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## Welcome

Could building engineering become the degree of choice for the next generation of undergraduates? The success of the Olympics has drawn attention not only to the gold medallists, but also to the engineering talent that made the spectacle possible. Between cheering on the supreme efforts of Team GB at the Velodrome, spectators were discussing how engineers had created the optimum riding conditions for Chris Hoy and co, with the minimum amount of mechanical heating and cooling.

The Olympics was a perfect advertisement for a career in engineering, and because of the Games young people are now becoming more aware of the opportunities and rewards of a career in building services.

Senior mechanical engineer Sophia Negus is one of them. She worked on the London Olympics masterplan for AECOM, and is now helping deliver the Rio masterplan and five venues for the 2016 Games. As well as working on the Velodrome, Negus is lead building services engineer on the tennis centre, despite being only 30 (page 4).

One of Negus's most exciting and

rewarding challenges is the move towards low carbon building, which ranges from the specification of low-embodied energy products to the creation of lasting legacies for the venues after the Games.

The skills and knowledge of building service engineers will be increasingly valued as the UK strives for zero carbon. Core services such as heating, ventilation, water, and lighting all have an impact on the earth's resources, and those professionals best able to minimise their use will be highly sought after.

Our visual guide to a career in building services (page 8) shows the many different roles available and explains the educational path to full qualification. We also talk to those recruiting within the industry to find out how you can maximise your chances of landing a plum role (page 15).

Finally, you'll want to know what you could be earning in the industry. The Hays/CIBSE salary survey reveals all (page 11).

**Alex Smith, Editor**



# Next stop RIO

**Roxane McMeeken** gets a first-hand perspective on what it's like to work on the Rio 2016 Olympic Games from senior mechanical engineer, Sophia Negus



It's great to learn how people do things in other countries, particularly the engineering solutions they adopt due to local conditions, such as fuel prices

If you loved the London Olympics buzz last year, you might be keen to know that a career in building services could keep you involved in that excitement full-time. Building services engineers are needed for constructing sports venues the world over. As a result, some follow Olympic Games building projects around the globe.

Sophia Negus, 30, spends every day at work in the UK right now on preparations for the Rio 2016 Olympics in Brazil. She is a senior mechanical engineer in the building services engineering arm of Aecom, a planet-spanning, multi-disciplinary built, natural and social environment consultancy.

Negus says: 'It's really exciting to be working on such a high-profile project in a place as interesting as Brazil.' The job comes with challenges, she says, but the rewards are huge.

Aecom was involved in the London Games, including drawing up the masterplan – the map of what buildings go where and how they are

connected – for the London Games. The firm continues to work on the 25-year-plus scheme to revamp the east London area around the Olympic Park. Based on this expertise, Aecom won the international competition to deliver the masterplan and five venues for Rio's 300-acre Olympic Park.

### Exciting challenges

Part of Aecom's role in Rio is designing the Tennis Centre, including mechanical, electrical and public health building services. This covers everything, from the lights to the air conditioning, to the integration of specialist equipment such as real-time scoring systems and information relay.

Negus is involved in the Velodrome, although her main focus is the Tennis Centre, on which she is the lead building services engineer. Negus says: 'I am lucky to have been involved from an early stage, that's really rewarding. And I'm delighted to work in detail on a specific venue.'



SHUTTERSTOCK

Building services engineers' world view

It is a demanding role though. She says: 'I started working on Rio at the start of 2012 and given the size and scale of the venue, it's been pretty fast-track from day one.'

The Tennis Centre features three main stadiums: the 10,000-seat centre court, which will be decreased to 6,500 seats after the Games; plus two temporary venues of 5,000 and 3,000 seats respectively. There are a further seven match courts and six external practice courts during games mode.

At the moment, Negus is thrashing out the final concept design, a stage known as design stage C. 'We have strict time, budget and planning constraints,' says Negus. 'We absolutely have to deliver in time for 2016. Unlike other projects, where things might be more flexible, this deadline is immovable. We also have to constantly keep the budget in mind – funding levels are set at the onset and an overspend could require additional funding.'

Negus must juggle all this with sustainability. 'We also have to meet increasingly stringent energy targets.'

According to Negus, the ability to cooperate

with other disciplines is essential: 'As we develop the design it's often an iterative process, working closely with the architects and other engineers. So you have to maintain the flow of information so everyone is aware of the changes being made to the design.'

Some of this communication is long distance. Although Negus will visit Brazil in due course, she is based in Aecom's St Albans office, while some of her colleagues are in Rio. But Negus does not see this as a drawback: 'It's great to learn how people do things in other countries, particularly the engineering solutions they adopt due to local conditions, such as fuel prices.'

Negus has learned, for example, that, in Brazil, solar thermal power is routinely used to boost hot water provision. 'So we are using it but it's different in Brazil compared to the UK because you have a much higher yield due to the intensity of the sun.'

### Making a difference

One of the exciting things about being a building services engineer is that they are uniquely positioned to make the built environment more sustainable. Negus says: 'Building services are often hidden, but as we strive towards carbon neutral buildings and as fuel prices rise, building services engineers have the ability to make a positive impact on lifetime fuel use of a building and its carbon emissions.'

The construction industry is looking increasingly beyond the energy that buildings consume while they are occupied. The focus is expanding to the energy used to make, transport, install and eventually uninstall building products. This 'cradle to grave' assessment means building services engineers are again

taking on an ever more critical role, says Negus.

By specifying the right products at the start of the project, building services engineers can improve the lifetime performance of the built environment, she says. 'They also set the scene for future building adaptability to suit changing market conditions and end-user requirements.'

In Rio, this holistic approach encompasses the legacy use of venues. Although seven of the venues will be temporary, nine will remain after the Games. Negus says: 'Legacy is an integral part of Aecom's design planning process. Stadia, when designed well, should last for decades and be suitably adaptable for future use so that they can continue to benefit the local area,' says Negus. Around 70% of the infrastructure built for Rio 2016 is expected to be used after the event, with planned regeneration to include housing and commercial development.

The potential to travel is one of the things Negus loves about working in buildings services. 'There's huge potential to travel, especially with Aecom because we have so many global projects. I have worked on projects in Montenegro, Poland and Ukraine, but nothing as exotic as Brazil.'

Negus is passionate about travel and first visited Brazil during a gap year after graduating from Imperial College London with first class honours in mechanical engineering (MEng) in 2005. Why did she choose building services? 'I wanted to do something that was not quite pure science or maths, while involving both, and I like design and understanding how things work. Building services combines all these things.'

In the future, Negus is looking forward to 'new projects in new countries'. She adds: 'It's always good to work on buildings of different types and I'd love another big project to get stuck into.' ➔

# Hoare Lea is an award winning firm of Building Services Consulting Engineers and the largest of its kind in the UK.

For over 150 years, we have been at the forefront of engineering design for the built environment. As an independent Partnership, we are in control of our destiny, with the freedom to shape our business without the constraints of outside shareholders. This means we stay focused on what's important - designing great buildings that respond to what our clients need.

Our team makes us unique. With a 600 strong workforce that is expanding all of the time, we work closely together to deliver the best results. We employ some of the most skilled and experienced people in the industry, giving us a competitive edge. It also means that if you work for us, you're learning from the best.

Our approach has kept us market leading 'engineers of choice' for many years and as we pass the firm from generation to generation of Partner, it's important that we maintain our position.



**Calum Davies Smith**  
Trainee Engineer



I started at Hoare Lea after finishing my A-Levels in August 2012. I am currently working towards a HNC in Building Services Engineering and hope to

go to University in the future.

I chose Hoare Lea as I knew that it was a well-established firm that invests in training. I could become an Electrical Engineer, Mechanical Engineer, or become part of a specialist group. I have improved my knowledge and been able to work in all areas of building services.

**Brian Meegan**  
Electrical Placement student



During my summer placement at Hoare Lea, I have gained a wealth of experience, and have been able to get hands-on experience using the latest software

programmes – which Hoare Lea heavily invest in to keep us ahead of the game.

Each day brings a new challenge and the opportunity to work on a range of different projects. What makes working here even better is the extremely friendly and professional people who make working here so much fun.

**Kate Glensman**  
Graduate Mechanical Engineer



Whilst at university, I did a number of summer placements. I noticed that in multi-disciplinary consultancies, building services is often underrepresented.

This was the main reason I applied to Hoare Lea. Its focus is on building services, which means we have the resources and experience to come up with innovative designs. With Hoare Lea's international presence, I am looking forward to the opportunity to work on projects further afield whilst working towards my Chartership.

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This cutting edge, eco-friendly building uses the latest green technology and innovative design features to significantly reduce the building's CO<sub>2</sub> emissions. This innovative approach led to the first ever BREEAM 'Outstanding' rating for a higher education building under BREEAM Higher Education 2008.

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We offer permanent, as well as placement opportunities, so that individuals who are still studying get the chance to work with us in the holidays to start developing their professional skills in this progressive industry.

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We invest heavily in your benefits. We offer competitive starting salaries, comprehensive medical insurance, a contributory pension scheme and life assurance. Optional benefits include the opportunity to buy more holiday and get loans for discounted computers, SMART technology and bikes.

We are committed to employee development and run an industry-leading IET, IMechE and CIBSE accredited Initial Professional Development Scheme and a variety of Continuing Professional Development events covering technical developments, sustainability workshops, management and leadership.

If you'd like to find out more about the fantastic opportunities available, please visit our website.

[www.hoarelea.com/careers](http://www.hoarelea.com/careers)

# How to grow your career

For budding engineers, there are myriad routes into the building services industry. Our visual guide to the huge number of exciting roles and opportunities shows how you can build a flourishing career in this dynamic and forward-looking industry. **By Roxane McMeeken**

## *Dorte Rich Jorgensen* sustainability manager, Atkins

Led the delivery of the London 2012 Olympics' sustainability objectives for a number of elements, including structures, bridges and parkland. Passionate about cutting carbon.

**D**id you know that buildings consume 42% of all electricity worldwide? That's not even including the masses of energy used to make them and their myriad components.

So, if you care about the environment, joining the construction industry will put you on the front line of the battle to save the planet. Building services engineers are uniquely positioned to lower the carbon footprint of the built environment. But that's just one reason people choose a career as a building services engineer.

Building services engineers design, advise on, install and maintain everything in a building that makes it work, from lighting and plumbing to lifts and air conditioning. This means that, arguably, when it comes to making buildings greener, no one has a more critical role.

Angela Ringguth, head of careers promotion at CIBSE, says: 'There is a growing realisation that we must use less energy and more renewable energy, and that means increasing demand for people who can deliver this.'

While the construction industry has been focused on how to make buildings use less energy once they're up and running, the focus of the battle to emit less carbon is now shifting. This is another trend that's giving building services engineers a starring role.

The industry is increasingly looking at the energy-intensive processes used to make

## *Bringing buildings to life*

### **Building services are everything that makes a building habitable**

- Managing the environmental performance of buildings throughout their lifecycles, known as the 'cradle to grave' approach
- Collaborating with world-leading clients, architects, interior designers, structural engineers and more
- Opportunities to work all over the planet
- A role at the heart of construction projects, and becoming even more integral because of the growing importance of energy efficiency
- On the frontline of the ongoing battle against global climate change
- Exciting projects, such as Olympic stadiums, skyscrapers, science laboratories, music venues, schools in developing countries, headquarters of multi-national companies, hospitals, art galleries and museums.
- Working with cutting edge and rapidly changing technology, including Building Information Modelling
- Membership of a highly respected and agenda-setting professional body: CIBSE

## *The heart of construction*

### **All the areas that building services cover**

- Energy supply – gas, electricity and renewable sources
- Heating and ventilating
- Water, drainage and plumbing
- Lighting – natural and artificial
- Escalators and lifts
- Harnessing renewable energy, such as solar power
- Communications, telephones and IT networks
- Security and alarm systems
- Fire detection and protection
- Air conditioning and refrigeration
- Facade engineering
- Public health engineering
- Control systems

## *Nourishing growth*

Once in the industry, the levels of professional qualification you can pursue with CIBSE are: chartered engineer (CEng), incorporated engineer (IEng) or engineering technician (Eng Tech). Achieving these makes you an expert in your field and brings you letters after your name to prove it – these are recognised worldwide.

*Rafay Hasan*

senior engineer, Gronmij



Designs mechanical services for office buildings, hotels and high-end residential. He says: 'Being a building services engineer means you can make a difference by designing sustainable buildings to minimise environmental impact. I enjoy the opportunity to travel and work alongside world renowned designers and architects on iconic buildings.'

Designs mechanical services for office buildings, hotels and high-end residential. He says: 'Being a building services engineer means you can make a difference by designing sustainable buildings to minimise environmental impact. I enjoy the opportunity to travel and work alongside world renowned designers and architects on iconic buildings.'

*Branching out*

Some of the different jobs you can do in building services

- Air conditioning engineer
- Business manager or proprietor
- Building physics engineer
- Carbon emissions specialist
- Computer aided design technician
- Commissioning engineer
- Consulting engineer
- Contract or project engineer
- Design engineer
- Domestic heating engineer
- Domestic plumber
- Ductwork installer
- Educator and trainer
- Electrotechnical panel builder
- Electrical repair and rewinder
- Energy inspector/adviser
- Estimator
- Facilities manager
- Fitter/welder
- Gas fitter
- Heating and ventilating engineer
- Highway electrical systems installer
- Industrial and commercial plumber
- Installation electrician
- Instrumentation installer/engineer
- Lighting expert
- Maintenance electrician
- Public health engineer
- Quantity surveyor
- Refrigeration engineer
- Satellite systems engineer
- Service and maintenance engineer
- Sheet metal weathering specialist
- Site supervisor
- Environmental engineer
- Project engineer

*Doug Oughton*FREng FCIBSE  
consultant at Aecom

Helped to shape the global building services engineering business at AECOM, and is a past CIBSE president. He is also a past member of UNESCO Science Committee Engineering Council and the UK sustainable construction research organisation, the Building Research Establishment. He has worked on Buckingham Palace, Lloyds of London, the Royal Academy of Music and Windsor Castle.

*Kaval Patel*associate director,  
Buro Happold

Kaval leads a team within the Buro Happold London Building Fabrics Group nurturing the

next generation of young engineers. He is also director and leader of projects both here in the UK and around the world.

*Putting down roots*

Some of the 'roots' into building services and membership of CIBSE

- Degrees including civil engineering, electrical engineering, energy, environmental engineering, design and technology, engineering, maths, mechanical engineering, physics and product design
- Inspire Scholarship Scheme supports full-time undergraduates studying – construction degrees
- National Certificate and Higher National Certificate qualifications in building services engineering
- Arkwright Scholarship sponsored by CIBSE to support studying in school years 12 and 13
- NVQ Diploma (England), SQVF (Scotland), or Apprenticeships
- Remember, for a career in building services, you must keep up maths and science after GCSE!

*Jamsin Tweddell*

**senior engineer,  
Max Fordham**



Spearheading the company's work on building performance and soft landings, which ensure buildings stay sustainable after the construction phase. Tweddell says: 'Everyone is designing low energy buildings now, but because of the way the buildings are used they don't end up being so sustainable. So staying with the building after construction to understand how it works when in use is an exciting and crucial new area for building services.'

*Patrick Bellew*

**principal, Atelier Ten, an environmental design and building services engineering firm**

Co-founded Atelier Ten in 1990. Named a Royal Designer for Industry by the Royal Society of Arts (RSA) in 2010. A founding member of the UK Green Building Council, with more than 30 years' experience in the design of high performance buildings.

*Sasha Krstanovic*

**director of arts and culture sector lead for AECOM building engineering, Europe**



Has worked in China, Iceland, India, Russia and the United Arab Emirates. Responsible for occupant comfort and the associated amount of energy buildings consume. Krstanovic says: 'I am a project director, which means winning work, conceptualising the design and ensuring the successful delivery of the project. I work with amazing people all over the world.'

construction products and the long distances they sometimes travel. For example, a 'British' boiler could have started life as Australian iron ore and ended up being assembled in a German factory. Industry leaders are also looking at the environmental impact of decommissioning and disposing of construction products and materials.

Looking at the whole construction process in this way is known as 'cradle to grave'. It is at the cutting edge of modern sustainability thinking worldwide and there's no one better equipped to do it than a building services engineer.

Indeed, the opportunities to work overseas is another reason for choosing a career in building services. You could work on London's Shard, the Rio Olympics or Qatar's World Cup. Ringguth says: 'Building services engineers are involved in major buildings and developments on every continent of the globe. This is particularly because CIBSE-qualified engineers have a status that is internationally recognised.'

Building services engineers are certainly in demand. Ringguth says: 'We hear a lot about graduate unemployment at the moment, but this is definitely not the case in our sector. Demand for skilled professionals greatly outstrips supply and the wage premium for people with engineering degrees has grown over the last 20 years. This is good news for young people coming into our industry.' 

*David Fisk CB*

**former chief scientific adviser to government, current CIBSE president and director of Laing O'Rourke Centre for Systems Engineering and Innovation at Imperial College London**

Received his CB for services to the Department of Environment in 1996.

*Doug King*

**Royal Academy of Engineering Visiting Professor of Building Physics at the University of Bath**

Founded sustainability specialists King Shaw Associates Consulting Engineers in 2002. Known in the industry for pointing out the pitfalls of less useful sustainable additions to buildings – what he calls 'eco-bling'.

*Professor Max Fordham*

**Founded building services engineering partnership Max Fordham in 1966**

Awarded the Prince Philip Designers Prize in 2008 by the RSA, an enlightenment organisation, which deemed him a 'pioneer of environmental design for buildings'. Believes strongly in looking at buildings holistically, with a creative but practical approach. Visiting professor at Bath University to travel and work alongside world renowned designers and architects on iconic buildings.'

*Lee Tabis*

**trainee design engineer, NG Bailey**



CIBSE's 2012 graduate of the year. Tabis is an electrical design engineer who works on various projects of all sizes throughout the UK, and mentors apprentices. He says: 'My job is a fine balance between science and practicality, and every project has its own lessons to learn. There's something new to learn everyday.'

# The end of the ice age?

Building services salaries may have been in the deep freeze during the recent downturn, but data from the CIBSE/Hays Salary Survey suggests a thaw could be on the way, with 71% of firms optimistic about prospects in 2013, and 57% planning to recruit more staff. **Roxane McMeeken** says this is good news for graduates entering the industry



“The emphasis right now is on trying to win work, so those involved in bidding and particularly the economic viability of bids are more crucial than ever

**Mike McNally, Hays**

**T**he pay freeze for building services engineers has yet to thaw. This year's survey of salaries and benefits, conducted exclusively for *CIBSE Journal* by Hays Building Services, a leading recruitment expert, shows that over the past year there has been scant change in levels of pay in the sector.

The research, which included interviews with employers and employees, revealed that a consequence of this stagnation appears to be widespread itchy feet: of the employees questioned, more than four in ten plan to look for a new job in the next 12 months.

However, the sector's bosses appear to be blissfully unaware of the looming shake-up, with just 9% of employers expecting problems with staff retention next year. In an industry that is already struggling to attract and retain the most talented people, these findings are a wake-up call for the sector.

This is especially when you consider that 71% of firms surveyed were optimistic about prospects in the next business year, and 57% said they were planning to recruit. This optimism suggests 2013 could be the year.

#### Associate engineer (£)

	Typical	Min	Max
Central London	50,000	51,000	65,000
South East	35,000	30,000	60,000
South West	41,000	37,000	45,000
Wales	40,000	35,000	48,000
West Midlands	46,000	40,000	55,000
East Midlands	44,000	40,000	48,000
East Anglia	39,000	33,000	44,000
North West	41,000	39,000	46,000
North East & Yorkshire	40,000	38,000	45,000
Scotland	44,000	44,000	50,000
Northern Ireland	36,000	34,000	40,000
<b>National Average</b>	<b>44,000</b>	<b>40,000</b>	<b>49,000</b>

What will keep people on board is the thrill of the job. This means that the growing importance and expanding breadth of the building services profession, due to the critical role it plays in sustainability, could hardly be better timed

**Rob Harris, Elementa**

salaries start to rise. Indeed, more than half of the employers surveyed said they were planning pay increases.

**The big freeze**

However in 2012, 75% of the employees questioned said that they had not received a wage rise in the last 12 months. Mike McNally, director at Hays, says: 'The static nature of salaries reflects the UK economy in general and it's been well documented that construction and property has suffered disproportionately in the recession.'

Indeed, the latest data from the Office for National Statistics, published in October, showed that over the three months from June to August this year construction output was 11.9 per cent lower than the same period in 2011. New work decreased by 15.6 per cent and the volume of new infrastructure work decreased in particular - by a dismal 23.9 per cent.

McNally says: 'Demand for services has been flat, therefore demand for skills has been flat, with little movement between jobs, and that has a knock-on effect on salaries.' Hence, Hays found that many national average salaries for roles have not moved – or hardly moved – in the past twelve months. For example, the average wage for a chartered associate-level consulting engineer, is now £44,300 compared to £44,000 last year. The average UK mechanical engineer salary, meanwhile is now £33,700, up minimally from £33,000 a year ago.

Although pay was generally static, some roles are in demand and have seen pay rises as a result. McNally says cost roles are sought-after above all others: 'The emphasis right now is on trying to win work, so those involved in bidding and particularly the economic viability of bids are more crucial than ever.' However, the sector's depressed condition means that although there have

been sporadic rises for cost roles, the national averages for senior estimators and estimators have remained broadly the same, at £39,800 and £32,500 respectively.

Equally there were some falls in salaries in geographical regions for particular roles where vacancies remain rare and numbers of candidates high. An intermediate-level design engineer in the South East, for example, could command a typical salary of £30,000 in 2011 but this dropped to £28,000 in 2012.

In this climate, redundancies have continued. Hays found that more than two thirds of employers (69%) had implemented redundancies, whether voluntary or involuntary, as a part of cost cutting measures over the past 12 months.

Further pay cuts have been implemented too. Of the employees questioned, 31% said that in the past year they had taken a reduction in salary.

**Brain drain**

The survey shows starkly how these conditions are hitting morale. Some 72% of employees said they believed salaries in the sector were low and, perhaps partially as a consequence – and alarmingly for employers – a significant 43% said that they planned to leave their job within the next twelve months.

Simon Stoker, senior HR officer at Arup, says this may also be because the sector, depressed as it is, is seeing a little more activity than in 2010. 'Whereas, two years ago, fewer people wanted to switch job because they were concerned about job security, as some markets have started to improve people may well start to look around.'

The research did not reveal whether employees planned simply to switch jobs within the sector, or to leave the industry altogether. For some, it could be the latter. Becci Taylor, associate and building services engineer at Arup, says: 'People do leave the

**Principal design engineer (£)**

	Typical	Min	Max
Central London	50,000	43,000	55,000
South East	42,000	38,000	50,000
South West	35,000	31,000	39,000
Wales	33,000	30,000	40,000
West Midlands	42,000	38,000	45,000
East Midlands	40,000	38,000	43,000
East Anglia	43,000	37,000	44,000
North West	39,000	36,000	42,000
North East & Yorkshire	38,000	36,000	42,000
Scotland	36,000	36,000	43,000
Northern Ireland	32,000	28,000	33,000
<b>National average</b>	<b>39,000</b>	<b>36,000</b>	<b>43,000</b>

**Intermediate design engineer (£)**

	Typical	Min	Max
Central London	34,000	30,000	38,000
South East	28,000	24,000	32,000
South West	25,000	22,000	30,000
Wales	24,000	22,000	27,000
West Midlands	28,000	25,000	35,000
East Midlands	27,000	24,000	29,000
East Anglia	26,000	23,500	30,800
North West	27,500	23,500	29,500
North East & Yorkshire	26,000	22,000	28,000
Scotland	27,000	26,000	31,000
Northern Ireland	24,000	22,000	26,000
<b>National average</b>	<b>27,000</b>	<b>24,000</b>	<b>31,000</b>

**Junior engineer (£)**

	Typical	Min	Max
Central London	25,000	22,000	30,000
South East	20,000	18,000	24,000
South West	18,000	17,000	23,000
Wales	18,000	16,000	20,000
West Midlands	20,000	18,000	23,000
East Midlands	21,000	19,000	22,000
East Anglia	21,000	18,000	22,000
North West	18,000	17,000	22,000
North East & Yorkshire	18,000	17,000	22,000
Scotland	19,000	18,000	22,000
Northern Ireland	18,000	16,000	20,000
<b>National average</b>	<b>20,000</b>	<b>18,000</b>	<b>23,000</b>



industry if they are motivated more by money than anything else – you can earn a lot more elsewhere and everyone knows that.'

HR heads also say that a growing number of staff are interested in leaving to become contractors. Stoker says: 'There are salary differences between salaried and contract staff rates, so if people are motivated by money they may want to move to contracting.'

There appear to be more opportunities for contractors, too; Hays found that 74% of employers in the past 12 months had hired temporary staff, whereas only 52% of them had made any permanent appointments.

Whatever employees' motives, employers have a fight on their hands to retain the best brains. While some may be easy to replace, others will not - particularly those in whom you have invested time and money for training, and who know how your

organisation operates.

Rob Harris, business development director at Elementa, says senior people are particularly difficult to recruit because of an ongoing shortage. He says: 'It takes six months to a year to find a high level principle engineer and then another six months to see if they are up to standard. It can be very frustrating as it makes it difficult to plan ahead.'

Ironically, as we have seen, few employers appear to be aware of the looming fight, with less than one in 10 employers anticipating the potential exit of close to half their staff. Neither are many expecting to raise salaries, with 65% not planning pay rises in the next 12 months.

### Laws of attraction

For employers, there is still time to put in place strategies to retain and attract talent

– and, unfortunately for staff, it need not involve raising pay. But first, McNally says the battle for the best brains must start in schools. 'The sector needs to make itself known – and attractive – to school children. That means visiting schools to talk about the career and what it involves.'

It is essential to keep creating opportunities for graduates and apprentices too, despite the downturn. Taylor says this is a must in any case: 'These new entrants are the future of the business, so we must invest in them – not just at Arup but industry-wide. If we lose them to another industry now we will struggle to attract them later.'

Companies may find that their international operations provide both the need for entry-level recruits and the means to attract them. Mike Burton, director of building engineering at Aecom UK, says: 'We are able to attract people with the overseas opportunities we

#### Senior estimator (£)

	Typical	Min	Max
Central London	52,000	48,000	55,000
South East	43,000	40,000	50,000
South West	36,000	32,000	40,000
Wales	34,000	29,000	38,000
West Midlands	39,000	35,000	45,000
East Midlands	40,000	36,000	42,000
East Anglia	46,000	41,000	46,000
North West	37,500	33,500	40,000
North East & Yorkshire	37,000	33,000	40,000
Scotland	38,000	34,000	45,000
Northern Ireland	35,000	32,000	42,000
<b>National average</b>	<b>40,000</b>	<b>36,000</b>	<b>44,000</b>

#### Estimator (£)

	Typical	Min	Max
Central London	42,000	40,000	45,000
South East	35,000	32,000	40,000
South West	29,000	26,000	31,000
Wales	28,000	25,000	30,000
West Midlands	32,000	28,000	34,000
East Midlands	32,000	29,000	35,000
East Anglia	35,000	31,000	37,000
North West	33,000	27,500	35,000
North East & Yorkshire	33,000	25,000	35,000
Scotland	30,000	28,000	35,000
Northern Ireland	30,000	29,000	35,000
<b>National average</b>	<b>33,000</b>	<b>29,000</b>	<b>36,000</b>

#### Senior mechanical/electrical contracts manager (£)

	Typical	Min	Max
Central London	48,000	43,000	52,000
South East	45,000	40,000	50,000
South West	39,000	35,000	42,000
Wales	35,000	32,000	40,000
West Midlands	38,000	36,000	45,000
East Midlands	37,000	34,000	41,000
East Anglia	45,000	38,000	48,000
North West	37,000	34,000	42,000
North East & Yorkshire	37,000	34,000	43,500
Scotland	38,000	33,000	43,000
Northern Ireland	32,000	33,000	38,000
<b>National Average</b>	<b>39,000</b>	<b>36,000</b>	<b>44,000</b>

**Mechanical/electrical contracts engineer (£)**

	Typical 12	Min 12	Max 12
Central London	40,000	38,000	44,000
South East	38,000	32,000	40,000
South West	34,500	31,000	36,000
Wales	32,000	29,000	34,000
West Midlands	32,000	29,000	40,000
East Midlands	31,000	28,000	33,000
East Anglia	35,000	32,000	38,000
North West	33,000	30,000	36,000
North East & Yorkshire	32,500	30,000	36,000
Scotland	33,000	28,000	37,000
Northern Ireland	30,000	26,000	34,000
<b>National average</b>	<b>34,000</b>	<b>30,000</b>	<b>37,000</b>

**Operations director (£)**

	Typical	Min	Max
Central London	70000	65000	77000
South East	65000	62000	67000
South West	47000	43000	51000
Wales	45000	40000	50000
West Midlands	47000	43000	53000
East Midlands	51000	46000	55000
East Anglia	55000	49000	59000
North West	50000	45000	55000
North East & Yorkshire	50000	42000	54000
Scotland	45000	40000	50000
Northern Ireland	42000	36000	45000
<b>National average</b>	<b>52,000</b>	<b>46,000</b>	<b>56,000</b>

**Operations manager (£)**

	Typical	Min	Max
Central London	60,000	55,000	65,000
South East	60,000	55,000	63,000
South West	40,000	35,000	45,000
Wales	40,000	33,000	42,000
West Midlands	44,000	35,000	44,000
East Midlands	45,000	40,000	48,000
East Anglia	45,000	42,000	48,000
North West	40,000	37,000	45,000
North East & Yorkshire	40,000	37,000	45,000
Scotland	37,000	35,000	43,000
Northern Ireland	34,000	32,000	38,000
<b>National average</b>	<b>44,000</b>	<b>40,000</b>	<b>48,000</b>

can offer. We currently have building services graduates working in Auckland, Sydney and California.

The way companies work can also help. Burton says: 'Part of why we attract people is the working environment. We work in design studios with flexible spaces, informal meeting areas, cafes and comfy chairs. We also allow people to communicate how they want, whether that's through twitter or email etc – we recognise that younger people are often less keen to pick up the phone.'

It may also be worth firms revisiting their branding. Alasdair Reid, senior partner at Max Fordham, says: 'Graduates have always liked the fact that we have the theme of sustainability running through everything we do, because they want to use their engineering skills to improve wider society. So we rebranded our website 18 months ago to emphasise that, and we have seen an upsurge in applicants for jobs.'

In lieu of higher salaries, firms can offer employees a stake in the business. At Max Fordham, for example, the partnership structure can be attractive. Of the firm's 160 staff, 90 are partners. Reid says: 'We are a democratic partnership and that empowers the people that work here. A sense of ownership and responsibility is ingrained in them from the word go.'

At Arup, a profit-share scheme fosters a similar sense of belonging. This is likely to be popular: Hays asked employees what benefits they considered most important when considering a new job, and the most popular choice – picked first by 20% – was performance related bonuses. This was followed by pension (18%) and flexible working or a flexible benefits package (17%).

However, career development opportunity is perhaps the most important factor in attracting and keeping employees. Stoker says: 'Our strategy is to support professional development and provide a variety of career

paths and varied projects for individuals. It's about people fulfilling their potential and being stretched. This breeds loyalty.'

Harris agrees: 'Money is important but it only has a short-term impact on people's motivation.' What will keep people on board is the thrill of the job, he says. This means that the growing importance and expanding breadth of the building services profession – due to the critical role it plays in sustainability – could hardly be better timed.

McNally says that with so many ways to lure recruits, the industry should not be fixated on its inability to increase salaries. 'Don't worry if you can't increase salaries at the moment – remember that this is an industry-wide issue and even outside it most sectors are seeing pay freezes.' Instead, he says: 'The trick is to use more inventive ways of attracting and keeping talent.'

Graduates have always liked the fact that we have the theme of sustainability running through everything we do, because they want to use their engineering skills to improve wider society

**Alasdair Reid,  
Max Fordham**

**Key survey findings:  
Employers vs employees**

**Employers**

1. 57% of the employers surveyed said they would recruit in the next 12 months.
2. 77% of those recruiting will seek a mix of permanent and temporary staff.
3. 71% said they were optimistic about the prospects for their business in the coming year.
4. 38% thought the main reason the sector struggles to attract recruits is lack of jobs

- and 29% cited lack of understanding of the roles.
5. 62% said recovery from recession would have the greatest impact on building services over the next five years.

**Employees**

1. 49% of the employees questioned said they felt fairly or very secure in their current role, with 41% saying they had felt no change in their level of job security over the past twelve months.

2. 47% would recommend their current employer to a friend.
3. 84% said they had a good or average work-life balance.
4. 46% think the industry struggles to attract recruits because packages are not seen as competitive, and 41% cited the industry's image not being exciting.
5. 61% said recovery from recession would have the greatest impact on building services over the next five years.

# Making a good job of it

**Roxane McMeeken** asks people in the know how to break into the building services industry



It's easy to see when a CV is quite generic and we immediately discount these

**Steven Bentley**



We receive job application letters where the candidate has forgotten to change the name of the addressee

**Charmaine McKeown**

**W**hen applying for multiple jobs, candidates can make some alarming gaffes. Charmaine McKeown, head of human resources at engineering firm Max Fordham, has seen a few: 'We receive job application letters where the candidate has forgotten to change the name of the addressee.'

This would be a fairly easy mistake to avoid and suggests that it is certainly worth giving your next covering letter a final check before pressing send. Here we look at what else you must do to land a job in building services, whether you're going for your first role or are in the early years of your career.

### Getting an interview

You can find out about vacancies by scanning employers' and recruitment agents' websites, but it's also worth networking – the real

and virtual kind. Mike McNally, sales and development director at Hays Construction, a leading recruitment expert, says: 'Try to go to events, whether it's a local CIBSE Young Engineers Network (YEN) workshop or your company's own internal groups. This will bring you a network of people who have studied in the same area as you and will tell you about job opportunities.'

McNally recommends complementing this with social media networking, such as CIBSE's LinkedIn group or YEN's Facebook group, or join Hays' specialist building services network groups on LinkedIn.

When you're ready to send your CV to an employer, tailor it to the job. Steven Bentley, director at engineering consultancy Ramboll, says: 'It's easy to see when a CV is quite generic and we immediately discount these.'

McNally says: 'Study the job specification and pull out two or three points on your CV that match them – you can even highlight the most relevant areas.'

Tailoring might mean taking experience that seems not to be directly relevant and presenting it so it's interesting for the employer. Bentley says: 'We get a lot of graduates who've done manufacturing-based degrees and they'll talk at length about designing aircraft. That's not really what we do, so it suggests they're not interested in the built environment.' However, if you present your aircraft design experience as evidence of a general passion for the fundamentals of engineering, Bentley says he will take notice.

Include a paragraph at the top of your CV summing yourself up. McNally says: 'Think of >



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▶ this as your sales pitch. It should briefly describe your experience, your ambitions and how you would add value for the employer.'

Try not to leave time gaps on your CV. 'Make sure any gaps on your CV are explained, otherwise people draw their own conclusions,' says McNally.

Do include a covering letter, which again should always be bespoke. McKeown says: 'We expect a cover letter – not just an email saying "Please find my CV attached". It should show that you know the industry and our company's culture and values, and why you are the best person for the role. We want people whose aspirations chime with ours.'

Carol White, UK head of resourcing at engineer WSP, adds: 'Mention the things you can't put on your CV, like career ambitions and why you love engineering. We look for letters showing real passion and a great work ethic.'

### Meeting the employer

When you get an interview, preparation is crucial. It might sound obvious, but know your own CV inside out – including which version you sent to the employer. If you are sending different versions to various companies, keep records.

Study the job specification too. 'Make sure you know how the job spec and your CV link,' says McNally.

You must also research the company you are interviewing with. Find out what their commercial activities entail, whether they have been involved in any recent mergers and their latest financial results. For stock market-listed companies, check how the share price is faring.

McNally recommends a search on LinkedIn of the person interviewing you. 'If you find out

what they do and what their objectives are, you can respond to that in the interview.'

Interviews in building services may be 'competency-based'. This is where the employer needs people with certain qualities and asks candidates to prove how they meet these needs by describing an example of a past experience. So prepare to talk about your key study, work and volunteering experiences and what they show about your abilities.

A number of employers in the sector, including WSP, recruit graduates via assessment centres. As intimidating as this may sound, White says WSP tries to make the day-long experience non-threatening. 'We give talks during the first half of the day to give people the chance to ask questions, get to know us and relax.'

In the afternoon the candidates are assessed while working in groups of between eight and 10 to solve a problem. White says: 'There are no surprises and candidates should feel that these sessions are similar to exercises they did at university.'

It's not such a big deal if you can't solve the problem: 'We are assessing behaviour more than technical ability. Our work is specialised so people we hire will learn on the job.'

However, you must speak. 'If we don't hear you, we can't assess you, so we do need you to contribute,' says White. But don't overdo it: 'Don't overrule everything that everyone else in your group says. Be careful that your contribution is balanced.'

Lastly, remember that during any presentations or breaks, you're still being assessed. 'We'll see if you are on your mobile during a presentation,' says White. 



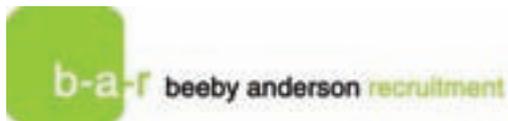
Study job specifications and pull out two or three points on your CV that match them

Mike McNally



We look for letters showing real passion and a great work ethic

Carol White



## Beeby Anderson Recruitment

**Address:** The Wenlock, 50 – 52 Wharf Road, London, N1 7EU

**Website:** [www.b-a-r.com](http://www.b-a-r.com)

**Telephone:** 0203 176 2666

**Contact:** Peter Anderson, director

**Email:** [peter@b-a-r.com](mailto:peter@b-a-r.com)

Beeby Anderson Recruitment operate solely within building services and concentrates 100% of its time developing an unrivalled knowledge of the temporary and permanent building services job market across the UK and internationally. For its candidates, it provides a complete comprehensive approach to managing their job search, while for its clients it targets the best people, and attracts them into your business.



## Talent Motion

**Address:** 27 Austin Friars, London, EC2N 2QP

**Website:** [www.talentmotion.com](http://www.talentmotion.com)

**Telephone:** 0207 614 3431

**Contact:** Dominic Evans/Will Pearce

**Email:** [hello@talentmotion.com](mailto:hello@talentmotion.com)

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## Eden Brown

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**Contact:** Peter Berry

**Email:** [p.berry@edenbrown.com](mailto:p.berry@edenbrown.com)

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## BSV Recruitment Limited

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**Website:** [www.bsvrecruitment.co.uk](http://www.bsvrecruitment.co.uk)

**Telephone:** +44(0) 1483 768600

**Contact:** Darren Warmington – building services

**Email:** [Darren.warmington@bsvrecruitment.co.uk](mailto:Darren.warmington@bsvrecruitment.co.uk)

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**Telephone:** 0207 033 8866

**Contact:** Simon Beresford – M&E team leader

**Email:** [simon@skilledcareers.co.uk](mailto:simon@skilledcareers.co.uk)

**Email:** [lmccormack@skilledcareers.co.uk](mailto:lmccormack@skilledcareers.co.uk)

Our associates collectively have more than 100 years of experience in the search and recruitment industry. Our M&E team of six are specialists in providing building services jobs for contract, temporary and permanent positions. We offer a wide range of jobs in building services, such as mechanical design, electrical design, CAD, public health and sustainability consultants. So, whether you're a graduate or director, we can assist you. As a business, we recruit specialists from architecture through to facilities management, so please feel free to browse our website for current opportunities in the market.



## Human Capital Solutions

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**Telephone:** 0207 614 3432

**Contact:** Richard Federer

**Email:** [richard.federer@humancapitalsolutions.co.uk](mailto:richard.federer@humancapitalsolutions.co.uk)

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## Cardiff University

**Address:** Cardiff School of Engineering, Queens Buildings, The Parade, Cardiff, CF24 3AA

**Website:** [www.cardiff.ac.uk/engin](http://www.cardiff.ac.uk/engin)

**Telephone:** 0292 087 4975

**Contact:** Julie Cleaver, admissions office

**Email:** [engineering-pg@cardiff.ac.uk](mailto:engineering-pg@cardiff.ac.uk)

**Courses offered:** MSc Structural Engineering, MSc Civil Engineering, MSc Geoenvironmental Engineering, MSc Hydroenvironment Engineering, MSc Sustainable Energy and Environment, MSc Professional Engineering (Distance Learning), MSc Advanced Mechanical Engineering, MSc Electrical Energy Systems, MSc Wireless and Microwave Engineering.

## London South Bank University

### London South Bank University

**Address:** 103 Borough Road, London, SE1 0AA

**Website:** [www.lsbu.ac.uk](http://www.lsbu.ac.uk)

**Telephone:** 0800 923 8888

**Contact:** Course enquiries team

**Email:** [course.enquiry@lsbu.ac.uk](mailto:course.enquiry@lsbu.ac.uk)

**Courses offered:** **CIBSE accredited:** BEng Building Services Engineering, MSc Building Services Engineering, MSc Sustainable Energy Systems  
**ICE accredited:** BEng Civil Engineering (also accredited IStrucE), MSc Civil Engineering  
**IStrucE accredited:** MSc Structural Engineering  
**RIBA accredited:** BA Architecture, PgDip Architecture, RIBA Part 3  
**RICS accredited:** BSc Surveying, MSc Building Surveying, MSc Property Development and Planning, MSc Quantity Surveying, MSc Real Estate  
**ClOB accredited:** BSc Commercial Management (Quantity Surveying), BSc Construction Management, BSc Property Management, MSc Construction Project Management.



## Leeds College of Building

**Address:** North Street, Leeds, LS2 7QT

**Website:** [www.lcb.ac.uk](http://www.lcb.ac.uk)

**Telephone:** Students – 0113 222 6003;

Employers – 0113 222 6003

**Contact:** Admissions team and employer engagement team

**Email:** [info@lcb.ac.uk](mailto:info@lcb.ac.uk)

**Courses offered:** Specialists in construction education and training, from entry level to courses for senior management. We have a full suite of building services courses, including Level 3 Apprenticeship and Level BTEC Diploma, with progression to HNCs, HNDs and the new Higher Apprenticeship.



## School of Engineering and Design, Brunel University

**Address:** Kingston Lane, Uxbridge, Middlesex, UB8 3PH

**Website:** [www.brunel.ac.uk/sed](http://www.brunel.ac.uk/sed)

**Telephone:** 01895 266634

**Contact:** Tom Kissack

**Email:** [Thomas.Kissack@brunel.ac.uk](mailto:Thomas.Kissack@brunel.ac.uk)

**Courses offered:** MSc Building Services Engineering MSc (full-time and distance learning)\*, MSc Building Services Engineering with Sustainable Energy MSc (FT and DL), MSc Building Services Engineering Management MSc (DL).

\*FT: full-time one year; DL: three to five years distance learning.



## BSRIA Training

**Address:** Old Bracknell Lane West, Bracknell, Berkshire, RG12 7AH

**Website:** [www.bsria.co.uk/events](http://www.bsria.co.uk/events)

**Telephone:** 01344 465589

**Contact:** David Bleicher, head of training

**Email:** [david.bleicher@bsria.co.uk](mailto:david.bleicher@bsria.co.uk)

**Location:** Bracknell (or on site for in-company training)

**Courses offered:** Introductions to BIM, Soft Landings, BREEAM, Building Regulations, Maintaining Building Services, Mechanical and Electrical Building Services. More in-depth courses covering Project and Commissioning Management, Heat Pumps, Life Cycle Costing and Pre-Commissioning Cleaning of Pipework Systems. BINDT approved Domestic Air Tightness Testing.



## UCL (University College London)

**Address:** Bartlett School of Graduate Studies, Central House, 14 Upper Woburn Place, London WC1H 0NN

**Telephone:** +44 20 3108 9018

**Contact name:** Ian Lewis, Bartlett post graduate officer

**E-mail:** [bartlett.pgclerk@ucl.ac.uk](mailto:bartlett.pgclerk@ucl.ac.uk)

**Website:** [www.bartlett.ucl.ac.uk/graduate/programmes/postgraduate/mscdiploma-facility-environment-management\(London\)](http://www.bartlett.ucl.ac.uk/graduate/programmes/postgraduate/mscdiploma-facility-environment-management(London)) and [www.bartlett.ucl.ac.uk/graduate/programmes/postgraduate/mscdiploma-facility-environment-management-singapore\(Singapore\)](http://www.bartlett.ucl.ac.uk/graduate/programmes/postgraduate/mscdiploma-facility-environment-management-singapore(Singapore))

**Courses offered:** MSc Facility and Environment Management



## University of Salford

**Address:** School of the Built Environment, College of Science

& Technology, Maxwell Building, Salford M5 4WT, UK

**Website:** [www.salford.ac.uk/built-environment](http://www.salford.ac.uk/built-environment)

**Telephone:** 0161 295 4545

**Contact:** College enquiries team

**Email:** [cst-enquiries@salford.ac.uk](mailto:cst-enquiries@salford.ac.uk)

**Courses offered:** Undergraduate courses – Architectural Design and Technology; Building Surveying; Construction Project Management and Quantity Surveying. Postgraduate courses available full-time, part-time and by distance learning: Accessibility and Inclusive Design; BIM and Integrated Design; Construction Law and Practice; Construction Management; Project Management in Construction; Quantity Surveying; Real Estate and Property Management.



## The College of Estate Management

**Address:** Whiteknights, Reading, Berkshire, RG6 6AW

**Website:** [www.cem.ac.uk](http://www.cem.ac.uk)

**Telephone:** 0800 019 9697

**Contact:** Enquiries Department

**Email:** [courses@cem.ac.uk](mailto:courses@cem.ac.uk)

**Courses offered:** BCSC Diploma in Shopping Centre Management; Diplomas in Construction Practice and Surveying Practice; BSc(Hons) Building Services Quantity Surveying, Building Surveying, Construction Management, Estate Management, Property Management, Quantity Surveying; Postgraduate Diplomas in Adjudication and Arbitration; PGDip/MSc Conservation of the Historic Environment, PGDip/MSc Facilities Management; PGDip/MSc Property Investment; PGDip/MSc Surveying (Graduate Development Programme); MSc Real Estate; and MBA Real Estate and Construction Management.



## University of Ulster

**Address:** Shore Road, Newtownabbey, Northern Ireland, BT37 0QB

**Website:** <http://study.ulster.ac.uk>

**Telephone:** 028 9036 6521

**Contact:** Faculty office

**Email:** [adbe@ulster.ac.uk](mailto:adbe@ulster.ac.uk)

**Courses offered:** BEng (Hons) Energy and Building Services Engineering, four years with placement; MEng Energy and Building Services Engineering, five years with placement; and MSc Renewable Energy and Energy Management, by distance learning over three years part-time.



## Glasgow Caledonian University, School of Engineering and Built Environment

**Address:** Cowcaddens Road, Glasgow, G4 0BA, Scotland, UK

**Website:** [www.gcu.ac.uk](http://www.gcu.ac.uk)

**Telephone:** 0141 331 3277

**Email:** [schoolebe@gcu.ac.uk](mailto:schoolebe@gcu.ac.uk)

**Courses offered:** MSc Building Services Engineering, MSc Energy and Environmental Management, MSc Sustainable Energy Technology, MSc Waste Management.

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