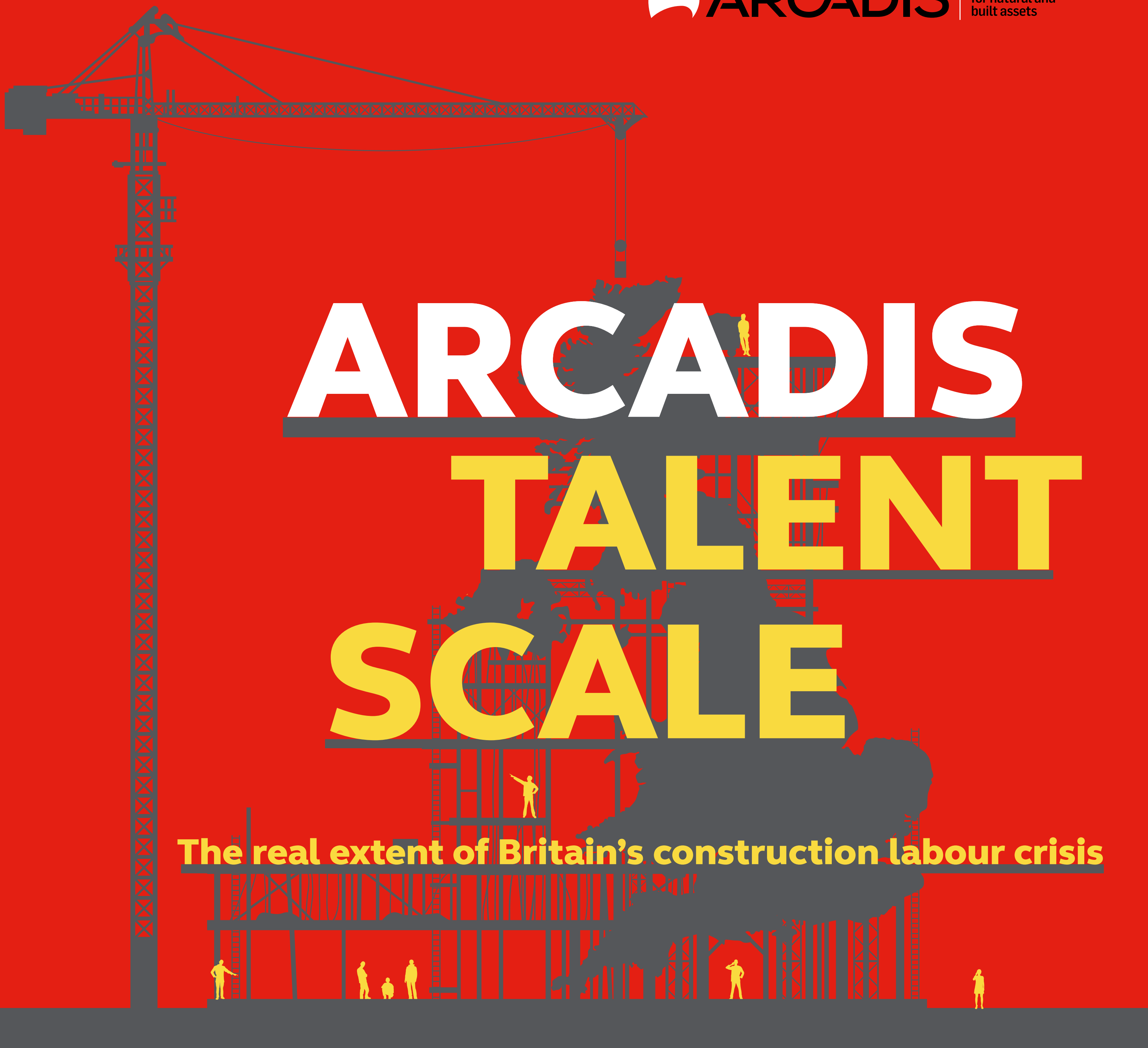
ARCADIS Design & Consultancy for natural and built assets

ARCADIS TALENT SCALE



The real extent of Britain's construction labour crisis

INTRODUCTION

From 'bridging' and 'plugging' it, to 'minding' and 'closing' it, the nation's skills gap is something that the industry loves to discuss, yet shies away from implementing practical solutions. As with lags in housebuilding and infrastructure investment, the British government and the construction sector have been in denial for decades. Now we are beginning to see the consequences of this procrastination and a fragmented industry.

Systematic underinvestment in the national workforce and a failure to heed the warning signs have contributed to a slip in productivity that currently sees the UK languish behind a host of other world economies. Meanwhile, capacity ceilings in some areas of the industry have seen prices jump and projects delayed.

When it comes to construction, the housing industry bemoans planning restrictions; the infrastructure sector cites indecision as stalling progress; and Brexit triggered a deluge of talk about material costs and currency effects. These factors are hugely significant butwithout the right people to do the work none of them matter one bit.

Even before Britain voted to exit the European Union, the number of people in the UK properly equipped to deliver the nation's lofty modernisation plans was well below requisite levels. Official figures show that construction employment is 15 percent down on 2008, with large numbers leaving the industry in their fifties. These people have left the industry never to return.

When it comes to building the homes and transport hubs of tomorrow it is sadly not as simple as merely training more people or relying on technology, automation and robotics. Getting the right people in the right places to do the right jobs is infinitely more complex than many give credit.

At Arcadis we are taking the skills crisis very seriously. In order to evidence the scale of the issue we have undertaken a detailed analysis of how many people are needed to build our homes and infrastructure to make sure our economy succeeds. As a nation, this is now the biggest issue we face.

SIMON LIGHT
UK Client Development Director

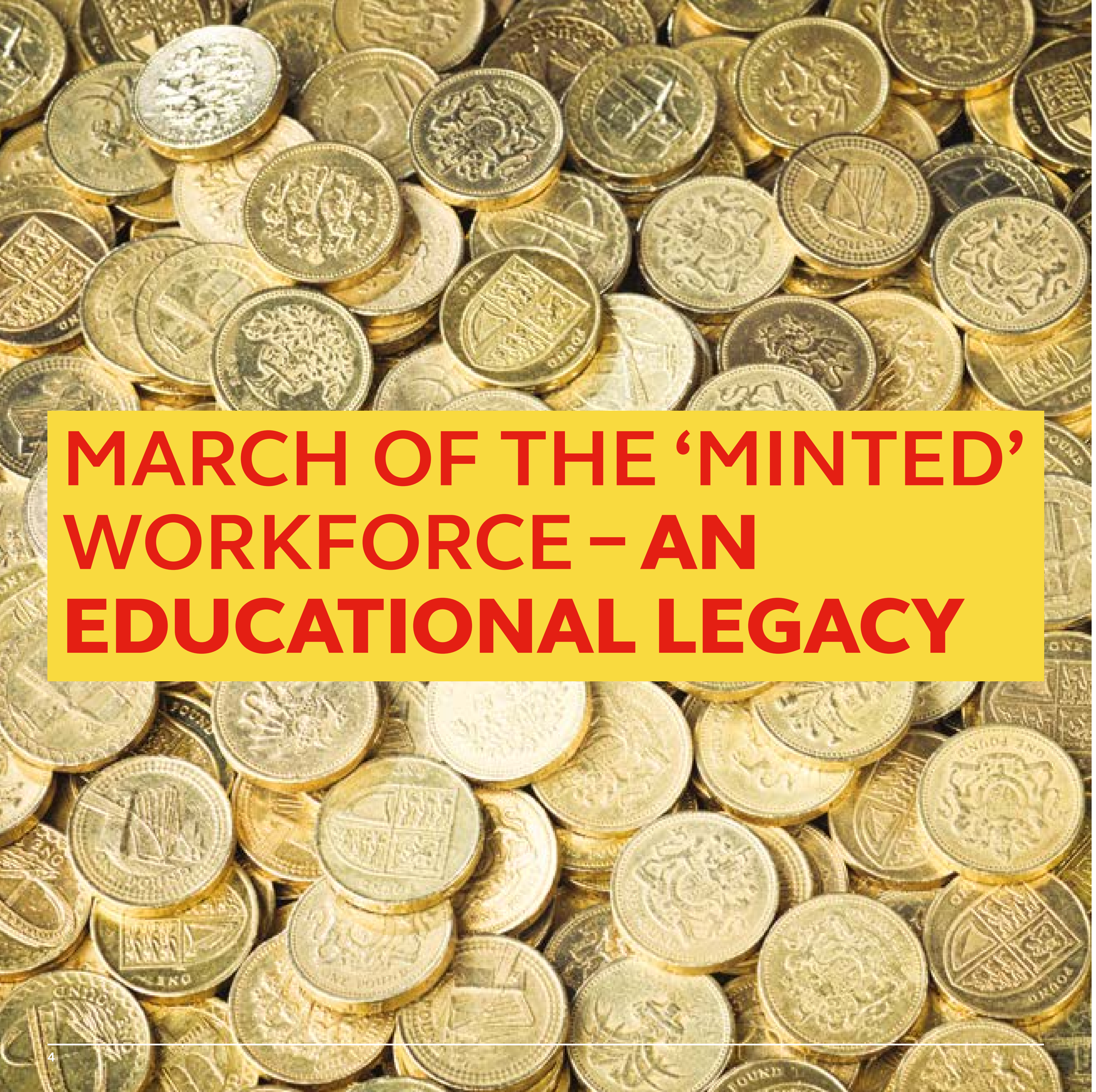
ARCADIS TALENT SCALE : KEY FINDINGS

Britain must recruit over **400,000 people** each year to deliver in line with housing and infrastructure need, equivalent of **one person every 77 seconds**

London, the **South East** and the **East of England** have the **greatest need** for people

A **hard Brexit** could see UK construction **miss out** on as many as **214,000 EU workers**

The **skills crisis** cannot be solved through training and technology alone, **rapid plugging is required** to minimise any Brexit shortfall



MARCH OF THE 'MINTED' WORKFORCE – **AN EDUCATIONAL LEGACY**

For a generation of school leavers, the university degree has long been the traditional gold standard of academic achievement and a failsafe gateway to a fulfilling future career. Yet this higher education drive does not always reflect the reality of the British labour market, and is certainly not the only route to entry. In fact, this historical focus on purely academic qualifications at the expense of practical skilled labour has done little to chip away at the increasingly lengthening shadow of housing undersupply and infrastructure underinvestment.

"Getting the right people in the right places to do the right jobs is infinitely more complex than many give credit"

The number of school leavers graduating in STEM subjects (Science, Technology, Engineering and Maths) has stuttered. Perhaps just as poignantly, unwarranted snobbery around studying technical subjects – many of which are now in drastically short supply – has seen uptake wane. As is illustrated so plainly in our findings, for many traditional trades, such as joiners and electricians, the supply shortfall in many parts of the country is substantial.

Such is the extent of this gap that if businesses and government continue to resist change in the way they run their operations, this could give rise to the MINTED workforce. The *Most In Need Trades Earning Double* workforce whose skills are in such short supply that they could potentially see their pay double before another generation enters the workplace.

That said, things are already changing. Many large organisations, including Arcadis, are leading the way when it comes to recognising the value that is manifest in hiring and developing school leaver talent. Professional services firms, banks and service industries all support extensive apprentice programmes and the development of school leavers into experienced and valuable employees in their future workforce.

An employment model more weighted towards apprenticeships could see businesses save on costs and produce a generation of young employees better suited to the world of work than many of their graduate counterparts of the same age.

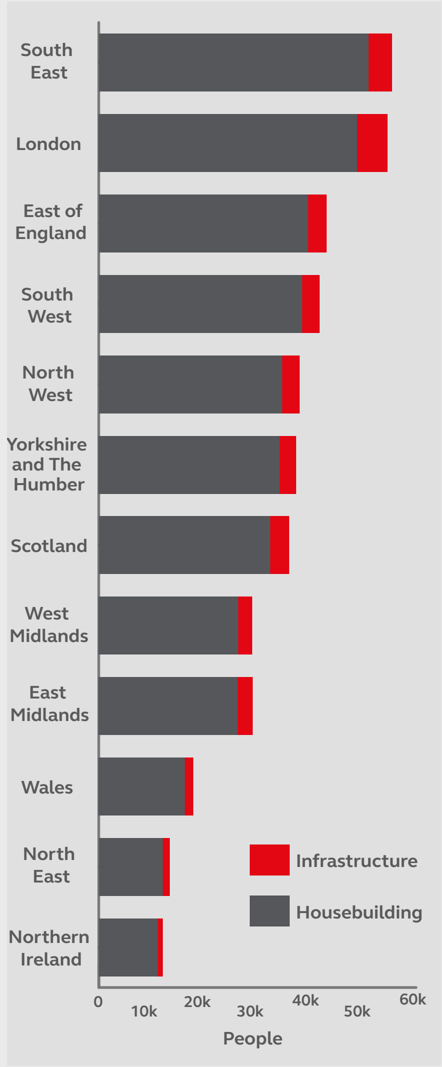
A BUILDING **PROBLEM**

Many occupations have yet to recover from the blow they experienced in the wake of the financial crisis, which led to a substantial downturn in the construction industry. To measure the true scale of the problem we have considered the construction workforce in a broad sense, including the most relevant occupations and industries.

This means that as well as those directly employed in the building process, we also consider those working in demolition and site preparation, electrical, plumbing and other construction installation activities.

We have considered current employment figures for these occupations, estimates as to the increase in labour demand the sector faces over the coming years, and factoring in projected attrition rates. This has given us an estimate as to exactly how many roles the industry will need to recruit, excluding the impact of Brexit, each year to be successful in delivering housing targets and major infrastructure programmes.

THE BRITISH ANNUAL RECRUITMENT REQUIREMENT FOR HOUSEBUILDING AND INFRASTRUCTURE 2016-2021



	Production managers and directors in construction	Engineers	Architects	Quantity surveyors	Construction project managers and related professionals	Draughtspersons	Electricians and electrical fitters	Steel erectors	Bricklayers and masons	Roofers and roof tilers	Plumbers and heating and ventilating engineers	Carpenters and joiners	Glaziers, window fabricators and fitters	Construction and building trades N.E.C	Plasterers	Floorers and wall tilers	Painters and decorators	Construction and building trades supervisors	Scaffolders, stagers and riggers	Road construction operatives	Rail construction and maintenance operatives	Elementary construction occupations	Total
TOTAL	26,403	7,414	8,109	7,325	7,478	4,169	40,340	1,359	18,146	9,890	46,827	60,409	7,575	57,009	18,610	7,958	33,641	6,775	4,185	1,366	677	31,830	407,495
South East	5,163	745	751	1,033	1,216	1,096	5,792	246	1,500	2,128	6,290	9,001	1,684	10,064	2,663	486	2,056	538	296	50	-	2,642	55,440
London	4,815	1,221	2,836	1,283	1,145	213	3,957	-	1,950	812	5,877	6,947	344	12,433	2,083	185	781	988	970	-	114	5,602	54,556
East of England	2,459	770	250	729	1,012	469	3,976	145	2,809	1,195	4,516	5,678	737	5,550	2,880	1,126	4,760	254	624	58	159	2,897	43,052
South West	2,176	612	1,280	387	457	352	3,379	-	1,307	415	4,694	5,981	715	4,962	1,814	1,690	7,144	660	284	146	-	3,310	41,766
North West	2,135	528	739	522	961	450	4,133	362	1,915	1,023	4,165	5,981	141	5,137	925	908	3,836	798	140	55	100	3,024	37,976
Yorkshire and The Humber	2,184	345	372	451	605	210	4,771	288	752	1,234	5,141	4,229	1,190	3,716	2,219	1,027	4,343	501	614	212	121	2,737	37,261
Scotland	1,909	908	779	101	691	379	3,731	-	1,376	1,028	3,128	6,222	306	1,444	949	1,485	6,279	1,105	501	179	55	3,374	35,932
East Midlands	1,124	593	392	538	284	240	2,431	207	2,047	731	3,809	5,316	761	4,067	439	381	1,610	890	130	285	94	2,706	29,074
West Midlands	2,152	675	515	841	437	280	3,491	-	1,162	317	4,204	4,108	582	5,247	927	352	1,486	131	274	220	-	1,591	28,992
Wales	1,133	367	-	812	88	254	1,860	111	805	166	2,626	2,477	515	1,930	1,937	-	-	206	241	55	-	2,292	17,874
North East	748	360	-	278	370	131	1,940	-	1,606	685	1,020	1,933	254	1,270	1,159	-	-	433	111	62	34	1,050	13,446
Northern Ireland	404	289	195	350	213	93	879	-	916	155	1,356	2,537	348	1,188	616	319	1,346	272	-	45	-	605	12,127

Source: CSN, DCLG, ONS, Cebr analysis

THE REGIONAL NEED FOR PEOPLE

Given the varying degree of construction activity across different areas of the country, it is unsurprising that the shortfall of skilled workers to build the homes and infrastructure we need is greater in some areas than others. The extent to which some parts of the country are impacted, however, is quite alarming.

The areas where the gap is at its widest – namely southern and eastern England – have a lot of ground to make up if they are to meet the demands placed upon them. Further exacerbating the problem, the south east has been identified as having the greatest additional need in housebuilding and related industries, while London will need to employ more people in the infrastructure sector than any other region.

Given the strength of transport connections in and out of the south east, accessing the nation's mobile workforce should, in theory, prove easier. However, doing so could weigh heavy on other parts of the UK. Furthermore, the Chancellor's proposed review into taxable benefits and the potential crackdown around the Inland Revenue 35 regulation could potentially increase tax burdens for employers and employees who are required to work away from home, making resourcing from a national pool more challenging and expensive.

That said, there are some positive steps that can be taken to ease the strain being placed on the market. The HS2 Academy in the West Midlands and Doncaster is a fantastic example of the industry taking the bull by the horns, while the National Skills Academy for Nuclear aims to better equip people around the country to work in the energy sector.

> ***"A greater emphasis on regional, needs-based training is required if we are to truly tackle the issues in a short timeframe."***

A greater emphasis on regional, needs-based training and upskilling is required if we are to truly tackle the issues at play in a short timeframe.

Another area of opportunity lies within the devolution agenda. With combined authorities soon to be appointing their long-awaited mayors, the regional skills agenda needs to be at the very top of the to-do list. Many current devolution deals involve allocating regional funding to the further education sector. This investment must be properly managed and targeted

at areas, such as construction, where need is greatest. However, initiatives such as these take time to produce tangible benefits so engaging with the Local Enterprise Partnership at the earliest possible opportunity is the best way to ensure the right funding is allocated to the right areas.

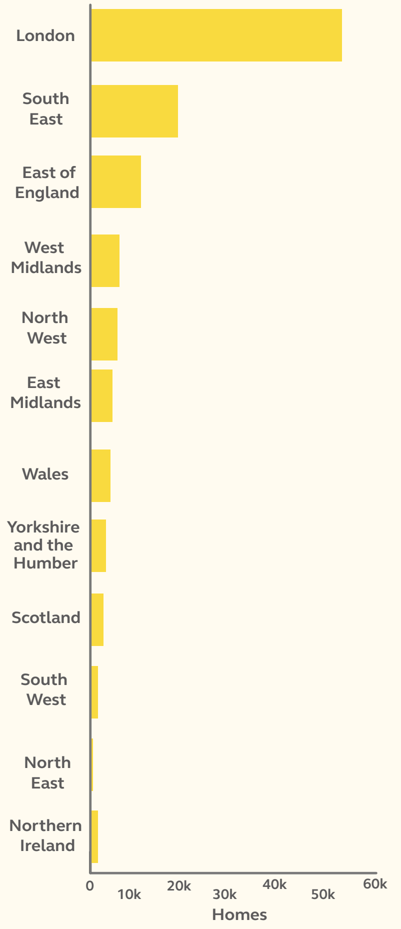
HOUSEBUILDING

When it comes to the much maligned 'housing crisis', there is no doubt that the sheer lack of people to physically build the homes we need is evident. Between now and 2026 the UK needs to build an additional 110,000 homes per annum on top of those currently projected in order to keep pace with our growing and ageing population.

Housebuilding is a particularly labour intensive industry and although new technologies and increased off-site production are being implemented to reduce costs and increase productivity, the supply of labour is still one of the binding constrictions on output. Existing evidence suggests that the relationship between labour and number of houses that can be built is close to being linear. Therefore, in order to increase the number of homes being built the labour force employed in housebuilding needs to increase by the same share.

NUMBER OF ADDITIONAL PEOPLE NEEDED EACH YEAR TO INCREASE OUTPUT TO AROUND 270,000 HOMES OVER THE NEXT FIVE YEARS

ADDITIONAL HOMES NEEDED PER YEAR TO ELIMINATE THE HOUSING GAP BY 2026



Source: DCLG

	Production managers and directors in construction	Engineers	Architects	Quantity surveyors	Construction project managers and related professionals	Draughtspersons	Electricians and electrical fitters	Steel erectors	Bricklayers and masons	Roofers and roof tilers
TOTAL	21,743	1,870	5,887	5,788	5,140	3,204	37,270	1,217	17,479	9,450
South East	4,252	188	545	816	836	842	5,351	220	1,445	2,034
London	3,965	308	2,059	1,014	787	164	3,656	-	1,879	776
East of England	2,025	194	181	576	695	360	3,673	130	2,705	1,142
South West	1,792	154	930	306	314	270	3,122	-	1,259	396
North West	1,758	133	536	413	660	346	3,818	324	1,845	978
Yorkshire and The Humber	1,799	87	270	357	416	162	4,408	258	725	1,179
Scotland	1,572	229	566	80	475	291	3,447	-	1,326	982
West Midlands	1,772	170	374	665	300	216	3,226	-	1,120	303
East Midlands	926	150	284	425	195	184	2,246	186	1,972	698
Wales	933	93	-	641	60	195	1,718	100	776	159
North East	616	91	-	220	255	101	1,792	-	1,547	654
Northern Ireland	333	73	142	276	147	72	812	-	882	148

	Plumbers and heating and ventilating engineers	Carpenters and joiners	Glaziers, window fabricators and fitters	Construction and building trades N.E.C	Plasterers	Floorers and wall tilers	Painters and decorators	Construction and building trades supervisors	Scaffolders, stagers and riggers	Elementary construction occupations	Total
TOTAL	46,085	59,521	7,432	55,445	18,343	7,958	32,347	4,598	3,760	26,427	370,964
South East	6,191	8,869	1,652	9,788	2,625	486	1,977	365	266	2,193	50,941
London	5,784	6,845	337	12,092	2,053	185	751	671	872	4,651	48,847
East of England	4,445	5,595	723	5,398	2,838	1,126	4,577	172	560	2,405	39,523
South West	4,620	5,893	702	4,826	1,788	1,690	6,869	448	255	2,748	38,382
North West	4,099	5,893	138	4,996	912	908	3,689	541	126	2,511	34,622
Yorkshire and The Humber	5,060	4,166	1,167	3,614	2,187	1,027	4,175	340	551	2,273	34,220
Scotland	3,078	6,131	300	1,404	935	1,485	6,038	750	450	2,801	32,342
West Midlands	4,137	4,047	571	5,103	914	352	1,429	89	246	1,321	26,353
East Midlands	3,748	5,238	747	3,955	432	381	1,548	604	117	2,246	26,284
Wales	2,585	2,440	505	1,877	1,909	-	-	139	217	1,903	16,250
North East	1,004	1,905	249	1,235	1,143	-	-	294	99	872	12,077
Northern Ireland	1,335	2,500	341	1,156	607	319	1,295	185	-	502	11,123

Source: CSN, ONS, Cebr analysis

INFRASTRUCTURE

Britain has one of the most ambitious national infrastructure programmes in Europe. With HS2 and Crossrail underway and much more planned, companies in the industry will draw heavily on the common talent pool. Despite the uncertain outlook for the UK economy following Brexit, the government under Theresa May seems committed to drive the largest projects forward. Moreover, it is expected that the government will set aside more money for road and rail works in order to support the UK economy over the coming years.

According to figures from the Construction Products Association, the infrastructure sector is projected to grow only by 1.2 percent in 2016. However, for the years from 2017 to 2020 it predicts a pick-up in infrastructure output of 30 percent. Increased demand for people in the infrastructure industry is calculated by assuming that the workforce has to expand in line with this growth.

NUMBER OF NEW PEOPLE NEEDED EACH YEAR TO MEET FORECAST INFRASTRUCTURE NEED

	Production managers and directors in construction	Civil Engineers	Architects	Quantity surveyors	Construction project managers and related professionals	Draughtspersons	Electricians and electrical fitters	Steel erectors	Bricklayers and masons	Roofers and roof tilers	Plumbers and heating and ventilating engineers
TOTAL	**4,660**	**5,543**	**2,222**	**1,537**	**2,338**	**965**	**3,070**	**142**	**666**	**440**	**742**
London	850	913	777	269	358	49	301	-	72	36	93
South East	911	557	206	217	380	254	441	26	55	95	100
Scotland	337	679	214	21	216	88	284	-	51	46	50
East of England	434	576	68	153	316	109	303	15	103	53	72
South West	384	458	351	81	143	81	257	-	48	18	74
North West	377	395	202	110	300	104	315	38	70	46	66
Yorkshire and The Humber	386	258	102	95	189	49	363	30	28	55	81
East Midlands	198	444	107	113	89	56	185	22	75	33	60
West Midlands	380	504	141	176	136	65	266	-	43	14	67
Wales	200	275	-	170	27	59	142	12	30	7	42
North East	132	269	-	58	116	30	148	-	59	30	16
Northern Ireland	71	216	53	73	67	22	67	-	34	7	21

	Carpenters and joiners	Glaziers, window fabricators and fitters	Construction and building trades N.E.C	Plasterers	Painters and decorators	Construction and building trades supervisors	Scaffolders, stagers and riggers	Road construction operatives	Rail construction and maintenance operatives	Elementary construction occupations	Total
TOTAL	**888**	**143**	**1,563**	**268**	**1,294**	**2,178**	**425**	**1,366**	**677**	**5,402**	**36,531**
London	102	6	341	30	30	318	99	-	114	951	5,709
South East	132	32	276	38	79	173	30	50	-	448	4,499
Scotland	91	6	40	14	242	355	51	179	55	573	3,590
East of England	83	14	152	41	183	82	63	58	159	492	3,529
South West	88	13	136	26	275	212	29	146	-	562	3,383
North West	88	3	141	13	148	256	14	55	100	513	3,353
Yorkshire and The Humber	62	22	102	32	167	161	62	212	121	465	3,041
East Midlands	78	14	112	6	62	286	13	285	94	459	2,791
West Midlands	60	11	144	13	57	42	28	220	-	270	2,638
Wales	36	10	53	28	-	66	25	55	-	389	1,624
North East	28	5	35	17	-	139	11	62	34	178	1,369
Northern Ireland	37	7	33	9	52	87	-	45	-	103	1,004

Source: Construction Products Association (CPA), ONS, Cebr Analysis

BREXIT WOUNDS

The matter of Brexit is not necessarily the real issue, it merely brought an pre-existing problem to the fore. However, on top of the lack of skills in each profession and sector, the eventual Brexit deal that the UK strikes with the European Union looks likely to further increase the strain.

Construction is heavily reliant on unskilled or semi-skilled workers and a points-based system could prove problematic in terms of bringing in the right labour. This is further complicated by the fact that, as a net importer of talent, there is currently little incentive for EU nations to invest in visa structures.

Regardless of the outcome of the negotiations, restricting EU migration to the UK will add significantly to the administrative burden associated with satisfying visa requirements. This will both slow the recruitment process and increase costs for construction employers, potentially seeing projects delayed.

Furthermore, with construction such a margin-sensitive industry, controlling post-Brexit labour and resource costs will prove critical if we are to ensure housebuilding and infrastructure projects remain viable.

While the sheer numbers involved appear extremely challenging, the real issue is time. All industry segments face a similar melting pot of challenges – an ageing workforce, lack of skilled trades, reliance on EU migrant labour and a lack of capacity to upskill and train new entrants to the labour market. However, not every industry has historically proved as inflexible as construction.

RAPID PLUGGING

Plugging the employment gap the nation faces in such a short period of time cannot be wholly achieved through education and technologies alone. The following measures could go some way to covering the shortfall in the near term.

RECRUITING FROM OTHER INDUSTRIES

Looking for workers with transferable skills in other sectors and those looking to return to work is achievable. Such a move could see an influx to the industry's labour force much sooner than training and educational investment will allow.

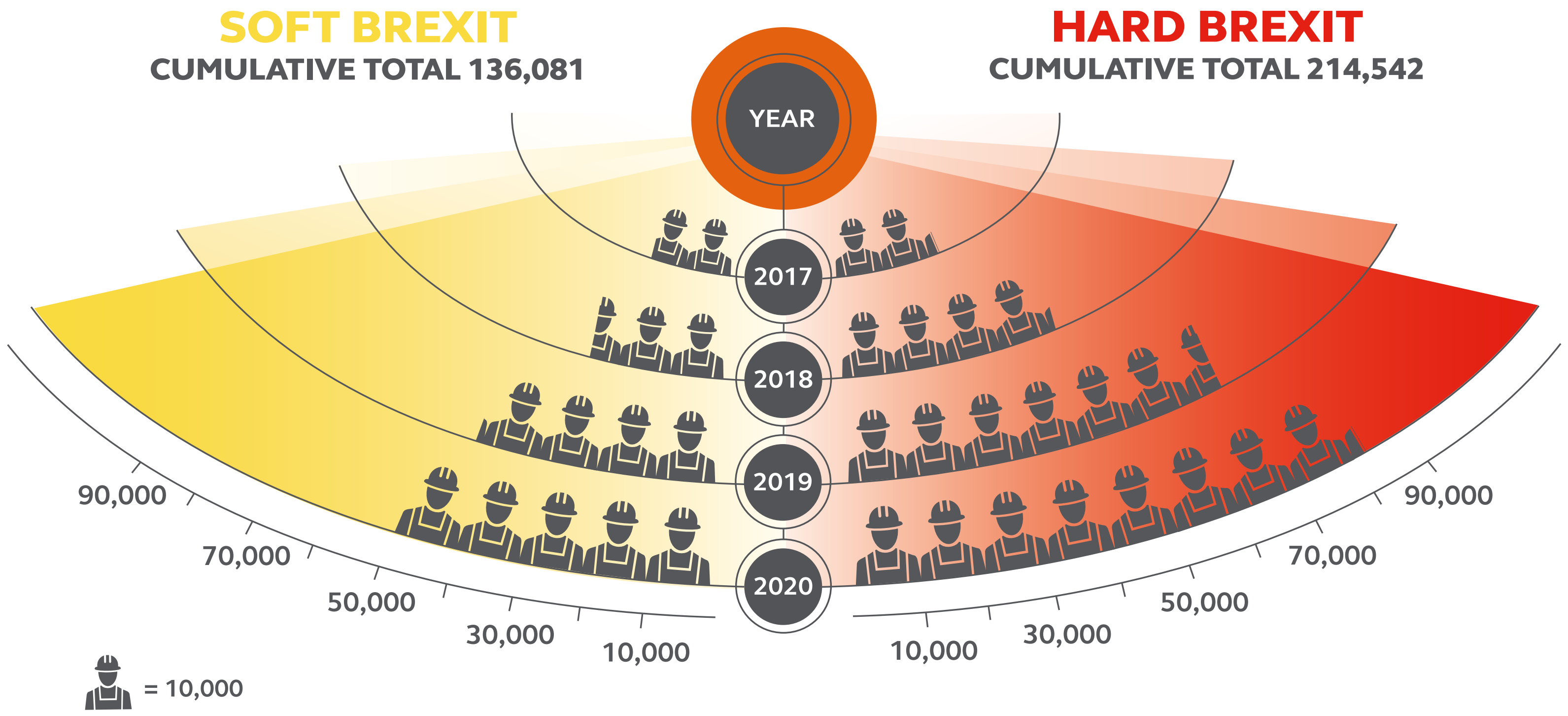
BACK TO BASICS REVIEWS OF WASTE

Collectively looking at wasted labour and time across the supply chain would reduce duplication and ensure everyone is fully enabled to perform. This is not an easy endeavour for an industry that struggles so glaringly with collaboration, but the benefits could be significant.

BOOSTING SUPERVISION

More efficient planning and execution could be achieved by moving people from the highly skilled, but ageing, workforce into a wider array of supervisory roles. This could both stem industry attrition whilst also facilitating valuable knowledge transfer, ultimately leading to improved productivity.

NET LOSS OF EU WORKERS TO HOUSEBUILDING AND INFRASTRUCTURE BY 2020



In the event of a 'soft' Brexit the construction workforce could see a steady reduction in numbers. We have estimated a scenario whereby, for instance, rigid quotas are introduced or policies implemented on a sector-by-sector basis, allowing for a degree of EU migration into the sector.

A potential 'hard' Brexit scenario – for instance, extending the points-based system currently in place for non-EU migrants – could see the number of EU construction workers entering the UK fall at the rate of attrition. This would mean that those EU nationals leaving the industry cannot be replaced at the same rate by new EU workers.

*Based on assumed 2016 housebuilding and infrastructure workforce of 1.5m

ALL IN IT TOGETHER

With an issue as complex and long-standing as the British skills crisis there is no silver bullet.

That said, there is plenty that government, the business community and even those within the existing workforce can do to better equip themselves and our nation for the challenges that lie ahead.

WHITEHALL

Clarity around the existing EU labour force within the UK is critical. Securing the rights for those currently working in British construction will be essential if we are to ensure an element of relative continuity and avoid a sudden workforce landslide at the point of Brexit.

The visa system is amongst the most crucial considerations for any future Brexit terms. The pre-existing multi-tiered system is weighted towards assessing levels of formal education rather than skills. Such a system is not fit for a future workforce of EU workers who possess the skills we need, if not obtained through formal educational routes. Quotas or a points-based system for critical skills shortages is a must. The sooner industry understands where these parameters lie, the less impact this is likely to have on the health of our economy.

In the Chancellor's 2016 Autumn Statement he outlined a consultation on tax treatment on benefits in kind. Many of the projects that the British government have pinned their hopes on for economic stimulus – such as Hinkley Point and HS2 – will put additional cost burden on those living away from home and make future headline grabbing projects more difficult and costly to resource, which will only drag on project schedules.

BRITISH BUSINESS

Companies will typically only make significant operational changes if there is a direct benefit to the bottom line. The time has now come. British business must now evolve more quickly and respond to the challenge of a rapidly changing commercial and political global landscape.

Modern methods of construction such as off-site manufacturing, robotics and Building Information Modelling have been available for some time but remain seriously underused. Never before has there been a greater need to push for action and investment. Tax relief and a commitment to public sector procurement using these vehicles would provide a solid base. However, even with this technology new skills and knowledge are needed to effectively use and maintain it.

Meanwhile, nobody can deny that construction suffers from a fundamental image problem. Many view it as a '4D industry' – dirty, dangerous, demeaning and depressing – and this has held us back for some time. Strong leadership can push forward the necessary cultural change. If we are to move forward and attract a more diverse and inclusive workforce this needs to be addressed. To this end, businesses have a role to play in highlighting how rewarding a career in construction can be, and how fulfilling it is to be part of an industry that creates such incredible feats of human endeavour.

Perhaps just as importantly, businesses can make better use of their existing people. Investment in up-skilling and cross-skilling people is time and cost intensive, and with businesses reporting on quarterly results with tight margins, the appetite is understandably lacking to make any decision that could have a detrimental impact. It is precisely here that decisive leadership can, again, make the difference.

However, with evolving client needs comes an increased need for evolving skills. Agility and mobility are now critical and a project manager needs to be an experienced generalist, with a comprehensive knowledge of a variety of sectors. Tomorrow we could also require skills that we are not even aware of today. The old-fashioned preserve of sector specialisations will reduce our ability to respond to market changes and have a substantial impact further down the line.

BRITISH WORKERS

For an increasingly flexible national economy many UK workers have become too specialised in their skill sets. Estimates suggest that in a few years a large chunk of the British workforce will be freelance. Such a scenario will create a vastly increased requirement for those with wider industry skills and with wider experience. If this shortage is not addressed, what could unfold is a freelance labour force racing to the bottom of the rate card. Not only does this mean potential wage depression in certain pockets but we could also see service quality compromised.

For generations, British talent has borne something of a quality 'kitemark' around the world. If we are to maintain quality and quantity of outputs, and remain attractive to investors we must ensure that British skills and talent are viewed as desirable. This reputation is hard won, based on our economic achievements so far. Any dilution in the commodity value achieved will lead to a depression on the labour market with capacity issues.

> ***"If Britain is to maintain outputs and remain attractive to investors we must ensure that our exportable talent is viewed as desirable."***

ARCADIS

Our world is under threat - from climate change and rising sea levels to rapid urbanisation and pressure on natural resource.

We're here to answer these challenges at Arcadis, whether it's clean water in Sao Paolo or flood defences in New York; rail systems in Doha or community homes in Nepal. We're a team of 27,000 and each of us is playing a part.

Arcadis. Improving quality of life.

DISCLAIMER

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This report was commissioned by Arcadis and produced by Cebr, an independent economics and business research consultancy established in 1992, for Arcadis. The views expressed herein are those of the authors only and are based upon independent research by them.

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