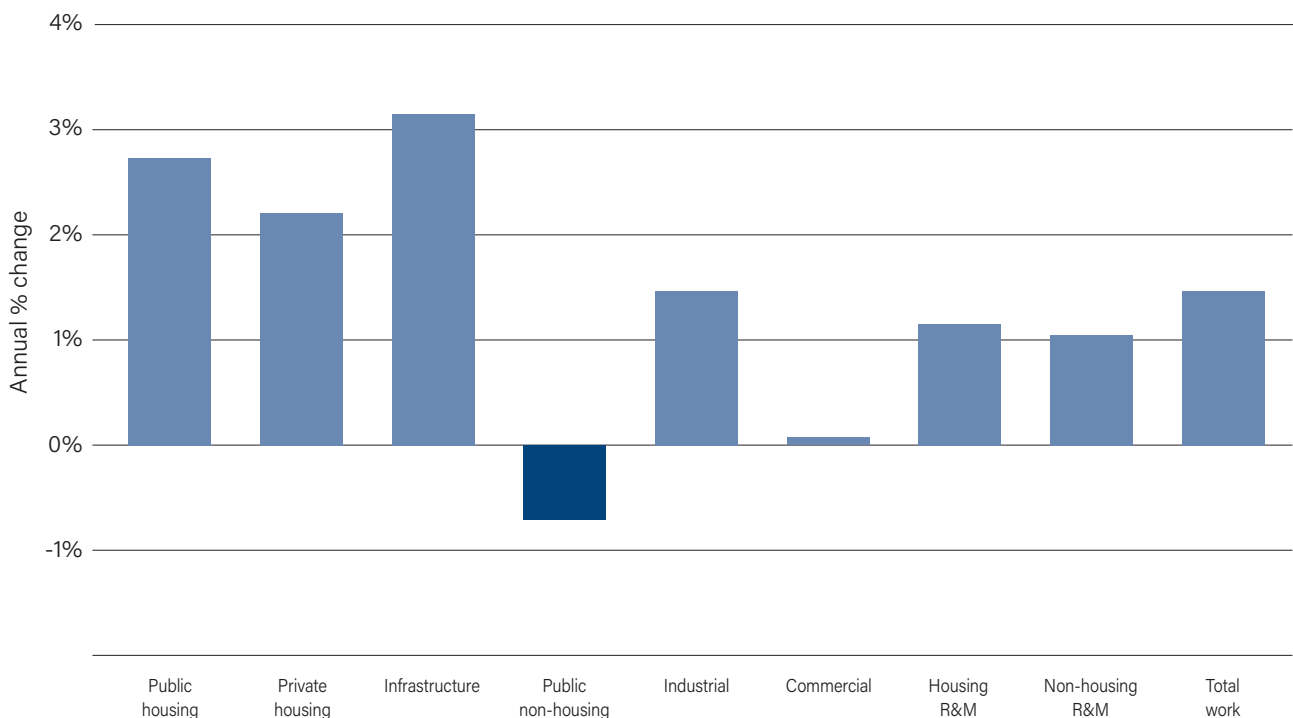


## CONSTRUCTION OUTPUT - UK (£ MILLION, 2015 PRICES)

	Estimate	Forecast annual % change					Annual average
	2017	2018	2019	2020	2021	2022	2018-2022
Public housing	5,493	3%	3%	1%	4%	3%	2.8%
Private housing	32,025	4%	3%	2%	0%	2%	2.2%
Infrastructure	18,977	3%	9%	-1%	0%	5%	3.1%
Public non-housing	10,671	-1%	0%	-3%	1%	0%	-0.6%
Industrial	4,233	1%	1%	1%	2%	2%	1.4%
Commercial	29,563	-1%	-3%	-2%	2%	4%	0.0%
<b>New work</b>	<b>100,963</b>	<b>2%</b>	<b>2%</b>	<b>0%</b>	<b>1%</b>	<b>3%</b>	<b>1.5%</b>
Housing R&M	29,025	0%	1%	1%	2%	2%	1.2%
Non-housing R&M	26,362	1%	2%	2%	1%	0%	1.1%
<b>R&amp;M</b>	<b>55,387</b>	<b>0%</b>	<b>1%</b>	<b>1%</b>	<b>2%</b>	<b>1%</b>	<b>1.1%</b>
<b>Total work</b>	<b>156,350</b>	<b>1%</b>	<b>2%</b>	<b>0%</b>	<b>1%</b>	<b>2%</b>	<b>1.3%</b>

Source: CSN, Experian.

## ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 - UK



Source: CSN, Experian.

# EMPLOYMENT

Employment is projected to grow, for the fourth consecutive year, at 0.5% a year on average to 2022, the same as the whole economy rate. This would take employment in the industry to 2.77 million in 2022, only 3% below the 2008 peak.

**Demand: Annual Recruitment Requirement:** Projected employment growth leads to an average annual recruitment requirement (ARR) of 31,600 from 2018 to 2022, 11% down on the ARR of 35,470 estimated for the 2017 to 2021 period last January.

In a medium term context, the annual average means that the industry needs to recruit an extra 158,000 workers over the next five years to meet projected demand.

**Professions in high demand:** The largest ARR for specialist trades are predicted for: wood trades and interior fit out (3,070) other construction process managers (2,770) professionals and technical staff (2,140).

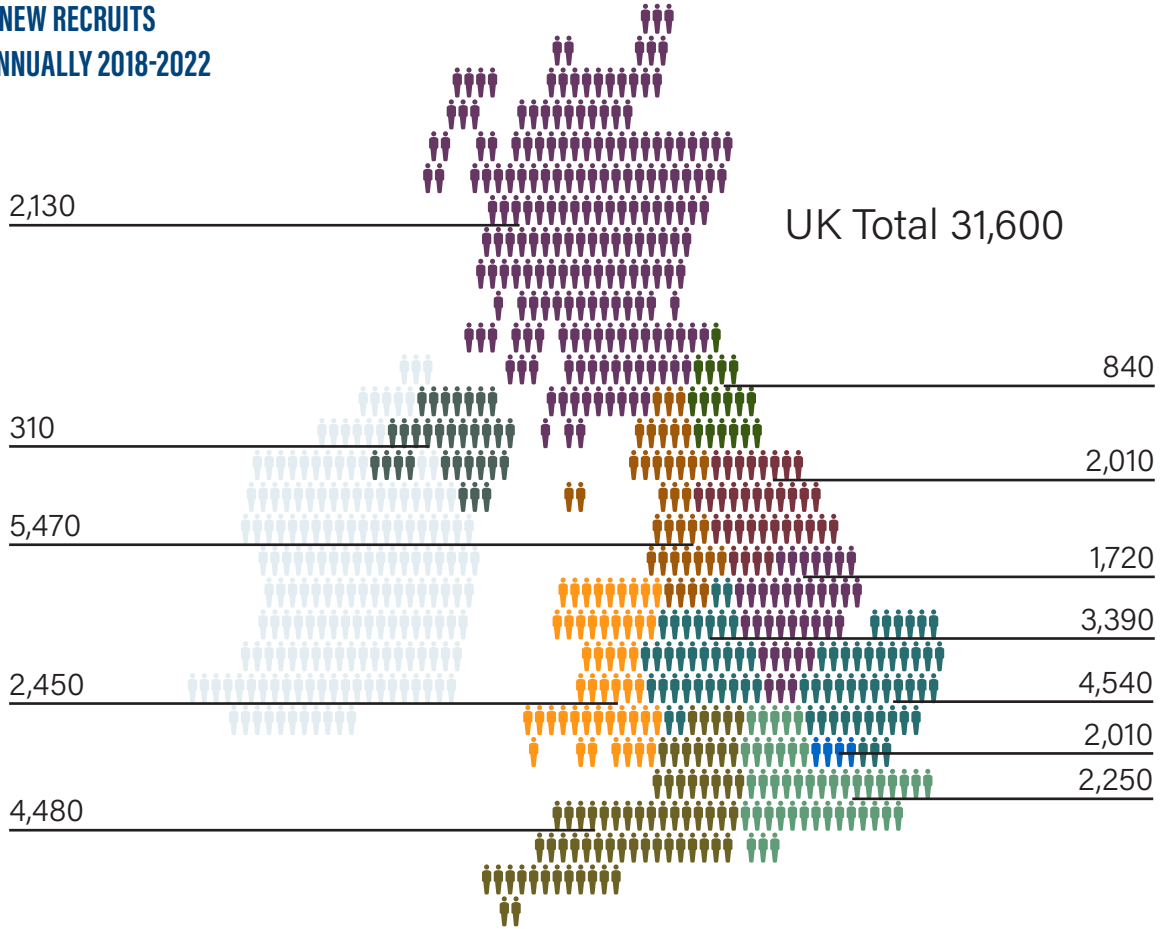
Taken as a proportion of base 2018 employment levels, the highest ARRs are for logistics personnel (3.4%) construction trades supervisors (3.1%) civil engineers (2.5%).

There is continued growth in well paid managerial roles, which is welcome and should prove straightforward in recruitment terms. There is no reason to expect that this trend will change in the short to medium term and as construction modernises we believe that professional, managerial roles will become established as a key area for recruitment.

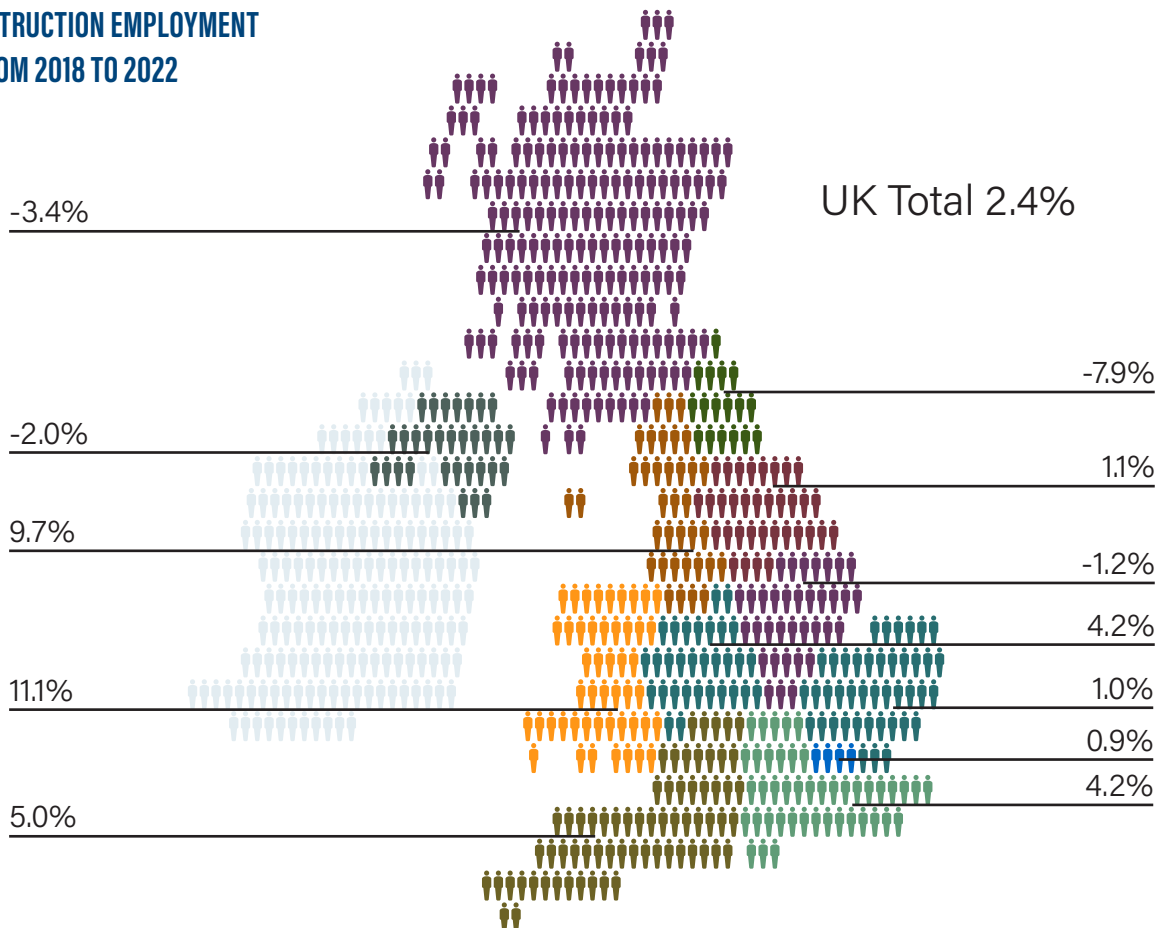
Construction remains an attractive option for new business start-ups. The latest Business Population Estimates from the Department of Business, Energy & Industrial Strategy reporting nearly 33,000 more construction businesses at the start of 2017 compared with the start of 2016.



**NUMBER OF NEW RECRUITS  
REQUIRED ANNUALLY 2018-2022**



**TOTAL CONSTRUCTION EMPLOYMENT  
GROWTH FROM 2018 TO 2022**



# NATIONS AND REGIONS

The picture is mixed across the regions and devolved nations with overall economic performance tending to drive stronger construction growth in the southeast corner of England, except where major infrastructure schemes have an impact. Wales leads output growth for the fourth consecutive year.

**1. Wales: 4.6%:** 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.

**2. South West: 2.0% and North West: 2.0%:** The South West and North West lead England's growth rankings with 2% a year on average. The South West will benefit from the new nuclear build at Hinkley Point, the North West will prosper via the construction of the Moorside Nuclear Power Station. Enabling works at Hinkley Point have been ongoing for some time while some work at Moorside is projected to begin in 2022.

**3. West Midlands: 1.8%:** 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.

**4. Greater London: 1.5%:** London only manages average yearly growth of 1.5%. Although 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.

**5. East of England: 1.3%:** The region's construction output is forecast to rise by an annual average of 1.3% in the five years to 2022, in line with the UK rate. Private housing is expected to be the most significant contributor to regional growth.

**6. South East: 1.1%:** SE construction output is forecast to rise by an annual average of 1.1% over the next five years, just below the UK average of 1.3%. 11,250 construction workers will be required. SE's public housing sector is expected to see the greatest annual average expansion, 3.5% between 2018 and 2022. There is a variety of long-term local housing projects and "garden villages" at early planning stages.

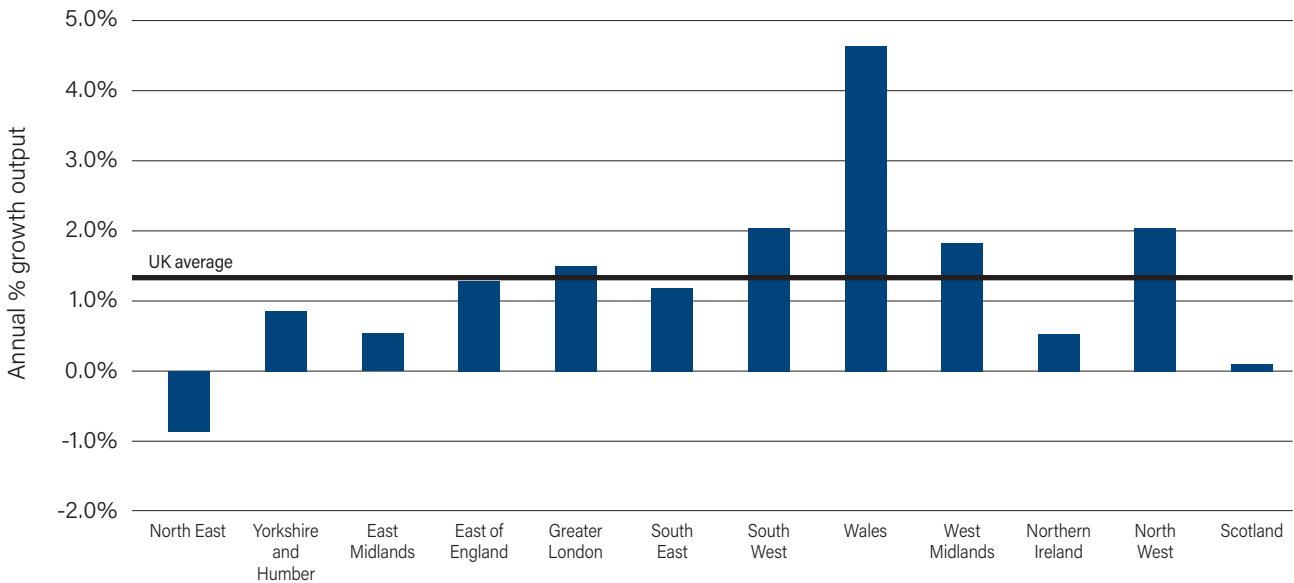
**7. Yorkshire and Humber: 0.8%:** CSN forecasts 10,050 new construction jobs for Yorkshire and Humber from 2018 – 22. The industrial sector is likely to be the main growth-driver. Output is predicted to be an annual average of 0.8% over the next five years, below the UK rate of 1.3%. However, by 2022, growth is projected to be just short of its 2004 peak.

**8. Northern Ireland: 0.5% and East Midlands: 0.5%:** 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. CSN estimates 8,600 new construction jobs will be created in the East Midlands from 2018 – 22. Infrastructure is the strongest sector, growing at an annual average rate of 4.6%. This figure is aided by the build-up of work related to HS2 and the expectation that a large offshore wind farm will be built at Triton Knoll in Mablethorpe, Lincolnshire.

**9. Scotland: 0.1%:** 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.

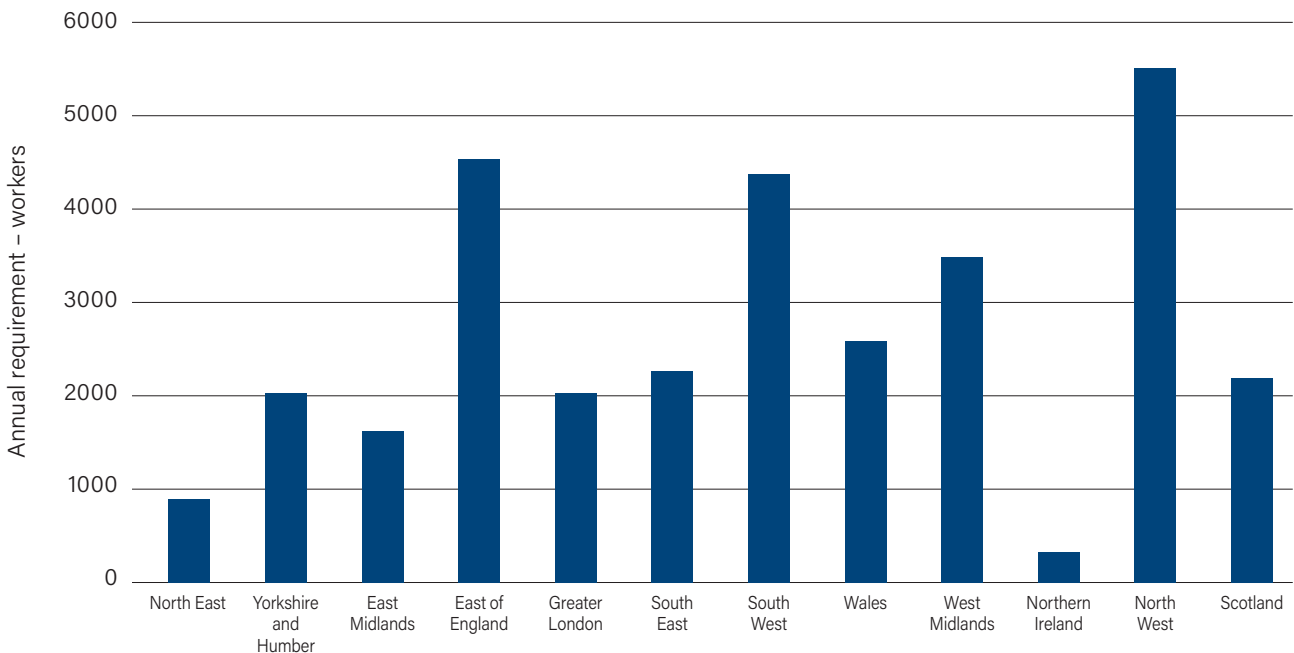
**10. North East: -0.8%:** CSN forecasts 4,200 new construction created in the North East from 2018 – 22. The industrial sector is likely to see the biggest average increases per annum. There are several projects in the pipeline that should lead to steady expansion. For example, work on a £70m Teesside mineral refinery should start next year. The region's biggest sector, private housing, is anticipated to reach a new high of £1.33bn by 2022 (2015 prices).

## 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.

Average construction employment is expected to grow at just 0.5% per year over the forecast period.

# WALES

Construction output growth in Wales over the 2018 to 2022 period is projected to average 4.6%, down from 6.2% projected last year for the 2017 to 2021 period. This is due in part to changes in the timing of some major projects and the loss of one programme of work, the electrification of the rail line between Cardiff and Swansea. Nevertheless, Wales's growth rate is significantly higher than the UK's (1.3%). Based on the expansion in output, employment is expected to grow at an annual average rate of 2.1%, again well above the UK rate of 0.5%. Wales's annual average recruitment requirement (ARR) is estimated at 2,450, which represents 2.2% of base 2018 employment.

## KEY FINDINGS

Growth in the infrastructure sector

**14.2%**  
a year on average

Employment is forecast to grow by

**2.2%**  
a year on average

Wales has an ARR of

**2,450**

After a 10% rise in 2016, construction output in Wales is estimated to have grown by a further 6% last year, to £5.43bn (2015 prices), close to its 2007 level but still 4% below its 2004 peak. Growth was largely centred in the public housing, public non-housing and commercial sectors, the latter seeing a second consecutive year of very strong double-digit rises, albeit from a very low base.

Wales is projected to see annual average output growth of 4.6% over the five years to 2022, the strongest of any of the regions and devolved nations. It remains the case that expansion will be driven primarily by strong growth in the infrastructure sector, of around 14% a year on average. While the start of work on new nuclear build at Wylfa Newydd during the forecast period will be the main engine of growth, the sector will also benefit from a raft of other energy and transport projects, such as the M4 upgrade and South Wales Metro.

Governments, both at Westminster and in the devolved nations, are increasingly focussed on attempting to address the demand/supply mismatch in the housing market, meaning that the prospects for both public and private housing have improved. In Wales the target is for 20,000 new affordable homes by 2020/21, and there are a number of long-term regeneration projects either on site or in the pipeline that should provide a steady stream of output for many years to come.

In contrast, the prospects for the non-housing sectors are weaker, with public non-housing output only picking up towards the end of the forecast period as Band B of the 21st Century Schools programme ramps up. Commercial construction, after two very good years, is expected to suffer from investor caution due to Brexit over the next couple of years or so.

Employment growth is projected to average 2.1% a year between 2018 and 2022, well above the UK rate of 0.5%. The Welsh construction workforce is predicted to reach nearly 121,500. Demand is expected to be strongest for civil engineers and surveyors, both with annual average growth rates of around 4%. Overall, growth will be fairly evenly spread across the major occupational categories – managerial/administrative, professional, and trades/manual.

Wales's ARR is estimated at 2,450 a year on average, representing 2.2% of base 2018 employment, once again the highest ratio across all the regions and devolved nations, and well above the UK's 1.2%. Wales traditionally suffers from high net outflows of its construction workforce to other areas of the UK, in particular to the South West and North West of England, and so it tends to have a high relative ARR.

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 3%

Private housing

20% | 17%

Infrastructure

12% | 25%

Public non-housing

7% | 9%

Industrial

3% | 2%

Commercial

19% | 13%

Housing R&M

19% | 19%

Non-housing R&M

17% | 12%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - WALES

### Annual recruitment requirement (ARR) by occupation

Occupation	Total employment	2018	2022	ARR
<b>Non-manual occupations</b>				
Non-construction professional, technical, IT, and other office-based staff	12,140			280
Other construction process managers	7,640			-
Senior, executive, and business process managers	3,690			70
Construction Trades Supervisors	3,110			80
Construction Project Managers	1,250			<50
Non-construction operatives	1,600			-
<b>Manual occupations</b>				
Wood trades and interior fit-out	13,010			410
Labourers nec*	5,700			220
Electrical trades and installation	6,530			190
Painters and decorators	5,000			150
Plumbing and HVAC Trades	8,970			100
Bricklayers	5,810			220
Plant operatives	1,780			<50
Logistics	1,010			<50
Plasterers	5,450			70
Roofers	1,650			<50
Scaffolders	790			-
Specialist building operatives nec*	4,130			-
Building envelope specialists	4,290			<50
Steel erectors/structural fabrication	1,550			-
Glaziers	560			<50
Plant mechanics/fitters	1,590			50
Floorers	110			-
Civil engineering operatives nec*	1,550			<50
<b>Professional occupations</b>				
Other construction professionals and technical staff	6,940			260
Civil engineers	1,870			70
Surveyors	3,570			100
Architects	1,340			<50

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

# SCOTLAND

Construction output in Scotland is projected to be stable during the 2018-2022 period, 0.1% average annual growth per year, with ongoing falls in infrastructure work mitigated by growth in most of the remaining sectors. On this output prognosis, construction employment in Scotland will fall due to some productivity gains, and the decline is estimated at 0.7% a year on average. Despite this, net flows to and from the industry workforce means that Scotland still has an average annual recruitment requirement, estimated at 2,130, 0.9% of base 2018 employment, a lower ratio than for the UK at 1.2%.

## KEY FINDINGS

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

**3.9%**

Employment is forecast to decline by

**0.7%**  
a year on average

Scotland has an ARR of

**2,130**

After three years of growth, construction output in real terms stalled in Scotland in 2016, largely due to a sharp fall in the infrastructure sector from its peak in 2015. Output is estimated to have fallen by 3% in 2017 due to declines in infrastructure, public non-housing and commercial sectors, along with stagnation in repair & maintenance (R&M) work.

Over the 2018 to 2022 period, construction output in Scotland is expected to remain stable, with ongoing falls in infrastructure activity mitigated by decent growth in the housing sectors and R&M. If the infrastructure sector was excluded from the calculations, then the rest of the construction industry is predicted to grow by an annual average rate of 1.4%.

Expansion in both public and private housing will be driven in no small part by the Scottish Government's target to build 50,000 new affordable homes by 2021, the bulk of which will be public, but a significant proportion will be delivered by the private sector. There are several big long term housing developments on site or in the pipeline, particularly around the Aberdeen area, and these should help to drive decent growth in the private housing sector.

Infrastructure output in Scotland peaked in 2015 at over £3.6bn (2015 prices), a figure which represented 26% of total construction north of the border, double its share in the UK (13%). This very high level of output was being driven by a raft of largely transport projects, many of which have now completed, and output in the sector has been on the way down since 2016. While there are other programmes of work in the

pipeline, they are spread over quite long timeframes and their impact on sector growth is diluted. Output is expected to continue to decline sharply over the 2018 to 2022 period, by nearly 7% a year on average, although this will still leave its level in 2022 reasonably high in a long-term context.

Construction employment is projected to experience an average annual decline of 0.7% over the forecast period, after four years of growth which took its level to within 4% of its 2008 peak in 2017. Employment is expected to be around 233,280 in 2022. As is the case across the UK as a whole, professionals and managerial/administrative occupations are expected to fare better than the trades/manual ones in Scotland.

The ARR for Scotland over the 2018 to 2022 period is estimated at 2,130, which represents 0.9% of base 2018 employment, a lower ratio than across the UK (1.2%).

While there are no occupations flagged up as having a high requirement, there are three with a medium one (a ratio of between 2.6% and 5% of base employment), civil engineers (4.5%), trades supervisors (4.1%), and logistics (3.8%).



## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 5%

Private housing

20% | 14%

Infrastructure

12% | 20%

Public non-housing

7% | 12%

Industrial

3% | 2%

Commercial

19% | 17%

Housing R&M

19% | 13%

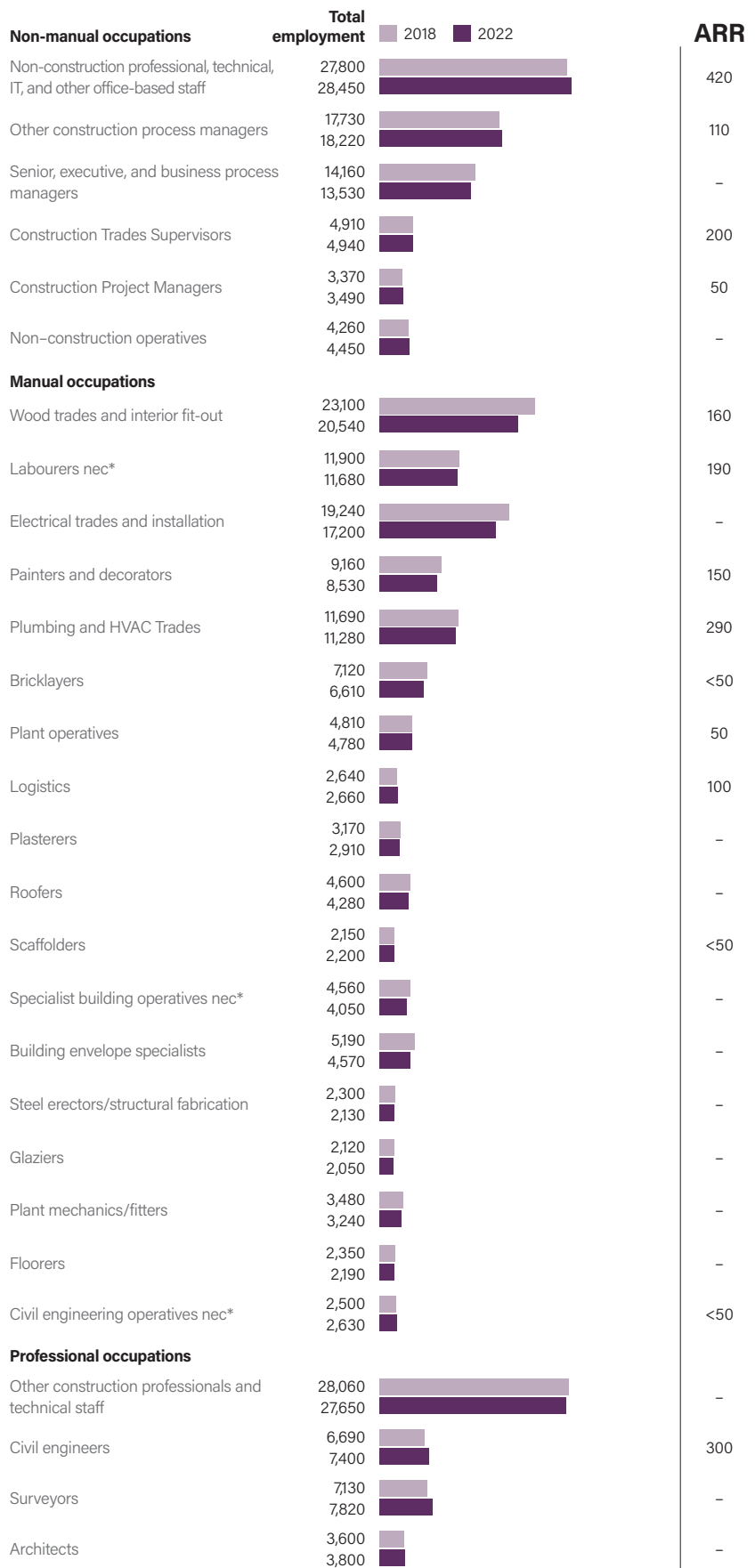
Non-housing R&M

17% | 17%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - SCOTLAND

### Annual recruitment requirement (ARR) by occupation



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

# NORTHERN IRELAND

Construction output growth in Northern Ireland is projected to average 0.5% a year over the 2018 to 2022 period, a slower growth rate than across the UK as a whole. However, output is expected to sustain a level not far short of £3bn (2015 prices) during the forecast period, not seen since the 2008/09 recession. Nevertheless, given expected productivity gains, this level of expansion in output will not be enough to drive an overall increase in employment, which is predicted to fall by 0.4% a year on average over the five-year period. Due to net outflows from the devolved nation, there will still be an annual average recruitment requirement (ARR), estimated at 310, 0.5% of base 2018 employment, a lower ratio than for the UK of 1.2%.

## KEY FINDINGS

Long term growth is expected to focus on the public housing sector at

**5.7%**

Employment is forecast to fall by

**0.4%**

a year on average

Northern Ireland has an ARR of

**310**

The recovery in the Northern Ireland construction industry, which started in 2014, continued last year, with an estimated rise in output of 11% to just under £2.9bn in 2015 prices, the best outturn since 2008. The public housing sector remained very buoyant with a third consecutive year of double-digit output increases, and robust growth was seen in the private housing and commercial construction sectors.

Almost inevitably after a period of strong recovery, output growth is projected to slow over the next few years, and average 0.5% a year over the 2018 to 2022 period, but sustain a level not far short of £3bn (2015 prices), the best performance since 2008. The sectors expected to expand are the housing (public and private) and repair & maintenance (R&M) sectors.

The public housing sector will be driven by the Northern Ireland Executive's plans to build 1,600 new social and affordable housing units. This target is being delivered in partnership with organisations such as Clanmill Housing Group, which has some 900 units on site or due to start within the next year. Output growth is predicted to average close to 6% a year over the 2018 to 2022 period.

The private housing sector is likely to see much more modest growth, of around 0.8% a year over the forecast period. There are some very big projects on site or in the pipeline at Newtownards, Coleraine, and Ballyclare, amongst

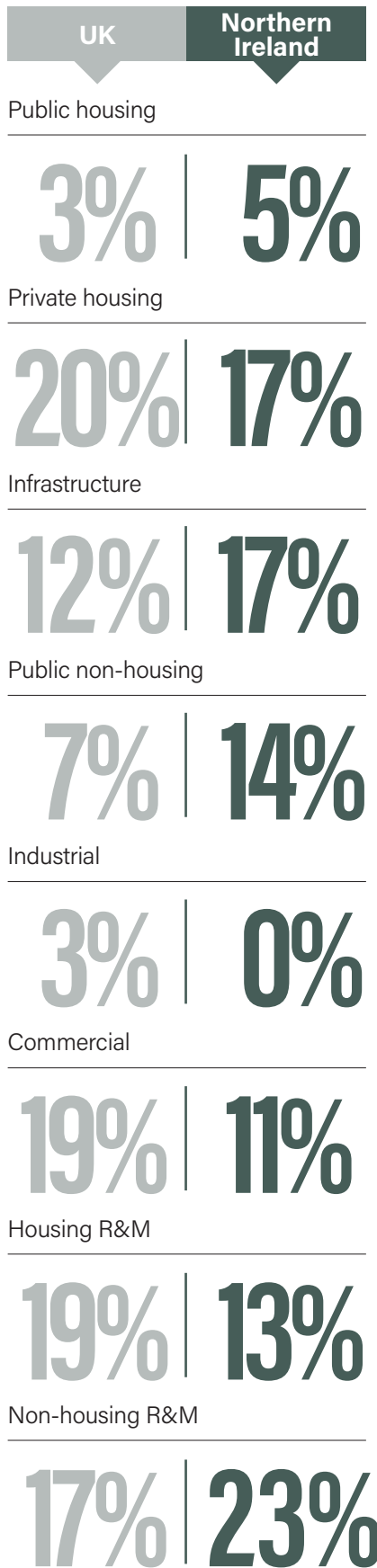
others. However, they are all long-term, with output spread over many years, thus have only a moderate impact on year-on-year growth. Nevertheless, output is projected to be in the £530m to £560m region (2015 prices) a year over the forecast period, the best sustained level of activity since 2010.

While over the past 25 years the R&M sectors have fared better in Northern Ireland compared with the UK, a similar level of R&M growth in both geographies is expected going forward as the share in the former has now reached the same level as in the latter, and weaker economic growth and some retrenchment in disposable incomes are likely to affect expenditure in the sector.

Construction employment in the devolved nation is expected to fall by 0.4% a year on average over the forecast period, to around 61,770 in 2022, after peaking in 2019 at close to 63,500. The professional occupations are predicted to see growth overall, but the managerial/administrative and trades/manual ones to see some decline.

The average annual recruitment requirement is estimated at 310, representing 0.5% of base 2018 employment, a lower ratio than for the UK at 1.2%. Only one occupation, bricklayers, is flagged up as having a ratio to base employment of over 2.5%.

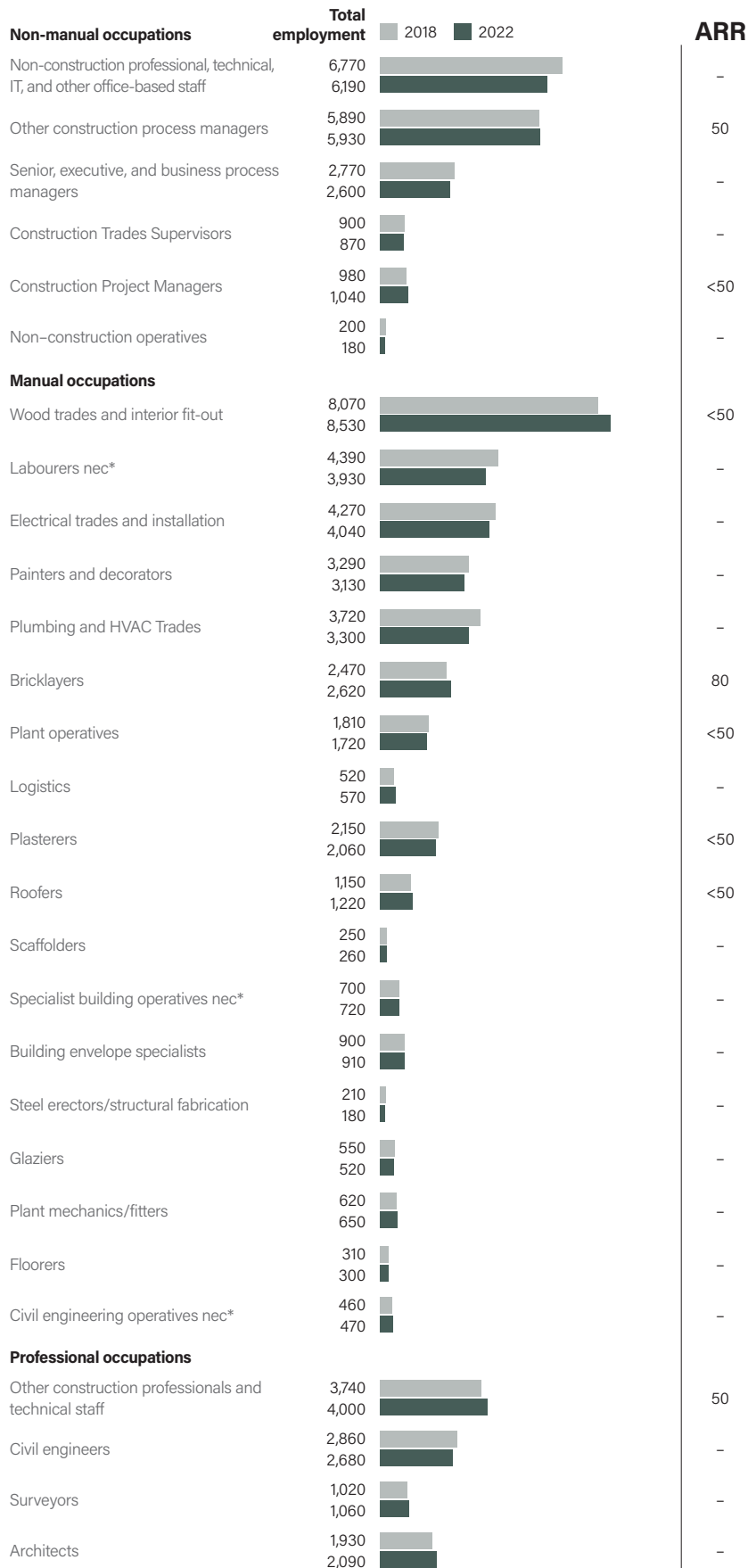
## CONSTRUCTION INDUSTRY STRUCTURE 2017



Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - NORTHERN IRELAND

### Annual recruitment requirement (ARR) by occupation



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

# NORTH EAST

In the five years to 2022 the region's total construction output is expected to decline on average by 0.8% per annum. In contrast, overall UK output is predicted to rise, by an annual average of 1.3%. The North East's construction employment is anticipated to decrease by an average yearly rate of 1.6%, while annual average expansion of 0.5% is likely for the UK. The region's annual recruitment requirement (ARR) is estimated at 840, which represents 0.9% of base 2018 employment, lower than the UK rate of 1.2%.

## KEY FINDINGS

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

**3.3%**

Employment is forecast to decline by

**1.6%**

a year on average

The North East has an ARR of

**840**

Of all regions and devolved nations, the North East's construction industry is the only one projected to decline over the next five years, with annual average falls of 0.8%. New work is forecast to decrease by an average of 1.3% per annum while the repair & maintenance (R&M) sector is likely to fare better with marginal average yearly expansion of 0.2%.

Over both the short and long term the industrial sector is likely to see the biggest average increases per annum. There are several projects in the pipeline that should lead to steady expansion. For example, work on a £70m Teesside mineral refinery should start next year. Minerals would be processed for use in a range of products including automotive parts, mobile phones, and wind turbines.

The region's biggest sector, private housing, is projected to see output rise by an annual average of 1% between 2018 and 2022. There are projects expected to take place over the forecast period however they are of a small nature. Nonetheless, by 2022 is anticipated to reach a new high of £1.33bn (2015 prices).

An average yearly fall of 5.1% is projected for the infrastructure sector in the five years to 2022. Currently the largest project taking place in the sector is MGT Power's £650m Tees Renewable Energy Plant at Teesport. With no other sizeable schemes planned, infrastructure output is likely to suffer, despite work scheduled over the long term for a raft of small sized projects.

An annual average decrease of 1.5% is predicted for the commercial sector between 2018 and 2022. Uncertain economic times as a result of Brexit has

caused investors and developers to be much more wary in taking forward new projects. This is expected to adversely affect sector output during the near term. As the terms of Brexit become clearer, both consumer and investor confidence should rise. This is then likely to lead to some growth in output over the latter part of the forecast period.

Between 2018 and 2022 the region's construction employment is likely to see average yearly falls of 1.6%. However, not all movements are likely to be in a downward direction, with 10 out of the 28 occupational categories seeing increases over the forecast period. In general, the managerial/administrative and professional occupations are expected to fare better than the trades/manual ones, in line with the UK profile.

With 840 extra recruits required per year over the five years to 2022, the region's ARR is 0.9% of base 2018 employment, lower than the UK rate of 1.2%. Despite the regions low ARR, construction trade supervisors are likely to be under some pressure with an ARR ratio between 2.6% and 5% of base employment.

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 2%

Private housing

20% | 25%

Infrastructure

12% | 18%

Public non-housing

7% | 7%

Industrial

3% | 5%

Commercial

19% | 15%

Housing R&M

19% | 14%

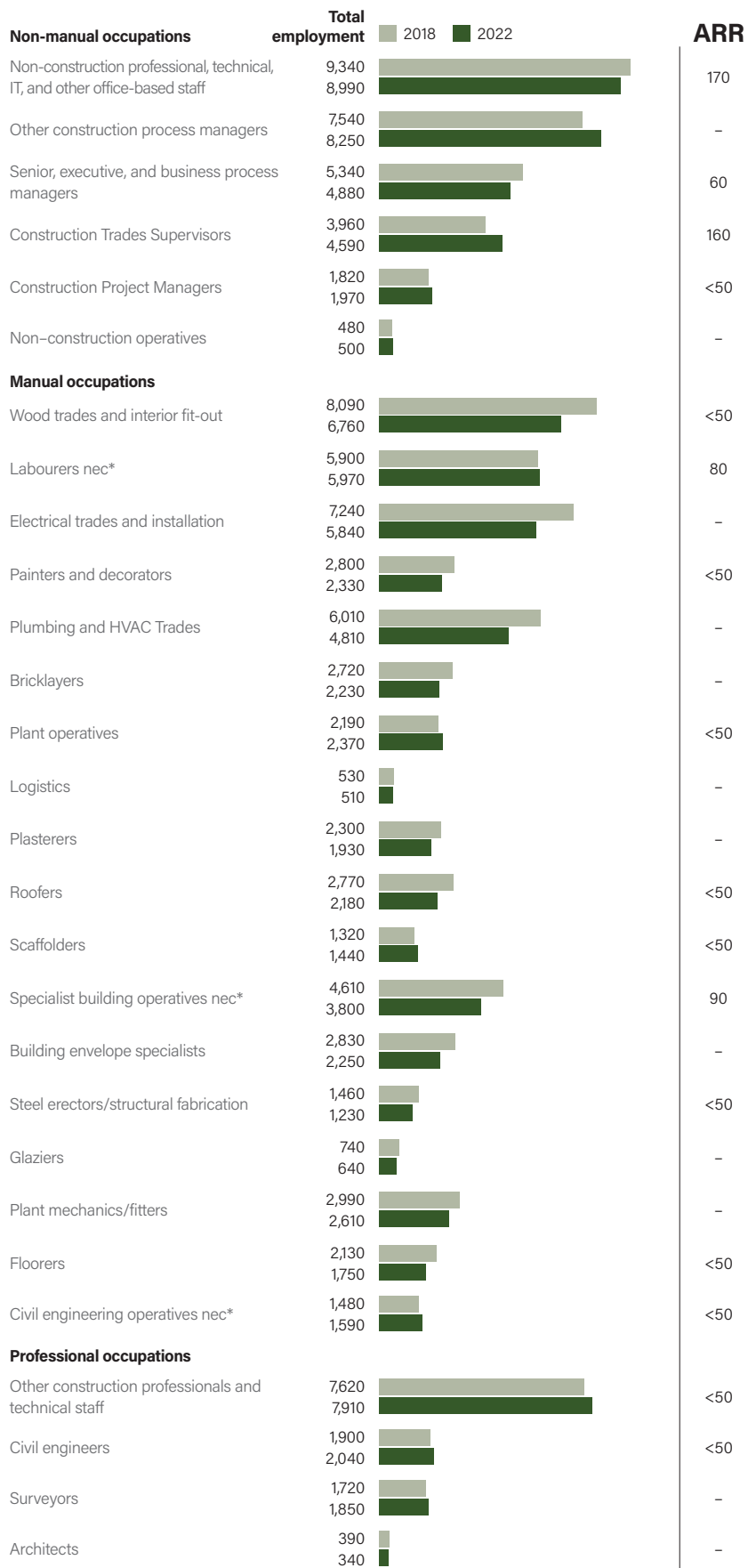
Non-housing R&M

17% | 14%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - NORTH EAST

### Annual recruitment requirement (ARR) by occupation



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

# 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 annual basis.

## KEY FINDINGS

Growth is expected to focus on the infrastructure sector in the short 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.

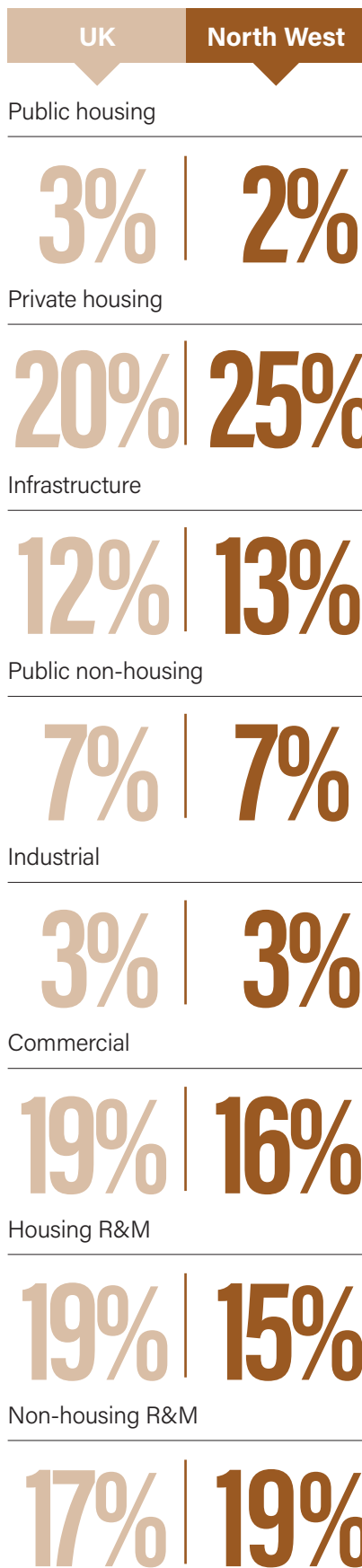
Public housing output is likely to increase by an annual average of 2.1% over the next five years, supported by projects such as the £100m deal signed by Sefton Council to build more than

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).

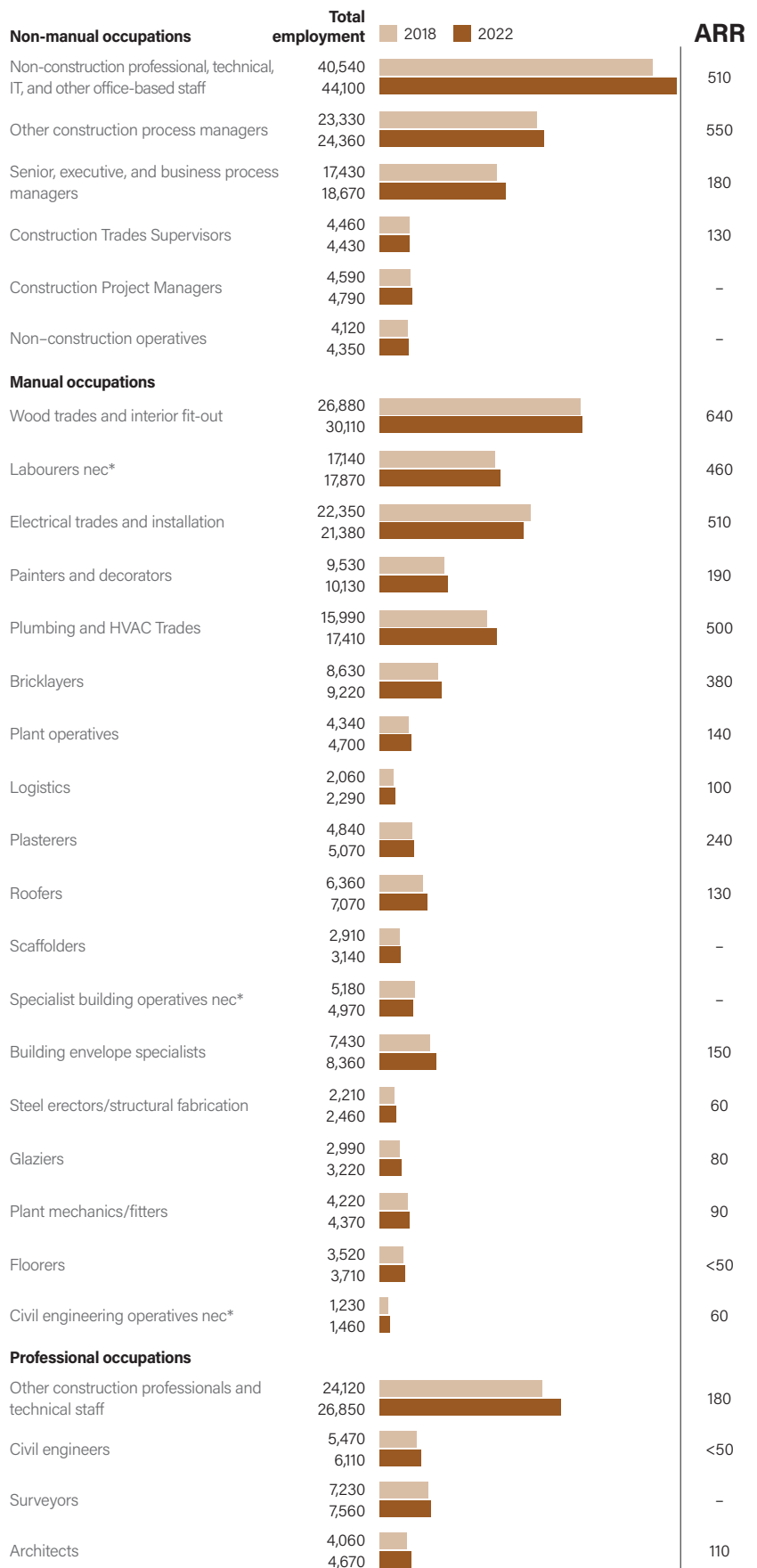
## CONSTRUCTION INDUSTRY STRUCTURE 2017



Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - NORTH WEST

### Annual recruitment requirement (ARR) by occupation



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

# 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 short 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

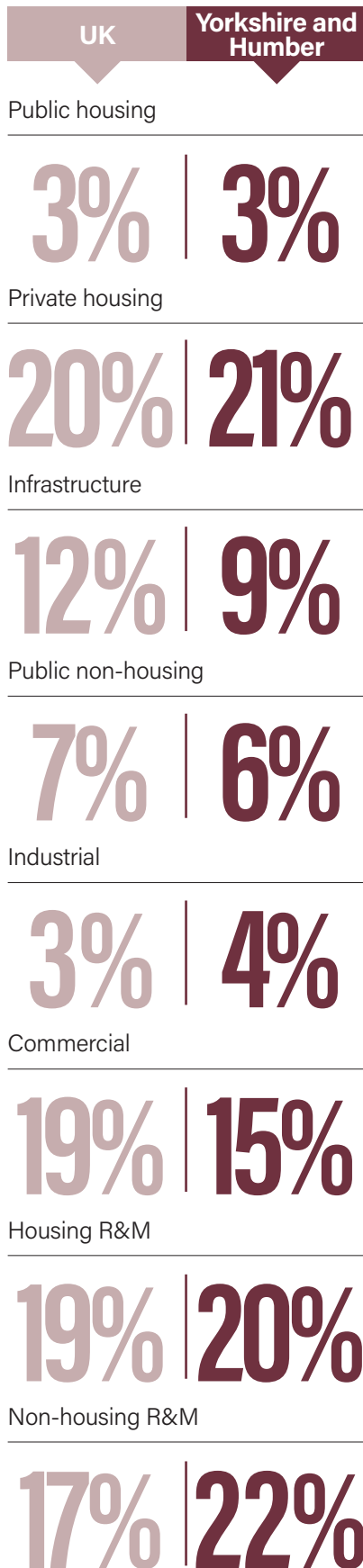
uncertain economic times created as a result of Brexit impacts investor confidence, growth is expected to stall during the middle of the forecast period. As the terms of Brexit become clearer, confidence should increase in the economy. This in turn is likely to lead to growth in commercial output from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



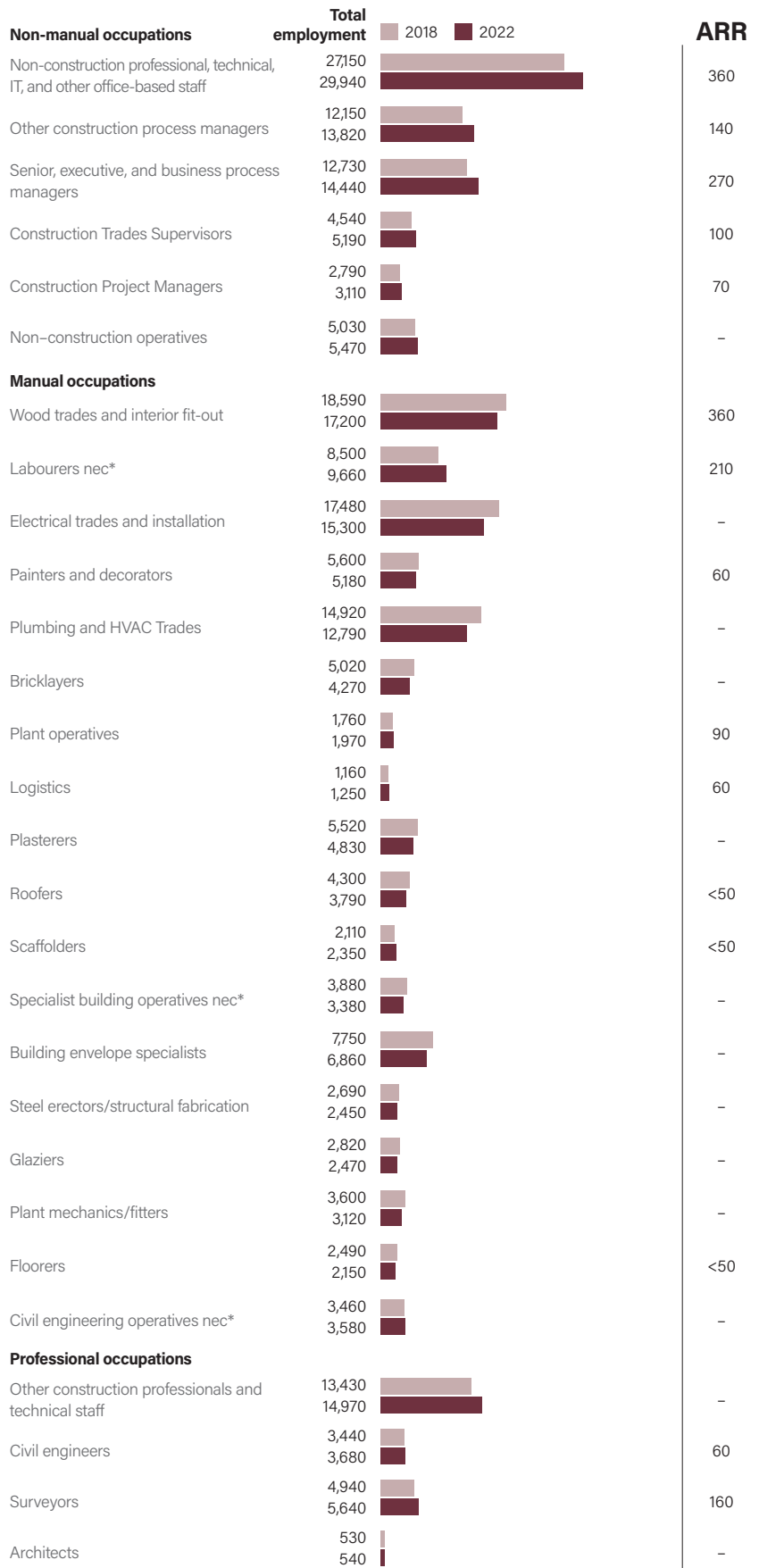
## CONSTRUCTION INDUSTRY STRUCTURE 2017



Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - YORKSHIRE AND HUMBER

### Annual recruitment requirement (ARR) by occupation



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

# EAST MIDLANDS

Construction output in the East Midlands is forecast to increase at an annual average rate of 0.5% in the 2018–2022 period, this compares unfavourably to projected growth of 1.3% at the UK level. Given the relative weakness in construction output gains, employment is expected to fall by 0.2% a year on average between 2018 and 2022, compared to annual average increases of 0.5% nationally. The annual recruitment requirement (ARR) for the region is projected to be 1,720 for the same period, representing 1% of base 2018 employment, a lower ratio than the UK's at 1.2%.

## KEY FINDINGS

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

**4.6%**

Employment is forecast to decline by

**0.2%**

a year on average

The East Midlands has an ARR of

**1,720**

Total construction output in the East Midlands rose by 6% in 2016 to £8.7bn in 2015 prices, broadly in line with the 2015 gain. Construction output had been rising since 2013 though it remained below the pre-recession peak of nearly £10bn. The commercial sector drove the gains in 2016, with output increasing by 47%, to £1.4bn, the first increase in six years, and the largest outturn since 2010. The infrastructure and public non-housing sectors also made decent gains, at 9% and 8% respectively, building on growth of 47% and 14% in 2015. At £1.3bn infrastructure output was at an all-time high.

In 2017 construction output in 2015 prices is estimated to have fallen by 1%, putting an end to three years of solid growth. Beyond this, in the 2018–2022 period annual average growth is expected to come in at 0.5% a year. Annual gains of 2% in 2020 and 1% in 2022 underline the improved outlook in the long term.

The pattern of growth amongst the components of total construction sees the infrastructure sector grow most strongly, at an annual average rate of 4.6%, aided partly by the build-up of work related to HS2 and the expectation that a large offshore wind farm will be built, at Triton Knoll, in Mablethorpe, Lincolnshire. The public and private housing sectors remain middling performers, with growth projected to average 2.3% and 1% respectively. In the public non-housing, commercial and industrial sectors output is anticipated to fall by -3.3%, -3.1% and -0.8% on an annual average basis.

Total construction employment is forecast to fall at an annual average rate of 0.2% in the five years to 2022. This compares unfavourably to a projected gain of 0.5% at the national level, and sees employment drop from an estimate of over 180,000 in 2017, to below 179,000 in 2022. Of the 28 occupational aggregates, only 15 are expected to register employment growth in this period. The ARR for the East Midlands is projected to be 1,720 for the 2018 – 2022 period. This represents 1% of base 2018 employment, a lower ratio than the UK's at 1.2%. None of the 28 occupational categories were flagged as having a high ARR requirement (over 5% of base 2018 employment).

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 2%

Private housing

20% | 21%

Infrastructure

12% | 15%

Public non-housing

7% | 8%

Industrial

3% | 7%

Commercial

19% | 16%

Housing R&M

19% | 13%

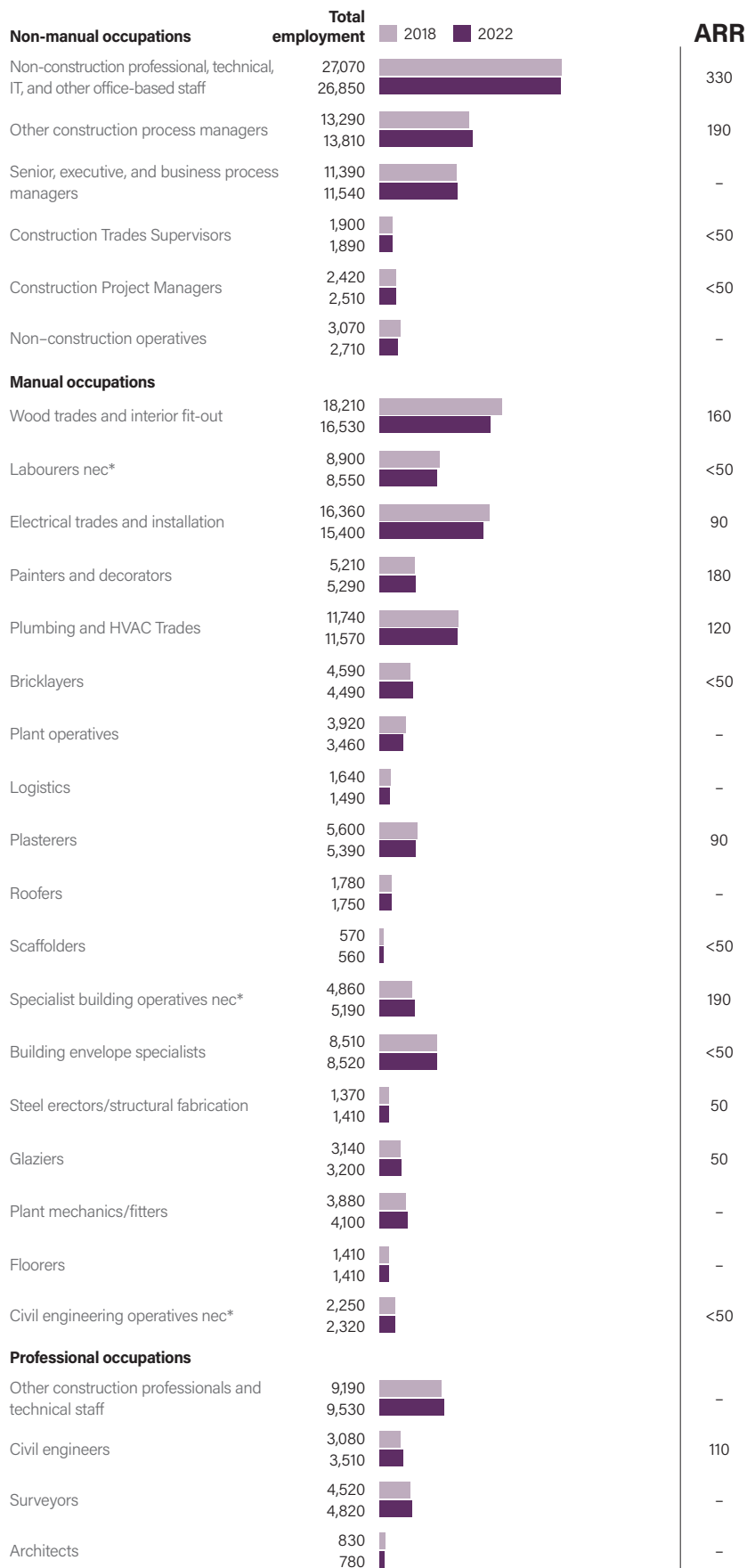
Non-housing R&M

17% | 18%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - EAST MIDLANDS

### Annual recruitment requirement (ARR) by occupation



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

# WEST MIDLANDS

Construction output in the West Midlands is forecast to grow at an annual average rate of 1.8% in the 2018-2022 period. This compares favourably to the expected gains of 1.3% at the UK level. It also represents an upgrade from last year's forecasts, which also saw a 1.3% rise in the region, in the five years to 2021. Employment is anticipated to grow at an annual average rate of 0.8% between 2018 and 2022, outperforming the UK average gains of 0.5%. The annual recruitment requirements (ARR) for the region is projected to be 3,390 in the same period. This represents 1.5% of base 2018 employment, a higher ratio than the UK's at 1.2%.

## KEY FINDINGS

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

**9.3%**

Employment is forecast to grow by

**0.8%**

a year on average

The West Midlands has an ARR of

**3,390**

Total construction output in the West Midlands increased by 3% in 2016 to £11bn in 2015 prices. This follows gains of 8%, 8% and 4% in the three previous years, and the outturn was the highest it has been since 2006. The increase was driven by rises in output of 34% and 20% in the private housing and industrial sectors respectively. The former rose to an all-time high of £2.5bn. The infrastructure and commercial sectors also both grew, but by a much more moderate 5% and 3% respectively. Conversely, there were output declines of 4% and 8% in the public housing and public non-housing sectors.

The private housing and industrial sectors continued to contribute strongly to growth in the first three quarters of 2017, registering gains of between 28% and 17% in current prices compared with the same period a year earlier. In addition, the public housing sector turned around its weak 2016 performance, growing by 13%, from a low base, and in the commercial sector output appears to be trending up, growing by 22%. However, the infrastructure sector made by far the largest contribution to growth, doubling to over £1bn. The public non-housing sector did less well, with output falling by 8%.

Total construction output is expected to grow at an annual average rate of 1.8% in the 2018-2022 period, with the increases skewed slightly to the short-term. An anticipated 9.3% annual average increase in infrastructure construction output, including strong

rises in 2020 and 2021, makes by far the largest contribution to growth. A number of large projects, including work on the HS2 scheme, and £250m of government funding to improve other transport in the region will contribute towards the gain. This is offset somewhat by an anticipated contraction of 0.8% in the industrial sector in the same period, and a gain of just 0.1% in public non-housing output.

Total construction employment is forecast to grow at an annual average rate of 0.8% in the five years to 2022, which compares favourably to an estimated gain of 0.5% at the national level. The majority of the 28 occupational categories (21) are expected to see an increase. The ARR for the West Midlands is projected to be 3,390 in the same period. This represents 1.5% of base 2018 employment, a higher ratio than the UK's at 1.2%. None of the occupational categories were flagged as having a high ARR requirement (more than 5% of base 2018 employment), however nine were deemed to have medium requirements (between 2.6% and 5% of base 2018 employment).

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing



Private housing



Infrastructure



Public non-housing



Industrial



Commercial



Housing R&M



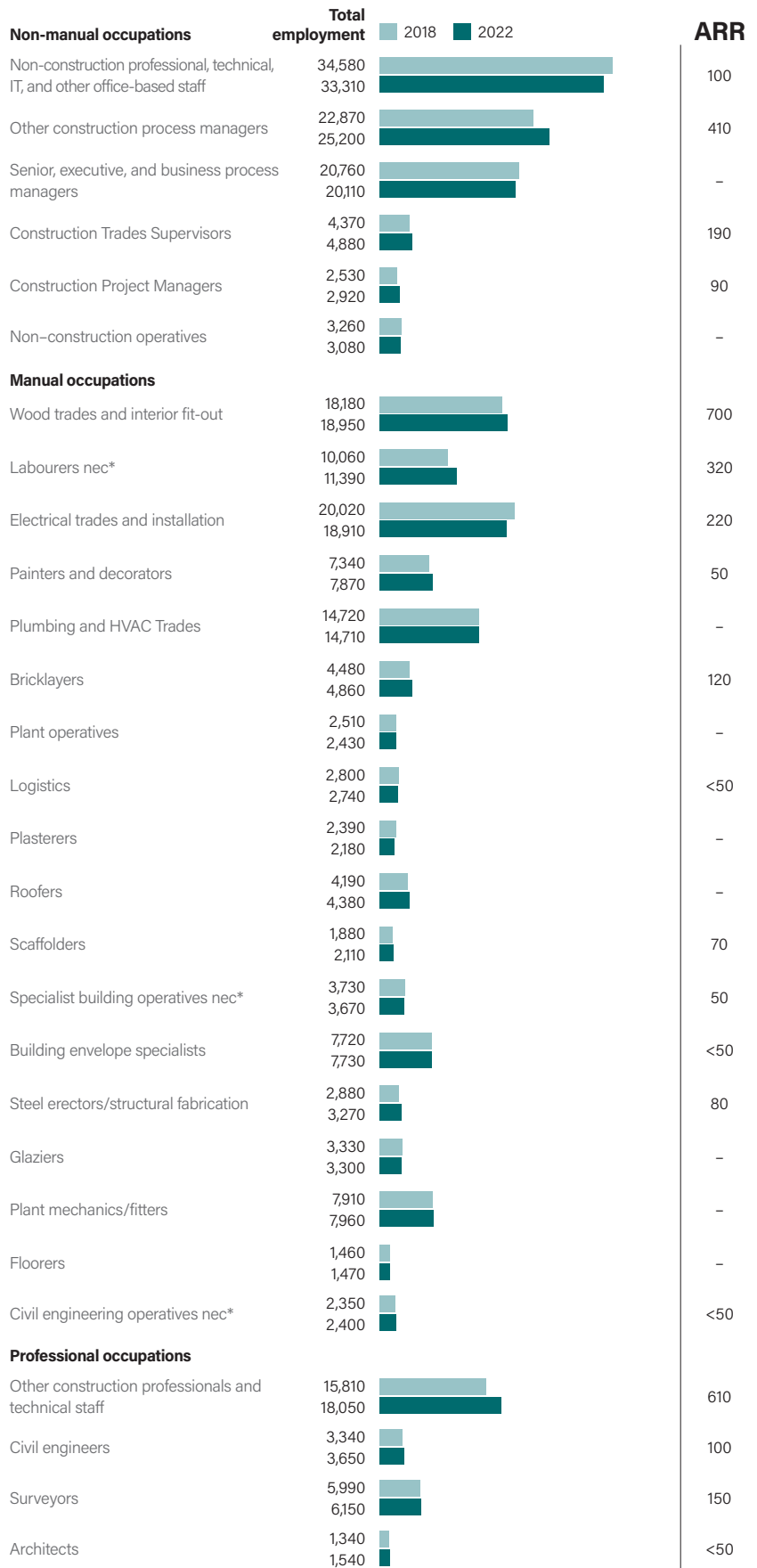
Non-housing R&M



Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - WEST MIDLANDS

### Annual recruitment requirement (ARR) by occupation



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

# EAST OF ENGLAND

The region's total construction output is forecast to rise by an annual average of 1.3% in the five years to 2022, in line with the UK average. Construction employment in the East of England is projected to increase by an average yearly rate of 0.2% over the same period, below the UK rate of 0.5%. At 1.8% of base 2018 employment, the region's annual recruitment requirement (ARR) exceeds the UK average of 1.2%.

## KEY FINDINGS

Output is expected to focus on both the private housing and industrial sectors in the short term, averaging

**2.3%**  
per year

Employment is forecast to grow by

**0.2%**  
a year on average

The East has an ARR of

**4,540**

Output in the region's construction industry is expected to rise by an annual average of 1.3% in the five years to 2022, in line with the UK average over the same period.

As the largest sector with the joint strongest growth forecast of 2.3% for the next five years (along with the much smaller industrial sector), private housing is expected to be the most significant contributor to overall regional expansion. It remains the case that, short of a recession, given the demand/supply mismatch and strong population growth, private housing activity in the East of England will continue to grow. Work is ongoing on the University of Cambridge's £1bn North West Cambridge development, due for completion by 2027. The programme is comprised of a number of construction elements, with a sizeable residential element.

Following on from a particularly strong forecast for the 2018-2019 period, average annual output growth in the infrastructure industry is expected to moderate to 1% over the five-year period to 2022 as the biggest energy and transport projects supporting growth in the near term reach completion around 2020. £600m of investment is planned for Stansted airport. Construction is to be phased as demand builds, starting as early as 2018 with most works finishing by 2020/2021. The £1.5bn A14 Cambridge to Huntingdon improvement scheme is also scheduled to conclude by late 2020, having been ongoing since late 2016.

The biggest drag on construction output growth over the five-year forecast is expected to be the commercial sector, as the second largest by output in 2016 (in 2015 prices), with an annual average contraction of 0.5%. Given a lack of major projects in the pipeline and the vulnerability of the offices and retail sub-sectors to Brexit uncertainties, decline in the sector is expected to be strongest over the next two years, with gradual recovery expected towards the end of the five-year period to 2022.

In 2016 the East of England accounted for around 9% of UK construction employment. Over the next five years construction employment in the region is projected to rise by an annual average of 0.2%, placing it in the middle of the regional rankings in terms of growth rates, below the UK average of 0.5%. As is the case across the UK as a whole, the strongest growth will tend to be in the managerial/administrative and professional occupations rather than the trades/manual ones.

At 4,540 extra recruits required per year over the forecast period, the region's ARR is 1.8% of base 2018 employment, above the UK rate of 1.2%. There are two occupational categories that have an ARR in excess of 5% of base 2018 employment, logistics personnel (7.1%) and scaffolders (6.6%).

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 2%

Private housing

20% | 17%

Infrastructure

12% | 13%

Public non-housing

7% | 5%

Industrial

3% | 3%

Commercial

19% | 15%

Housing R&M

19% | 26%

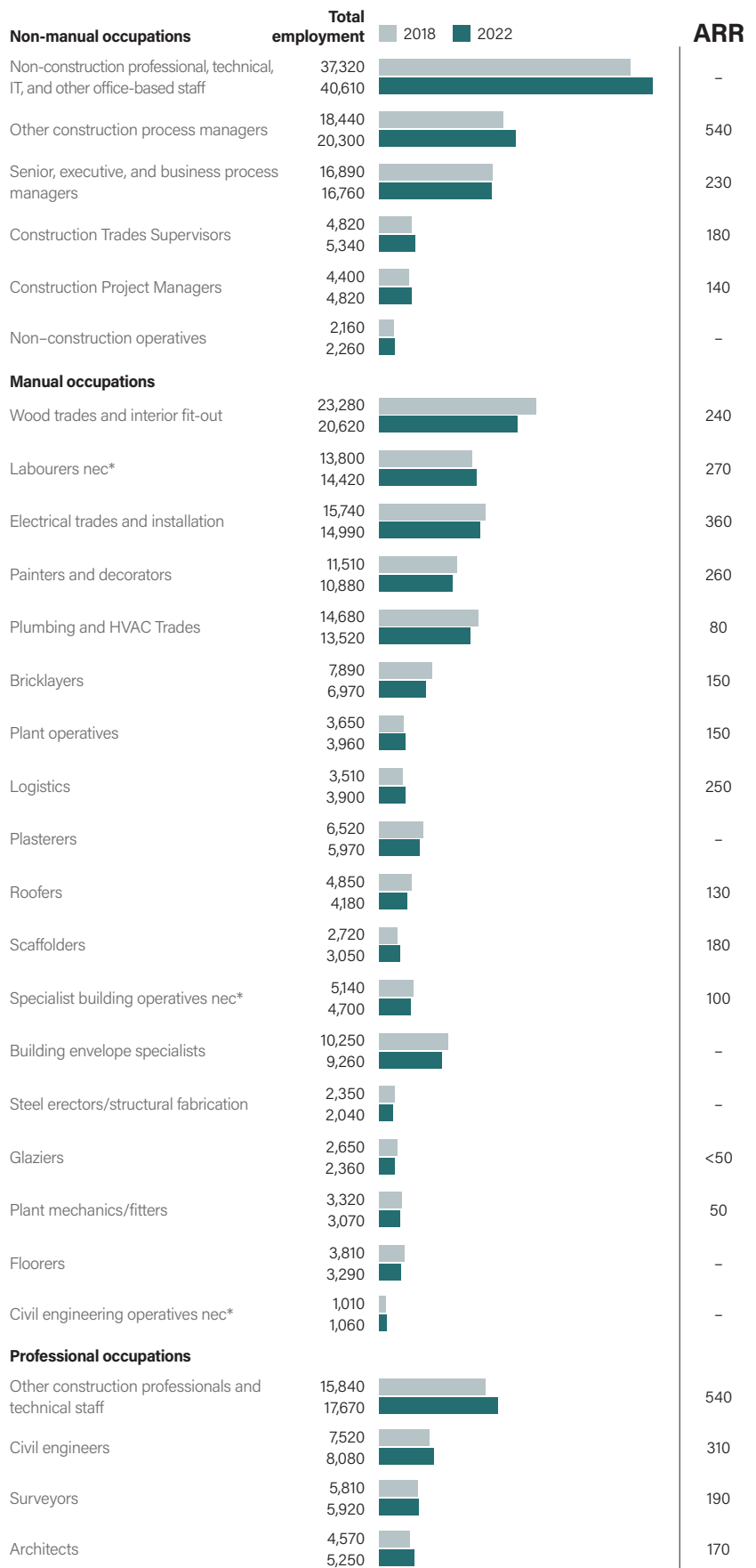
Non-housing R&M

17% | 19%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - EAST OF ENGLAND

### Annual recruitment requirement (ARR) by occupation



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

# GREATER LONDON

The region's total construction output is forecast to rise by annual average of 1.5% over the next five years, slightly above the UK average of 1.3%. Once again new work is expected to perform better than repair & maintenance (R&M) (1.9% vs. 0.4%). Construction employment growth in the capital is expected to be marginal at 0.2% a year on average, while annual average expansion of 0.5% is likely for the UK. Greater London, joint with Northern Ireland, has the lowest annual recruitment requirement (ARR) relative to the size of its construction market, at just 0.5%.

## KEY FINDINGS

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

**7.3%**

Employment is forecast to grow by

**0.2%**  
a year on average

Greater London has an ARR of

**2,010**

The region is anticipated to see annual average growth of 1.5% in total construction output over the next five years. By 2022, output is projected to reach to a new high of £34.87bn (2015 prices).

Over both the short and long term the infrastructure sector is likely to see the biggest average increases per annum. The largest project to take place over the forecast period is High Speed 2 (HS2), which more than offsets large schemes achieving or nearing completion such as Crossrail. Other smaller projects that are in the pipeline include the £400m upgrade at London City Airport.

The private housing sector is predicted to see a rise of 3.0% per annum in the five years to 2022. Expansion is expected to be minimal over the next couple of years as uncertainty surrounding Brexit reduces investment in the sector. However, growth should pick up in the second half of the forecast period as the terms of Brexit become clearer, bringing confidence back into the sector.

Brexit is likely to have a bigger impact on the capital's commercial sector as moderate declines in commercial output are anticipated over the next three years. There is work on large regeneration schemes entering the pipeline, but there are sharp output falls expected in commercial sub-sectors such as offices, hindering the overall performance of the sector. One project that has been given the go ahead despite Brexit is Google's new £1bn King's Cross head office. The

first phase worth £350m is expected to start this year.

Public non-housing output is expected to grow by a yearly average of 1.3% over the long term. Expansion is likely to be the strongest over the next couple of years due to work that is scheduled to take place on University College London's new campus. Another sizeable university project by London South Bank University has been postponed. By 2022, public non-housing output is predicted to be around 69% of its 2010 peak.

In 2016 Greater London accounted for around 15.8% of UK construction employment. Between 2018 and 2022 construction employment is likely to see only marginal growth overall. Plant operatives are anticipated to see the strongest annual average increases of 3.5%.

With 2,010 extra recruits required per year over the five years to 2022, the region's ARR is just 0.5% of base 2018 employment, lower than the UK rate of 1.2%. As London has a high inflow of construction workers there are only a handful of occupational categories that have an ARR between 2.5% and 5%, namely civil engineers, logistics, plant operatives, scaffolders and construction trade supervisors.



## CONSTRUCTION INDUSTRY STRUCTURE 2017



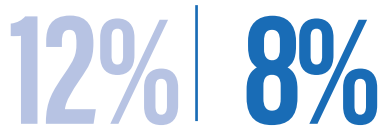
Public housing



Private housing



Infrastructure



Public non-housing



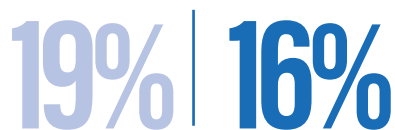
Industrial



Commercial



Housing R&M



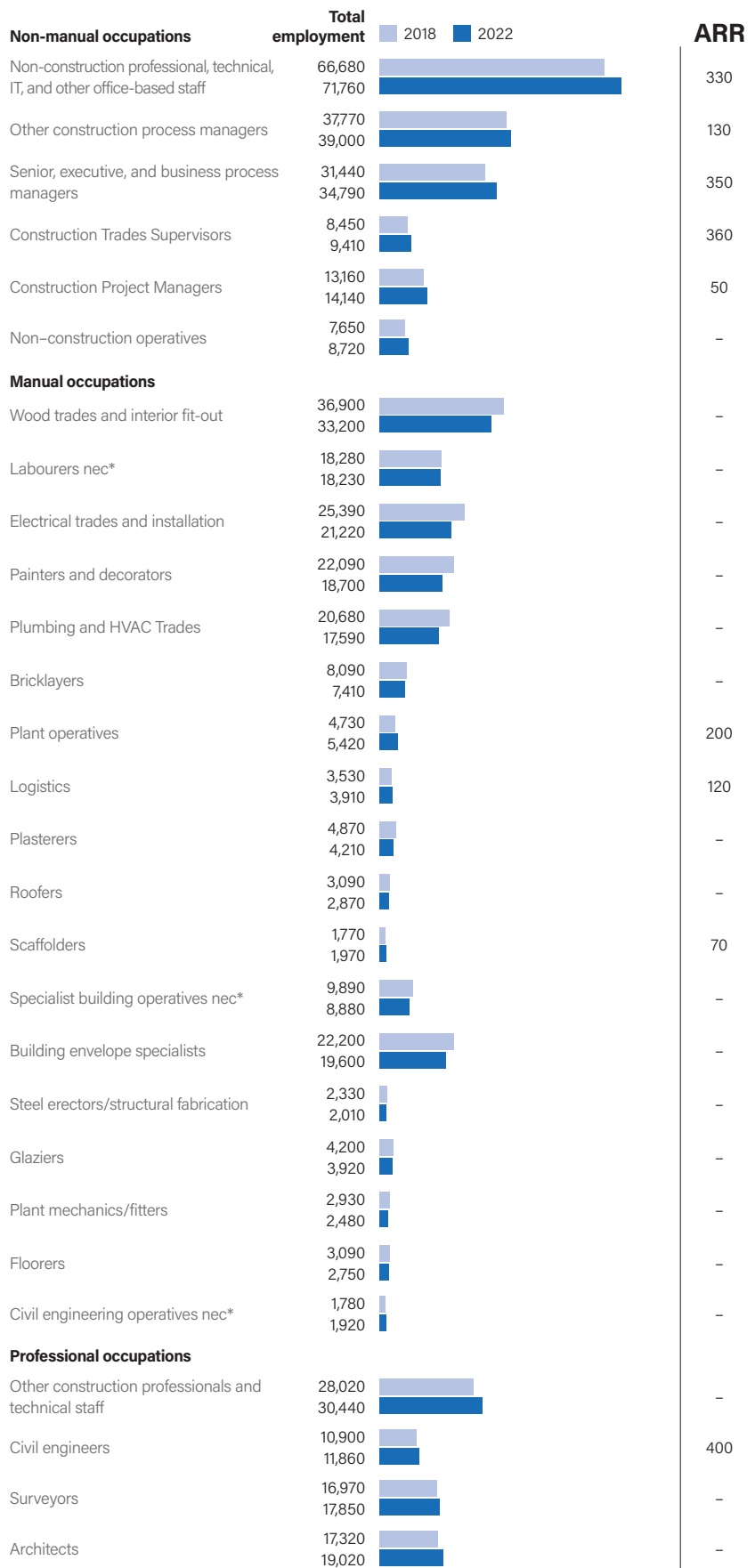
Non-housing R&M



Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - GREATER LONDON

### Annual recruitment requirement (ARR) by occupation



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

# SOUTH EAST

The region's total construction output is forecast to rise by an annual average of 1.1% over the next five years, just below the UK average of 1.3%. The South East's construction employment is anticipated to increase by an average yearly rate of 0.8%, above the UK rate of 0.5%. The region's annual recruitment requirement (ARR), at 2,250 represents 0.6% of base 2018 employment, half that of the UK ratio which is 1.2%.

## KEY FINDINGS

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

**3.5%**

Employment is forecast to grow by

**0.8%**

a year on average

The South East has an ARR of

**2,250**

The region's total construction output is projected to see average yearly increases of 1.1% over the next five years, just below the UK average of 1.3%.

The public housing sector is expected to see the greatest annual average expansion of 3.5% between 2018 and 2022. In the Autumn 2017 Budget an additional £15.3bn of new 'financial support' for housing was pledged in the form of capital funding, loans and guarantees, which will support both the public and private sectors. This comes on top of the £2bn set aside in October to provide 25,000 new council homes from 2020.

Average yearly growth of 2.8% has been predicted for the private housing market, the region's largest new work sector. Given the continued demand/supply mismatch and strong population growth, private housing activity in the South East is likely to continue growing. There are a variety of long-term local housing projects and 'garden villages' at early planning stages, and plans for the 6,000 home Welborne Garden Village will be brought before Fareham borough council in early 2018 with construction due to start in 2019 if the project is approved.

Commercial output is forecast to average 2.5% growth annually over the next five years, with increases in 2018 and 2019 followed by contraction in 2020 and 2021. Construction work is ongoing at the £460m Victoria Square development in Woking, which is due for completion in 2020. Work is also expected to start on Reading FC's

£500m Royal Elm Park scheme in early 2018, with final completion in 2023.

Infrastructure is expected to contract at an annual average of 1.5% over the five-year forecast period, but with a volatile output profile throughout. Reasonably strong growth in 2020 and 2021 is expected off the back of a number of major road projects, mitigating the overall decline. More than £240m is to be spent on improving existing facilities at Gatwick airport in 2018, as part of a wider £2.5bn framework lasting the duration of the forecast period.

In 2016 the South East accounted for around 15% of UK construction employment. Over the next five years construction employment in the region is projected to rise by 0.8% per year on average, the fifth strongest growth rate of all the regions and devolved nations and above the UK's rate of 0.5%. As is the case across the UK as a whole, the strongest growth will tend to be in the managerial/administrative and professional occupations rather than the trades/manual ones.

At 2,250 extra recruits required per year over the forecast period, the region's ARR is 0.6% of base 2018 employment, below the UK rate of 1.2%. There are two occupational categories that have an ARR between 2.5% and 5.0% of base 2018 employment, namely logistics and civil engineering operatives nec.

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 2%

Private housing

20% | 19%

Infrastructure

12% | 11%

Public non-housing

7% | 8%

Industrial

3% | 2%

Commercial

19% | 15%

Housing R&M

19% | 26%

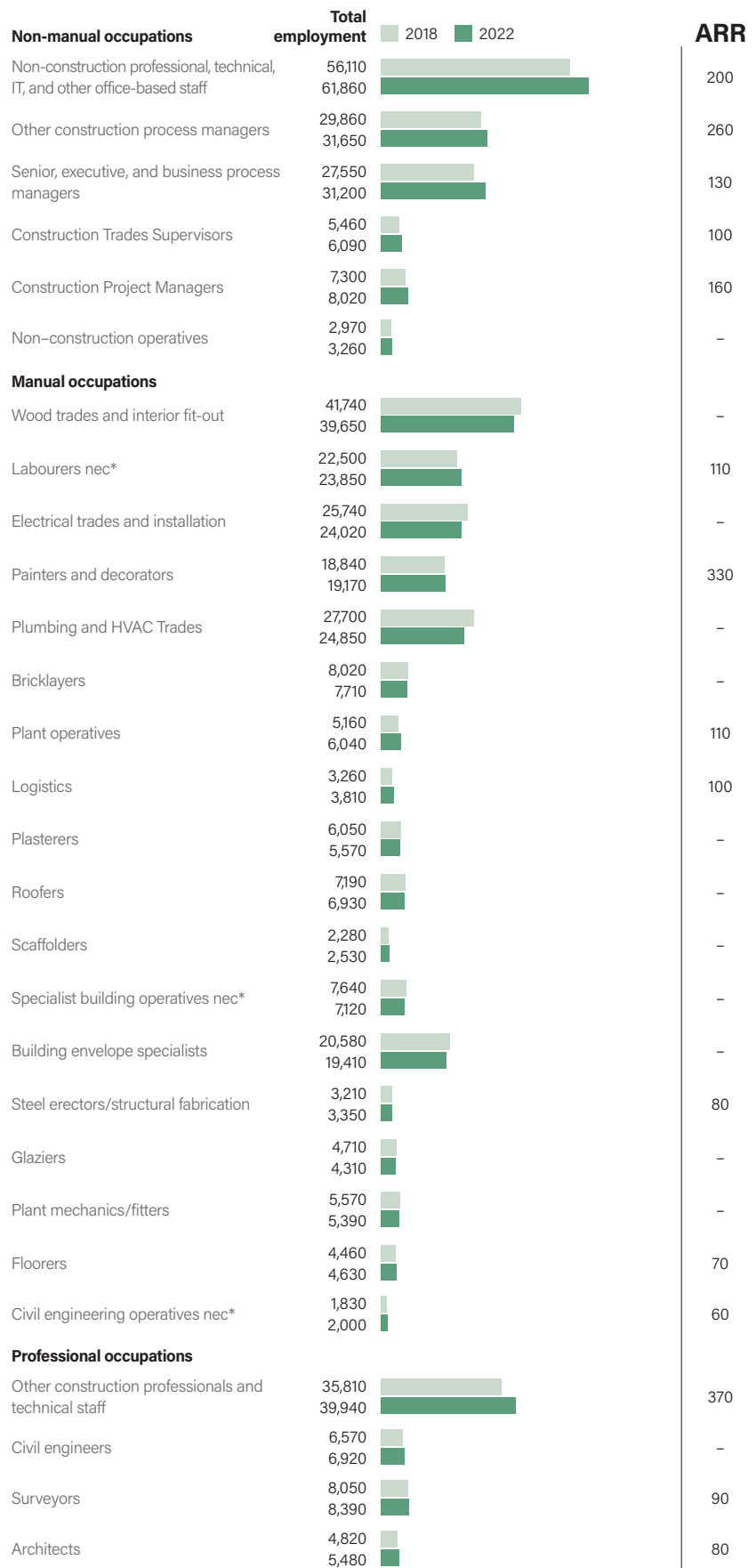
Non-housing R&M

17% | 17%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - SOUTH EAST

### Annual recruitment requirement (ARR) by occupation



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

# SOUTH WEST

Construction output in the South West is forecast to increase at an annual average rate of 2% in the 2018–2022 period. This compares favourably to projected growth of 1.3% at the UK level, though represents a downgrade compared to last year’s forecast for a 3.1% annual average increase in the five years to 2021. The projected rate of employment growth in the region of 1% a year between 2018 and 2022 is also expected to outpace the national average of 0.5%. The annual recruitment requirement (ARR) is projected to be 4,480, representing 1.9% of base 2018 employment, as opposed to 1.2% for the UK as a whole.

## KEY FINDINGS

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

**9.9%**

Employment is forecast to grow by

**1.0%**

The South West has an ARR of

**4,480**

Total construction output in the South West rose by 5.5% in 2016 to £11bn in 2015 prices, the highest outturn since before the financial crisis. The annual gains in 2016 were driven by increases of roughly 50% in the public housing and industrial sectors. Public non-housing and private housing output also grew strongly, by 17% and 11% respectively.

In 2017 construction output growth is estimated to have accelerated to 8% taking output to £11.9bn in 2015 prices, driven by a very big increase in the public non-housing sector and a lesser but still double-digit rise in commercial construction activity.

Between 2018 and 2022 total construction output is projected to grow at an annual average rate of 2%. The gains in output in the forecast are skewed towards the short-term, largely due to a rapid rise and eventual plateau in infrastructure output linked to construction of the Hinckley Point C nuclear power plant. However, growth in the latter years of the forecast is also expected to ease in the private housing, public non-housing, and industrial sectors. The completion of large projects, and a lack of confirmed projects in the pipeline underlines the slowdown.

The region also benefits strongly from work related to the Army Basing Plan, to provide accommodation for troops

returning from Germany by 2020. The South West will take a significant share of the £1.8bn of scheduled expenditure.

Total construction employment in the region is forecast to grow at an annual average rate of 1% in the 2018–2022 period. This compares favourably to a projected gain of 0.5% at the national level, and sees employment rise from an estimate of just over 230,000 in 2017, to nearly 242,000 in 2022. Of the 28 occupational aggregates, 22 are expected to register employment growth in this period.

The ARR for the South West is projected to be 4,480 between 2018 and 2022. This represents 1.9% of base 2018 employment, a higher ratio than the UK’s at 1.2%. Only plasterers were flagged as having a high ARR requirement (more than 5% of base 2018 employment) at 5.2%, but a number of other occupations have a medium requirement of between 2.6% and 5% of base 2018 employment, including other construction process managers (2.8%), bricklayers (3.4%), roofers (4.2%), glaziers (4.7%), and surveyors (3.5%).

## CONSTRUCTION INDUSTRY STRUCTURE 2017



Public housing

3% | 3%

Private housing

20% | 24%

Infrastructure

12% | 9%

Public non-housing

7% | 7%

Industrial

3% | 3%

Commercial

19% | 14%

Housing R&M

19% | 22%

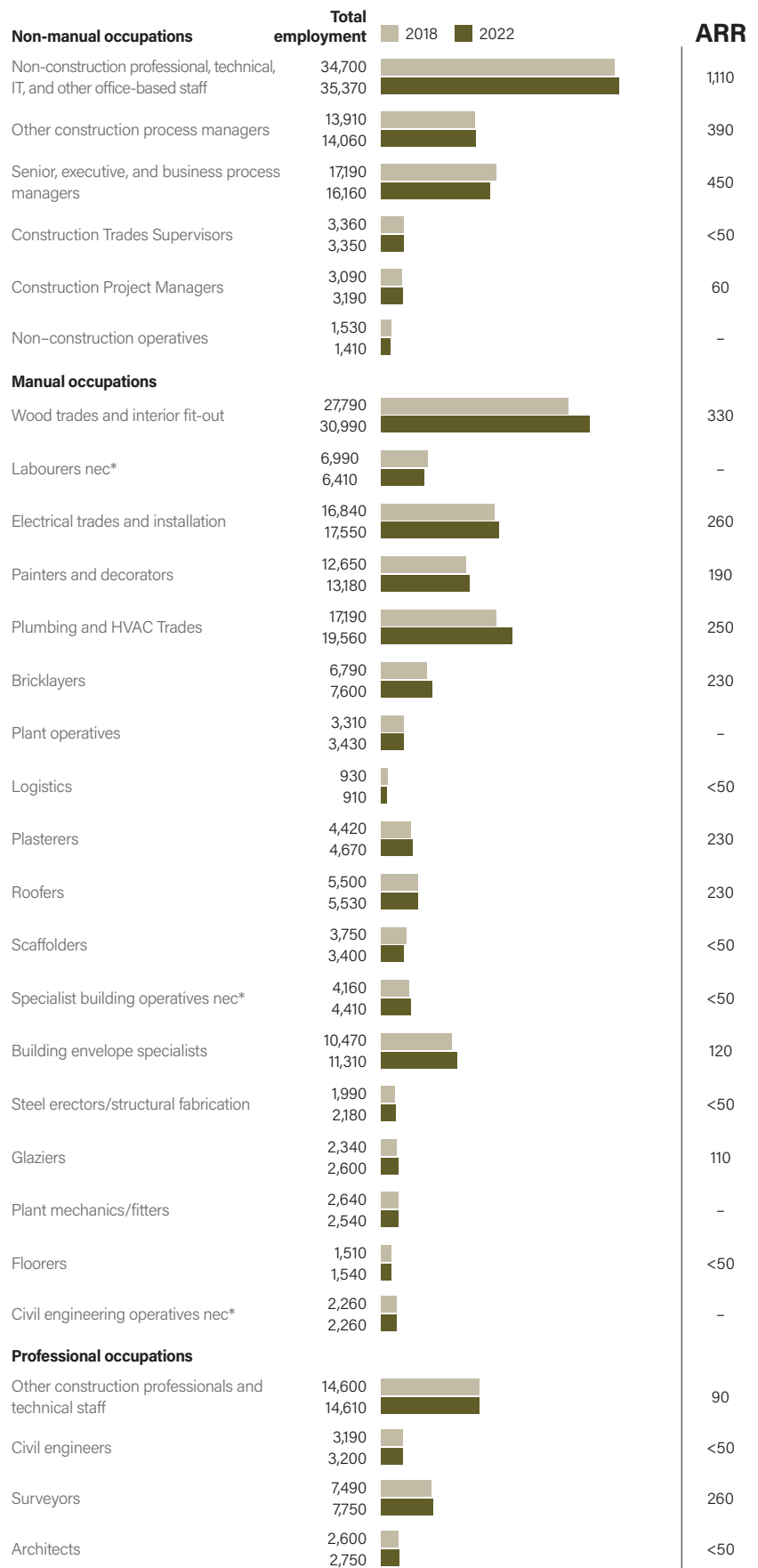
Non-housing R&M

17% | 18%

Source: ONS, Experian

## TOTAL EMPLOYMENT BY OCCUPATION - SOUTH WEST

### Annual recruitment requirement (ARR) by occupation



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

# 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.



# GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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





# NOTES

## NOTES

- 1 Except for Northern Ireland, output data for the English regions, Scotland and Wales is supplied by the Office for National Statistics (ONS) on a current price basis. 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 EXAMPLES

## **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 construction<sup>1</sup>**

### **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 work<sup>1</sup>**

### **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.<sup>2</sup>

**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.<sup>3</sup>



<sup>1</sup> 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'.

<sup>2</sup> 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.

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

# OCCUPATIONAL GROUPS

<b>Occupational group</b>			
Description, SOC (2010) reference.			
<b>Senior, executive, and business process managers</b>			
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
<b>Construction project managers</b>		Company secretaries	4214
Construction project managers and related professionals	2436	Sales related occupations nec*	7129
<b>Other construction process managers</b>		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
<b>Non-construction professional, technical, IT, and other office-based staff (excl. managers)</b>		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	<b>Construction trades supervisors</b>	
		Skilled metal, electrical and electronic trades supervisors	5250
		Construction and building trades supervisors	5330
		<b>Wood trades and interior fit-out</b>	
		Carpenters and joiners	5315
		Paper and wood machine operatives	8121
		Furniture makers and other craft woodworkers	5442
		Construction and building trades nec* (25%)	5319

<b>Bricklayers</b>		Air-conditioning and refrigeration engineers	5225
Bricklayers and masons	5312	<b>Logistics</b>	
<b>Building envelope specialists</b>		Large goods vehicle drivers	8211
Construction and building trades nec* (50%)	5319	Van drivers	8212
<b>Painters and decorators</b>		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
<b>Plasterers</b>		<b>Civil engineering operatives not elsewhere classified (nec*)</b>	
Plasterers	5321	Road construction operatives	8142
<b>Roofers</b>		Rail construction and maintenance operatives	8143
Roofers, roof tilers and slaters	5313	Quarry workers and related operatives	8123
<b>Floorers</b>		<b>Non-construction operatives</b>	
Floorers and wall tilers	5322	Metal making and treating process operatives	8117
<b>Glaziers</b>		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
<b>Specialist building operatives not elsewhere classified (nec*)</b>		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
<b>Scaffolders</b>		Street cleaners	9232
Scaffolders, staggers and riggers	8141	Gardeners and landscape gardeners	5113
<b>Plant operatives</b>		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	<b>Civil engineers</b>	
Mobile machine drivers and operatives nec*	8229	Civil engineers	2121
<b>Plant mechanics/fitters</b>		<b>Other construction professionals and technical staff</b>	
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
<b>Steel erectors/structural fabrication</b>		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
<b>Labourers nec*</b>		Town planning officers	2432
Elementary construction occupations (100%)	9120	Electronics engineers	2124
<b>Electrical trades and installation</b>		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	<b>Architects</b>	
<b>Plumbing and heating, ventilation, and air conditioning trades</b>		Architects	2431
Plumbers and heating and ventilating engineers	5314	<b>Surveyors</b>	
Pipe fitters	5216	Quantity surveyors	2433
Construction and building trades nec* (5%)	5319	Chartered surveyors	2434
		*Not elsewhere classified	

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**CITB RESEARCH**

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