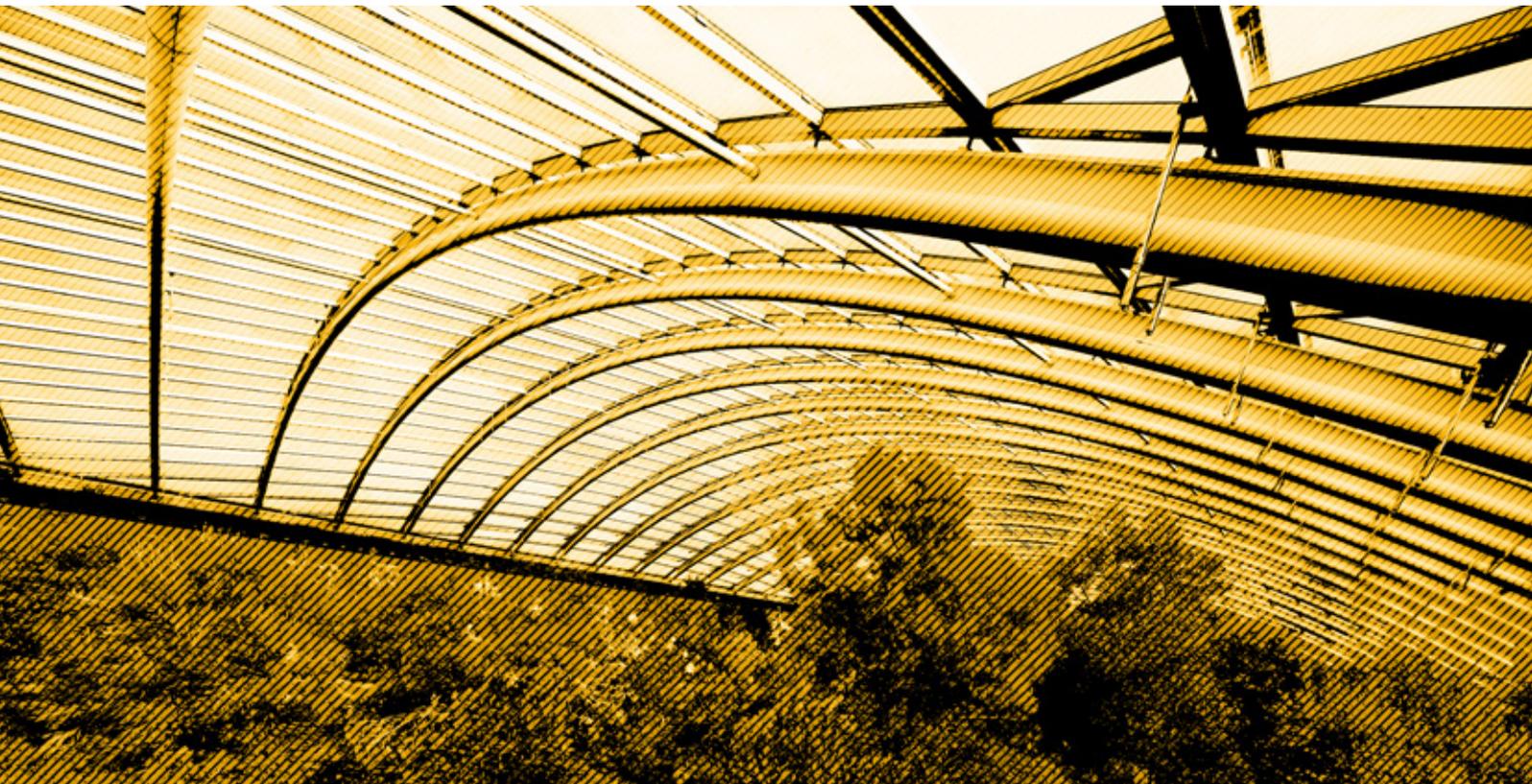


INDUSTRY INSIGHTS

Construction Skills Network
Forecasts 2017–2021



WALES

About CITB

CITB is the Industrial Training Board (ITB) for the construction industry in Great Britain (England, Scotland and Wales). CITB ensures employers can access the high quality training their workforce needs and supports industry to attract new recruits into successful careers in construction.

Using its evidence base on skills requirements, CITB works with employers to develop standards and qualifications for the skills industry needs now, and in the future. CITB is improving its employer funding to invest in the most needed skills and by making it easier for companies of all sizes to claim grants and support.

About Experian

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

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SUMMARY – WALES

Wales is projected to see annual average output growth of 6.2% over the 2017 to 2021 period, down from the 7.1% projected last year for the 2016 to 2020 period, but still a very robust increase. Growth in Wales is expected to outstrip that for the UK as a whole by a considerable margin (1.7%). Based on the expansion in output, employment is expected to grow at an annual average rate of 2.7%, again well above the UK rate of 0.6%. Wales's annual average recruitment requirement (ARR) is estimated at 3,890, which represents 3.4% of base 2017 employment.

Growth in the infrastructure sector

16%

a year on average

Employment is forecast to grow by

2.7%

a year on average

Wales has an ARR of

3,890

KEY FINDINGS

Construction output is estimated to have grown for the fourth successive year in 2016, reaching £4.8bn in 2013 prices. However in real terms it is still some 15% lower than its 2004 peak of nearly £5.7bn. Growth last year is likely to have been fairly moderate at around 2%, driven largely by strong expansion in the private housing and commercial sectors, the latter starting to recover from a very low base.

Wales is projected to see annual average output growth of 6.2% over the five years to 2021, the strongest of any of the English regions and devolved nations. This expansion will be driven in no small part by very strong growth in the infrastructure sector, of nearly 16% a year on average, predicated on the start of work on new nuclear build at Wylfa Newydd during the forecast period. The sector will also benefit from a significant road improvement programme, in which the largest scheme will be the M4 upgrade around Newport, currently scheduled to start in 2018.

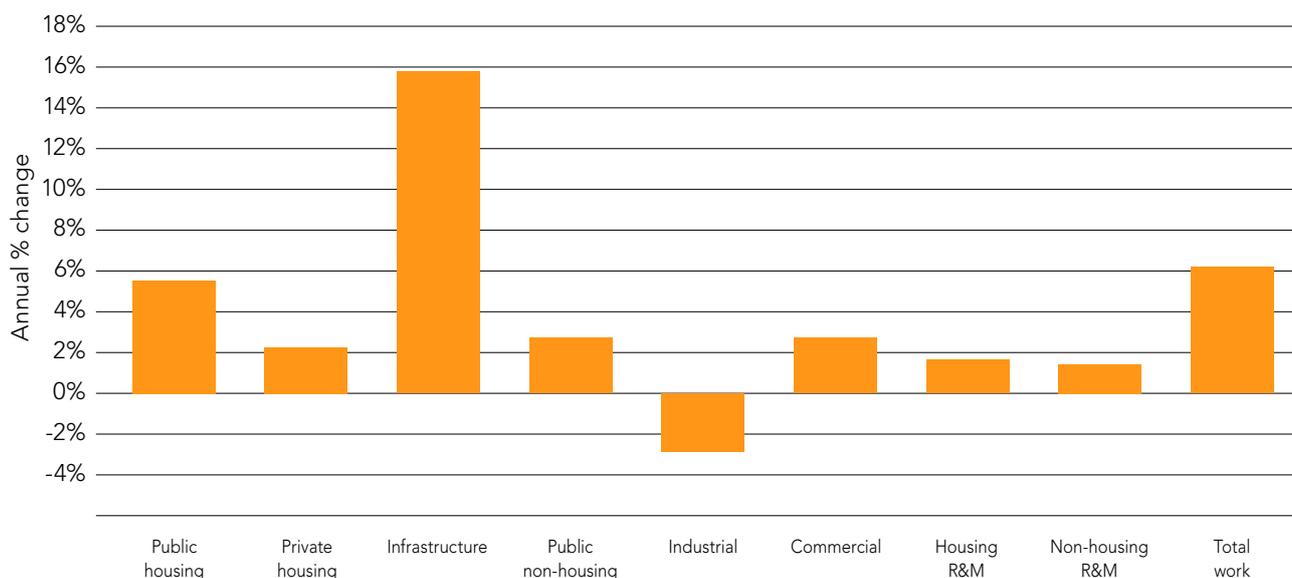
While house price growth in Wales is projected to be very moderate over the forecast period, there are a number of projects on site or in the pipeline that should lead to growth in output in both the public and private sectors, such as the 'urban village' on the site of Ely paper mill in

Cardiff and Taylor Wimpey's Torfaen development. Decent growth is also forecast for the public non-housing and commercial sectors, the former largely driven by health projects and the latter continuing to recover from its current low level.

Employment growth is projected to average 2.7% a year between 2017 and 2021, well above the UK rate of 0.6%, with the Welsh construction workforce reaching close to 128,000 by 2021, making it, along with the South East, the only region/devolved nation in which employment will exceed its 2008 peak. Demand is expected to be strongest for construction trades supervisors and civil engineering operatives nec., both with annual average growth rates of over 4%. Overall, growth will be fairly evenly spread across the major occupational categories – managerial/supervisory, professional, and trades.

Wales's ARR is estimated at 3,890, the fifth largest requirement on an absolute level and the highest as a ratio of base 2017 employment (3.4%). This is well above the UK ratio of 1.4%. 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 thus tends to have a high relative ARR.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2021 – WALES



Source: CSN, Experian.
Ref: CSN Explained.

REGIONAL COMPARISON 2017-2021

	Annual average % change in output	Change in total employment	Total ARR
North East	-0.1%	-2,840	1,270
Yorkshire and Humber	0.5%	-1,300	1,860
East Midlands	0.0%	-2,340	1,770
East of England	1.0%	3,230	3,970
Greater London	2.4%	27,110	3,870
South East	2.2%	25,550	3,940
South West	3.1%	8,240	4,180
Wales	6.2%	16,120	3,890
West Midlands	1.3%	4,280	2,800
Northern Ireland	1.6%	1,430	710
North West	2.5%	14,520	5,140
Scotland	-0.4%	-8,420	2,340
UK	1.7%	85,580	35,740

Source: CSN, Experian.
Ref: CSN Explained.

Wales is projected to see annual average output growth of 6.2% over the five years to 2021, the strongest of any of the English regions and devolved nations.

THE OUTLOOK FOR CONSTRUCTION IN WALES

CONSTRUCTION OUTPUT IN WALES – OVERVIEW

Construction output in Wales rose for a third consecutive year in 2015, to an estimated £4.73bn in 2013 prices, a 4% increase. However, output remained nearly 17% lower than its 2004 peak in real terms. Expansion in 2015 was driven almost entirely by the infrastructure sector, in which output more than doubled. Repair and maintenance output fell back to the level seen in 2013 after being one of the main engines of growth in 2014.

INDUSTRY STRUCTURE

The diagram, Construction Industry structure 2015 – UK vs Wales graphic, 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 very strong growth in the infrastructure sector has significantly changed the structure of the industry in Wales in 2015 and its relationship with the UK average. While in 2014, the share infrastructure took of total construction output was similar in Wales and the UK, its share in the former almost doubled in 2015 to 27% and now compares with 15% in the UK. This infrastructure growth has squeezed the shares of all other sectors in Wales except for the industrial one, which saw its share rise from 2% in 2014 to 3% in 2015.

If anything the structure of the Welsh construction industry has differed even more than is usual from the UK average in 2015. Private new housing accounted for only 13% of total construction output in Wales compared with 18% in the UK, and the commercial (10% vs 18%) and non-housing R&M (14% vs 17%) sectors were also proportionally smaller. In

contrast the public non-housing sector was proportionally larger, taking a 12% share of output in 2015 compared with 7% for the UK as a whole.

ECONOMIC OVERVIEW

The expected performance of a regional or national economy over the forecast period (2017 – 2021) provides an indication of the construction sectors in which demand is likely to be strongest.

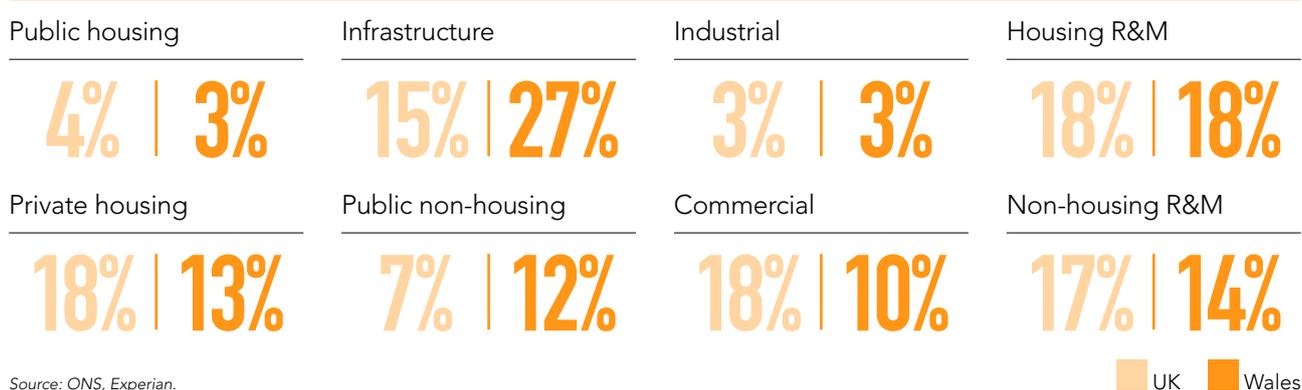
ECONOMIC STRUCTURE

The main engines of growth in the Welsh economy in the five years to 2015 have been professional and other private services (3.1% growth a year on average), wholesale and retail (2.9%) and accommodation, food services and recreation (2.4%). These three sectors accounted for 37% of gross value added (GVA) in Wales in 2015. Manufacturing saw only modest growth averaging 1.1% a year with public services displaying more marginal expansion of 0.7% over the same period. This indicates that there has been a further shift from manufacturing and public services to the private services sector in recent years. Nevertheless both manufacturing and public services still accounted for a significantly larger proportion of GVA in Wales in 2015 than they did in the UK – 16.1% vs 9.6% in the case of the former and 25.3% vs 18.2% in the case of the latter. Public services remains the largest sector in the devolved nation.

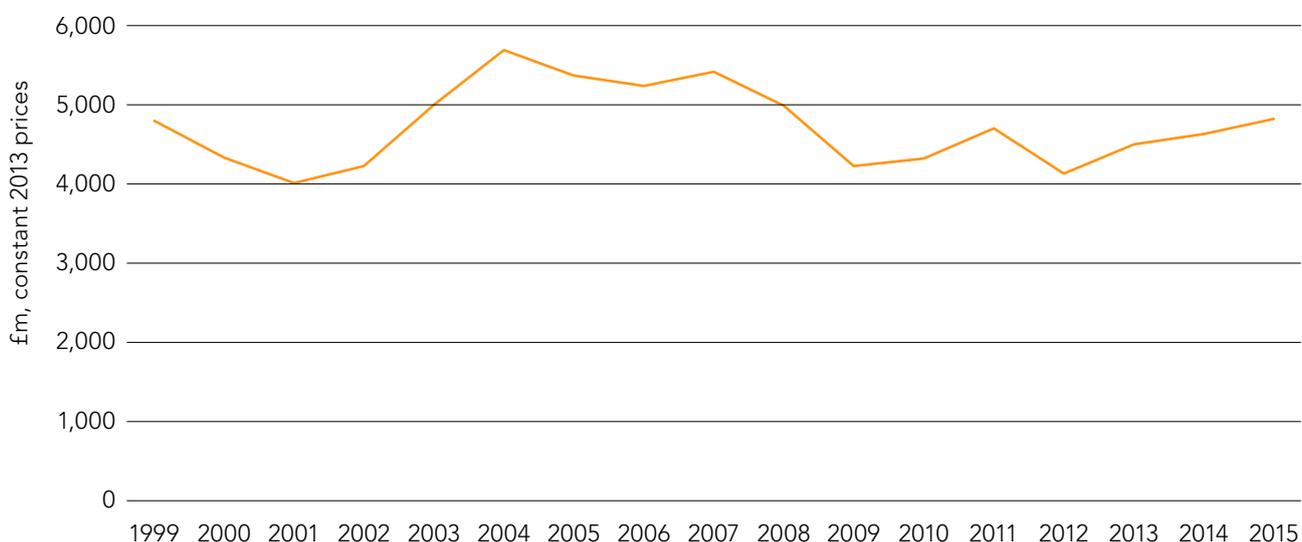
Wales' higher reliance on the manufacturing and public services sectors is a key factor accounting for the difference in overall economic performance in the five years to 2015, with the UK experiencing 2% a year expansion on average compared with 1.6% in Wales.



CONSTRUCTION INDUSTRY STRUCTURE 2015 – UK VS WALES



CONSTRUCTION OUTPUT 1999-2015 – WALES



Source: ONS.
Ref: CSN Explained.

ECONOMIC STRUCTURE – WALES (£ BILLION, 2012 PRICES)

	Actual	Forecast (Annual % change, real terms)					
	2015	2016	2017	2018	2019	2020	2021
Public Services	13.3	1.3	0.2	0.5	1.3	2.1	2.2
Professional & Other Private Services	11.8	2.9	1.3	1.2	1.6	1.8	2.0
Manufacturing	8.5	0.2	-0.3	1.0	0.9	0.9	0.9
Wholesale & Retail	5.4	4.6	1.2	1.2	1.7	1.9	2.1
Accommodation, Food Services & Recreation	2.3	2.9	1.9	1.6	1.7	1.5	1.7
Total Gross Value Added (GVA)	52.7	2.0	0.6	0.9	1.4	1.7	1.8

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

FORWARD LOOKING ECONOMIC INDICATORS

GVA in Wales reached £52.7bn (2012 prices) in 2015, 3.4% of the UK total. With the devolved nation accounting for 4.8% of UK population, GVA per capita remains well below the UK average. GVA is estimated to have risen by 2% in 2016, in line with the UK rate, driven by good performances in the information and communication (5.8%), wholesale and retail (4.6%), and professional and other private services (2.9%) sectors.

Expansion in the Welsh economy is expected to continue to lag the UK, by around half a percentage point a year on average (1.3% vs 1.8%) over the 2017 to 2021 period. Growth generally is projected to be slower than predicted a year ago due to global uncertainties, not just as a result of the European Union referendum result in the UK, but also linked to the recent U.S. elections and continuing instability in the Middle East. Wales will also suffer from weaker demographics, with population in the devolved nation only expected to expand by 0.3% a year on average, compared with 0.7% across the UK as a whole.

The factors mentioned above are expected to impact consumer spending and business investment across the UK and Wales is unlikely to be immune from this. Real household disposable income growth is likely to turn negative this year under pressure from higher inflation and household spending growth is projected to slow to around 1.3% a year on average in the 2017 to 2021 period, compared with 2.1% in the five years to 2015.

NEW CONSTRUCTION ORDERS – OVERVIEW

After two weak years in terms of growth, new construction orders in Wales rose by over 27% to £2.68bn in current prices in 2015, their highest level since 2007. By far the biggest rise was in the infrastructure sector where new orders increased from £272m in 2014 to £1.3bn in 2015. However, it looks like most of this uplift in new orders has already made its way through to output in the same year. Growth in new orders for industrial construction was also strong, for the second consecutive year, although they are coming back from a very low base.

NEW CONSTRUCTION ORDERS – CURRENT SITUATION

In the first three quarters of 2016 new orders totalled £2.41bn, 19% higher than in the corresponding period of 2015. Not surprisingly the infrastructure sector has not built on the exponential growth it saw in 2015, but its level has remained stable. Strongest growth was in the commercial sector, where new orders more than doubled to £467m, and the public and private housing, and public non-housing sectors all saw double-digit growth.



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

	Actual	Forecast (Annual % change, real terms)					
	2015	2016	2017	2018	2019	2020	2021
Real household disposable income (2012 prices)	48.2	2.3	-0.4	1.3	1.4	1.8	2.0
Household spending (2012 prices)	49.4	2.5	1.3	0.5	1.2	1.8	1.9
Working age population (000s and as % of all)	1,891.4	61.2%	61.1%	61.0%	61.1%	61.5%	61.4%
House prices (£)	138,667	2.6	0.7	0.8	1.8	2.3	2.6
LFS unemployment (millions)	0.09	-18.5	15.6	1.2	0.1	0.4	-0.2

Source: ONS, DCLG, Experian.

NEW CONSTRUCTION ORDERS GROWTH 1999-2015 – WALES VS GB



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

	Actual	Annual % change				
	2015	2011	2012	2013	2014	2015
Public housing	47	-44.4	-2.0	-15.3	-30.1	-19.0
Private housing	497	-40.3	42.5	-4.4	4.8	8.0
Infrastructure	1,305	-37.7	159.5	-2.6	-43.3	379.8
Public non-housing	314	-21.7	31.7	-11.0	88.5	-62.5
Industrial	180	-1.4	12.3	-11.0	58.9	55.2
Commercial	337	-32.0	28.7	21.6	-35.9	-6.4
Total new work	2,680	-32.5	47.2	-0.6	1.0	27.4

Source: ONS.
Ref: CSN Explained.

CONSTRUCTION OUTPUT – SHORT-TERM FORECASTS (2017–2018)

Regional Office for National Statistics (ONS) output statistics are published in current prices and are thus inclusive of any inflationary effect. At the time of writing, regional ONS construction output statistics were only available for the first three quarters of 2016.

Construction output in the first three quarters of 2016 reached £4.1bn in current prices, a 9% increase on the corresponding period of 2015. Growth in the private housing and commercial construction sectors was strong, at around 40% in both, but the public housing, public non-housing and industrial sectors experienced falls. On an annualised basis output was 7% higher in the third quarter of last year than at the end of 2015 in nominal terms and in real terms – that is, stripping out the impact of inflation – growth is estimated at around 2% for 2016 as a whole.

Short-term growth in Wales is expected to average a very modest 0.4% a year in 2017 and 2018, largely due to a poor outlook for infrastructure this year in growth terms. However, in absolute terms infrastructure output is expected to remain historically high, at close to £1bn (2013 prices).

In the transport arena around £136m of work was due to complete by the end of 2016 but nearly £350m is planned to start, including the A487 Caernarfon – Bontnewydd Bypass, the A483/A489 Newtown Bypass, improvements to Junction 28 of the M4, the Five Mile Lane improvement scheme and Eastern Bay Link in Cardiff, and the M4 Brynglas Tunnels.

Social housing providers are expected to fare better in the devolved nations compared with those in England in a more conducive political atmosphere. Annual average growth of over 3% is expected over the next two years in public housing output. Cadwyn Housing Association is currently delivering 33 units across Cardiff, which are due to complete by April 2017, with a further six planned. Plans have been approved to deliver 62 new affordable homes in Flint town centre under the Strategic Housing and Regeneration Programme (SHARP). Completion of the new homes is scheduled for April 2018. Overall the SHARP programme is intended to deliver 500 new homes across Flintshire by 2021, 300 for affordable rent and 200 for social rent.

Private housing output is projected to grow at the same rate as the public sector over the next two years. Recent house price data paints a moderate picture of demand, with month-on-month growth in October 2016 of 0.7% and an annualised rate of growth of 4.4% according to the Office for National Statistics (ONS), weaker than in England, but stronger than in Scotland and Northern Ireland.

Work started last December on a £100m project to create an 'urban village' on the site of Ely paper mill in Cardiff. The development by Tirion Homes will deliver up to 800

affordable and open-market units. One of the most active developers in Wales at present is the Conygar Investment Company plc, which is currently taking forward three marina projects, at Fishguard, Holyhead and Pembroke Dock, all with large residential elements, totalling 937 apartments.

The public non-housing sector has performed poorly in the past two years, but is expected to be one of the main engines of growth in 2017 and 2018 with annual average expansion of 6.5%. An increasing number of projects have completed the approval process under the £1.4bn 21st Century Schools programme, in which the Welsh Government provides 50% of the funding with local authorities providing the other half.

In the health sub-sector plans have been submitted for the proposed new £210m Velindre Cancer Centre in Cardiff. The project will be the first to be funded through the Non-profit Distribution method in Wales and all being well construction is scheduled to start in 2018.

Outside of the health and education sectors, Muse Developments Ltd has started demolition works on Conwy Borough Council's offices in Colwyn Bay in preparation for starting work on a new £35m complex in the spring. The project is scheduled for completion in autumn 2018.

The short-term prospects for industrial construction are dull, with output expected to fall by close to 3% a year on average over the next two years. While manufacturers may benefit somewhat from higher exports due to the weakness of sterling, the effects of this are likely to be dwarfed by a slowdown in domestic demand this year and next.

Moderate growth of around 2.4% a year on average is predicted for commercial construction in 2017 and 2018. The sector has started to recover from historically very low levels of output and this is expected to continue despite the impact global uncertainties may have on investment.

Enabling works have now commenced on the £200m Talbot Green town centre project, a mixed use development including office, retail and leisure facilities to support the recent growth of new residential building in the area. Main works on the scheme are expected to start towards the end of this year. Work has started on BBC Wales' new £120m headquarters at Central Square, Cardiff, and it is due to become operational in 2018. The project will anchor phase 2 of 5 in the Central Square redevelopment. Construction is due to commence shortly on the new International Convention Centre for Wales at the Celtic Manor Resort. The £100m facility is scheduled to open in early 2019.

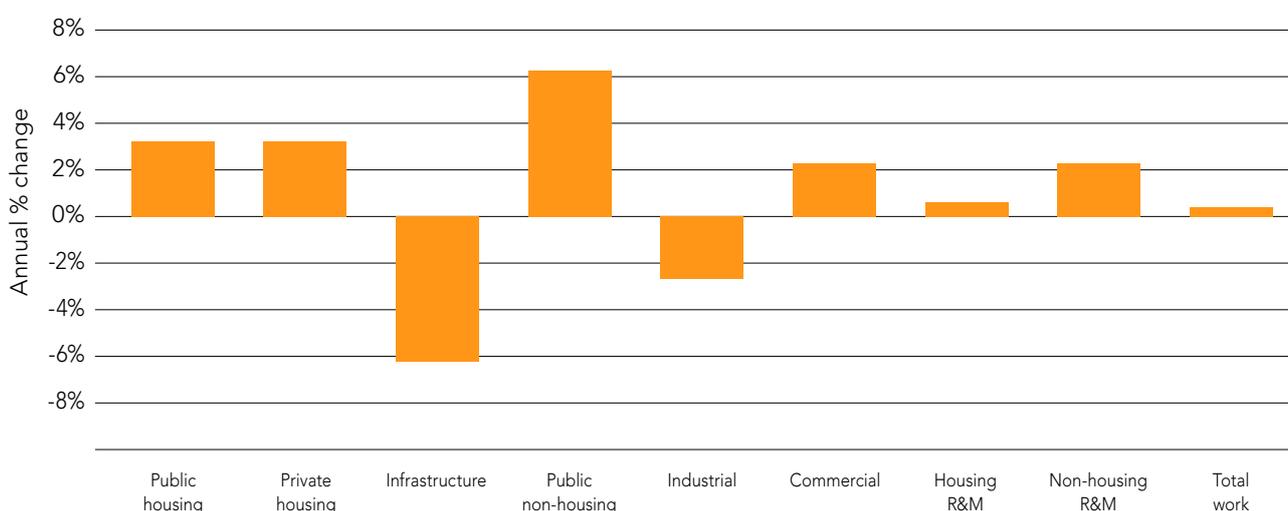
The percentage of social housing meeting the Welsh Housing Quality Standard (WHQS) rose to 79% as of end March 2016, a 7% increase on end March 2015. This represented a slight acceleration in compliance from the 5% rise seen in the year to end March 2015. Given that social housing providers have four years to bring the remainder of their stock up to WHQS standards, there is likely to be a deceleration of work to 2020.

CONSTRUCTION OUTPUT – WALES (£MILLION, 2013 PRICES)

	Actual	Forecast (Annual % change)			Annual average
	2015	2016	2017	2018	2017-2018
Public housing	120	-2%	2%	4%	3.2%
Private housing	612	26%	7%	0%	3.2%
Infrastructure	1,281	-4%	-22%	12%	-6.2%
Public non-housing	592	-18%	2%	12%	6.5%
Industrial	146	-7%	2%	-7%	-2.8%
Commercial	465	14%	2%	2%	2.4%
New work	3,217	2%	-6%	6%	-0.1%
Housing R&M	867	2%	-1%	2%	-0.7%
Non-housing R&M	645	2%	1%	4%	2.5%
Total R&M	1,511	2%	0%	3%	1.5%
Total work	4,728	2%	-4%	5%	0.4%

Source: Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2018 – WALES



Source: Experian.
Ref: CSN Explained.

Annual average employment growth in Wales is expected to be strong at 2.7% over the five years to 2021, significantly above the projected UK rate of 0.6%.

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

There is a substantial difference between the short-term forecast of annual average growth of 0.4% and the longer term one of 6.2% and this is primarily down to the projected start of work on nuclear new build. Enabling works at Wylfa Newydd are likely to start in 2018 with first nuclear concrete pour in 2019 or 2020, although this timetable remains indicative and is likely to be subject to change. However, even without Wylfa Newydd, the prospects for infrastructure look good, with around £2.2bn of onshore wind farm projects and a considerable number of roads schemes, the largest of which is the £1bn M4 corridor around Newport, currently in the pipeline.

The Welsh Government's budget for road and rail schemes showed a significant decline in investment in 2016/17, but it is scheduled to rise by 50% to nearly £186m in 2017/18, before dropping sharply in 2018/19 to £112m. In the transport arena, as well as the M4 upgrade, work is due to start on sections 5 and 6 of the A465 Heads of the Valleys Dualling project in 2018, although no budget has yet been set.

Welsh Water plans to invest just under £1.5bn over the Asset Management Programme 6 period (AMP6), 2015-2020, with expenditure peaking in 2015/16 and 2016/17 and then falling moderately thereafter.

Both the public and private housing sectors are expected to see growth over the five years to 2021, with the former doing better than the latter. As well as the schemes mentioned in the previous sector Conygar also has plans for a 900 residential unit scheme in Haverfordwest and Cardiff Council's 1,000 new home plan continues, as does Taylor Wimpey's Torfaen development. Phase 2 of the mixed use development at Cardiff Pointe should now be on site, which includes a further 120 residential units to add to those already completed. In total around 800 residential units are to be built on the site by the early 2020s.

The Welsh Government's latest draft budget shows both education and health capital expenditure falling in 2017/18 from 2016/17, but then picking up thereafter, while the local government capital budget rises seven-fold in 2017/18 from the previous year and then holding at its new level. Overall capital expenditure on health, education and local government is planned to rise from around £455m in 2016/17 to £542m in 2020/21, an increase of 19%. This should help support annual average output growth of around 2.6% in the public non-housing sector.

The Welsh Government has identified investment in the NHS estate and equipment as a key area over the next four years, hence a significant number of hospital redevelopment and refurbishment projects in the pipeline. The final business case was submitted to the Welsh Government in the spring for the £240m Critical Care Centre in Torfaen, while one is currently being worked up for the £119m refurbishment of two floors of the Prince Charles Hospital in Merthyr Tydfil.

Prospects for industrial construction remain dull over the medium term with falling output across the whole of

the forecast period. Growth in manufacturing output is projected to average a modest 0.7% a year to 2021. While the transport and storage sector is likely to do better with around 1.4% a year growth on average, neither rate is strong enough to drive a general rise in demand for new industrial premises, although there is always a requirement for bespoke space.

Planning consent was granted earlier this year to build an additional 65,700 square feet of warehouse and industrial units at St. Modwen's 100-acre Celtic Business Park development in Newport. In total the site is intended to accommodate around 1.5 million square feet of employment space over the next 20 years.

Commercial construction growth is projected to average 2.5% a year over the forecast period, significantly better than the UK performance (1.2%). As has already been mentioned, part of the reason for this is that the sector is recovering from a very low base, but it is also the case that the devolved nation is less likely to be impacted by global investment decisions, than, for example, the London market.

Nevertheless, growth in the sectors that tend to drive demand for commercial premises is expected to be moderate over the next five years, ranging from 1.9% a year on average for information and communications, to 0.7% for finance and insurance. The biggest of the service sectors, professional and other private services, is expected to expand by around 1.6% a year on average to 2021.

The next big project scheduled to start at Cardiff's international sports village is the proposed £150m Snow Dome, which it is hoped will open its doors in early 2020.

While the Welsh Government's capital budget for achieving quality housing is scheduled to fall from around £153m in 2016/17 to £108m in 2017/18 and remain at the lower level thereafter, only 16% of the housing stock in Wales is public. 84% of stock is privately owned and thus is the private housing R&M sector that tends to drive overall housing R&M growth, which is projected to be 1.5% a year on average to 2021.

BEYOND 2021

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.

The Swansea Tidal Lagoon project has been excluded from these forecasts as they were finalised before the Hendry review recommendations were published. If the Swansea Tidal Lagoon project proves successful it could well act as a catalyst for other schemes of a similar nature.

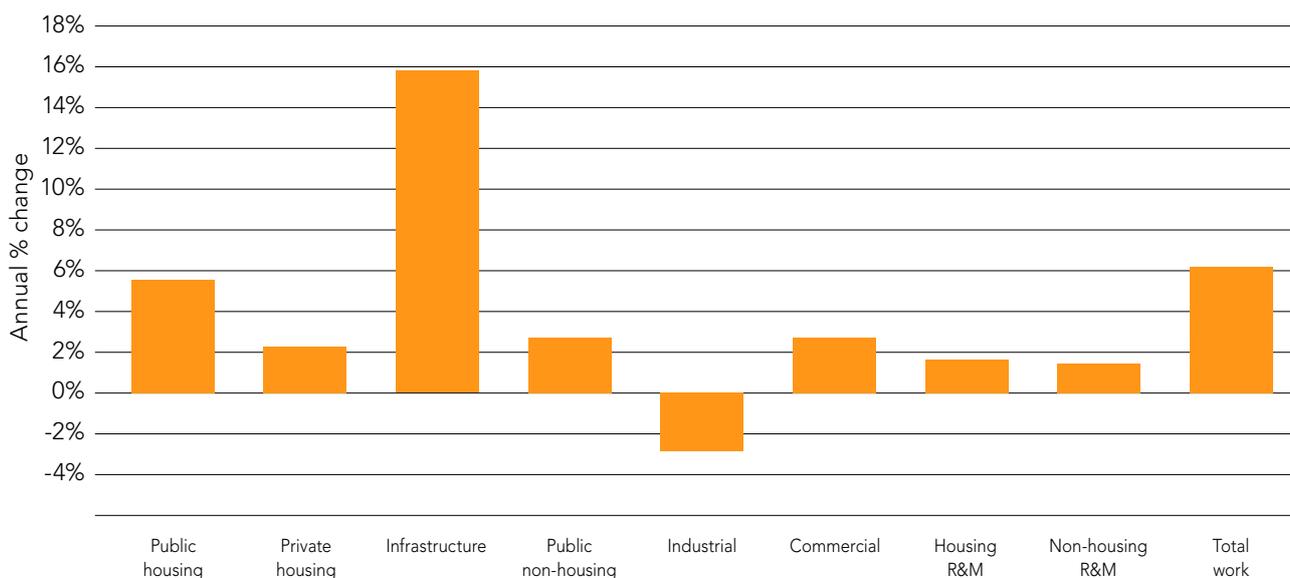
In the transport arena, investment in the electrification of the Great Western Rail Line and the Valley Lines Network is likely to run on into Network Rail's Control Period 6 (CP6), which will begin in 2019 and last until 2024.

CONSTRUCTION OUTPUT – WALES (£ MILLION, 2013 PRICES)

	Estimate	Forecast (Annual % change)					Annual average
	2016	2017	2018	2019	2020	2021	2017-2021
Public housing	118	2%	4%	3%	9%	9%	5.5%
Private housing	772	7%	0%	1%	3%	1%	2.3%
Infrastructure	1,229	-22%	12%	79%	19%	11%	15.8%
Public non-housing	484	2%	12%	1%	-5%	4%	2.6%
Industrial	136	2%	-7%	-2%	-3%	-3%	-2.8%
Commercial	531	2%	2%	2%	3%	2%	2.5%
New work	3,269	-6%	6%	27%	10%	7%	8.2%
Housing R&M	888	-1%	2%	3%	3%	0%	1.5%
Non-housing R&M	658	1%	4%	1%	1%	0%	1.4%
R&M	1,546	0%	3%	2%	2%	0%	1.5%
Total work	4,814	-4%	5%	19%	7%	5%	6.2%

Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL AVERAGE CONSTRUCTION OUTPUT GROWTH 2017-2021 – 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 2015, the estimated total employment across 28 occupational categories in 2016 and forecasts for the industry for 2017 to 2021. A full breakdown of occupational groups is provided in Section 5 of CSN Explained.

Annual average employment growth in Wales is expected to be strong at 2.7% over the five years to 2021, significantly above the projected UK rate of 0.6%. New nuclear build has a much smaller impact on employment numbers than output as such projects have a relatively low labour requirement per output generated. Assuming a 2018/19 start for the scheme, construction employment at Wylfa Newydd is expected to peak in 2022 at around 4,700, which would be approximately 4% of the construction workforce in Wales. Employment growth is expected to accelerate towards the end of the forecast period as work on Wylfa Newydd builds up.

Construction employment in Wales is expected to reach around 127,800 by 2021, up from an estimated 111,700 in 2016, and increase of over 16,000. On this prognosis Wales will be one of only two regions/devolved nations – the other being the South East – where employment will be above its 2008 peak. Employment in the UK as a whole is expected to be still 6% below its 2008 peak in 2021.

Unlike many of the other regions and devolved nations, employment growth is likely to be fairly evenly spread across the main groupings of occupations – managerial/supervisory, trades, and professionals. Elsewhere growth is tending to be stronger in the managerial/supervisory and professional occupations and weaker in the trades. Not surprisingly given the projected growth rate for the infrastructure sector, demand for civil engineers (nearly 4% a year on average) and civil engineering operatives nec. (more than 4%) is likely to be strong, although it should be remembered that these occupations are required in many other sectors of construction.



TOTAL EMPLOYMENT BY OCCUPATION – WALES

	Actual	Estimate	Forecast	
	2015	2016	2017	2021
Senior, executive, and business process managers	4,180	3,860	3,640	3,730
Construction project managers	1,380	1,430	1,430	1,610
Other construction process managers	8,460	8,840	8,790	9,990
Non-construction professional, technical, IT, and other office-based staff	9,610	9,800	9,500	10,490
Construction trades supervisors	2,560	2,500	2,530	3,070
Wood trades and interior fit-out	14,560	14,090	14,780	16,180
Bricklayers	6,350	6,560	6,910	7,890
Building envelope specialists	3,590	3,700	3,770	4,250
Painters and decorators	5,540	5,520	5,670	6,560
Plasterers	4,640	4,600	4,800	5,300
Roofers	1,320	1,250	1,320	1,470
Floorers	120	120	130	140
Glaziers	640	640	650	710
Specialist building operatives nec*	3,500	3,440	3,610	4,110
Scaffolders	890	840	840	880
Plant operatives	1,990	2,030	1,970	2,180
Plant mechanics/fitters	1,490	1,490	1,510	1,800
Steel erectors/structural fabrication	1,380	1,350	1,390	1,420
Labourers nec*	5,950	6,100	6,010	6,680
Electrical trades and installation	6,880	6,740	6,950	7,750
Plumbing and HVAC Trades	9,820	9,930	10,350	11,990
Logistics	810	900	860	1,000
Civil engineering operatives nec*	1,210	1,310	1,340	1,620
Non-construction operatives	1,310	1,300	1,260	1,270
Civil engineers	2,040	2,120	2,130	2,550
Other construction professionals and technical staff	5,490	5,790	5,830	6,810
Architects	1,240	1,270	1,290	1,480
Surveyors	3,790	4,170	4,270	4,910
Total (SIC 41-43)	98,180	98,340	100,010	112,090
Total (SIC 41-43, 71.1, 74.9)	110,740	111,690	113,530	127,840

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

ANNUAL RECRUITMENT REQUIREMENT (ARR) BY OCCUPATION

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

The ARR for Wales is projected at 3,890 for the 2017 to 2021 period, which represents 3.4% of base 2017 employment, a considerably higher ratio than the UK's at 1.4%. The primary reason for this high requirement is not the demand created by Wylfa Newydd, although this does have some impact, but the fact that Wales traditionally suffers from high net outflows of its construction workforce to other UK regions/devolved nations, in particular the North West and South West of England. It should be remembered that the ARR is the numbers required over and above the net flows predicted on the basis of historical precedent.

There are a significant number of occupational categories (15) that are flagged up as having ARR's higher than 2.5% of base 2017 employment. On an absolute basis, the largest requirements are for wood trades (770), bricklayers (390), and other construction professionals (360), but absolute levels tend to be a function of the size of the occupational category. However, in Wales' case on a relative level – that

is as a ratio of 2017 employment – the largest requirements were similar, with other professionals (6.2%), bricklayers (5.6%), and labourers nec. (5.3%) the top three.

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

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



ANNUAL RECRUITMENT REQUIREMENT BY OCCUPATION – WALES

	2017-2021
Senior, executive, and business process managers	70
Construction project managers	<50
Other construction process managers	–
Non-construction professional, technical, IT, and other office-based staff	330
Construction trades supervisors	120
Wood trades and interior fit-out	770
Bricklayers	390
Building envelope specialists	70
Painters and decorators	260
Plasterers	130
Roofers	60
Floorers	–
Glaziers	<50
Specialist building operatives nec*	–
Scaffolders	–
Plant operatives	<50
Plant mechanics/fitters	70
Steel erectors/structural fabrication	–
Labourers nec*	320
Electrical trades and installation	330
Plumbing and HVAC Trades	180
Logistics	<50
Civil engineering operatives nec*	<50
Civil engineers	110
Other construction professionals and technical staff	360
Architects	50
Surveyors	160
Total (SIC 41-43)	3,210
Total (SIC 41-43, 71.1, 74.9)	3,890

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

COMPARISONS ACROSS THE UK

As is usually the case, the 1.7% annual average output growth rate for the UK as a whole masks considerable differences in the projected rates for individual English regions and the devolved nations, from expansion of over 6% a year on average in Wales to a decline of 0.4% in Scotland on the same measure.

Wales and the South West remain on top of the growth rankings due to the prospective start of new nuclear build at Wylfa Newydd and Hinkley Point respectively in their areas. However, Wales in particular is not necessarily a 'one-hit wonder' with other sizeable projects such as the M4 upgrade around Newport due to start in the forecast period.

The Greater London construction market is more vulnerable than most to a fall in business investment because of the large size of its commercial sector. However, a weak performance here is expected to be more than compensated for by strong growth in infrastructure, driven in part by the start of work on HS2, and private housing, fuelled by strong increases in the capital's population.

The other two regions expected to see annual average output growth in excess of 2% are the North West (2.5%) and the South East (2.2%). Growth in the former will be driven by energy and transport projects, the largest of which is the prospective new nuclear build facility at Moorside. In the latter, new renewable energy facilities should drive growth in the infrastructure sector and the commercial construction sector will benefit from the theme park in north Kent.

For the remainder of the English regions growth is predicted to range between an annual average rate of 1.3% in the West Midlands, which should see some HS2-related work by the end of the forecast period, to a marginal decline of 0.1% in the North East, which will suffer from a dearth of major projects and weak housing demand.

Scotland is projected to be the worst performing of all the regions and devolved nations, with an annual average decline of 0.4%. The primary reason for this is a sharp fall in infrastructure output from its current very high level as a number of large projects, such as the Queensferry Crossing, the M8/M73/M74 motorway upgrade, and the Aberdeen Western Peripheral Route, are completed over the next two years.

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

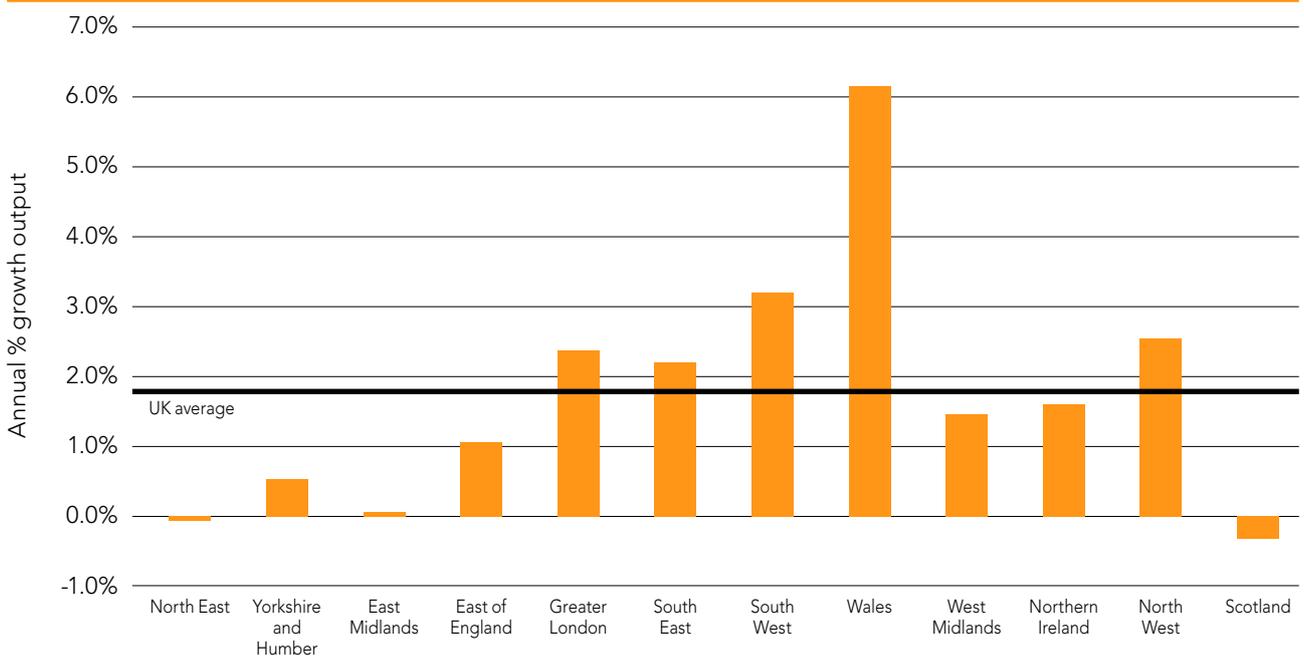
high of 2.7% in Wales to a low of -0.8% in Scotland, against a UK rate of 0.6%.

The impact of new nuclear build on employment in the regions and devolved nations that will host such projects is much less than on output due to its capital rather than labour-intensive nature. However, it still boosts employment growth in Wales quite considerably as it is a very big project in a small market. The impact is smaller in the South West, which has a bigger construction market, and thus contributes less to overall employment growth, which is expected to be around 0.7% a year on average over the five years to 2021.

Output growth in Scotland, the North East, East Midlands, and Yorkshire and Humber will not be strong enough to drive growth in employment; thus, these are all expected to experience some fall in construction employment between 2017 and 2021.

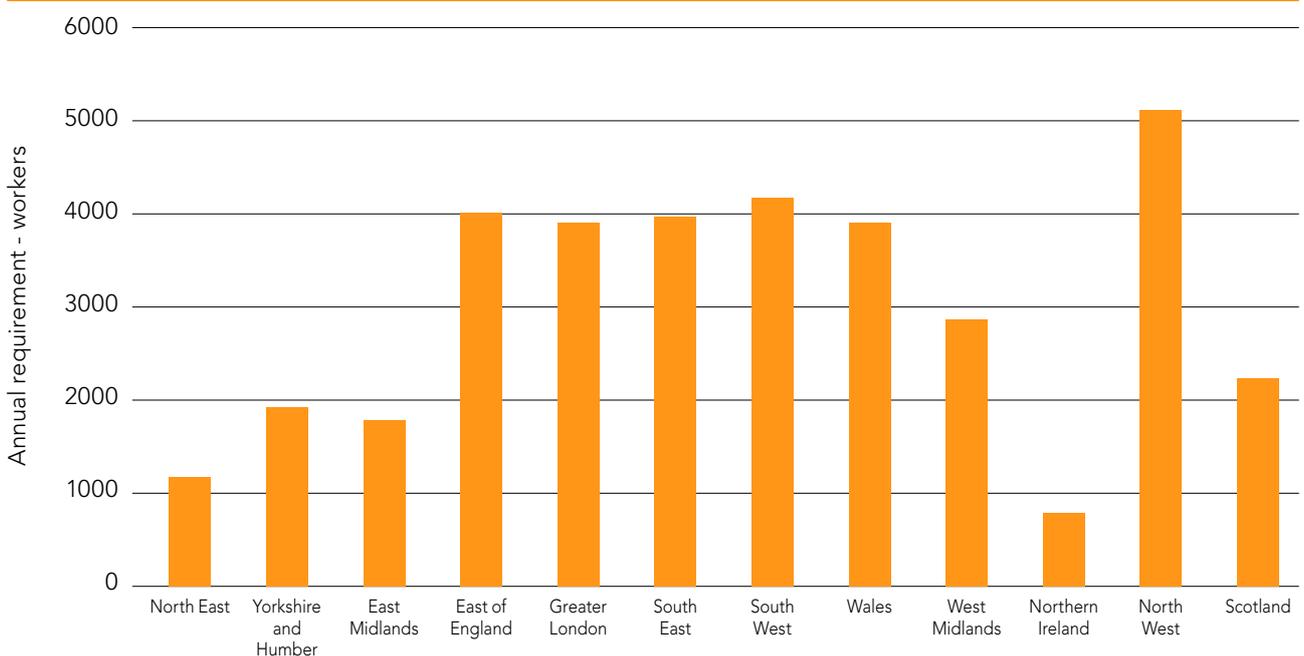
The pattern of annual recruitment requirements can look significantly different to the profile of output and employment, as some regions and devolved nations have historically strong net inflows and some suffer from large net outflows. Thus, Greater London's ARR represents just 0.9% of base 2017 employment, the lowest ratio along with Yorkshire and Humber, despite being high up the rankings in terms of output and employment growth. This is because the capital naturally acts as a magnet for the construction workforce from other parts of the country and from abroad; thus, its additional requirement is relatively small. At the other end of the scale Wales traditionally suffers strong net outflows, in particular to the North West and South West of England and often has the highest ARR ratio as a result of this. The 2017 to 2021 period is no exception, with buoyant output and employment growth and the strong net outflows leading to an ARR ratio of 3.4% of base 2017 employment. The remaining regions and devolved nations have an ARR ratio of between 1% and 1.9% of base 2017 employment.

ANNUAL AVERAGE OUTPUT GROWTH BY REGION 2017-2021



Source: CSN, Experian.
Ref: CSN Explained.

ANNUAL RECRUITMENT REQUIREMENT (ARR) BY REGION 2017-2021



Source: CSN, Experian.


 The annual average recruitment requirement (ARR) for Wales is projected at 3,890 for the 2017 to 2021 period, which represents 3.4% of base 2017 employment, a considerably higher ratio than the UK's at 1.4%.
 

CSN EXPLAINED

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

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

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

NOTES has some further information relating to the data sources used for the various charts and tables. This section also outlines what is meant by the term 'footprint', when talking about the areas of responsibility.

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

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

CSN METHODOLOGY

BACKGROUND

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

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

Observatory groups currently meet twice a year and consist of key regional stakeholders invited from industry, Government, education and sector bodies, all of whom contribute their local industry knowledge and views on training, skills, recruitment, qualifications and policy. The National Group also includes the same range of representatives and meets twice per year to set the national scheme, forming a backdrop for the Observatories.

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

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

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

THE MODEL APPROACH

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

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

The annual recruitment requirement (ARR) is a gross requirement that takes into account workforce flows into and out of construction, due to such factors as movements between industries, migration, sickness and retirement. However, these flows do not include movements into the industry from training, although robust data on training provision is being developed by CITB in partnership with public funding agencies, further education, higher

GLOSSARY OF TERMS

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

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

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

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

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

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

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

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

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

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

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

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

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

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



NOTES

NOTES

- 1 Except for Northern Ireland, output data for the English regions, Scotland and Wales is supplied by the Office for National Statistics (ONS) on a current price basis. Thus, national deflators produced by the ONS have been used to deflate prices to a 2005 constant price basis, so that the effects of inflation have been stripped out.
- 2 The annual average growth rate of output is a compound average growth rate, i.e. the rate at which output would grow each year if it increased steadily over the forecast period.
- 3 Only selected components of gross value added (GVA) are shown in this table and so do not sum to the total.
- 4 For new construction orders, comparison is made with Great Britain rather than the UK, owing to the fact that there are no orders data series for Northern Ireland.
- 5 Employment numbers are rounded to the nearest 10.
- 6 The tables include data relating to plumbers and electricians. As part of SIC 43, plumbers and electricians working in contracting are an integral part of the construction process.
- 7 A reporting minimum of 50 is used for the annual recruitment requirement (ARR). As a result, some region and devolved nation ARR forecasts do not sum to the total UK requirement.
- 8 The Employment and ARR tables show separate totals for SIC 41–43 and SIC 41–43, 71.1 and 74.9. The total for SIC 41–43 covers the first 24 occupational groups on the relevant tables and excludes civil engineers, other construction professionals and technical staff, architects and surveyors. The total for SIC 41–43, 71.1 and 74.9 includes all occupations.



FOOTPRINTS FOR BUILT ENVIRONMENT SECTOR

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

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

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

The CSN's current baseline forecast assumes that a deal between the UK and EU will be agreed within a 4 year time horizon, with some form of trade access to the single market. As it is unlikely that the trade terms will be as favourable as the current situation, the forecast includes a small downgrade to the UK's long term export and investment projections, compared to the pre-Brexit vote baseline. No adjustments have been made to underlying population projections in the base case as it is too early to assess any potential slowdown in EU migration.

DEFINITIONS: TYPES AND EXAMPLES OF CONSTRUCTION WORK

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

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

Private sector housing

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

Infrastructure – public and private

Water

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

Sewerage

Sewage disposal works, laying of sewers and surface drains.

Electricity

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

Gas, communications, air transport

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

Railways

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

Harbours

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

Roads

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

Public non-residential construction¹

Factories and warehouses

Publicly owned factories, warehouses, skill centres.

Oil, steel, coal

Now restricted to remedial works for public sector residual bodies.

Schools, colleges, universities

State schools and colleges (including technical colleges and institutes of agriculture); universities, including halls of residence, research establishments etc.

Health

Hospitals including medical schools, clinics, welfare centres, adult training centres.

Offices

Local and central Government offices, including town halls, offices for all public bodies except the armed services, police headquarters.

Entertainment

Theatres, restaurants, public swimming baths, caravan sites at holiday resorts, works and buildings at sports grounds, stadiums, racecourses etc. owned by local authorities or other public bodies.

Garages

Buildings for storage, repair and maintenance of road vehicles, transport workshops, bus depots, road goods transport depots and car parks.

Shops

Municipal shopping developments for which the contract has been let by a Local Authority.

Agriculture

Buildings and work on publicly financed horticultural establishments; fen drainage and agricultural drainage, veterinary clinics.

Miscellaneous

All work not clearly covered by any other headings, such as fire stations, police stations, prisons, reformatories, remand homes, civil defence work, UK Atomic Energy Authority work, council depots, museums, libraries.

Private industrial work

Factories, warehouses, wholesale depots, all other works and buildings for the purpose of industrial production or processing, oil refineries, pipelines and terminals, concrete fixed leg oil production platforms (not rigs); private steel work; all new coal mine construction such as sinking shafts, tunnelling etc.

Private commercial work¹

Schools and universities

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

Health

Private hospitals, nursing homes, clinics.

Offices

Office buildings, banks.

Entertainment

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

Garages

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

Shops

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

Agriculture

All buildings and work on farms, horticultural establishments.

Miscellaneous

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

New work

New housing

Construction of new houses, flats, bungalows only.

All other types of work

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

Repair and maintenance

Housing

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

All other sectors:

Repair and maintenance work of all types, including planned and contractual maintenance.³



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

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

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

OCCUPATIONAL GROUPS

Occupational group

Description, SOC (2010) reference.

Senior, executive, and business process managers

Chief executives and senior officials	1115
Financial managers and directors	1131
Marketing and sales directors	1132
Purchasing managers and directors	1133
Human resource managers and directors	1135
Property, housing and estate managers	1251
Information technology and telecommunications directors	1136
Research and development managers	2150
Managers and directors in storage and warehousing	1162
Managers and proprietors in other services nec*	1259
Functional managers and directors nec*	1139
IT specialist managers	2133
IT project and programme managers	2134
Financial accounts managers	3538
Sales accounts and business development managers	3545

Construction project managers

Construction project managers and related professionals	2436
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Other construction process managers

Production managers and directors in manufacturing	1121
Production managers and directors in construction	1122
Managers and directors in transport and distribution	1161
Waste disposal and environmental services managers	1255
Health and safety officers	3567
Conservation and environmental associate professionals	3550

Non-construction professional, technical, IT, and other office-based staff (excl. managers)

IT operations technicians	3131
IT user support technicians	3132
Finance and investment analysts and advisers	3534
Taxation experts	3535
Financial and accounting technicians	3537
Vocational and industrial trainers and instructors	3563
Business and related associate professionals nec*	3539
Legal associate professionals	3520
Inspectors of standards and regulations	3565
Programmers and software development professionals	2136
Information technology and telecommunications professionals nec*	2139
Estate agents and auctioneers	3544
Solicitors	2413
Legal professionals nec*	2419
Chartered and certified accountants	2421
Business and financial project management professionals	2424

Management consultants and business analysts	2423
Receptionists	4216
Typists and related keyboard occupations	4217
Business sales executives	3542
Bookkeepers, payroll managers and wages clerks	4122
Records clerks and assistants	4131
Stock control clerks and assistants	4133
Telephonists	7213
Communication operators	7214
Personal assistants and other secretaries	4215
Sales and retail assistants	7111
Telephone salespersons	7113
Buyers and procurement officers	3541
Human resources and industrial relations officers	3562
Credit controllers	4121
Company secretaries	4214
Sales related occupations nec*	7129
Call and contact centre occupations	7211
Customer service occupations nec*	7219
Elementary administration occupations nec*	9219
Chemical scientists	2111
Biological scientists and biochemists	2112
Physical scientists	2113
Laboratory technicians	3111
Graphic designers	3421
Environmental health professionals	2463
IT business analysts, architects and systems designers	2135
Conservation professionals	2141
Environment professionals	2142
Actuaries, economists and statisticians	2425
Business and related research professionals	2426
Finance officers	4124
Financial administrative occupations nec*	4129
Human resources administrative occupations	4138
Sales administrators	4151
Other administrative occupations nec*	4159
Office supervisors	4162
Sales supervisors	7130
Customer service managers and supervisors	7220
Office managers	4161
Construction trades supervisors	
Skilled metal, electrical and electronic trades supervisors	5250
Construction and building trades supervisors	5330
Wood trades and interior fit-out	
Carpenters and joiners	5315
Paper and wood machine operatives	8121
Furniture makers and other craft woodworkers	5442
Construction and building trades nec* (25%)	5319
Bricklayers	
Bricklayers and masons	5312

Building envelope specialists			
Construction and building trades nec* (50%)	5319		
Painters and decorators			
Painters and decorators	5323		
Construction and building trades nec* (5%)	5319		
Plasterers			
Plasterers	5321		
Roofers			
Roofers, roof tilers and slaters	5313		
Floorers			
Floorers and wall tilers	5322		
Glaziers			
Glaziers, window fabricators and fitters	5316		
Construction and building trades nec* (5%)	5319		
Specialist building operatives not elsewhere classified (nec*)			
Construction operatives nec* (100%)	8149		
Construction and building trades nec* (5%)	5319		
Industrial cleaning process occupations	9132		
Other skilled trades nec*	5449		
Scaffolders			
Scaffolders, staggers and riggers	8141		
Plant operatives			
Crane drivers	8221		
Plant and machine operatives nec*	8129		
Fork-lift truck drivers	8222		
Mobile machine drivers and operatives nec*	8229		
Plant mechanics/fitters			
Metalworking production and maintenance fitters	5223		
Precision instrument makers and repairers	5224		
Vehicle technicians, mechanics and electricians	5231		
Elementary process plant occupations nec*	9139		
Tool makers, tool fitters and markers-out	5222		
Vehicle body builders and repairers	5232		
Steel erectors/structural fabrication			
Steel erectors	5311		
Welding trades	5215		
Metal plate workers and riveters	5214		
Construction and building trades nec* (5%)	5319		
Smiths and forge workers	5211		
Metal machining setters and setter-operators	5221		
Labourers nec*			
Elementary construction occupations (100%)	9120		
Electrical trades and installation			
Electricians and electrical fitters	5241		
Electrical and electronic trades nec*	5249		
Telecommunications engineers	5242		
Plumbing and heating, ventilation, and air conditioning trades			
Plumbers and heating and ventilating engineers	5314		
Pipe fitters	5216		
Construction and building trades nec* (5%)	5319		
Air-conditioning and refrigeration engineers	5225		
Logistics			
Large goods vehicle drivers		8211	
Van drivers		8212	
Elementary storage occupations		9260	
Buyers and purchasing officers (50%)		3541	
Transport and distribution clerks and assistants		4134	
Civil engineering operatives not elsewhere classified (nec*)			
Road construction operatives		8142	
Rail construction and maintenance operatives		8143	
Quarry workers and related operatives		8123	
Non-construction operatives			
Metal making and treating process operatives		8117	
Process operatives nec*		8119	
Metalworking machine operatives		8125	
Water and sewerage plant operatives		8126	
Assemblers (vehicles and metal goods)		8132	
Routine inspectors and testers		8133	
Assemblers and routine operatives nec*		8139	
Elementary security occupations nec*		9249	
Cleaners and domestics*		9233	
Street cleaners		9232	
Gardeners and landscape gardeners		5113	
Caretakers		6232	
Security guards and related occupations		9241	
Protective service associate professionals nec*		3319	
Civil engineers			
Civil engineers		2121	
Other construction professionals and technical staff			
Mechanical engineers		2122	
Electrical engineers		2123	
Design and development engineers		2126	
Production and process engineers		2127	
Quality control and planning engineers		2461	
Engineering professionals nec*		2129	
Electrical and electronics technicians		3112	
Engineering technicians		3113	
Building and civil engineering technicians		3114	
Science, engineering and production technicians nec*		3119	
Architectural and town planning technicians*		3121	
Draughtspersons		3122	
Quality assurance technicians		3115	
Town planning officers		2432	
Electronics engineers		2124	
Chartered architectural technologists		2435	
Estimators, valuers and assessors		3531	
Planning, process and production technicians		3116	
Architects			
Architects		2431	
Surveyors			
Quantity surveyors		2433	
Chartered surveyors		2434	

*Not elsewhere classified

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

Adam Evans

Research Analyst

0300 456 7226

Adam.evans@citb.co.uk

citb.co.uk/csn

