CITB RESEARCH

INDUSTRY INSIGHTS

WALES

Construction Skills Network
Labour Market Intelligence
2018–2022

About CITB

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

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

About Experian

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

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SUMMARY – 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.

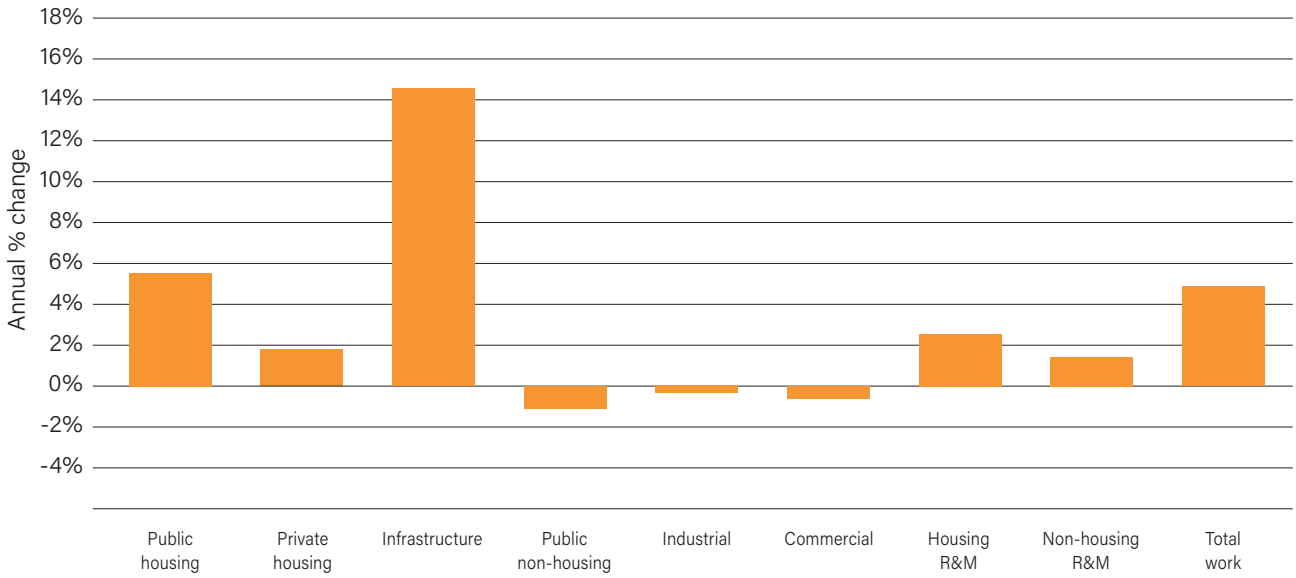
Governments, both at Westminster and in the devolved nations, are increasingly focussed on attempting to address the demand/supply mismatch in the housing market, meaning that the prospects for both public and private housing have improved. In Wales the target is for 20,000 new affordable homes by 2020/21, 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.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 - WALES



Source: CSN, Experian.
Ref: CSN Explained.

REGIONAL COMPARISON 2018-2022

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

Source: CSN, Experian.
Ref: CSN Explained.

> 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.

THE OUTLOOK FOR CONSTRUCTION IN WALES

CONSTRUCTION OUTPUT IN WALES – OVERVIEW

2016 was a good year for construction in Wales, with output growing by 10% to £5.43bn (estimated 2015 prices), its highest level in real terms since 2004. After its doubling in 2015 infrastructure posted another year of good growth at 14%, but the strongest increases in 2016 were in the private housing and commercial construction sectors. Private housing output rose by 36% to £907m (2015 prices) and was getting back to the sort of levels seen in the peak years between 2004 and 2007, while commercial construction increased by 44% to £727m, albeit from a low base.

INDUSTRY STRUCTURE

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

The substantial rise in infrastructure output in 2015 has led to Wales currently having a significantly different construction industry structure than the UK average. The infrastructure sector accounted for over 25% of construction output in 2016. Consequently, most other sectors are proportionally smaller in Wales than in the UK, with the biggest differences being for the commercial (13% vs. 19%), non-housing R&M (12% vs. 17%) and private housing (17% vs. 20%) sectors. It is interesting to note that Scotland has experienced a similar surge in infrastructure work in recent years, although it has subsided now, and this may reflect differing priorities between the devolved administrations and that in Westminster.

In terms of changes in total output shares in Wales, the private housing sector's has grown by 4% from 13% in 2015 to 17% in 2016, the public non-housing one has shrunk by the same amount from 13% to 9%, and the commercial sector's has risen by 3% from 10% to 13%.

ECONOMIC OVERVIEW

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

Gross value added (GVA) in Wales is estimated to have reached £55.4bn (2013 prices) in 2016, a 1.8% increase on the previous year. Growth is expected to have slowed in 2017, to 1.5%, a little below the UK average (1.6%), with a slowdown in expansion in three of the biggest five sectors in the devolved nation, while growth in manufacturing remained static at around 0.9% and only public services saw a better performance (1% vs. -0.7%).

Wales has not been immune to the impact of rising inflation on disposable incomes, which in real terms are estimated to have dropped by 1.2% in 2017 after a rise of 1% in the previous year. This has inevitably had an impact on household spending growth which has slipped from 2.2% in 2016 to 1.3% last year.

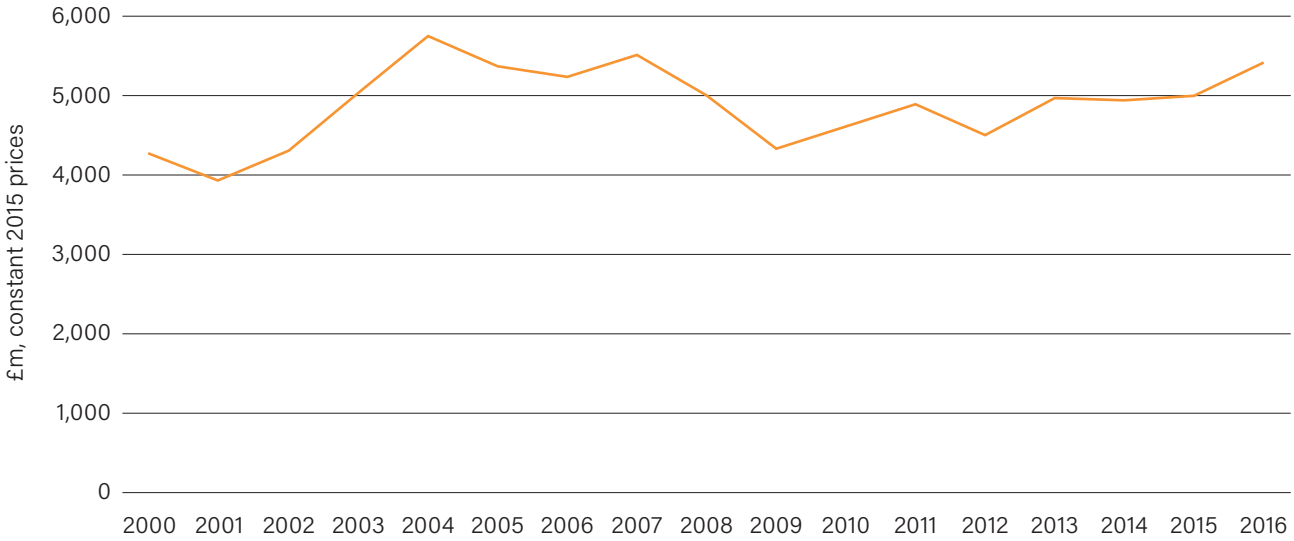
Employment growth in Wales also stagnated last year on the workforce jobs measure after five years of growth.

ECONOMIC STRUCTURE

The Welsh economy is more weighted towards manufacturing and the public services sectors than the UK as a whole, which account for around 40% of GVA in the former compared with 27% in the latter. These tend to be slower growing sectors than the main private services ones such as professional and other private services, which is proportionally 5% smaller in Wales. One of the strongest growing sectors in the UK in recent years has been the information and communication sector, but again this is proportionally smaller in Wales compared with the UK (3.2% vs. 6.5%).

While the share of manufacturing and public services in the Welsh economy has fallen since the start of the millennium and that of professional and other private services risen, the rebalancing has been relatively modest.

CONSTRUCTION OUTPUT 2000-2016 - WALES



Source: ONS.
Ref: CSN Explained.

CONSTRUCTION INDUSTRY STRUCTURE 2016 - UK VS WALES

Public housing	Infrastructure	Industrial	Housing R&M
3% | 3%	12% | 25%	3% | 2%	19% | 19%
Private housing	**Public non-housing**	**Commercial**	**Non-housing R&M**
20% | 17%	7% | 9%	19% | 13%	17% | 12%

Source: ONS, Experian.

UK Wales

ECONOMIC STRUCTURE - WALES (£ BILLION, 2013 PRICES)

	Actual	Forecast (Annual % change, real terms)					
	2016	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Public Services	13.5	1.0	0.8	1.4	1.7	1.9	2.3
Professional & Other Private Services	12.5	2.0	1.4	1.7	1.7	1.9	2.3
Manufacturing	8.6	0.9	0.7	1.3	1.0	1.0	1.2
Wholesale & Retail	5.6	1.9	1.1	1.6	1.8	2.2	2.8
Finance & Insurance	2.6	0.2	0.4	0.8	1.5	1.9	2.4
Total Gross Value Added (GVA)	**55.4**	**1.5**	**1.1**	**1.5**	**1.6**	**1.8**	**2.2**

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

FORWARD LOOKING ECONOMIC INDICATORS

GVA growth in Wales is projected to lag the UK's by close to half a percent a year over the forecast period (1.6% vs. 2%), the almost inevitable consequence of the economic structure of the Welsh economy mentioned above, and a lower rate of population expansion.

GVA growth has in recent years been driven as much by overall increases in population as improvements in productivity, thus lower population growth will equal lower GVA growth, unless productivity gains accelerate. Population growth in Wales over the next five years is expected to be only half that of the UK at 0.3% a year on average.

Growth is projected to be strongest in the up-and-coming information and communications sector at 2.2% a year on average over the five years to 2022, followed by wholesale and retail (1.9%) and accommodation, food services and recreation (1.9%). The large professional and other private services and public services sectors are expected to see annual average growth of 1.8% and 1.6% respectively, while manufacturing should see more modest expansion of around 1% a year on average.

As inflation starts to subside through 2018, real household disposable income growth should turn positive again, although the rise in any one year is unlikely to exceed 2% between 2018 and 2022. On the back of this there will be a recovery in household spending growth from a low of 0.5% in 2018 to around 2% in 2021 and 2022. After two years of stagnation in 2017 and 2018 employment on the workforce jobs measure should start to increase again from 2019.

The acceleration of growth across the UK in the second half of the forecast period is highly dependent on the outcome of Brexit negotiations and whether these are seen as positive or negative by the investment and business community. A harder Brexit than expected would be likely to lead to a lower rate of growth in the period 2020 to 2022.

NEW CONSTRUCTION ORDERS – OVERVIEW

After two largely stagnant years, orders for new construction work in Wales rose by nearly 28% in 2015 and have increased by a further 7% in 2016 to £2.87bn (current prices), although they remained 17% below their peak level in 2006. The infrastructure sector experience a second consecutive year of record high new orders in 2016 at over £1.3bn, although they showed little growth on the previous year.

The commercial sector saw the strongest increase in new orders in 2016, rising by nearly 65% to £555m, although they remain less than half their peak level in 2006. The public housing and public non-housing sectors also saw decent growth in new orders of 12% and 14% respectively, but those for the industrial construction sector saw a sharp contraction after two strong years of growth.

NEW CONSTRUCTION ORDERS – CURRENT SITUATION

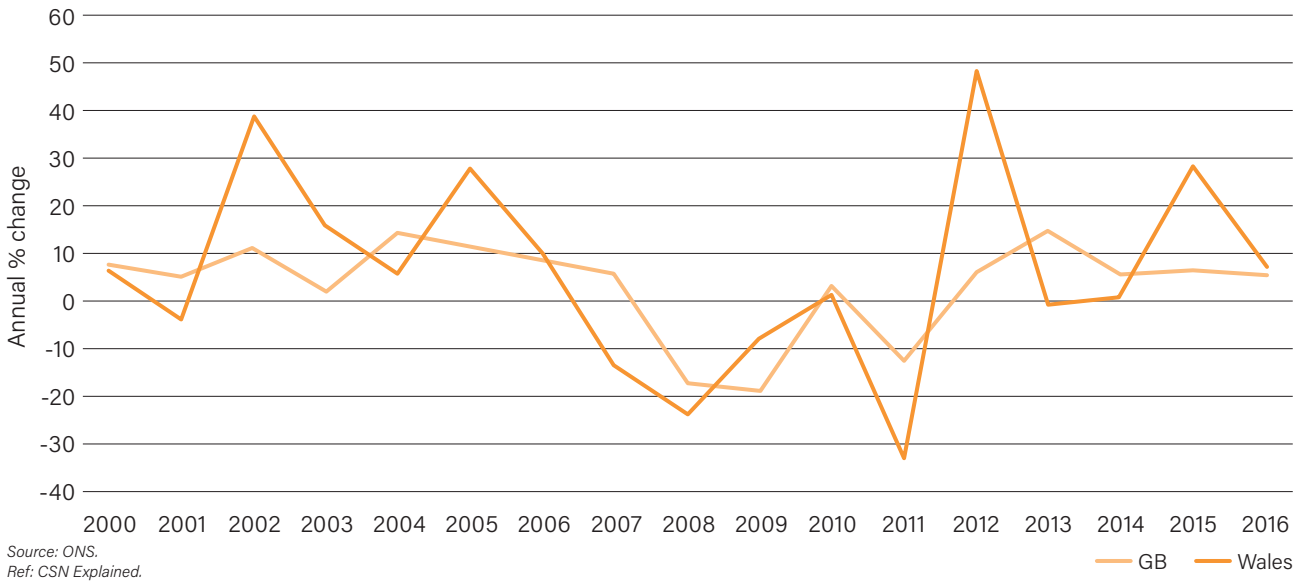
In the first three quarters of 2017 new orders totalled £2.14bn, 11 per cent down on the same period in the previous year. While the public non-housing and commercial sectors saw strong increases, of 94% and 48% respectively, the infrastructure, public housing and industrial sectors experienced declines, of 67%, 24% and 19% respectively. New orders for private housing were largely stable.

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

	Actual	Forecast (Annual % change, real terms)					
	2016	2017	2018	2019	2020	2021	2022
Real household disposable income (2013 prices)	50.7	-1.2	0.8	1.0	1.3	1.4	1.8
Household spending (2013 prices)	51.5	1.3	0.5	1.2	1.2	1.9	1.8
Working age population (000s and as % of all)	1,904	61.1	61.0	61.1	61.5	61.4	61.1
House prices (£)	144,333	3.2	1.3	1.9	2.1	2.4	3.5
LFS unemployment (millions)	0.07	2.0	-2.0	4.2	3.2	-0.2	-4.4

Source: ONS, DCLG, Experian.

NEW CONSTRUCTION ORDERS GROWTH 2000-2016 – WALES VS GB



Source: ONS.
Ref: CSN Explained.

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

	Actual	Annual % change				
	2016	2012	2013	2014	2015	2016
Public housing	55	-2.0	-15.3	-30.1	-15.5	12.2
Private housing	488	42.5	-4.4	4.8	8.0	-1.8
Infrastructure	1,309	159.5	-2.6	-43.5	380.8	0.5
Public non-housing	357	31.7	-11.0	88.5	-62.5	13.7
Industrial	105	12.3	-11.0	58.9	55.2	-41.7
Commercial	555	28.7	21.6	-35.9	-6.4	64.7
Total new work	**2,869**	**47.2**	**-0.6**	**1.0**	**27.6**	**7.0**

Source: ONS.
Ref: CSN Explained.

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

Regional Office for National Statistics (ONS) output statistics are published in current prices and are thus inclusive of any inflationary effect. At the time of writing, regional ONS construction output statistics were only available for the first three quarters of 2017.

Construction output in the first three quarters of 2017 totalled £4.47bn in current prices, 9% higher than in the corresponding period of 2016. Strongest growth has been in the commercial construction (85%), public non-housing (46%) and public housing (26%) sectors, while industrial and housing R&M output has contracted sharply, by 36% and 20% respectively. Movements in the private housing and infrastructure sectors have been more moderate with the former seeing growth of 6 per cent and the latter a decline of 9%, albeit from a very high base.

Taking into account the likely fourth quarter figure, which given recent trends should be around £1.5bn in current prices, and the effects of inflation, should mean an outturn for 2017 in 2015 prices of around £5.74bn, a 6% rise on the previous year.

The prospects for growth in the short term are very good, with Welsh construction output expected to rise by over 6% a year on average in 2018 and 2019. However, this prognosis rests heavily on another very strong surge in infrastructure activity, driven by the start of work in the M4 upgrade around Newport this year and the prospects of some enabling work on the Wylfa Newydd new nuclear build project in 2019, although this could slip to 2020. The reactor design recently passed its generic design assessment and Horizon is now planning to apply for the Development Consent Order in the first quarter of this year.

The Welsh Government recently published its latest draft budget (October 2017), which shows scheduled capital expenditure to 'increase the supply and choice of affordable housing' of £221.4m in 2018/19, falling to £133.2m in 2019/20. This expenditure is part of the £1.4bn the Welsh Government has committed to build 20,000 affordable homes by 2020/21 and which includes nearly £340m released from reserves, suggesting a higher level of expenditure than previously budgeted for. Thus, the prospects for growth in public housing output are good with projected annual average growth of over 5% in 2018 and 2019, the strongest rate after the infrastructure sector (nearly 24%).

Housing starts were on a rising trend to the second quarter of 2017 on an annualised basis, but they dropped sharply in the third, although they remain at a good level in the context of recent history. However, the Welsh housing market, as evidenced by movements in house prices, has strengthened in recent months, with the annualised rate rising from 2% in May 2017 to 4.5% in October. Regeneration projects in Cardiff, Swansea, and at Barry Waterfront, will continue to drive reasonable growth in private housing output over the short and medium term.

The Welsh Government's latest draft budget shows capital expenditure on core NHS allocations rising from £284m in 2018/19 to £317.7m in 2019/20, while the education sector is scheduled to see a smaller rise, from £168m in 2018/19 to £176.1m in 2019/20. Additional capital funding of £132m in 2018/19 will allow accelerated development of the Grange University Hospital (formerly known as the Specialist Critical Care Centre) in Torfaen.

The outline planning application for the new £210m Velindre Cancer Centre in Cardiff was submitted earlier this year. The project finance will be delivered through the Non-profit distributing model, but as yet there is no confirmed start date for the scheme. There is a further £556m of health projects either ongoing or in the pipeline at this juncture.

However, it looks that the strong increase in new orders in the first three quarters of 2017 has already largely fed into output, thus a marginal slide in activity is expected over the next two years.

Growth in manufacturing and transport and storage output is expected to remain relatively modest, at an average annual rate of 1% for the former and 1.3% for the latter. These growth rates are unlikely to drive a general increase in demand for factory or warehouse space, although there is always a requirement for bespoke facilities. Wales's geographical location on the periphery of Britain means that it has a small distribution and logistics market, thus its industrial construction sector is mainly focussed on factories.

An £80m Steel Science Centre has been proposed as part of the city deal for the Swansea Bay City Region. However, the proposal has come under attack from a Teesside MP who fears that the centre may duplicate work already done at the Materials Processing Institute in Redcar. If the scheme goes ahead it could start in mid-2018.

While total take up in Cardiff, the main offices market in Wales, was only half its five-year average in the second quarter of last year according to Bilfinger GVA, it was closer but still below the five-year average in the third quarter, once public sector take-up was discounted. The figures indicate a weakening in demand in recent quarters, and this is likely to impact commercial construction activity over the next two to three years, which is projected to decline by around 4% a year on average in the short term.

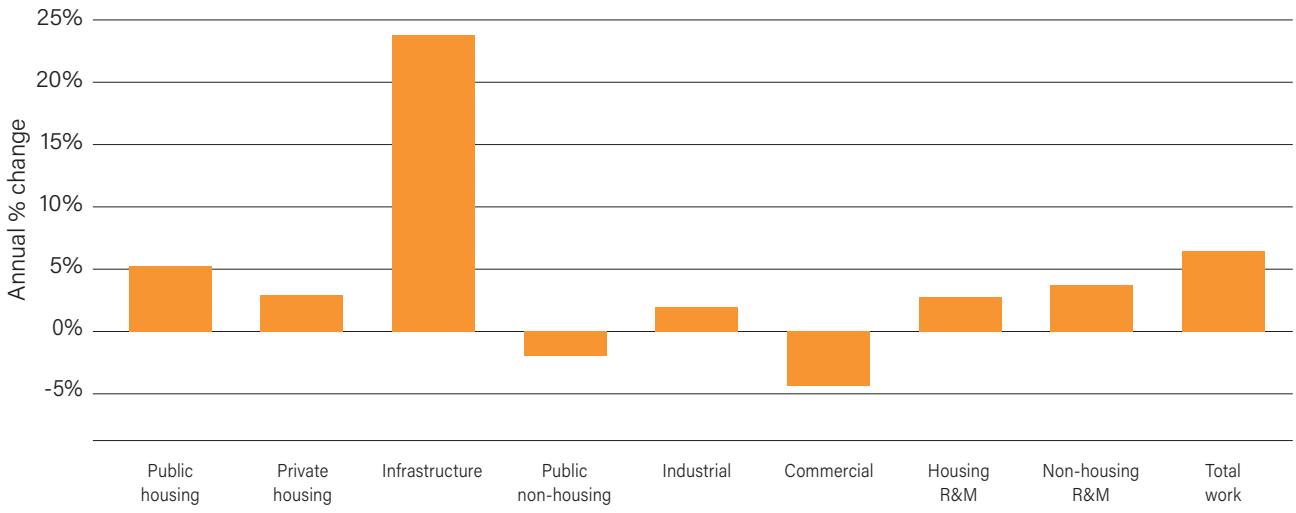
Central Quay, as opposed to Central Square, is the scheme to redevelop the old Brains brewery site to the south of Cardiff Central station with a mix of office and leisure facilities, and residential units. The scheme is valued at £200m with work scheduled to start this year.

CONSTRUCTION OUTPUT – WALES (£MILLION, 2015 PRICES)

	Actual	Forecast (Annual % change)			Annual average
	2016	**2017**	**2018**	**2019**	**2018-2019**
Public housing	129	19%	6%	4%	5.1%
Private housing	907	6%	2%	4%	2.7%
Infrastructure	1,376	-7%	15%	33%	23.8%
Public non-housing	463	29%	-2%	-2%	-2.0%
Industrial	127	-33%	4%	0%	2.2%
Commercial	727	46%	-1%	-7%	-4.1%
New work	**3,729**	**11%**	**5%**	**10%**	**7.5%**
Housing R&M	1,047	-8%	2%	4%	2.8%
Non-housing R&M	658	-4%	2%	4%	3.4%
Total R&M	**1,704**	**-6%**	**2%**	**4%**	**3.0%**
Total work	**5,433**	**6%**	**4%**	**9%**	**6.3%**

Source: Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2019 – WALES



Source: Experian.
Ref: CSN Explained.

> Employment growth is projected to average 2.1% a year between 2018 and 2022, well above the UK rate of 0.5%.

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

Despite Wales' relatively poor economic performance, it is expected to be the strongest of the UK regions/devolved nations in terms of construction output growth, with an annual average rate of 4.6%, driven primarily, but not exclusively, by work in the infrastructure sector, and in particular new nuclear build at Wylfa Newydd.

Infrastructure output is already at historically high levels in the devolved nation and accounted for nearly 25% of total construction output in 2016, a much higher share than in the UK as a whole (12%). Infrastructure output is projected to grow by a very strong annual average of over 14% over the five years to 2022, although year-on-year performance is likely to be volatile depending on the timing of major projects. In the pipeline are an £800m biomass power station in Port Talbot, the £650m Swansea Tidal Lagoon, and the £400m South Wales Metro, all big projects in the context of the Welsh construction sector. However, not all is positive. The Westminster government has recently confirmed plans to scrap rail electrification for the main line between Cardiff and Swansea. The focus will instead be on the production and use of "bi-modal" trains that can either run on electric or diesel generators. Nevertheless, by 2022 infrastructure is expected to account for 35% of total output in Wales.

Excluding infrastructure, average annual output growth in Wales to 2022 would be much lower at around 1%.

Wales, like the other devolved nations, has substantial affordable house building plans, and the social housing sector is going to have to play an increasingly important role if overall targets are to be met. Hence the forecasts are now for quite robust growth in the sector over most of the forecast period as the Welsh Government strives to reach its 20,000 affordable homes target.

Given the long-term mismatch between supply and demand, in the absence of an economic downturn the overall trend for the private house building sector is likely to be upward. Output in the sector in Wales is still a little below its 2007 peak, thus there is potential for further moderate growth over the forecast period, put at a little under 2% a year on average. Demographic drivers to increase the housing stock in Wales are somewhat weaker than across the UK as a whole with population growth, at 0.3% a year, only half the UK average.

By far the largest residential development in Wales is the £2bn planned new garden city to the north west of Cardiff, called Plasdŵr. The scheme will be built out over a 15 to 20-year period and include 7,000 new homes plus social infrastructure, retail and leisure facilities. Work on phase 1, a total of 630 homes, started in spring 2017. There are other not insignificant developments ongoing or in the pipeline in Barry, Swansea, Holyhead, Fishguard, Haverdfordwest, and Flint, to name but a few.

In contrast the non-housing building sectors are likely to struggle to show any real growth over the medium term. In the public non-housing sector, there is a dearth of projects in the pipeline that are big enough to impact the bottom line. The first tranche of the 21st Century Schools programme (Band A) is due to complete in 2018/19, with an investment of £1.4bn across more than 150 schools and colleges. Band B is currently under development and this tranche is due to start in 2019, with a proposed £2.3bn of projects. Once the Band B programme builds up it is expected to contribute to a return to growth in the public non-housing sector from 2021.

Investment in factory and distribution facilities is being impacted by Brexit uncertainties, with developers more cautious about bringing forward new projects. Average annual manufacturing growth is not projected to accelerate over the medium from the 1% expected in the short term, although that for transport and storage is likely to improve, to around 1.7% from the 1.3% put forward for 2018 and 2019. However, as already mentioned, the industrial construction sector in Wales is weighted towards the factory sub-sector thus the stronger growth in transport and storage is unlikely to impact construction activity strongly. As part of the development of the tidal lagoon, Tidal Lagoon (Swansea Bay) plc will be looking to set up a turbine manufacturing facility in the locality. The estimated cost of the project is £30m but work will obviously be tied to the go-ahead for the project as a whole.

Commercial construction output is likely to hit its highest level since 2013 in 2017. However, some of the large projects currently on site, such as Central Square in Cardiff and Cardiff Pointe, are due to complete within the next two years, and it looks like the pipeline is a little thinner. Cardiff is the main offices market in Wales and the indications are that demand has weakened somewhat during 2017. In common with the industrial sector, commercial construction is one of the sectors most vulnerable to Brexit uncertainties.

Of the sectors that drive demand for commercial premises, the information and communication sector is predicted to fare the best with average yearly expansion of 2.2% over the five years to 2022. The remaining sectors are expected to post average annual growth rates of under 2%, with the largest, the professional and other private services one seeing expansion of around 1.8% a year. Thus, after two years of very good growth, commercial construction output is projected to subside between 2018 and 2020 as the Brexit effect on investment and development impacts the sector, before growth returns in 2021. Over the five years to 2022 commercial construction output is expected to contract modestly, by around half a per cent a year on average, albeit from a relatively high level.

Unlike the UK as a whole, the relationship between disposable income, consumer spending and housing R&M expenditure seems to have held true, with a decline or weaker growth in these variables resulting in a drop in output in the sector in 2017, of around 8%. Growth is expected to return to the sector over the forecast period as pressures on disposable incomes ease and consumer spending growth accelerates again. The impact of these factors should also be boosted by the quieter housing market that has prevailed across the UK since the 2008/09 recession, with people moving less and thus prepared to spend more on improvements.

BEYOND 2022

It remains the case that work, once started, at Wylfa Newydd will continue well beyond the current forecast period and into the middle of the next decade. The construction of such a large facility in what is a relatively remote and sparsely populated area will inevitably require significant upgrade of local infrastructure.

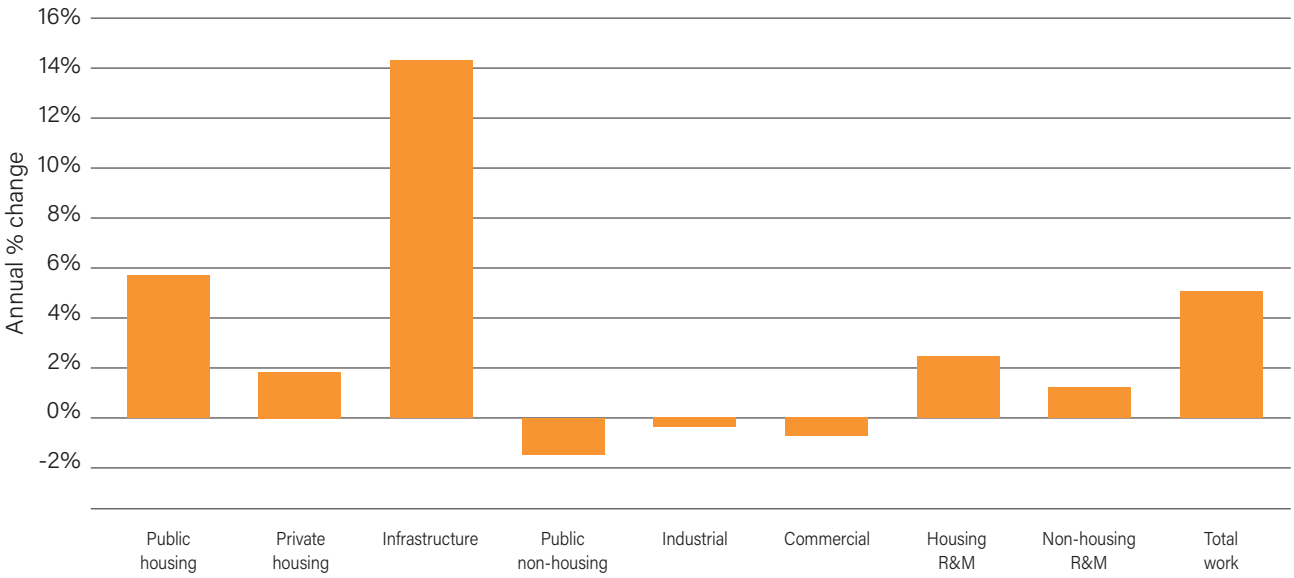
Housing has moved up the political agenda at Westminster, although it has tended to hold a higher priority in the devolved nations anyway. There are a number of long term major housing projects, such as Plasdŵr, Swansea city regeneration, and at Barry Waterfront, which will deliver construction output streams well into the 2020s or even 2030s.

CONSTRUCTION OUTPUT – WALES (£ MILLION, 2015 PRICES)

	Estimate	Forecast (Annual % change)					Annual average
	2017	2018	2019	2020	2021	2022	2018-2022
Public housing	153	6%	4%	10%	11%	-2%	5.6%
Private housing	965	2%	4%	3%	-2%	3%	1.8%
Infrastructure	1,282	15%	33%	-10%	-19%	75%	14.2%
Public non-housing	597	-2%	-2%	-5%	2%	2%	-1.1%
Industrial	85	4%	0%	-2%	-1%	-2%	-0.3%
Commercial	1,061	-1%	-7%	-1%	3%	4%	-0.5%
New work	**4,143**	**5%**	**10%**	**-4%**	**-7%**	**27%**	**5.6%**
Housing R&M	968	2%	4%	3%	2%	1%	2.2%
Non-housing R&M	633	2%	4%	1%	0%	-1%	1.3%
R&M	1,601	2%	4%	2%	1%	0%	1.9%
Total work	**5,744**	**4%**	**9%**	**-3%**	**-4%**	**19%**	**4.6%**

Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2018-2022 – WALES



Source: CSN, Experian.
Ref: CSN Explained.

CONSTRUCTION EMPLOYMENT FORECASTS FOR WALES

TOTAL CONSTRUCTION EMPLOYMENT FORECASTS BY OCCUPATION

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

According to data from the Labour Force Survey (LFS), construction employment in Wales (SIC41-43, 71.2 & 74.9) reached around 108,500 in 2016, about 12% below its 2008 peak, although output was similar to its 2007 level. However, ongoing productivity gains, even though weak, mean that more output is delivered by a smaller workforce over time, thus this pattern is what would be expected. However, care needs to be taken in interpreting this differential purely as a productivity gain. It can also be due to changes in the structure of the industry. Thus, the very strong growth in the low labour intensive infrastructure sector, which saw its share of output rise from 10% in 2007 to 25% in 2016, will have had an impact on the number of people required to deliver the same amount of output.

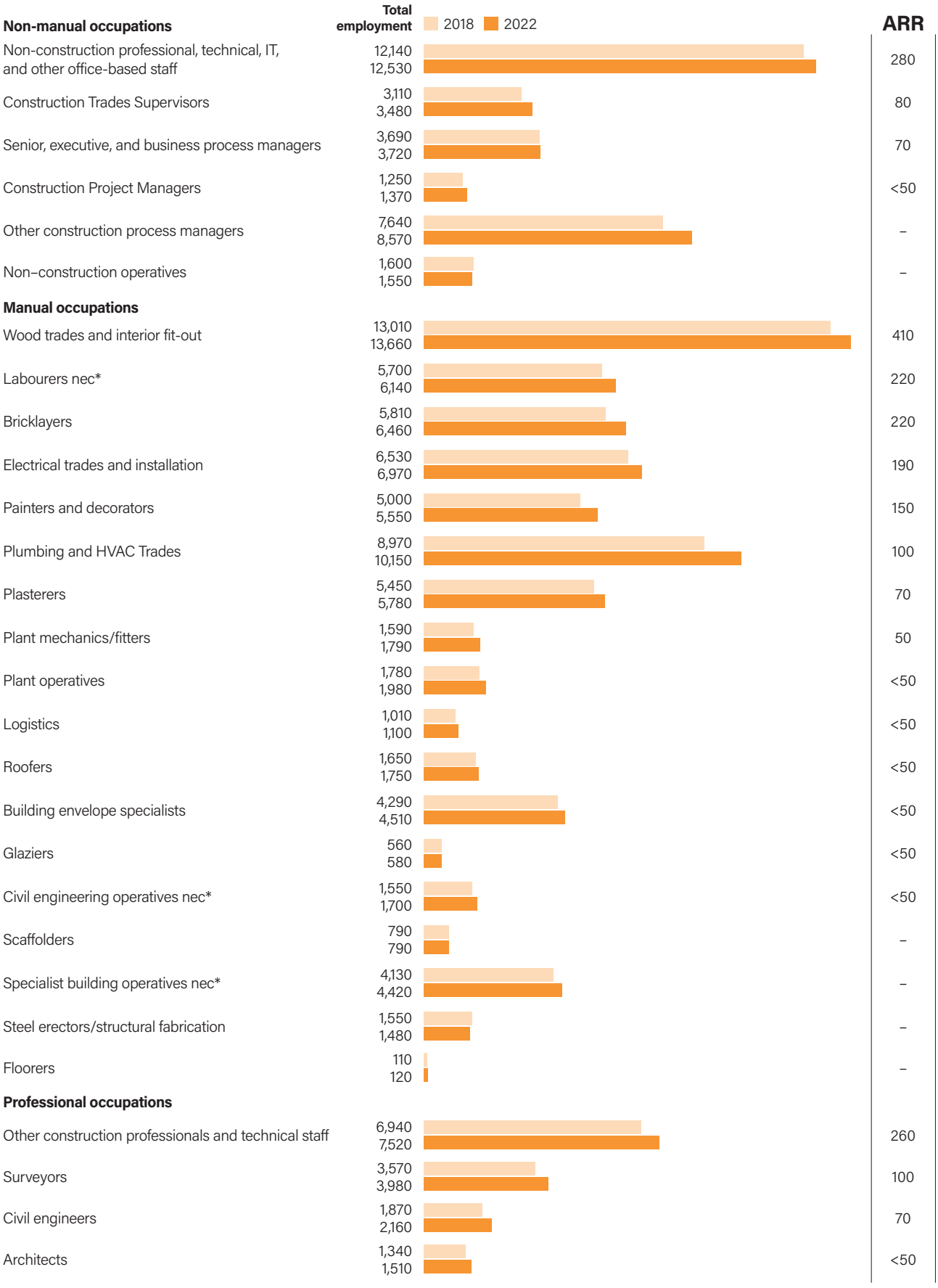
Nevertheless, the strong output growth will inevitably drive good employment growth, estimated at 2.1% a year on average, taking its level to over 121,000 by 2022, less than 2% below its 2008 peak.

All three main types of occupation – managerial and administration, trades and elementary, and professionals – are expected to see good growth over the forecast period, although the demand will be strongest for professionals, where the average annual growth rate is projected at nearly 3.5%, compared with a little under 2% for the other two categories.

Civil engineers and surveyors are likely to be in strong demand, with annual average growth rates of 4%, or close to, for both. The former are a particular requirement of big infrastructure projects, although they work across the whole of the construction industry, on the civil engineering aspects of housing and non-housing developments. On the trade side, robust growth is expected for plumbing and HVAC trades (3.5%), bricklayers (3.2%), and plant mechanics (3.1%).

TOTAL EMPLOYMENT BY OCCUPATION – WALES

Annual recruitment requirement (ARR) by occupation



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

ANNUAL RECRUITMENT REQUIREMENTS (ARR) BY OCCUPATION

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

Not surprisingly, given the strong employment growth Wales has a high annual recruitment requirement, estimated at 2,450, which represents 2.2% of base 2018 employment, a higher ratio than in the UK (1.2%). On an annual basis, the number doesn't sound large, but it does mean that the industry in Wales requires an extra 12,250 people over the next five years, over and above natural flows, to meet anticipated demand. Wales tends to have a fairly high ARR in relation to its base employment level as it tends to suffer from high net outflows of the workforce to the South West and North West of England.

Some 10 occupational categories are flagged up as having amber ARRs – that is an ARR above 2.5% of base employment – including wood trades, bricklayers, electricians, civil engineers and surveyors. For construction-specific occupational categories the biggest absolute requirements are projected for wood trades (410 on average a year), other construction professionals and technical staff (260), and bricklayers and labourers not elsewhere classified (220 each).

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

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

ANNUAL RECRUITMENT REQUIREMENT BY OCCUPATION – WALES

	2018-2022
Non-manual occupations	
Non-construction professional, technical, IT, and other office-based staff	280
Other construction process managers	–
Senior, executive, and business process managers	70
Construction trades supervisors	80
Construction project managers	<50
Manual occupations	
Wood trades and interior fit-out	410
Labourers nec*	220
Electrical trades and installation	190
Painters and decorators	150
Plumbing and HVAC Trades	100
Bricklayers	220
Plant operatives	<50
Logistics	<50
Plasterers	70
Roofers	<50
Scaffolders	–
Specialist building operatives nec*	–
Building envelope specialists	<50
Steel erectors/structural fabrication	–
Glaziers	<50
Plant mechanics/fitters	50
Floorers	–
Civil engineering operatives nec*	<50
Professional occupations	
Other construction professionals and technical staff	260
Civil engineers	70
Surveyors	100
Architects	<50
Total (SIC 41-43)	**1,990**
Total (SIC 41-43, 71.1, 74.9)	**2,450**

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

COMPARISONS ACROSS THE UK

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

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

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

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

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

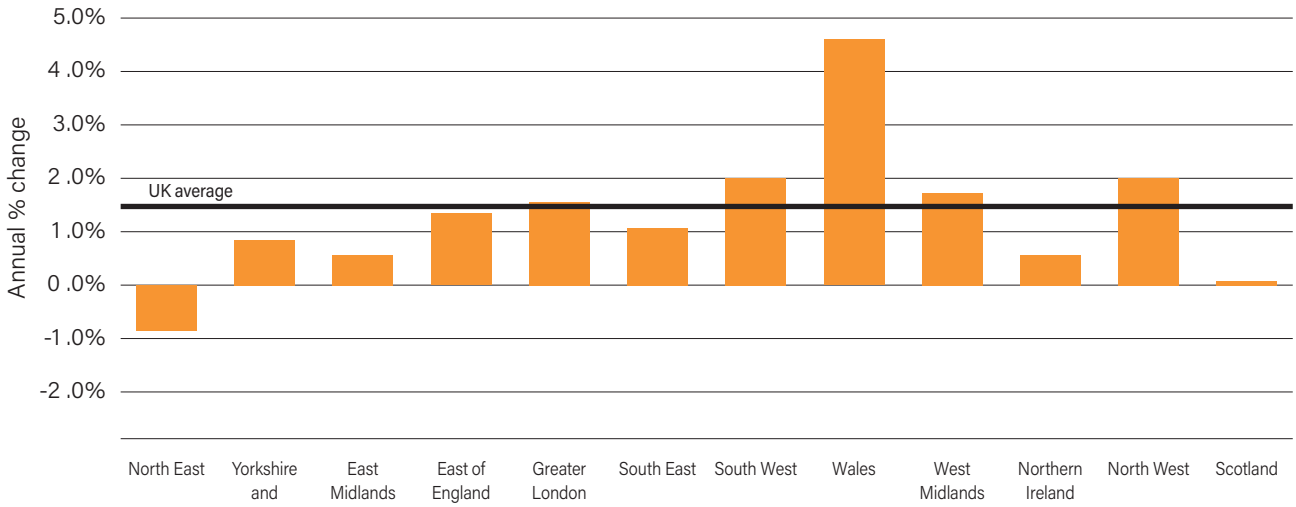
It is the case across the English regions that growth in the construction sector will tend to reflect expansion in the wider economy, unless the region benefits from the siting of major infrastructure projects. Both the South West and North West, which lead the English region growth rankings with 2% a year on average, will benefit from new nuclear build, at Hinkley Point in the case of the former and Moorside in the case of the latter. Enabling works at Hinkley Point have been ongoing for some time while some work at Moorside is projected to begin in 2022. London, and the East Midlands and West Midlands will also see good growth in infrastructure activity as work on High Speed 2 builds up over the forecast period. The strong infrastructure growth in the West Midlands should enable it to experience annual average expansion in total construction output of 1.8%, just behind the South West and North West.

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

Employment growth across the regions and devolved nations tends to mirror that of output, but at a lower level to take account of expected productivity gains and with some minor adjustments depending on whether output growth is in high or low labour intensive sectors. Annual average employment growth is projected to range from a high of 2.1% in Wales to a low of -1.6% in the North East, against a UK rate of 0.5%.

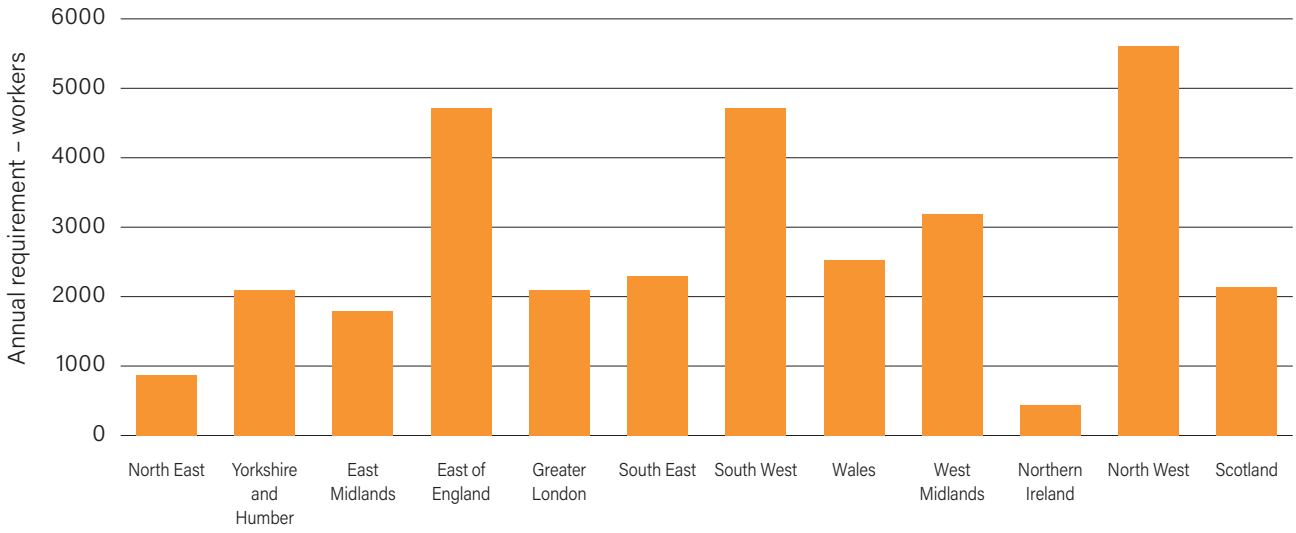
As the annual recruitment requirement (ARR) takes into account known supply-side factors, such as intra-regional labour movements and movements between other industries and construction, the pattern can look significantly different to the profile of output and employment, as some regions and devolved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

ANNUAL AVERAGE OUTPUT GROWTH BY REGION 2018-2022 - WALES



Source: Experian.
Ref: CSN Explained.

ANNUAL RECRUITMENT REQUIREMENT (ARR) BY REGION 2018-2022 - WALES



Source: Experian

> Wales's annual average recruitment requirement (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%.

CSN EXPLAINED

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

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

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

NOTES has some further information relating to the data sources used for the various charts and tables. This section also outlines what is meant by the term 'footprint', when talking about the areas of responsibility that lie with a Sector Skills Council (SSC) or Sector Bodies.

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

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

CSN METHODOLOGY

BACKGROUND

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

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

Observatory groups currently meet twice a year and consist of key regional stakeholders invited from industry, Government, education and sector bodies, all of whom contribute their local industry knowledge and views on training, skills, recruitment, qualifications and policy. The National Group also includes representatives from industry, Government, education and other SSCs and Sector Bodies. This Group convenes twice a year and sets the national scene, effectively forming a backdrop for the Observatories.

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

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

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

THE MODEL APPROACH

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

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

The annual recruitment requirement (ARR) is a gross requirement that takes into account workforce flows into and out of construction, due to such factors as movements between industries, migration, sickness and retirement. However, these flows do not include movements into the industry from training, although robust data on training provision is being developed by CITB in partnership with public funding agencies, further education, higher education and employer representatives. Thus, the ARR provides an indication of the number of new employees that would need to be recruited into construction each year in order to realise forecast output.

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

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

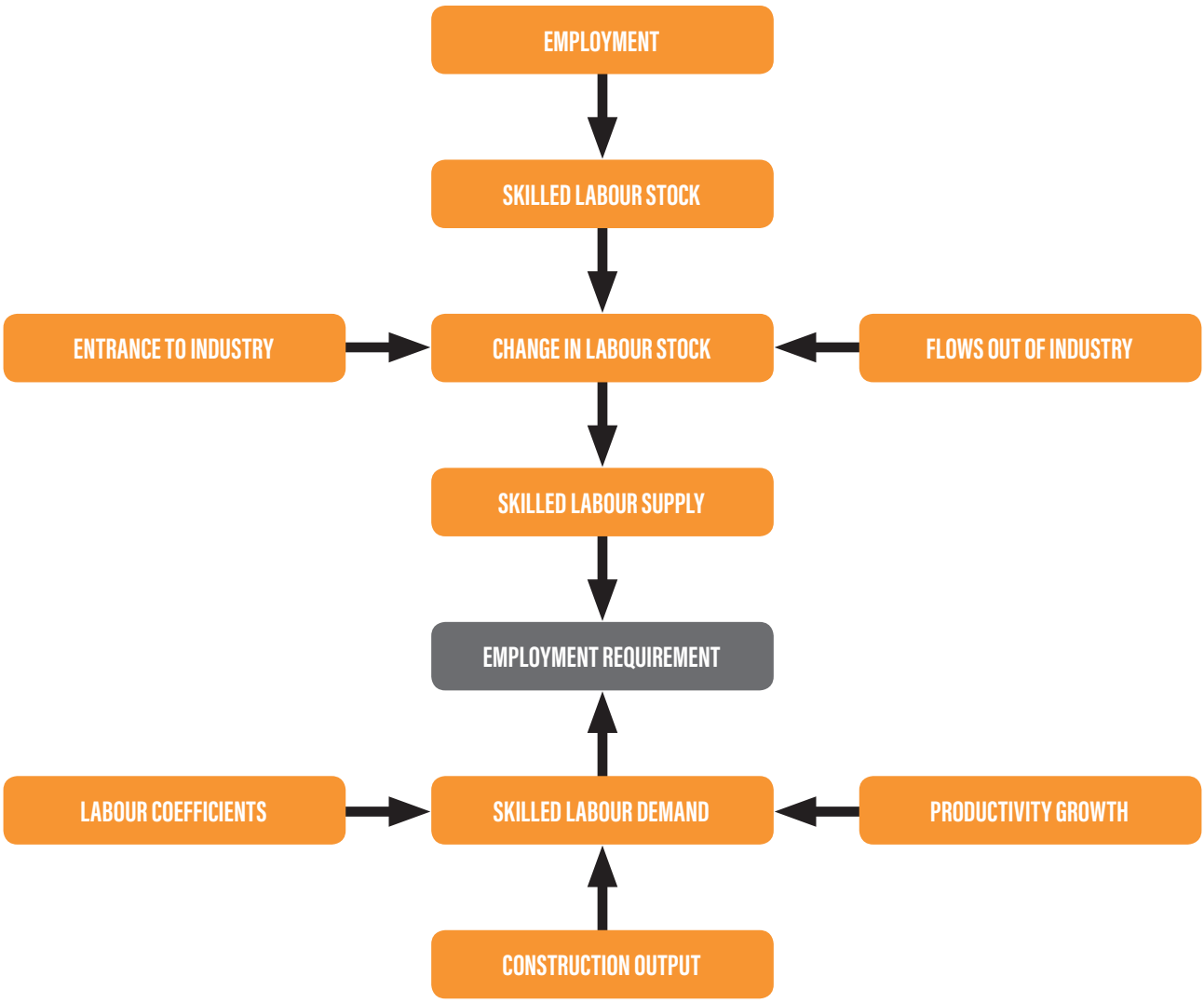
- Transfers to other industries
- International/domestic out migration
- Permanent retirements
  (Including permanent sickness)
- Outflow to temporary sickness and home duties.

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

Flows into the labour market include:

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

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



GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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

Productivity – output per employee.

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

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

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

NOTES

NOTES

1 Except for Northern Ireland, output data for the English regions, Scotland and Wales is supplied by the Office for National Statistics (ONS) on a current price basis. National deflators produced by the ONS have been used to deflate prices to a 2005 constant price basis, so that the effects of inflation have been stripped out.

2 The annual average growth rate of output is a compound average growth rate, i.e. the rate at which output would grow each year if it increased steadily over the forecast period.

3 Only selected components of gross value added (GVA) are shown in this table and so do not sum to the total.

4 For new construction orders, comparison is made with Great Britain rather than the UK, owing to the fact that there are no orders data series for Northern Ireland.

5 Employment numbers are rounded to the nearest 10.

6 The tables include data relating to plumbers and electricians. As part of SIC 43, plumbers and electricians working in contracting are an integral part of the construction process.

7 A reporting minimum of 50 is used for the annual recruitment requirement (ARR). As a result some region and devolved nation ARR forecasts do not sum to the total UK requirement.

8 The Employment and ARR tables show separate totals for SIC41–43 and SIC41–43, 71.1 and 74.9. The total for SIC41–43 covers the first 24 occupational groups on the relevant tables and excludes civil engineers, other construction professionals and technical staff, architects and surveyors. The total for SIC41–43, 71.1 and 74.9 includes all occupations.

FOOTPRINTS FOR THE BUILT ENVIRONMENT SECTOR

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

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

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

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

DEFINITIONS: TYPES AND EXAMPLES OF CONSTRUCTION WORK

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

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

Private sector housing

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

Infrastructure – public and private

Water

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

Sewerage

Sewage disposal works, laying of sewers and surface drains.

Electricity

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

Gas, communications, air transport

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

Railways

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

Harbours

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

Roads

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

Public non-residential construction[1]

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[1]

Schools and universities

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

Health

Private hospitals, nursing homes, clinics.

Offices

Office buildings, banks.

Entertainment

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

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

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

Agriculture
All buildings and work on farms, horticultural establishments.

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

New work

New housing
Construction of new houses, flats, bungalows only.

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

Repair and maintenance

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

All other sectors:
Repair and maintenance work of all types, including planned and contractual maintenance.[3]

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

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

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

OCCUPATIONAL GROUPS

Occupational group Description, SOC (2010) reference.	
Senior, executive, and business process managers	
Chief executives and senior officials	1115
Financial managers and directors	1131
Marketing and sales directors	1132
Purchasing managers and directors	1133
Human resource managers and directors	1135
Property, housing and estate managers	1251
Information technology and telecommunications directors	1136
Research and development managers	2150
Managers and directors in storage and warehousing	1162
Managers and proprietors in other services nec*	1259
Functional managers and directors nec*	1139
IT specialist managers	2133
IT project and programme managers	2134
Financial accounts managers	3538
Sales accounts and business development managers	3545
Construction project managers	
Construction project managers and related professionals	2436
Other construction process managers	
Production managers and directors in manufacturing	1121
Production managers and directors in construction	1122
Managers and directors in transport and distribution	1161
Waste disposal and environmental services managers	1255
Health and safety officers	3567
Conservation and environmental associate professionals	3550
Non-construction professional, technical, IT, and other office-based staff (excl. managers)	
IT operations technicians	3131
IT user support technicians	3132
Finance and investment analysts and advisers	3534
Taxation experts	3535
Financial and accounting technicians	3537
Vocational and industrial trainers and instructors	3563
Business and related associate professionals nec*	3539
Legal associate professionals	3520
Inspectors of standards and regulations	3565
Programmers and software development professionals	2136
Information technology and telecommunications professionals nec*	2139
Estate agents and auctioneers	3544
Solicitors	2413
Legal professionals nec*	2419
Chartered and certified accountants	2421
Business and financial project management professionals	2424
Management consultants and business analysts	2423
Receptionists	4216
Typists and related keyboard occupations	4217
Business sales executives	3542
Bookkeepers, payroll managers and wages clerks	4122
Records clerks and assistants	4131
Stock control clerks and assistants	4133
Telephonists	7213
Communication operators	7214
Personal assistants and other secretaries	4215
Sales and retail assistants	7111
Telephone salespersons	7113
Buyers and procurement officers	3541
Human resources and industrial relations officers	3562
Credit controllers	4121
Company secretaries	4214
Sales related occupations nec*	7129
Call and contact centre occupations	7211
Customer service occupations nec*	7219
Elementary administration occupations nec*	9219
Chemical scientists	2111
Biological scientists and biochemists	2112
Physical scientists	2113
Laboratory technicians	3111
Graphic designers	3421
Environmental health professionals	2463
IT business analysts, architects and systems designers	2135
Conservation professionals	2141
Environment professionals	2142
Actuaries, economists and statisticians	2425
Business and related research professionals	2426
Finance officers	4124
Financial administrative occupations nec*	4129
Human resources administrative occupations	4138
Sales administrators	4151
Other administrative occupations nec*	4159
Office supervisors	4162
Sales supervisors	7130
Customer service managers and supervisors	7220
Office managers	4161
Construction trades supervisors	
Skilled metal, electrical and electronic trades supervisors	5250
Construction and building trades supervisors	5330
Wood trades and interior fit-out	
Carpenters and joiners	5315
Paper and wood machine operatives	8121
Furniture makers and other craft woodworkers	5442
Construction and building trades nec* (25%)	5319

Bricklayers

Bricklayers and masons	5312

Building envelope specialists

Construction and building trades nec* (50%)	5319

Painters and decorators

Painters and decorators	5323
Construction and building trades nec* (5%)	5319

Plasterers

Plasterers	5321

Roofers

Roofers, roof tilers and slaters	5313

Floorers

Floorers and wall tilers	5322

Glaziers

Glaziers, window fabricators and fitters	5316
Construction and building trades nec* (5%)	5319

Specialist building operatives not elsewhere classified (nec*)

Construction operatives nec* (100%)	8149
Construction and building trades nec* (5%)	5319
Industrial cleaning process occupations	9132
Other skilled trades nec*	5449

Scaffolders

Scaffolders, stagers and riggers	8141

Plant operatives

Crane drivers	8221
Plant and machine operatives nec*	8129
Fork-lift truck drivers	8222
Mobile machine drivers and operatives nec*	8229

Plant mechanics/fitters

Metalworking production and maintenance fitters	5223
Precision instrument makers and repairers	5224
Vehicle technicians, mechanics and electricians	5231
Elementary process plant occupations nec*	9139
Tool makers, tool fitters and markers-out	5222
Vehicle body builders and repairers	5232

Steel erectors/structural fabrication

Steel erectors	5311
Welding trades	5215
Metal plate workers and riveters	5214
Construction and building trades nec* (5%)	5319
Smiths and forge workers	5211
Metal machining setters and setter-operators	5221

Labourers nec*

Elementary construction occupations (100%)	9120

Electrical trades and installation

Electricians and electrical fitters	5241
Electrical and electronic trades nec*	5249
Telecommunications engineers	5242

Plumbing and heating, ventilation, and air conditioning trades

Plumbers and heating and ventilating engineers	5314
Pipe fitters	5216
Construction and building trades nec* (5%)	5319
Air-conditioning and refrigeration engineers	5225

Logistics

Large goods vehicle drivers	8211
Van drivers	8212
Elementary storage occupations	9260
Buyers and purchasing officers (50%)	3541
Transport and distribution clerks and assistants	4134

Civil engineering operatives not elsewhere classified (nec*)

Road construction operatives	8142
Rail construction and maintenance operatives	8143
Quarry workers and related operatives	8123

Non-construction operatives

Metal making and treating process operatives	8117
Process operatives nec*	8119
Metalworking machine operatives	8125
Water and sewerage plant operatives	8126
Assemblers (vehicles and metal goods)	8132
Routine inspectors and testers	8133
Assemblers and routine operatives nec*	8139
Elementary security occupations nec*	9249
Cleaners and domestics*	9233
Street cleaners	9232
Gardeners and landscape gardeners	5113
Caretakers	6232
Security guards and related occupations	9241
Protective service associate professionals nec*	3319

Civil engineers

Civil engineers	2121

Other construction professionals and technical staff

Mechanical engineers	2122
Electrical engineers	2123
Design and development engineers	2126
Production and process engineers	2127
Quality control and planning engineers	2461
Engineering professionals nec*	2129
Electrical and electronics technicians	3112
Engineering technicians	3113
Building and civil engineering technicians	3114
Science, engineering and production technicians nec*	3119
Architectural and town planning technicians*	3121
Draughtspersons	3122
Quality assurance technicians	3115
Town planning officers	2432
Electronics engineers	2124
Chartered architectural technologists	2435
Estimators, valuers and assessors	3531
Planning, process and production technicians	3116

Architects

Architects	2431

Surveyors

Quantity surveyors	2433
Chartered surveyors	2434

*Not elsewhere classified

CITB RESEARCH

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