



# Annual review

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2019

**Bentley** 

**MMB** MOTT MACDONALD  
BENTLEY





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# Welcome

**Hello everybody, welcome to our 2019 Annual Review. This is always a catalyst for reflection for me and I really hope you enjoy the read.**

There are lots of people and projects that make me feel very lucky to be managing director of such an enterprise - and lots of people that know me well still can't understand how that happened! So, on with the reflections.

Our health and safety performance showed further improvement in 2019 as our AFR (the key measure for safety) fell to a five-year low of 0.08. Nearly 60,000 positive interventions were made on sites and in our offices, demonstrating a level of engagement that sets us apart from our competitors.

This engagement drives our positive safety culture and is something of which we should all be proud. However, our vision for health and safety is to achieve zero injuries, and whilst the improvement in 2019 was pleasing, I won't be truly happy until we reach and maintain an AFR of zero. How do we do this? We must take a positive approach to safety, remain motivated, embrace the new safety coaching, and continue to care about keeping each other safe every single day.

When visiting sites and offices in 2019 I felt they were engaged and alive. Whilst the year wasn't without its challenges, I genuinely don't remember the company ever feeling as energetic and positive as it does now. Teams are motivated and have a great blend of experience and youth. Our apprenticeship scheme went from strength-

to-strength. We have more apprentices on the books that ever before; seeing these colleagues develop and thrive as they progress through the business is something in which I take immense pride. Celebrating the achievements of our apprentices and their mentors at the revamped Apprentice Awards was a wonderful evening, and it was great to receive external verification from RateMyApprenticeship, who named us 17th best apprentice employer in the country - above many competitors and household names.

Financially, 2019 was a tough year. The primary reason for this was a consequence of the rapid growth we experienced two years ago, during which time the company doubled in size. At times of growth, it is difficult to improve because you expend so much energy becoming accustomed to your new surroundings. The good news is that with 2019 turnover broadly similar to that of 2018, we have stabilised and better appreciate exactly what is required of a £300m+ business.

Financial performance will continue to improve if we follow the principles of our Cost & Efficiency Strategy. Too often we shoot ourselves in the foot by veering from the basics of sound project delivery. Remember marginal gains - let's all do our bit.

A tough financial year for us comes against the backdrop of a water industry under more scrutiny

from its customers and the regulator than ever before. Our clients are being asked to do more for less, and at the same time lower their bills. This meant that AMP6 was the toughest five-year AMP period to date: AMP7 will be even tougher. We can take confidence from the very many projects that have really delivered in this challenging climate. Many of the jobs I've seen this year have made me extremely proud, but we need to be at our best more often in AMP7 than we have been in AMP6.

The good news is that we now have five years' experience of working in this environment. We're more practised at understanding the affordability challenges facing our clients, and better placed to deliver the outcomes they need.

Outside of the water sector, our work with the Environment Agency (EA) continues to impress. We have grown to understand their needs and I sense our people are enjoying delivering a varied portfolio of work with them. What a brilliant achievement for JBA Bentley picking up its first British Construction Industry Award (BCIA), for our project at the Foss Barrier in York. The project demonstrates just how successful we can be when all parties work collaboratively together. Well done to the MMB team at Five Fords who also won a prestigious BCIA.

I am also very pleased with the progress being

made with Rolls-Royce and Cadent Gas. Through the efforts of our teams, both clients have come to understand just what JN Bentley can offer and are great examples of what we're capable of outside of the water sector.

The environment and the effects of climate change remained headline news in 2019, its importance exemplified by the winter floods that hit the north of the UK. I'll take this opportunity to thank the colleagues who deployed to the South Yorkshire area at very short notice to assist the EA, RAF, Army and emergency services with the relief effort, many staying round the clock to prevent what could have become a far more severe flooding incident.

For JN Bentley, it is important we build a 'carbon culture'. To do this, we will apply the same logic as we do with safety to lower our carbon footprint and make low-carbon solutions the norm. A world class carbon culture will see us do a few things really well: educating colleagues and suppliers on carbon and focusing on using and doing less through the use of smart tools and behaviours. We will use the United Nations Sustainable Development Goals as a framework on which to build this culture.

JN Bentley has been part of the Mott MacDonald Group since 2014. In November we announced the decision to form a new region within the Group, known as MMBC. Operating as a new region will reinforce the importance of an interdependent commercial culture within Mott MacDonald Bentley (MMB), where the healthy tension between contractor and consultant ensures we deliver the very best outcomes for our clients.

Thank you once again for your efforts in 2019. Please continue to focus on what makes us stand out as we move into 2020 and beyond: looking after the money, having happy people, and keeping each other safe.

Paul Bentley | Managing Director

**Whilst the year wasn't  
without its challenges, I  
genuinely don't remember  
the company ever feeling  
as energetic and positive  
as it does now.**

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# Financial review



## **2019 saw JN Bentley achieve £300m+ turnover for a second successive year (2019: £312m; 2018: £308m).**

2019 captures the latter stages of the AMP6 period for our water clients and on a customer-by-customer basis we saw some variability in revenue, driven by the extent to which their capital expenditure programmes extended into the final year of the AMP period.

Our six major water clients accounted for 83% of our revenue in 2019 (2018: 85%). Revenue increased in United Utilities (37%) and Northumbrian Water (11%), with United Utilities particularly busy working to close out several larger schemes, including Hallbank, awarded earlier in the AMP period. Revenue reduced in Anglian Water (43%) and Yorkshire Water (23%) and to a lesser extent Severn Trent (9%) and Dŵr Cymru Welsh Water (3%) as workload diminished towards the end of their AMP periods.

The Environment Agency was our largest non-water client, with revenue up 37% as several new schemes were awarded ahead of the closure of the Water and Environmental Management (WEM) framework. Cadent Gas has also seen its revenue increase.

Margin performance in 2019 was disappointing

and pressures were encountered across several of our major customers. Some of the issues faced that have contributed to this have been operational and, as Paul has already mentioned, addressing these is the business's most important objective for 2020.

However, it is also the case that we have faced a very tough trading environment, with our customers sometimes passing their own cost pressures and uncertainties to the supply chain. Whilst low by our own standards, our margins still compare favourably to many of our peers in the contracting sector, and a number of other operators are continuing to struggle financially.

Contribution from the plant department remained an important driver of business profitability in 2019. The plant fleet has grown in excess of our revenue this year; we are becoming less reliant on externally hired in plant and at the same time achieving better overall utilisation of the fleet. Plant capital expenditure totalled £7.3m and included an 80T crawler crane, seven excavators, including ones using hybrid and intelligent technology, and 34 cabbed dumpers. We are committed to investing in innovative, safe and

carbon-efficient plant assets to ensure we remain at the forefront of industry change.

We maintained strong control over our overhead cost base during 2019 despite some headcount growth in the past 18 months to support the recent revenue increase to above £300m. Our non-staff overhead cost base has been relatively stable despite continued investment in training and IT. After recharges made to projects our remaining overhead as a percentage of revenue is unchanged from last year.

2019 saw further significant progress on embedding the Xpedeon ERP (Enterprise Resource Planning) system across the business. The final phases of new development are scheduled for 2020; the important new modules we will see introduced to the business during the year are payroll, timesheets, electronic (EDI) invoicing for some suppliers, and the integration of the application for payment process.

Additionally, investment is being made to develop the Form Builder solution and making handheld devices available to site-based colleagues to simplify incident reporting and many



# The key objective for 2020 is to rebuild our margin levels. Maintaining ongoing focus on cost and efficiency will be key to achieving this.

administrative processes, reducing physical paperwork wherever possible. Completing these roll-outs will be a great achievement for the business and will lay the foundation for significant operating efficiencies to be delivered in the future.

Our software providers at Xpedeon recognise the enthusiasm with which we are embracing these changes and see our approach as being particularly ambitious. This gives many mutual benefits – they are willing to invest time to develop our ideas and they also get the benefits of these developments within their core product.

Revenue for 2020 has been set at £290m in the budget. At the time of writing, 88% of this has been secured through existing contracts. The 7% reduction from 2019 reflects an anticipated short-lived slow down in the second half of 2020 as we wait for AMP7 workload to build across all our water frameworks. Despite being unsuccessful with the Environment Agency Next Generation Supplier Arrangement (NGSA) framework, the WEM frameworks will provide significant workload throughout 2020.

As mentioned above, the key objective for 2020 is

to rebuild our margin levels across all customers and the budget assumes that we will rebuild back to the levels achieved pre-2018. Maintaining an ongoing focus on cost and efficiency will be key to achieving this.

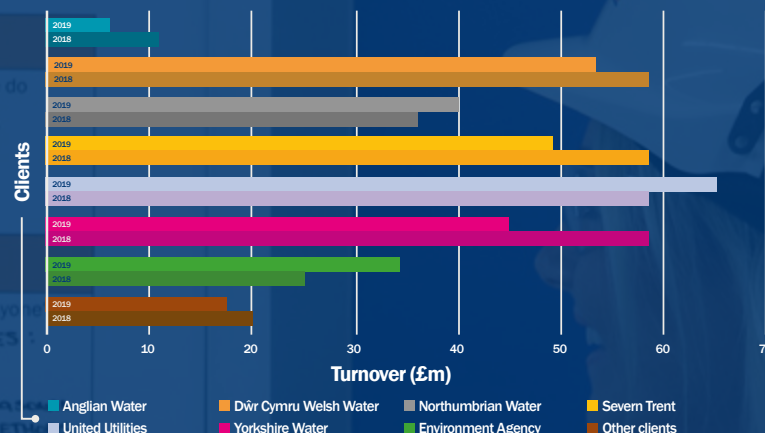
With reduced revenue for a period it is important that our headcount and overheads are carefully managed with all areas of the business needing to focus on this. That said, we fully expect to continue our investment in training, strategic recruitment and system development to ensure we are well placed for the revenue growth expected in 2021 and beyond once the AMP7 workload has built in the water sector.

We will continue to monitor the potential effect of Brexit and the coming transition period but believe we can look forward to a period of greater regulatory and political stability in 2020 following the OFWAT final determination and the UK general election.

**Jonathan Rhodes | Finance Director**

## Growth

A turnover of £312m represents the highest in the history of JN Bentley. The graph below illustrates turnover by client, plus a 2019 v 2018 comparison.



## Largest projects in 2019

Listed in order of revenue generated in 2019

Project	Client	Total project value (£m)
Hallbank Tunnel	United Utilities	22
Ribble Valley Batch	United Utilities	19
Hull WwTW	Yorkshire Water	27
Thirlmere Service Reservoirs	United Utilities	16
North Wales Sludge Strategy	Dŵr Cymru Welsh Water	33
Berwick and Fowberry WTWs	Northumbrian Water	17
Riding Mill	Northumbrian Water	12
Foss Barrier Recovery	Environment Agency	26
Stocksbridge WwTW	Yorkshire Water	12
Great Yarmouth Tidal Defence	Environment Agency	28

Read about each of these projects in the case studies section, starting on p26.

## What is cost and efficiency?

Our Cost & Efficiency Strategy engages employees, clients and supply chain in helping us achieve our vision: to reduce cost and maximise efficiency to add value for our clients. It comprises tools and guidance to help reinforce the importance of caring about the bottom line so that JN Bentley makes some money!

With over 22,000 commercial incidents reported in 2019, engagement with cost and efficiency is at an all-time high. Incidents report cost savings (actual and potential) and costs incurred, providing us with data we use to help us make improvements.

# Month-by-month

## January - a safe start

Extended Daily Briefings for everyone the first day back in the new year re-focused minds on safety. 2019 was an important year for health and safety, and performance remained good. To reach our vision for zero injuries, we must create a culture of positive health and safety.



## February - talk green, make green

The inaugural JN Bentley Environment Week had the business discussing all things green. As well as embedding our 10 Green Rules, the week launched four new environmental standards and culminated in a day focusing exclusively on reducing our use of plastics.

## March - inspiring the future

It's important to inspire the next generation; we have links with schools across the country to help open pupils' eyes to the world of work and just how rewarding a career in engineering and construction can be.



## April - milestones

April saw two high-profile projects hit major milestones. The outlet valves at Hanchurch DSR were opened, bringing the award-winning 42 megalitre reservoir into supply. Our client's largest pre-cast reservoir, the structure secures supplies to 100,000 customers in Stoke-on-Trent. In Sheffield, the Duke of Gloucester gave a new water treatment plant a royal seal of approval. The plant is buried to lessen its impact on the local landscape.

## May - MEP

Mechanical, electrical and process (MEP) engineering is a big part of what we do, with MEP engineers playing an integral role in the whole lifecycle of projects. 40 colleagues are enrolled on our dedicated development scheme for MEP engineers, and in May we became corporate partners with the IET, the Institute of Engineering and Technology.



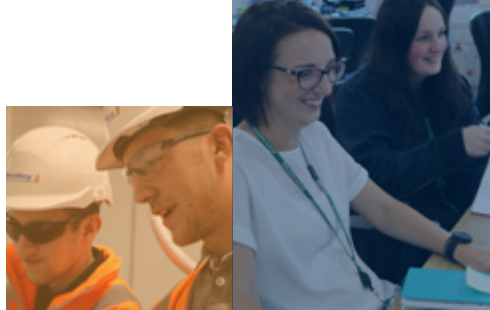
## June - in the community

Our people like to give a bit back to the communities in which we live and work, offering up their skills, time and expertise to help make a difference. As part of the Tyneside Residual Mains project, we teamed up with Northumbrian Water to help with a 'Just an Hour' event in Scotswood, fixing boardwalks, repairing pathways and installing new timber edging.



## July - early careers

27 placement students joined the business on a year out from university, continuing our long tradition of early careers recruitment at apprentice, placement and graduate level. Fulfilling roles in support, commercial and engineering teams, students gain real insight into their vocation of choice. We were recognised for our early years recruitment at the NUE Awards as we were named one of the Top 100 Undergraduate Employers 2019.



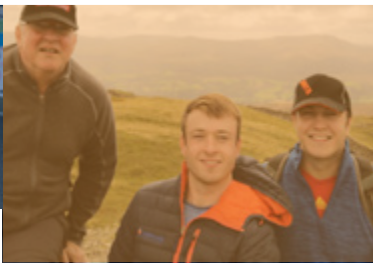
## September - digital transformation

The digital transformation of the business continued throughout the year, working closely with Algorithms and their Xpedeon software. Xpedeon is a sophisticated ERP system being fully tailored to JN Bentley's requirements. The team is collaborating closely with the Xpedeon team in both the UK and Mumbai, with both sides looking to push the boundaries of the system to deliver major efficiencies. The roll-out continues into 2020 and is revolutionising the way we work.



## November - a quick response

Every year we undertake a number of schemes requiring a quick response - we pride ourselves on having the ability to react to the needs of our clients at short notice. Some of these are more high-profile than others: in 2019 we deployed colleagues to the floods in Wainfleet and East Yorkshire, plus reacted the threat of dam wall collapse at Whaley Bridge. Read more about how we teamed up with the RAF on pages 40-41.



## August - wellbeing

The Summer Activity Challenge saw colleagues cycle, run and walk their way through August, sharing personal success stories along the way. Employee wellbeing plays a big part in life at JN Bentley: 2019 saw us start a conversation on mental health, with engagement with Mental Health Awareness Week and World Mental Health Day keeping the dialogue going. We want our people to have more great days.



## October - award winners

What a night! The prestigious British Construction Industry Awards crowned two of our projects as winners: our work at the Foss Barrier picked up Temporary Works Initiative of the Year, and our delivery of the North Wales Sludge Strategy was named Utility Project of the Year. In all, 2019 saw us pick up over 30 award wins and shortlistings - including engineer Alice Holleworth, who was named as one of the Top 100 Most Influential Women in Engineering.



## December - energy efficient

JN Bentley achieved certified to ISO 50001 for Energy Management, demonstrating our commitment to managing energy usage, improving efficiency and reducing consumption. A culture where solutions not only meet the needs of clients and are safe, but are low in carbon too, must become the norm. 2019 saw us up our engagement with the Sustainable Development Goals too.

# In numbers



£312m

JN Bentley achieved a turnover of £312m in 2019 - the highest in our history. This is the second successive year we have achieved this milestone.

1570

We employ over 1570 people in all roles, from site to office. This supports our direct-delivery model and sets us apart from competitors.

139

We're committed to early careers: we have 139 apprentices on the books, and welcomed 49 graduates and placement students to JN Bentley in 2019.



0.08

Our reportable injury frequency rate (AFR) was 0.08 - in short, fewer people were injured working on our sites in 2019 than in 2018.



£100k

The business and its people donated over £100,000 to good causes - on top of hours of their skill and expertise.



Over 90% of waste we generated was diverted from landfill - achieved by closely following the waste hierarchy.

90%





£1.5m

An investment of £1.5m in training and development gives our people every opportunity to thrive and progress through the business.

22,175

Our Cost & Efficiency Strategy encourages colleagues to maximise efficiency and reduce costs to add value for our clients - 22,175 commercial incident reports shows true engagement with cost and efficiency.



30

We landed over 30 award wins and shortlistings, including 2 British Construction Industry Awards, a place in Construction News' list of Top 100 contractors, and RateMyApprenticeship's 17th best employer.



Xpedeon is our new ERP IT system forming part of our digital transformation. 171 valued suppliers are already enrolled on the new Supplier Portal - just one of Xpedeon's many modules

171



158

The efforts of colleagues and suppliers were highlighted in 158 Be Recognised award nominations - all nominations made by peers across the business.



65%

Our supply chain plays an incredibly important role in our success: 65% of our supply chain is made up of small and medium-sized enterprises (SMEs)

# Care:

a sustainable approach  
to business.

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At JN Bentley we are committed to maximising our contribution to the Sustainable Development Goals (SDGs). We kicked-off engagement with the SDGs by mapping our business plan targets against one or more of the Goals and will be developing our commitment further in 2020.

# At JN Bentley, we believe that because we care about what we do, we do things better.

Sustainability means different things to different people, but for us it is the word 'care' that defines our sustainable approach to business:

## We care about our clients

Because we care, clients award us repeat-business. They sign long-term contracts with us and call on our services when deadlines are challenging, when they need an emergency response, and when the work needs a team willing to go that extra mile. And whilst working together, we care for the environment in which we're based.

## We care about our people and keeping them safe

Because we care, there is nothing more important to us than our people going home fit and well at the end of the day. We want our people to thrive and invest heavily in their development, and we want to see smiles on faces, supporting volunteering, charitable endeavours, and social events.

## We care about the bottom line

Because we care, we've put the tools in place to ensure we make some money. The Cost & Efficiency Strategy focuses on innovation, collective effort and making those small savings that all add up.

## Social value

Social value focuses on the economic, social and environmental benefits companies bring to the local communities in which they work. To us, social value is all about making a lasting positive difference to our clients, their customers and our communities, on top of delivering safe, high-quality schemes.

The importance of social value is ever increasing, something to which we as a business are responding positively. We design and deliver all our projects with social value in mind – what

effect are we having on the environments in which we work and what can we do to ensure we leave behind a positive, sustainable legacy?

Throughout the annual review, you'll see examples of the value we add, be it **socially** through community investment and educational partnerships; **economically** through our investment in people; and **environmentally** through our commitment to eliminating harm, reducing our impact and enhancing the environment wherever we can.



# Our people

**As a business we care about our people: having happy people is one of our core values.**

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In 2019, efforts were focused on employee wellbeing; ensuring colleagues feel empowered to deliver their very best; and recognising hard work and great contributions.

## **Wellbeing**

Core to our focus on wellbeing is the response to our employee Wellbeing and Engagement Survey, which highlighted areas for improvement: the effects of long commutes, lengthy hours and lodging away, plus a desire for more flexible working. The launch of the JN Bentley Wellbeing Strategy in 2020 will see us continue to tackle these subjects, led by our own Wellbeing Advisor who was recruited in 2019 to ensure real ownership of this important agenda.

We understand the importance of good mental health and I'm proud of the conversation that started on this topic in 2019. We recognise the subject can be difficult to discuss, but the level of engagement with Mental Health Awareness Week and the initiatives that followed was very pleasing. Our aim is for people to have more great days and the conversation will continue in 2020 and beyond, supported by line manager training that will help them spot the signs of mental ill health and prompt the question, "are you okay?"

## **Equality, diversity and inclusion**

It is a fact that team performance improves when everyone feels included. The launch of the Be Inclusive campaign in the latter part of 2019 was a big step forward. It highlighted the strength created by more diverse teams, and asked colleagues to challenge behaviour that's not respectful. Coupled with a programme of reverse mentoring, inclusive language coaching,

and unconscious bias training for members of the Board, we are pleased with the progress we're making in breaking down traditional blockers into the industry.

## **The Bentley Academy**

The Bentley Academy provides apprenticeships and upskilling for our people. The Academy matured in 2019, with the apprenticeship programme now bigger than ever. We saw a bespoke level four civil engineering apprenticeship get underway in partnership with Leeds College of Building; enrolled our first colleagues on degree apprenticeships; and kicked-off collaborative apprenticeships for MEP engineers and quantity surveyors in Wales, working closely with Cardiff and Vale College, client Dŵr Cymru Welsh Water (DCWW) and fellow capital delivery partners in the DCWW Alliance.

The Constructionarium initiative gave a group of apprentices the opportunity to experience all aspects of site life whilst developing their engineering and project management skills at the same time. We also ran Constructionarium with undergraduates from the University of Leeds, 12 of whom impressed us so much that we invited them to join us for placements over the summer.

The success of our apprenticeship programme was celebrated at the Apprentice Awards. The event brought together all level two and three apprentices, their mentors and invited guests to shine a light on their achievements in general construction operations, business administration and civil engineering. The efforts of colleagues and suppliers were also highlighted throughout the year in the Be Recognised Awards. Celebrating



those individuals and teams who have gone further for the business, Be Recognised will be revamped in 2020 to recognise more people than ever before.

It was another impressive year for training, as £1.5m was invested on a whole variety of programmes to both upskill colleagues and ensure compliance. We trained our people in everything from high-risk confined spaces to electrofusion, integral leadership to safety coaching. Colleagues must be given every opportunity to thrive and progress through the business.

### Looking to 2020

Together with the points that I've already touched on around wellbeing and equality, diversity and inclusion (EDI), on the people agenda for 2020 is social value and how JN Bentley can improve the wellbeing of the areas in which we work, especially when it comes to employment and improved links with local schools.

We're also reviewing how we become more agile in the way we work because we know that the working patterns expected by employees have evolved from those traditionally found in our industry. Finally, improvements to performance management and talent mapping will be made in order to better prepare our people for opportunities in the future.

We're embracing the changes to the people agenda and look forward to tackling these issues head on as we continue to make JN Bentley a great place to work.

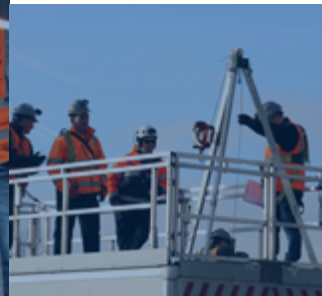
**Judith Jeffery, HR Director**



**The apprentice awards brought together our apprentices and their mentors to shine a light on their achievements.**

Described as a "great asset to the team", apprentice civil engineer, Olivia Perry, was named Rising Star at the awards.

Hear from the JN Bentley team in their own words over the page.



A few highlights: apprentices enrol at Leeds College of Building; Be Recognised celebrates achievement; training is as critical as ever; the Be Inclusive campaign highlights the importance of respect.

**Life at JN Bentley** | I'd describe working at JN Bentley as safe, rewarding and challenging. The thing I most enjoy is the varied work. You're never in the same spot, you get around the country and it's always something fresh.  
**Andy, Lead Hand**

**Opportunities to progress** | I've had chance to work my way up through the ranks. I joined as a Graduate QS, then progressed to Project QS before relocating to Peterborough to a more senior role and eventually commercial management. Now looking after my own team, in those individuals I look for what my peers would have looked for in me.  
**Alex, Commercial Manager**

**Up the ladder** | JN Bentley have supported me really well. When I started I told them what I wanted to do – work my way up the ladder. They're developing me, giving me tips on how to progress and that's what I've been doing.  
**Darren, Lead Hand (with brother Mark, Operative)**

**They care** | On placement I got to witness first hand how the company operates, and I found that their values align with my own; they care and that's something that attracted me.  
**Randeep, Quantity Surveyor**

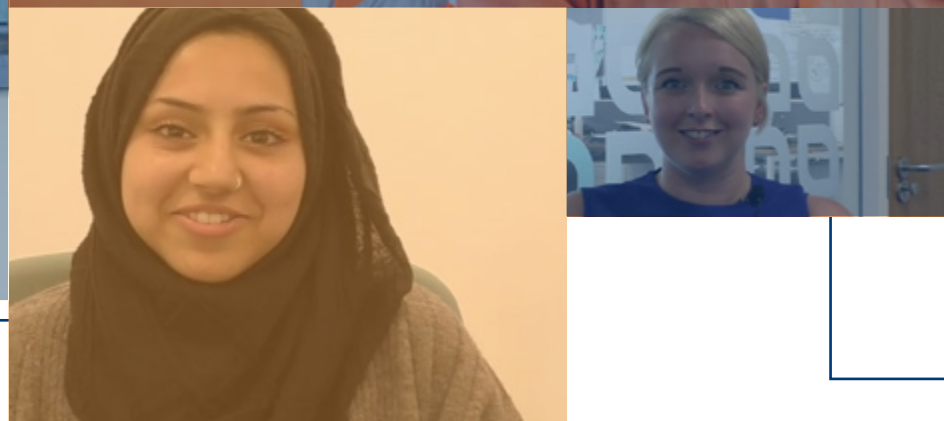
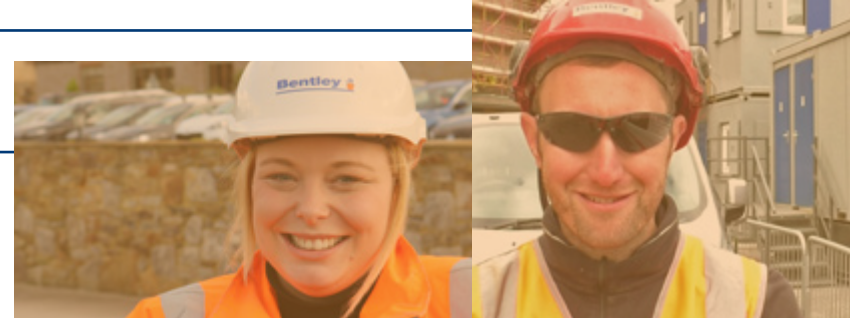
**A warm welcome** | I enjoy getting to know different people and feeling part of a whole group and part of a family. You feel very welcomed and know you can talk to anyone about anything. There's lots of advice and support, you won't ever feel alone.  
**Sunnah, Business Administration Apprentice**

**Structured development** | The development scheme is well structured: on a regular basis I have meetings with my line manager to discuss what I've learnt and any areas for improvement. As an MEP engineer I also have quarterly calls with my MEP lead to discuss progress. All this is linked to the specific competencies of the development scheme.  
**Danielle, MEP Engineer**

**Employee wellbeing** | To me it's a big positive that JN Bentley look at mental health as a big issue in the industry. There's so much mental health awareness and so much support; I think it's a real plus for the company.  
**Stan, Works Manager**

**Recognition** | The site team has a strong bond which really reflects on the work environment. People are happy to come to work and actually enjoy it. It's good to receive recognition from management even prior to winning Be Recognised: it keeps everyone positive and lifts the morale of the team.  
**Ryan (left), Civil Engineer and part of a winning Be Recognised team - with Works Manager Phil (centre) and Operations Director, Nick**

**Challenge** | What I enjoy about working at JN Bentley is the camaraderie I have with my colleagues and the challenges I'm faced with every day: it's never the same and forever changing; every day is different.  
**Scott, Buyer and Civil Engineer**







**Training and development** | JN Bentley have supported my career development by giving me the experience and opportunities to progress. They've developed me with lots of different types of training, they really invest in their employees. **Jodie, Site Manager**

**Professional development** | Since coming back as a graduate I've been enrolled on the Civil Engineering Development Scheme which runs in line with the ICE, with the aim of becoming chartered as soon as I can. **Clark, Graduate Civil Engineer**



**Career progression** | I love how varied my role is. Every day can be different and there's always different challenges and something new to learn. **Chantal, Quantity Surveyor**

**Apprenticeships** | An apprenticeship teaches you lots of different skills, you get to know a lot of different people, you get a qualification that benefits you long-term - and you get to work for a good company as well. **James, GCO Apprentice and winner of Level 2 Apprentice of the Year award**

**Varied experience** | No two projects are the same, so you get a lot of experience and exposure to what you do. I've worked in a few regions now and had a good experience in each; it's nice to have that varied style of work. **Nasar, Project Leader**



**A firm of families** | Working at JN Bentley, it's a big family firm. There are plenty of people that work here from the same family - including mine; my son has just been set on as an apprentice which is really good, and I know that he's going to come home to me safe at the end of the day. **Terry, Works Manager**

**A focus on training** | Last year we invested £1.5m in training and development. The training team has been focusing on maximising the grants available to us to, awarded for enrolling colleagues on apprenticeships and other training that is critical for our industry. **Helen, Lead Resources Coordinator**



**Varied experience** | I think doing an apprenticeship is one of the best ways forward, It's good to learn on the job and it makes your college work a lot easier because you're actually seeing what's going on on site. You've also got the right people around you to support your development. **Andy, Site Manager and former Apprentice**

**Support** | JN Bentley have massively supported me through my maternity leave and return to work. Since coming back I've worked with my line manager to really set out my next 12 months of career development. **Nikki, Project Manager**

**Be Heard** | As an elected group from across all our Operational Areas we are consulted on potential changes and are able to influence proposals prior to management sign off. It is great to work for an organisation where our views are taken into account. **Alice, Contracts Manager**



# Keeping people safe



**There is nothing we care more about than our people getting home safe and well at the end of the working day.**

We help our employees achieve this by using world-class processes, standards and procedures, and industry-leading training. In return we ask for engagement, involvement and a positive culture of caring about the people we work alongside.

## **Performance overview – the statistics**

In 2019, our health and safety statistics improved for the third year in succession. Our AFR (the reportable injury frequency rate) reduced from 0.13 to 0.08; injuries requiring first aid dropped by nearly 25%; and the number of serious near misses fell by a third. In short, fewer people were injured working on JN Bentley sites in 2019 than in the 12 months previous.

The industry-leading levels of engagement that we reported 12 months ago increased as we achieved 10 years of steady improvement. The number of unsafe conditions and unsafe acts corrected by our people increased by 23% to 58,744. With over 40% of these interventions made by our weekly workforce, suppliers and visitors, the whole team has shown that they care. Why is this important? Statistically, the more positive interventions made, the fewer people are injured.

These numbers are something to be proud of. Through a significant period of growth both in terms of people and turnover, we've maintained excellent safety performance.

However, our vision is to achieve zero injuries and people still came to harm on our sites and in our offices in 2019. We're well on our journey to zero, but we're not there yet.

## **Where are we now as a business?**

Despite an overall downward trend, our pursuit of an injury-free workplace requires further intensive effort. Our destination, a place operating 'beyond zero' where safety is a team game with everyone looking out for each other, is in sight but we still have a lot of work to do to get there.

## **To 2020 and beyond**

Our processes, standards and procedures are robust: we calculate that 97% of our incidents are caused by us making the wrong personal choice.

To tackle this, 2019 saw us team up with Setters, specialists in coaching safety performance improvement, to develop a personal choices safety programme. Designed to support our existing Health & Safety Strategy, the aim of this

training is to turn safety into a positive experience where people make better choices with the help of their teams. It introduces the concept of operating 'beyond zero', a place where people regularly make positive safety interventions by 'talking safe' and 'making safe' to reduce the chance of injury when the unexpected happens.

Over the next 24 months, every single employee will participate in safety coaching at a level appropriate to their role, reinforcing that everyone in the business is a safety leader. The training marks a significant investment, and one I am confident will help us create a culture at where people more regularly 'talk safe' by looking out for each other; and 'make safe' by spotting any unsafe conditions and putting them right.

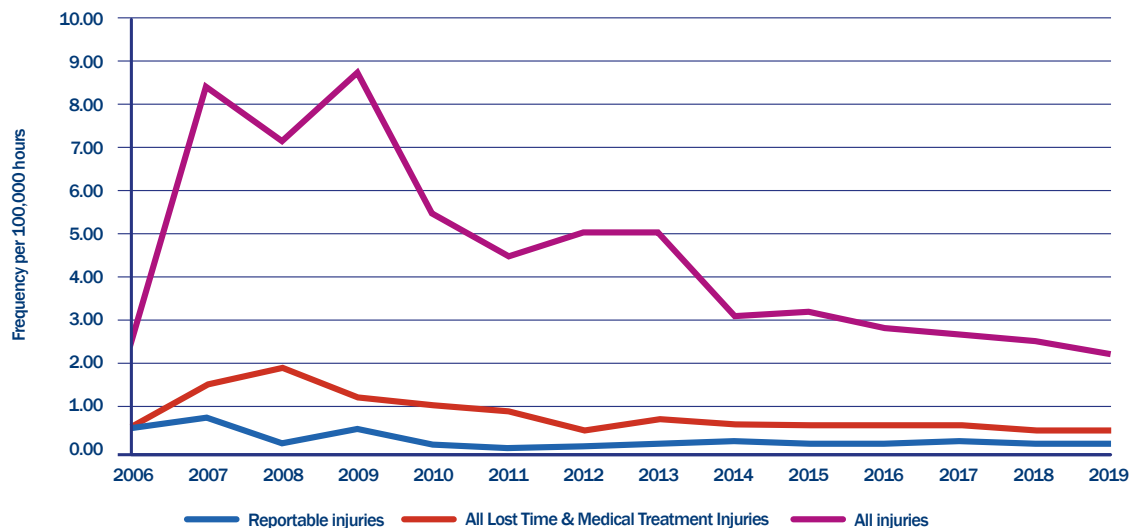
Our aspiration is to create a culture where discussions and challenges are given and received as positive health and safety interventions. When we all feel that this is the case, we will be working in a truly interdependent culture, relying on one another to stay safe. Only then will we achieve and maintain our goal of zero injuries and an injury-free workplace.

**Jamie Fitton | QES Director**

Our aim is to turn safety into a positive experience where people make better choices with the help of their teams.

Our vision is to achieve zero injuries and prevent occupational ill-health

All injuries frequency rate (2006-2019)



◀ The graph illustrates all injury frequency rates at JN Bentley since 2006, and demonstrates impressive improvement during this time. We're proud of the progress we have made in establishing a health and safety culture in our business, but recognise there is still work to do to achieve zero injuries.

Year	2015	2016	2017	2018	2019
Hours Worked	3,118,626	3,373,664	4,475,605	5,307,422	5,240,281
Unsafe Acts/Unsafe Conditions	14,149	20,359	31,359	47,637	58,744
Serious Near Misses*	10	25	75	66	44
First Aid Injuries	65	55	90	112	93
MTI/LTI	6	10	13	15	20
RIDDOR-Reportable	3	3	7	7	4
AFR	0.10	0.09	0.15	0.13	0.08

MTI/LTI = Medical Treatment Injuries/ Lost Time (>1 day) Injuries | AFR = RIDDOR-reportable injury frequency rate per 100,000 hours.

\*Since 2017 we have categorised all service strikes as 'serious near misses', which accounts for the increase in numbers you can see in the table.

AFR  
**0.08**

The AFR is the RIDDOR-reportable injury frequency rate, per 100,000 hours worked. In our industry it is the key measure for health and safety.

# The environment

## Without care for the built and natural environment, we wouldn't have a sustainable business.

### We measure three key areas of environmental performance:

- pollution prevention
- energy and emissions
- waste

For us it's not just about minimising our impact on the environment but reducing the potential for harm and enhancing our surroundings too.

We treat environmental management with the same rigour we do health and safety: a suite of processes, standards and procedures on core areas are complemented with training courses and sharing of best practice so that our people are equipped with the skills and knowledge they need. And as with safety, in return we want engagement and positive interventions where people 'talk green' and 'make green' every day.

### 2019 in review

We measure three key areas of performance:

**Pollution prevention** is measured by the number of positive interventions we make. 2019 was another year of improvement as the number of positive interventions increased by 28% to 10,932. Every intervention made is a potential incident prevented; we're proud of these levels of reporting, which continue to improve year-on-year, demonstrating excellent engagement.

Our **waste management** target is to direct >90% of the waste we generate from landfill, doing so by

following the waste hierarchy: prevent; minimise; re-use; recycle. When we combine excavated soils into our skip waste data, the actual diversion from landfill rate for 2019 exceeded 99% by volume/weight, far surpassing our annual target.

**Energy consumption and the associated emissions** is a key area for demonstrating impact. This encompasses embodied emissions, such as concrete and steel, indirect emissions, grid-supplied utilities, and direct emissions such as on-site generation. 2019 showed another significant carbon (CO<sub>2</sub>-e) improvement, with all key scope 1 and 2 carbon sources either reducing or remaining consistent. Our embodied carbon however, showed a slight increase when compared to previous years: the narrative on p19 explains more about our performance.

### To the future

There will be no let up in our focus on environmental management. We must make environmental management a positive experience where, because our people are regularly 'talking green' and 'making green', the chance of causing harm is greatly reduced. To bring us further in line with health and safety, we will launch new Operational Environmental Standard Visuals

and Checksheets. These will complement the full Operational Environmental Standards (OESs) rolled-out at 2019's Environment Week. Created with valuable input from colleagues around the business, the visuals provide an immediate snapshot of 'what good looks like' for ecology, waste, pollution prevention, and invasive species. They'll be carried in pocket-sized books, aimed primarily at our site-based workforce.

Carbon reduction is important to us and the clients we work with, a number of whom have set a goal of net zero carbon emissions by 2030. We are in the process of establishing a carbon task group. The group will produce a carbon management strategy, building on the success of our accreditation to ISO 50001. As Paul Bentley mentioned at the beginning of the Review, we're building a 'carbon culture', applying the same logic as we do with safety in order to reduce our carbon footprint and make low-carbon solutions the norm.

In summary, eliminating all instances of environmental harm on our projects and premises is a realistic goal and one that with a positive approach and willingness to look out for one another, and the environment, is achievable.



## Performance Energy and emissions

T carbon/£M turnover	2015	2016	2017	2018	2019
Turnover (£M)	135	165	257	310	312
In-situ concrete	28.66	41.97	35.81	38.05	41.97
Rebar	12.64	15.35	8.91	11.78	16.66
Designed precast concrete	18.94	7.05	7.00	6.97	6.64
- Rebar supplied in PCC	7.33	4.68	3.42	3.41	2.98
Manholes and covers	0.68	0.83	0.83	0.86	1.61
Aggregates	12.94	9.81	6.47	6.89	6.60
Sub-total	81.2	79.7	62.4	68.0	76.5
Gas oil	30.85	28.75	28.83	28.38	31.30
Diesel	16.09	13.28	8.98	7.58	7.48
Petrol	1.43	1.32	0.99	0.61	0.60
Natural gas	0.29	0.12	0.15	0.07	0.07
Electricity	1.96	2.24	1.24	1.07	0.61
Sub-total	50.6	45.7	40.2	37.7	40.1
<b>TOTAL</b>	<b>132</b>	<b>125</b>	<b>103</b>	<b>106</b>	<b>117</b>

We measure embodied, direct and indirect emissions before normalising them against turnover so the figures take into account our recent growth as a business.

2019 showed another significant carbon (CO2-e) improvement with all of our key scope 1 and 2 carbon sources either reducing or remaining consistent across our sites, transportation and owned or operated offices. Our embodied carbon however, showed a slight increase during 2019 when compared to previous years. Having reviewed the data in detail, we believe that this is due to the business delivering better value regarding these asset materials (effectively providing our clients more product for less money) so the usual normalising factor of carbon vs turnover doesn't accurately reflect any efficiencies in process. **This will be an area of focus in 2020 to ensure we continue to demonstrate like-for-like carbon measurements each year.**

### Pollution prevention

# +28%

We measure pollution prevention by the number of positive interventions we make. The number increased by 28% in 2019 to nearly 11,000. Every intervention is a potential incident prevented.

### Waste management

# 99%

We diverted 99% of waste from landfill when we combine excavated soils into our skip waste data. This exceeds our >90% target.

JN Bentley has achieved certification against ISO 50001 for Energy Management for the design, construction and commissioning of building and civil, mechanical and electrical projects. One of the first design and build contractors in the world to achieve ISO 50001, the accreditation will support us to use energy more efficiently as we establish our Energy Management System.



## Environment Week

In 2019 we hosted Environment Week, five days packed full of all things green.

The week was designed to engage design and construction colleagues in environmental matters and launch our new Operational Environmental Standards for ecology, waste management, pollution prevention, and invasive species.

Videos, posters, case studies and examples of best practice were shared, culminating with a focus on plastics on day five.

A competition sought suggestions for reducing single-use plastics, with the winning entry challenging us to reduce plastics in temporary works, sharing with the business alternatives that could make a real difference.

# Our supply chain

**We invest around 40% of our revenue with our supply chain, which means it plays an incredibly important role in our success.**

As we have grown as a business, our supply chain has grown with us: it now comprises a healthy mix of 1,900 fully-approved national and regional materials, plant, subcontract, agency and training suppliers.

To ensure we remain our clients' supplier of choice, the supply chain delivers work outside of our own core-competencies and supplies specialist materials and items of plant. Our suppliers are a great source of innovation; their input ensures we consider all solutions so that what we offer our clients is best value every time.

Our supply chain is built on long-standing partnerships: over 50% of our supply chain have worked with us for over 10 years, 15%

joining us since 2016. We've established 73 live frameworks with several national suppliers. Fixed for appropriate durations, they ensure we stay competitive in dynamic markets where requirements can quickly change.

To maintain a strong supply chain, suppliers must want to work with us too. We pride ourselves on fairness and engage with companies whose cultures mirror our own. Safety is always paramount, and we enjoy working with suppliers to look for improvements.

We're passionate about working with suppliers to help them develop their own products. For example, we've collaborated with Mecalac since 2017 to bring their new cabbed dumper all the way from concept to market. An early-adopter of cabbed dumpers, our own users' experience played an important role in helping Mecalac make their new machine safer and more productive.

◀ We're proud of our youthful, energy-efficient, high-spec fleet and invested £7.3m in plant, materials and equipment in 2019. This included five new 21T intelligent excavators with in-built GPS functionality that sees digging controlled in accordance with 3D models uploaded to the machines.



## An elite fleet

We operate a fleet of over 300 vans and in 2019 were named Van Operator of the Year by the Freight Transport Association (FTA). Up against a room full of logistics firms whose primary business is driving, our Safe Driving campaign and commitment to safety-focused innovations saw us pick up the prestigious award.

“ Safety is always at the forefront of JN Bentley minds – they're constantly challenging us to find safer products and solutions.

James Gabbott, Hire Station

JN Bentley supported our 'Designed with safety in mind' strategy when it came to the development of our MDX cabbed dumper range. It's fantastic for us as a manufacturer to have this customer engagement.

Allison Sedgwick, Mecalac

Transformation, innovation and new technologies are always high on the JN Bentley priority list. They're an early adopter of EE's new 5G technology, allowing their sites to get up and running without the need of fixed internet services.

Andy Heathcote, BT Enterprise (EE)



We have a well-established relationship with EE and in 2019 set up a new 5G framework so that our sites can get up-and-running without delay.



# Digital transformation

**JN Bentley is undergoing a digital transformation, supported in a large part by our new state-of-the-art ERP system, Xpedeon.**

Xpedeon is a sophisticated platform that, with the support of the Xpedeon team in the UK and Mumbai, is being fully tailored to our own requirements. With both ourselves and the Xpedeon team wanting to push the boundaries as to what the system can do, we're automating as many of our core processes as possible on a single user-friendly platform.

Many of our procurement, plant, invoicing and commercial functions have now transferred to Xpedeon, revolutionising how these teams work. We're beginning to realise efficiencies of our digital transformation and are excited with new developments that are set to follow in the coming months, including timesheets and new Form Builder functionality.



## Supply chain portal

In 2019 we launched the Xpedeon Supply Chain Portal. Accessed via the web, it allows the supply chain to log in and receive and view enquiries, submit quotations, track and manage orders, submit valuations, manage invoices and payments, and request instructions for additional work all in one place.

It has significantly reduced the amount of time spent manually transferring data from quotations, invoices and emails, and has improved collaboration with the supply chain as they play a more active role in the procurement process.

# 171

**171 suppliers are enrolled on the Xpedeon Supply Chain Portal; as this number grows, the efficiencies Xpedeon delivers will continue to increase.**

**A far more streamlined two-way approach to managing the supply chain.**

James, JN Bentley Quantity Surveyor

**The system ensures we see all relevant enquiries and gives us visibility of new opportunities in areas we might not have accessed in the past.**

Mike Senior, Frazer





**It's our aim to give a bit back to the community by offering our skills, time and expertise to make a different and leave a positive, lasting legacy.**

# In the community

**The nature of the work we deliver as engineers takes us into the heart of different communities every day.**

It's our aim to give a bit back to these communities by offering our skills, time and expertise to make a difference and leave behind a positive legacy.

## **Educational partnerships**

People are at the heart of our business. We have a proud history of recruiting talented people from school, college and university, providing opportunities through apprenticeships, year-out placements and graduate roles. We wouldn't have such a strong track-record without important, long-standing links with the education sector.

Recognising the continuing skills shortage in our industry, we partner with educational institutions with the aim of opening students' eyes to the world of construction and engineering by promoting the science, technology, engineering and maths (STEM) agenda.

Our employees support these partnerships by attending events, facilitating site visits and hosting Q&As to encourage young people to join the sector. Events also provide colleagues with new experiences and are a valuable opportunity for professional development as they work towards chartership and other qualifications.

## **Community projects**

We lend our skills, time and expertise to local community projects to give a bit back to the areas in which we live and work. We often team up with our clients to support projects to maximise community benefit; building these relationships is often critical to the success of our projects.

Throughout the year we supported a variety of initiatives, from making improvements to a primary school playground in the North West, to upgrading facilities at an educational centre in the Midlands, to volunteering with the Friends of Flass Vale in the North East to improve an area of vegetation.







# 12

Constructionarium saw us help provide engineering undergraduates from Leeds University with hands-on experience of site life as they spent a week building scaled-down versions of iconic structures. With our team of site managers, engineers and lead hands assisting with planning, setting-out, steel fixing and concreting, the week was great development for everyone involved. 12 students returned on summer placements after impressing us with their skills and enthusiasm.

We also ran Constructionarium with our own apprentices - see more on p12-15.

## Charitable giving and fundraising

Our people are a generous bunch, always up for a challenge and a laugh along the way. Every year we support employees' efforts inside and outside of work by matching funds raised for charity up to the value of £100. 37 colleagues applied for company matching in 2019 as we supported a whole range of different activities and events, from bike rides to football tournaments, long-distance races to coffee mornings.

We also continued to collaborate with our clients to support the efforts of WaterAid, a charity to which we link closely through our extensive work in the water sector.

**£100,694**

donated to good causes by JN Bentley and its employees in 2019

**57,094**

Company donations to WaterAid

**8,623**

Other company donations - incl. company matching

**9,614**

Other employee donations - team and office events etc.

**25,363**

Employee fundraising

Charitable donations - philanthropic giving, sponsorships, gifts-in-kind etc.





# MMB

MOTT MACDONALD  
BENTLEY



# MMB is 20 and going strong!

Mott MacDonald Bentley – more commonly known as MMB – celebrated its 20th birthday in 2019. MMB is a truly integrated design and build organisation, combining the global consulting expertise of Mott MacDonald with the contracting experience of JN Bentley.

Awarded its first AMP3 Yorkshire Water framework back in 1999, MMB has now delivered a staggering £1.7bn worth of work. MMB has contracts with more UK water companies than any other organisation, delivering complex engineering projects from the very north of England to South Wales and East Anglia.

## **MMB at its very best**

MMB is a unique offering for the engineering and construction industry, particularly in the water sector. Its longevity is testament to just how well the organisation works when at its very best.

It is a truly integrated design and build venture. It uses one management system, has one set of processes and, since JN Bentley joined Mott MacDonald in 2014, is all part of the same group. What has struck me since I was privileged enough to join MMB in 2019 is how strong the culture and values are across the different areas in which we operate.

People are at the heart of this – agile people with a ‘can do’ attitude, who aren’t willing to dwell on blockers but confront them as challenges to overcome. I like the sense of pride MMB people have in what they’re achieving, and how much they embrace the responsibility they’re given at early stages of their careers.





We work in 'triangles' comprising operational, commercial and design functions. At our best, these triangles are strong, efficient, interdependent teams realising opportunity to add value at every stage. None of the functions are ever just bolted on as an afterthought.

I'm regularly blown away by the work that our people do. I've been impressed with how much innovation I see, not just on the multimillion-pound flagship schemes, but on a lot of the lower-value, technical projects too. The consistency of set up on sites is also impressive. Every MMB site I've visited has felt safe and well organised, something that's not a given in our industry.

How are we going to further improve in 2020 and beyond? Our improvement plan focuses on becoming more efficient through greater consistency, reusing more designs, and creating the right environment for innovation to thrive. Digital tools will become increasingly

evident, and throughout the whole of the project lifecycle, not just in design – but only those tools that add real value. We must also become better at remote working, not only through the amazing MMB Global Delivery Services (GDS) team in Mumbai, but within the UK as well. This doesn't just come down to having the right technology but requires the right behaviours and culture too.

We also recognise our business is fast-paced and that we need to support our people to stay safe and healthy at work: as you'll read throughout this Annual Review, employee wellbeing remains very high on the agenda.

The formation of the new MMBC region within the Mott MacDonald Group marks the start of the next exciting chapter for MMB, and I'm really looking forward to what 2020 holds. AMP7 brings with it a huge amount of opportunity which we will embrace and add more value for our clients than ever before.

**Nick Fawcett**

General Manager, MMB



In 2014, Mott MacDonald acquired Bentley Holdings Ltd (including subsidiary company JN Bentley Ltd). The move was a natural progression in the highly successful partnership between the companies through MMB and in the years since has seen the JV go from strength to strength.





We've been helping Severn Trent meet stringent new levels of consent for the amount of phosphorus allowed in water discharged from sewage treatment works. Pictured here is our site at Trescott. Learn more on p34-35.



# Case studies

We deliver world-class engineering and construction solutions for clients across the UK.

Here is just a small selection of the most interesting and innovative projects delivered during 2019.



# Anglian Water

Anglian Water is the largest geographic water and wastewater company in England and Wales, covering 27,500km<sup>2</sup>. The region stretches from the Thames estuary to the Humber north of Grimsby, to Lowestoft on the east coast and across as far west as Buckinghamshire.

MMB is part of the @one Alliance, a collaborative organisation of six partners working together to deliver a significant proportion of Anglian Water's capital investment programme. In AMP6, this has seen the @one Alliance deliver £1.2bn of exciting design and construction projects across the region from a fully-integrated base in Peterborough.

In 2019, together with our five fellow contract partners, we started to close out AMP6 ahead of its March 2020 completion. AMP7 was firmly on the agenda too, with each partner bringing the very best of what they can offer to two major innovation events: the @one Alliance Engagement Event and Innovate East – a collaborative event hosted by Anglian Water and Essex and Suffolk Water.



## ◀ All Good

When new, tighter consent levels for ammonia were introduced by the Environment Agency, six water recycling centres within the Anglian Water region were identified as needing modifying to meet the new, lower targets.

With the levels of consent to be achieved varying across each site, differing process solutions were required – each of which has helped contribute to an overall 33% reduction in cost across the programme: at sites with higher consents, plant was optimised and existing equipment refurbished; where tighter consents were set, new tertiary plant was installed.

Each site presented the @one Alliance with its own set of challenges ranging from restricted access under a railway (Kibworth), power upgrades and working alongside HV lines (Ulceby), ecology within existing reed beds (Foxton) and weight limits on existing bridges accessing site (Louth). In 2019 we successfully delivered five projects, with number six set for completion ahead of the March 2020 compliance date.

**Project:** Good Ecological Status (GES) Schemes | **Expertise:** Water recycling; optimisation; ammonia removal

Overall reduction in cost across the programme:

# 33%

## ▼ Digital delivery

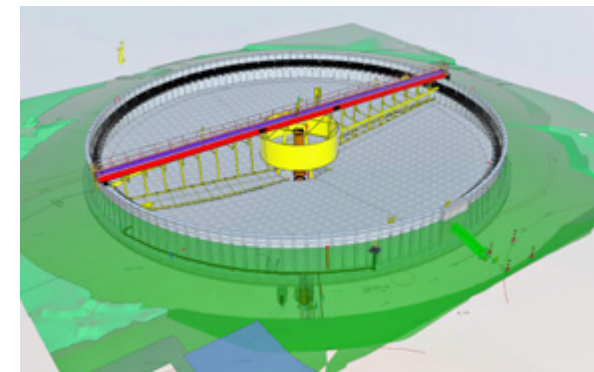
To cater for population growth, we are upgrading Whitlingham Water Recycling Centre (WRC), a major WRC serving the city of Norwich.

Our scope includes the construction of a new 45m diameter final settlement tank with associated M&E equipment, pumps and pipework; upgrades to the existing Inlet works with new larger compactors, new and refurbished cup screens and improved washwater flows; and

improvements to the aeration lanes with new jet aeration and improved air flow control valves.

The project is pioneering on-site digital delivery: 3D digital BIM models are being utilised ahead of traditional design drawings with models, rather than drawings being utilised on site to construct the new works. This learning is set to be carried forward into future AMP7 projects across the whole of the Alliance.

**Project:** Whitlingham Water Recycling Centre | **Expertise:** Water recycling; digital delivery







### ▲ Another UK first

Many of our clients' assets are being upgraded to help protect European eels – now classed as critically endangered after a 95% decline in population over the last 25 years.

At an intake into Wansford Water Treatment Works on the River Nene, the @one Alliance installed

new screens on a 45° angle to maximise the wetted area. The first time the screens from this supplier have been installed at an angle in the UK, the approach not only reduced the number of screens required from eleven to just seven, it also meant the screens could be installed within the width of the existing intake channel.

**Project:** Wansford Eel Screens | **Expertise:** Eel Regulations; innovation

### High praise ►

New developments need connecting to the water network, which is exactly what we've done at Alconbury Weald.

The project saw us lay over 2km of new water main and build a new pumping station. Fabricated off-site and situated within the grounds of an existing Anglian Water site, we developed the pumping station in collaboration with our client's operators so that it met their specific requirements.

The @one Alliance has worked with multiple landowners and constraints throughout: great crested newts, badgers, a Site of Special Scientific Interest (SSSI), protected orchids, high pressure gas mains and local highways authorities.

**Project:** Alconbury Weald

**Expertise:** Pipelines; stakeholder engagement



The team won a Be Recognised Award following high praise from @one Alliance Director, Paul Fletcher: "It was an absolute pleasure to visit such an obviously well-managed and operated site."



AMP7 partners showcased what they'll be bringing to AMP7 at two major innovation events: the @one Alliance Engagement Event (right) and Innovate East (above).





# Dŵr Cymru Welsh Water

MMB has firmly established itself in Wales since being awarded a place on an alliancing agreement with Dŵr Cymru Welsh Water at the beginning of AMP6.

In the last five years, from a standing start we've built a high-performing, local operational team comprising over 200 colleagues. In 2019 we delivered over £53m of revenue together, working on water and wastewater projects across the length and breadth of Wales, using our design-and-construction expertise to drive real efficiencies.

We've secured a five-year extension with Dŵr Cymru Welsh Water (DCWW) for AMP7, and have put in place an improvement plan that will ensure we build on the great foundations laid in the last five years.

**Award winner: The North Wales Sludge Strategy (NWSS) is a £56.2m flagship project that sees biosolids from satellite sites across North Wales all treated at a new Advanced Anaerobic Digestion (AAD) plant. We reduced capital investment by £15m and whole life costs by £40m by challenging initial plans for two AAD sites, resulting in a hugely more efficient outcome. The scheme wowed judges at the British Construction Industry Awards as they named it Utility Project of the Year.**

**Delivered efficiently and effectively by a passionate team who have clearly loved this project."**

British Construction Industry Awards judges, commenting on the North Wales Sludge Strategy

## Crossing boundaries ►

We've taken our service reservoir expertise into DCWW. Works are well underway on the construction of a new 34 megalitre structure at Bewdley Bank, Hereford. The design utilises MMB's modular build techniques for the storage tank with precast concrete elements delivered to site for erection. In addition to the new tank, the existing service reservoir is being refurbished, including new inlet pipework installations to allow operation in series. The transition to AMP7 will see the team develop a solution for a new service reservoir at Merthyr Tydfil.



**Project:** Bewdley Bank Service Reservoir  
**Expertise:** Service reservoirs; knowledge sharing



## ▲ A dedicated team

We have a long history of working at impounding reservoirs, and have taken this expertise into Wales to form a dedicated Reservoir Safety Team. The team is tasked with delivering multi-disciplinary projects from feasibility to construction and final commissioning.

2019 projects included FE analysis for dam structural integrity and stability, CFD analysis for spillway flow and cavitation prediction, and a critical tunnel inspection on an asset

not accessed for five years. Work has started replacing the spillway at Dolwen Reservoir, with further spillway replacements soon to commence at Ynysy Fro (Lower) and Upper Carno.

The replacement of the scour gate at Llyn Brenig and the refurbishment works at Pant Yr Eos also neared completion. The move into AMP7 will see the team deliver two major £10m+ schemes to enable the continued safe storage of water, amongst other projects.

**Project:** Reservoirs Programme | **Expertise:** Impounding reservoirs



**Llyn Brenig | We might work at reservoirs every day... but not reservoirs with draw off facilities located 120m from the shoreline and 50m below the surface. At Llyn Brenig in North Wales, precision engineering was required to replace the existing crane, bulkhead and primary gate and providing and installing a new secondary gate at the bottom of the existing draw off tower. Safely replacing and testing the gates for leaks involved 44 continuous days of single isolation, all under DCWW Gold Command.**



## ▼ Scope challenge

Protecting the environment and using our natural resources sustainably is a fundamental objective of ourselves and our clients.

Over the last two years, we have been supporting DCWW as they meet this challenge head on through a £32.5m programme of phosphorus removal work at nine sites across the country.

Each site has brought out the very best in MMB: innovative thinking, efficiency and timely delivery – all to ensure we safely hit key regulatory dates within budget.

Initial plans were to provide conventional hard engineering solutions to remove the phosphorus; through detailed analysis of the existing plant performance, watercourse sampling and catchment modelling we were able to challenge consents, resulting in a 'no build' solution at one site, and a large scope reduction elsewhere.

Huge progress was made in 2019 ready to meet the March 2020 regulatory driver.

**Project:** P-Removal Batch Programme

**Expertise:** Phosphorous removal; scope challenge



## ▲ Turning the screw

We've been on site for a number of years delivering a series of modifications to protect the environment and improve water quality at Pen Y Bont Wastewater Treatment Works. The highlight in 2019 was the replacement of four

of the six Archimedean screws, used to transfer flows into the inlet works and first of the new screens.

The biggest challenge was maintaining the performance of the works whilst removing the existing screw pumps and installing and commissioning their replacements. With each screw capable of transferring 2,200l/s, a major over-pumping operation was established to enable the highly technical mechanical installations to be carried out safely.

The team deservedly picked up DCWW's 'Team of the Month' award for their delivery of this challenging scheme.

**Project:** Pen Y Bont Screw Replacement

**Expertise:** Mechanical installation



# Northumbrian Water

We've worked in the North East for nearly 20 years, first as JN Bentley and now as MMB as Northumbrian Water benefit from our full design-and-build offering.

As an AMP6 contract partner on treatment and infrastructure frameworks, our work is focused on delivering water and wastewater projects across the region.

As well as making great progress on schemes across the region, 2019 also saw us ready ourselves for AMP7. This included starting a journey with Northumbrian Water towards ISO 44001 certification for collaborative business - a process we are proud our client has chosen to pioneer with MMB.



The Durham City Sewer Network Improvements project (see right) is part a wider programme of improvements being made across the city, including our award-winning works at Flass Vale, which was named Project of the Year 2019 by both CECA North East and by Northumbrian Water themselves.



## ▲ One to another

We're constructing two new water treatment works to supply drinking water to Berwick and Wooler and surrounding villages in more isolated parts of North Northumberland.

The same team will move from Berwick to Wooler (Fowberry) in 2020, taking with them improved knowledge, skills and efficiencies. The designers have already been busy fine-tuning plans for the second site, using feedback from our construction teams to produce designs with improved buildability.

The project pioneered the use of our new 21T intelligent excavators. With built-in GPS, excavation is controlled by 3D models uploaded to the machines. The excavator reduced the earthworks programme by 33%; reduced engineering time; prevented a need for colleagues to work in close proximity to the machine; and gave us a high quality of finish accurate to within a remarkable 6mm.

**Project:** Berwick & Fowberry Water Treatment Works  
**Expertise:** Buildability; intelligent excavators



## ▲ A collaborative approach

With a complex multi-disciplinary project to co-ordinate on a critical asset, great subcontractor and client relationships were crucial at Riding Mill Raw Water Pumping Station.

As part of the major refurbishment to improve efficiency and ensure compliance, we will remove, refurb and replace four 90MI/d pumps and one 20MI/d pump; installing new mechanical and electrical equipment; and upgrade much of the existing structure ahead of the arrival of four new fish exclusion screens.

The tight-knit team has worked together to realise opportunities, collaborating to reduce the duration needed on site by two months.

**Project:** Riding Mill  
**Expertise:** Collaborative planning; maintaining critical asset





## A first for England ►

One way we can reduce customer impact is by maximising the benefits of 'building off-site'. Tasked with maintaining customer water supplies whilst replacing an ageing water treatment works in a designated Area of High Landscape Value, we did just that, opting for a Transportable Treatment Unit (TTU) solution, not seen in England before.

The TTU modular package plant was designed, built and tested off-site at our supplier's factory, before being dismantled into six fully fitted out units and delivered to site ready for installation. This meant construction activities were far less intrusive, with time on site significantly reduced. The plant itself uses innovative nano-filtration technology, far cleaner and more compact than traditional treatment.

In modernising the works at Otterburn, the new technology will remove the need for operators to be present on site 365 days a year, driving major efficiencies for our client, including a reduced carbon footprint.



**Project:** Otterburn Water Treatment Works  
**Expertise:** Build off-site; water treatment



**Project:** Durham City Sewer Network Improvements  
**Expertise:** Third party liaison; constrained sites

## ◀ Network updates

As our cities continue to grow and grow, their sewer networks are dealing with levels of surface water run-off from roofs and areas of hardstanding for which they were never designed.

To help remedy this and separate the surface water from an aged combined sewer, we constructed a new outfall in the River Wear and engineered new drainage in the form of 800m of new pipework through Old Elvet, a 1000-year-old arterial route to the city centre.

Working in the historic city centre making improvements to an antiquated network of sewers isn't without its challenges. Critical was a complex 60m micro-tunnelling operation beneath live traffic. Liaising with a raft of third parties (hotels, restaurants, a city-wide festival, £75m building development and a church) ensured the task was carried out safely to plan.

## ◀ Value engineering

Needing to increase network capacity and help improve water quality in the River Tyne, we built a new surface water pumping station and drainage beneath an existing car park in Heworth.

The new pumping station removes a large proportion of flows from Heworth Burn that currently discharges to the combined system. To reduce costs by over £250,000 we value

engineered the original scope to build just one shaft, rather than original plans for two.

To achieve this, the new shaft was sunk directly above the culvert through which flows were flumed.

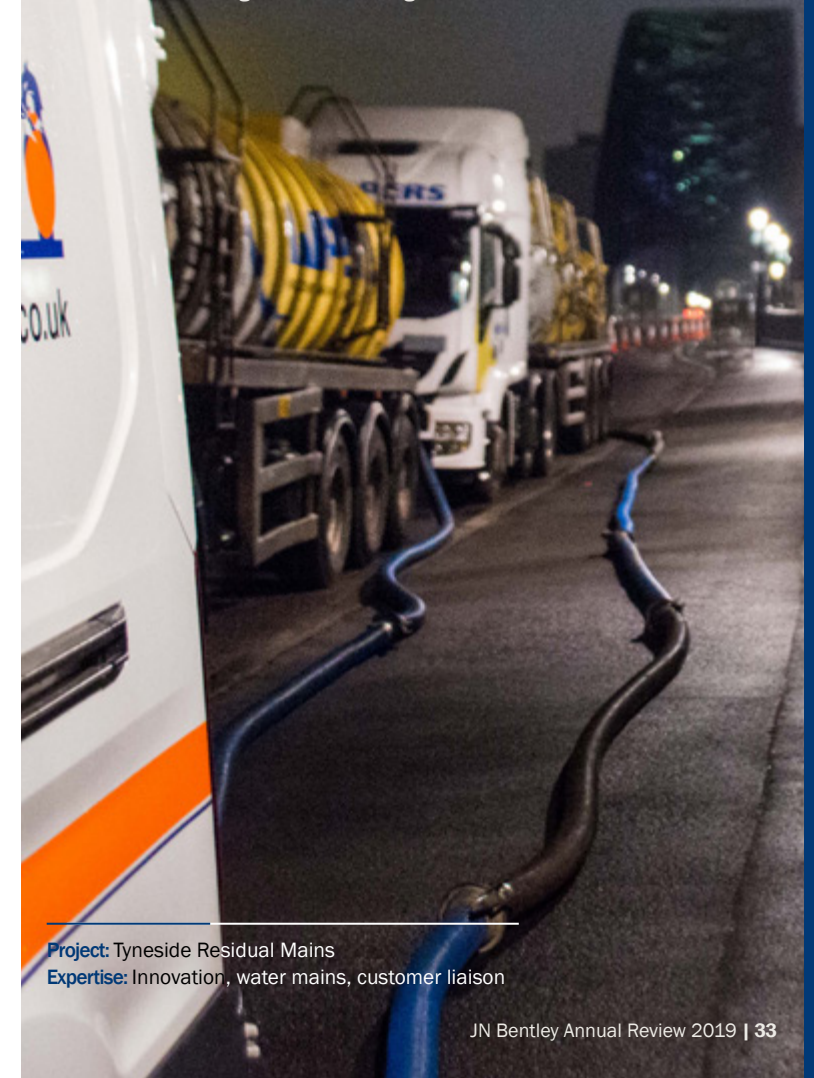
**Project:** Heworth Burn Surface Water Preparation  
**Expertise:** Shaft construction

## Ice pigging

Throughout the year we helped Northumbrian Water maintain the performance of their network, cleaning, reconnecting and abandoning water mains across Tyneside.

To reduce disruption to customers, 'ice pigging' was used to clean sediment from many of the trunk mains. Ice pigging has been adopted from the food production industry. It sees an ice slush pumped through a length of pipe, cleaning as it goes. It eliminates the need for abrasive or intrusive cutting/jetting cleaning methods and means a 2km length of pipe can be cleaned in a day. Traditionally it would take three weeks!

Working through the night, we successfully deployed ice pigging on the clean water pipe running under the Tyne Bridge, one of the region's most historic landmarks.



**Project:** Tyneside Residual Mains  
**Expertise:** Innovation, water mains, customer liaison



# Severn Trent

We celebrated our ten-year anniversary with Severn Trent in 2019, having first moved to the region in 2009 at the beginning of AMP5.

2019 saw us continue to deliver projects across the heart of the UK, not only on above ground assets but, for the first time with Severn Trent, their below ground infrastructure too.

During 2019, the efforts of the team were rewarded with the news that we had secured three new AMP7 contracts that will extend our stay in the region to 2025 and beyond. MMB was awarded a place on a new 'design and build' framework, with JN Bentley named partner on both 'civils building' and 'MEICA install' frameworks. Despite not starting until April 2020, we've already been awarded (and completed!) some early AMP7 projects as we kick-started this exciting new era.

Outside of the frameworks, we secured a £34m contract to build a new thermal hydrolysis plant (THP) near Nottingham, a similar scheme to our award-winning project at Five Fords in North Wales.



Walsall Wood

## Ground-breaking technology

With some of the tightest effluent consent requirements in the West Midlands, Walsall Wood Sewage Treatment Plant needed significant upgrades to ensure compliance.

Using ground-breaking technology in wastewater treatment solutions – Nereda and Mecana – we have upgraded the treatment plant to comply with new standards for phosphorous and ammonia.

**Ground-breaking technologies:** The team developed an innovative and sustainable solution to implement a Granular Activated Sludge (GAS) process (Nereda technology) and a tertiary solids removal cloth filter (Mecana technology). This solution reduced the construction footprint by a third compared to a conventional Activated Sludge Process, delivering savings over £1.6m and reducing the whole life carbon footprint of the project by 1.3TCO2-e.

**Project:** Walsall Wood Sewage Treatment Plant  
**Expertise:** Nereda and Mecana; precast concrete

Walsall Wood utilised innovative construction technologies including BIM in detailed design, virtual reality sessions and 'factory production' - using a precast concrete solution for the water retaining structures. This reduced the length of the programme on site and made construction safer.

# 26

Walsall Wood is part of the Activated Sludge Plant (ASP) batch. The project is one of 26 schemes (nine of which are being delivered by MMB) being undertaken to help Severn Trent meet stringent new requirements for levels of phosphorus allowed in water discharged from sewage treatment works.



Trescott



## ▼ Digging deep

Boreholes abstract water from underground stores known as aquifers. Boreholes are an integral part of the Severn Trent region's water supply. Boreholes can typically provide water for up to 80 years; with many of the region's boreholes drilled in the 1920s-30s they have effectively reached the end of their life, so we're now working together on a large investment programme to engineer new ones.

Before drilling the new boreholes, we installed temporary filtration to guard against any impact to water quality. The water has to be test pumped, sampled and licensed by the DWI and the EA before being put into supply. This allows the existing boreholes to be safely taken out of service and remediated, and the future water supply for the region protected.

**Project:** Boreholes Batch

**Expertise:** Boreholes



## A quick response

AMP7 might not officially kick off until April 2020, but we've already been working on a number of AMP7 schemes, including Mitcheldean in Gloucestershire where we are helping improve water quality at the water treatment works.

With a solution needed at short notice, after signing the works order our teams were on site within just one week. At the core of our solution is new large diameter pipework, installed to give our client's operations teams the ability to isolate

the joined contact tank and treated 24Ml/d water reservoir, something not considered when the structure was built in the 1970s. We are also installing a new final sample kiosk point which will be housed in an FRC chamber sunk into the ground. This allows gravity fed final samples to be obtained and removes the non-compliant pumped sample point.

**Project:** Mitcheldean Improvements

**Expertise:** Water treatment works; fast response

## ◀ A standard approach

Working closely with our client's Chief Engineer and subcontract experts, we designed and installed a batch of **30 clean water pump stations** and in doing so developed a standardised packaged pump station for 20 sites, helping Severn Trent achieve major efficiencies.

Required to give customers a safe, robust water supply, the compact FBA (factory build assembly) pump stations are built largely off-site: once delivered they just need installing and commissioning.

The 'off-the-shelf' clean water pump stations come in four sizes and have benefits for:

- **£150,000 design saving:** standard design = faster design
- **1-2 week construction saving:** precast slabs = shorter programme
- **Safer lift:** kiosk half the weight of previous
- **£330,000 land acquisition saving:** smaller footprint = fewer costs

**Project:** Packaged Clean Water Pump Stations

**Expertise:** FBA; batch approach

## Breaking new ground

Until 2019, our work with Severn Trent was almost exclusively 'above ground' at service reservoirs and treatment works. However, 2019 saw us break new ground as we secured a batch of infrastructure projects. Working closely with colleagues in other regions to learn from their experiences of working 'below ground', schemes have provided a variety of solutions for our client, including safeguarding customer properties against flood and pollution events, and enabling them to connect to the public sewerage system.

At Weoley Avenue, a partnership between Severn Trent, Birmingham City Council and the Environment Agency has reduced the risk of flooding at 13 properties. We delivered a sustainable, environmentally-friendly solution in a form of swales and detention basin to capture and store excess storm water runoff before it is fed back into the sewer system.

**Project:** Infrastructure Projects

**Expertise:** Infrastructure; sewerage; flood alleviation

**Innovation:** The project at Weoley Avenue pioneered our use of intelligent excavators. These machines use GPS and a 3D model of site to set out and accurately excavate the designed profile, removing the need for many manual processes. This has significant benefits for safety, as well as productivity.



# 312m

The deepest borehole was drilled at Dimmingsdale – a staggering 312m deep!

The EA have commented on the quality of health and safety, site tidiness as well as the wonderful work done with the customers - and of course were very happy to see the use of new technology on site."

Noor Kanber, Severn Trent PM





# United Utilities

One of four Construction Delivery Partners on United Utilities' framework, MMB delivers design and construction projects on infrastructure and non-infrastructure assets across the north west of England.

Working across both clean and wastewater sites, 2019 was our busiest ever year in the region as we delivered £70m of work. Flagship schemes for the business continued in Cumbria and we also deployed to two projects needing a fast response at Oswestry and Prenton.

The effort of the team was rewarded with an extension of the current contract that will see us collaborate on projects with United Utilities through AMP7 to 2025.

## ▼ One of the largest in Europe

With the quantity of water abstracted from lake sources needing to be reduced, the West Cumbria water supplies project is tapping into spare capacity at Thirlmere reservoir to sustain supplies to the area for years to come.

We're using our expertise in precast concrete (PCC) service reservoirs to engineer two new structures, one of which will be one of the largest PCC structures in Europe. Always looking to improve our approach, a new PCC wall design is reducing manual handling activity, improving accuracy and speeding up construction, with 16 wall units placed every day – twice the number typically expected.

The structures will hold 71 megalitres of treated water to supply customers across the region.

**Project:** Thirlmere Service Reservoirs

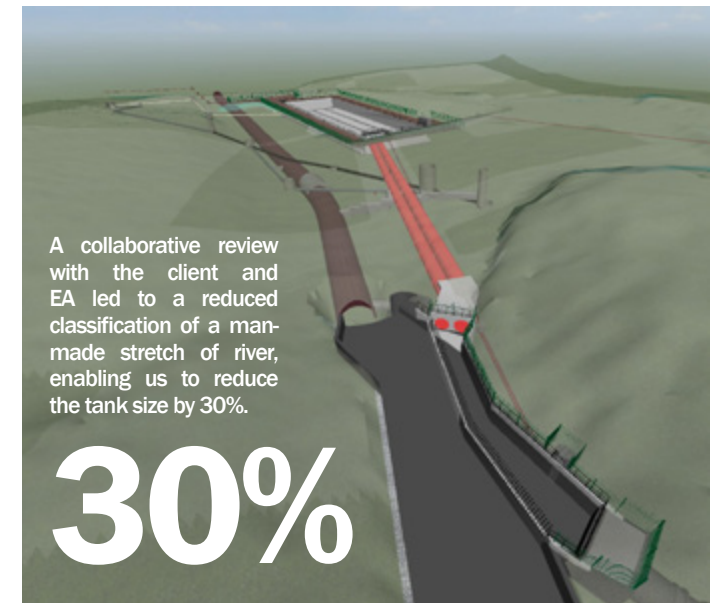
**Expertise:** Precast concrete service reservoirs; safe people/plant interface

## ▼ Improving river quality

Hyndburn 005 is part of a five-scheme batch improving river water quality across the Ribble Valley. Our solution includes 7,500m<sup>3</sup> storage that will be utilised during storm events to reduce spills into the nearby river.

A lift well planned with a specialist telehandler supplier saw the safe offload of 4,600kg of GRP pipework transported on curtain-sided vehicles from the continent. The pipes of differing diameter were nested together to drive a significant saving on transport costs – just one-way overall savings of £1m have been driven across the scheme.

**Project:** Hyndburn 005 | **Expertise:** Collaboration; safe lifting; innovative surveys, software and excavators







Project: RIB0017 and RIB0019

Expertise: Cross-framework sharing; constrained site

## Critical infrastructure ►

The Haweswater Aqueduct is the backbone of United Utilities' water supply network, delivering 570 megalitres of water to two million customers in Manchester and the Pennines every day. 65 years old, the structure is being overhauled to secure its long-term reliability.

As part of the overhaul, we're laying a new 2.5km four-pipe gravity pipeline to replace a section of the existing aqueduct. Working on two fronts – from the north and south – all 800 pipes are being laid across largely arable land, crossing four watercourses.

The project will culminate with a critical connection to the aqueduct during a four-week shutdown in the Autumn 2020.

## ◀ Crossing boundaries

Having never used GRP tanks on their network before, we invited United Utilities to view tanks we'd successfully installed with Yorkshire Water in 2012, giving them opportunity to speak to the client's end users who work with the tanks day in, day out.

Happy with what they saw, our challenge was given the green light and we installed tanks at two sites, ditching original plans to construct traditional concrete shafts estimated to have cost c.£200,000 each.

Through close liaison with the operational team, the tanks are being made bespoke to United Utilities' needs. Both tanks will hold water in the event of storm before it can be safely pumped back into the network. The site at RIB0017 was particularly constrained meaning a meticulously-planned lift was required to ensure the safe installation of the 19.4m long tank.

Project: Hallbank Tunnel

Expertise: Clean water networks; critical mains connection



Tablet-based Survey123 is collecting real-time QA data, eliminating paper records. The information displays on a real-time dashboard – something we've shared with the client so they can interrogate the results.

Production time for drawings was reduced from 1.5 days to just 30 minutes using Autodesk Civil 3D® design software, which automated updates to designs and earthwork removal quantities. With all checking and approval done via the 3D model, no 2D outputs were produced.



# GDS

The complex Cheshire Batch of schemes is helping our client improve the performance of five wastewater treatment works across the region.

The programme of upgrades and refurbishments has benefited from our pioneering link with MMB colleagues in Mumbai. Global Delivery Services (GDS) is providing a full

range of design services to a number of MMB projects. With visits both ways strengthening the relationship with India, the GDS team has helped drive a number of improvements on the Cheshire Batch. This included a deviation from an asset standard at Sandbach that cut the volume of filter media needed in half and meant the build required was much smaller than originally planned.



# Yorkshire Water

2019 marked the twentieth anniversary of MMB, and the twentieth anniversary of MMB working with Yorkshire Water – although JN Bentley's relationship with Yorkshire Water pre-dates this by many more years.

We work together on three AMP6 frameworks: above ground assets, below ground networks, and large schemes. We continue to competitively tender projects outside of the frameworks too: the major upgrade of Hull Wastewater Treatment Works was secured after a successful bidding process.

2019 saw us deliver £45m of projects together, and secure four significant AMP7 frameworks that will extend the MMB/Yorkshire Water relationship by a minimum of five years. Places on complex civils, minor civils, MEICA and infrastructure networks frameworks are reward for the high-standards delivered in AMP6 and years previously – plus the bid team!



The ingenuity shown by the team at Damflask (right) saw the project pick up the Pipeline Industries Guild's Utility Panel Projects Award 2019.

## Award-winning innovation ►

How do you retrofit 900mm pipework into a confined tunnel only 1.6m in diameter? You develop and install a rail guidance system.

With the existing scour system at Damflask deemed to have insufficient capacity to drawdown the reservoir fast enough in the event of an emergency, we designed a solution to upgrade the existing structure whilst maintaining our client's operational capacity.

The permanent rail guidance system pushed the spigot and socket ductile iron pipework up the tunnel. Each pipe length was secured to bespoke pipe supports designed to run along the rails, and once in position the downstream support was fixed to the tunnel floor.

The custom jacking frame was based upon the design of a railway buffer; it clamped to the rail guidance system, providing a moveable jacking point for hydraulic rams to 'push home' each pipe section. With a minimum working room of 200mm around the new pipe, the portable frame allowed quick and safe installation of the new pipe in the tunnel, minimising the time the construction team spent working in the confined space.

**Project:** Damflask Impounding Reservoir  
**Expertise:** Pipelines; innovation



## Major upgrades ►

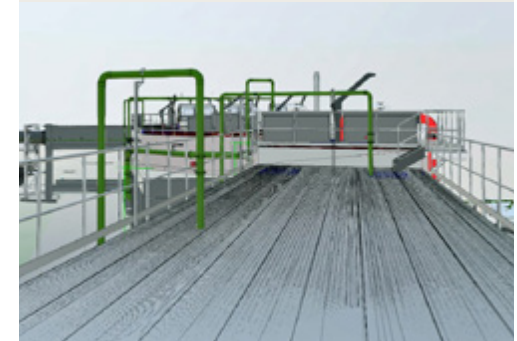
Major upgrades to Hull Wastewater Treatment Works are being undertaken to ensure improved compliance and operational efficiency.

Secured through a competitive tendering process, the £29m design-and-construction of a new inlet works and upgrade to the existing digestion plant continued through 2019 – with works on site set to run until 2021.

Through extensive liaison with the client's operations team and our own safety experts, we developed procedures to enable us to work safely around the existing live works: this includes working within explosive atmospheres whilst refurbishing the sludge treatment facility.

**Project:** Hull Wastewater Treatment Works  
**Expertise:** BIM 360; wastewater treatment

The project at Hull is pioneering our use of Autodesk BIM 360. The system enables multiple users, including clients and subcontractors, to access the 3D model information and empowers them to directly upload their own data. It enables real-time logging of activities such as pile installation and concrete inspection and was used by our engineers to set out site.



The 3D model was viewed and interrogated on a tablet, which connected directly to the robotic total station. The technology is streamlining workflows, making construction quicker and more accurate. It has the ultimate aim of removing the need to produce and print traditional 2D drawings.







### ◀ Early subcontractor involvement

Our long association with Yorkshire Water has seen us work at scores of impounding reservoirs across the region, but we've never relined a spillway as large as that at Lindley Wood.

With over 4,700m<sup>2</sup> of wall and invert lining to undertake, we worked on two separate work fronts using 135T and 80T cranes so that the base could be installed at the top and bottom of the spillway concurrently.

Early involvement from our formwork reinforcement subcontractor helped us hone the design of the steel reinforcement, making construction faster and safer. This included pouring a concrete 'skirting board' down the stepped spillway to which the shutters could clamp – saving a day per pour, and a total of five weeks.

When complete, the reservoir will be compliant with the very latest safety standards.

**Project:** Lindley Wood Impounding Reservoir

**Expertise:** Reservoirs; precast concrete; early subcontractor involvement



### Cross framework collaboration ▶

New property developments need to connect to the water network, and often the capacity of the network needs increasing to cater for the new demand. Stocksbridge WwTW is doing just that.

Construction of the new wastewater treatment works moved at pace in 2019. All process units were constructed and commissioned, with the site now treating sewage delivered from our newly-constructed pump station along 2km of twin rising main, laid under a busy A road.

The team has endured some challenges on the scheme, including operating on a tight footprint and pouring concrete in temperatures as low as -5°C. By working with skill and engaging specialists in other parts of MMB, the solution delivered by the team is now treating effluent to a very high standard, far in excess of consent requirements.

**Project:** Stocksbridge Wastewater Treatment Works

**Expertise:** Constrained site; wastewater treatment





# Environment Agency

Teaming up with environmental engineering specialists at Jeremy Benn Associates, our joint venture JBA Bentley delivers work with the EA.

**JBA Bentley** With teams based in the north and south of the country, our work covers a wide geographic spread. Under the framework, we deliver a variety of projects, from flood defence to pumping stations to reservoir improvements, primarily under the EA's Water and Environmental Management (WEM) Framework.

2019 saw WEM come to a close; however, having secured a number of significant 'legacy' projects, we will continue to deliver schemes at Great Yarmouth, Skeffling, Holderness, York and beyond until 2021. These schemes will bring turnover under WEM close to £200m.

JBA Bentley will also continue to work with the EA on two new frameworks in 2020 and beyond. The **Marine and Coastal Framework** is being run from our Leeds hub, and comprises design-and-build and build-only projects along the English coastline; the **Flood and Coastal Risk Management Framework** is being run from Peterborough and involves the delivery of sea defence repairs and asset inspections anywhere from the East Anglian coast to the Midlands to the Welsh border.

The framework also allows other DEFRA agencies to invite us to tender, opening up exciting opportunities with new clients.



British Construction Industry Awards 2019 'Temporary Works Initiative of the Year'  
Constructing Excellence National 2019 'Civils Project of the Year'

We've been on site in York since December 2015, undertaking award-winning restorations at the Foss Barrier following devastating floods. After involvement in the emergency response and temporary solution to get pumps back up-and-running, we've now built a pumping station housing eight new pumps and critical MEICA equipment.



Project: North Street Flood Defences  
Expertise: Flood defence; avoiding buried services



## ◀ A project to remember

With the park set to host one of the largest Armistice Day commemorations on Remembrance Sunday, the clock was ticking on new flood defences being constructed along Memorial Gardens in the heart of York city centre.

Works were handed back to our client defect-free, ahead of schedule, leaving the EA free to concentrate on other aspects of the scheme, including further defences along the River Ouse.

Site was heavily congested with buried services. To guard against hazardous service strikes and help the team visualise what was in the ground beneath them, they created signboards with photographs and section drawings at the location of every trial trench. Shared with the client, the EA plan to take this forward as part of a wider service avoidance strategy.

## Urban defences ►

With £4.3m of flood defence improvements needed across Lincoln, we created a hub in the city centre allowing us easy access to sites in the surrounding area.

The work is varied, but all has the ultimate aim of protecting the city in the event of heavy rainfall. From replacing sluice gates to rebuilding flood walls to installing new sheet piling, on each site we've dealt with the challenges of working in tight public areas and

outside residential properties, employing techniques such as silent piling to minimise disturbance to our neighbours.

Robust emergency procedures were put in place as JBA Bentley took full control of Lincoln's main flood defences whilst replacing the gates at Bargate Sluice. A close collaborative approach between the team and client ensured the gates were replaced without incident.

Project: Lincoln Defences | Expertise: Flood defences; emergency plans





Scope challenge led to carbon reduction of

# 60%



## Major savings

Great Yarmouth has a history of flooding; as recently as 2013, 9,000 people were urged to evacuate their homes when the highest ever tide was recorded on the town's river.

We're delivering £30m of a £40.3m scheme to improve flood defences, refurbishing 4km of existing flood defence walls to extend their life and improve protection to 4,500 homes, businesses and infrastructure. Some existing walls are being raised, with others having cathodic protection installed. We're also constructing new walls set back from the river-front.

Working closely with fellow suppliers, we challenged the conventional scope of works. Instead of opting to replace the quay piling we are refurbishing existing defences. This reduced costs by 47% and carbon by 60%.

**Project:** Great Yarmouth Tidal Defence

**Expertise:** Flood defence; carbon reduction

**This scheme is a prime example of how we are taking a long-term collaborative approach to tackling both the causes and the impacts of the climate emergency, ensuring that communities, homes and infrastructure are more resilient to the additional risks that the future will bring.** Emma Howard Boyd, Chair of the Environment Agency

## Flood relief

The consequences of flooding can be devastating – just ask the residents and business owners of South Ferriby after the village was hit by a tidal surge on the Humber estuary back in 2013.

To protect 110 residential properties and CEMEX's large cement factory – a major local employer – we kicked-off a scheme to engineer a 2.5km long, 4m high earth flood embankment and 300m of concrete flood walls.

Close collaboration with CEMEX has seen them supply the clay for the embankment free-of-charge from their on-site quarry. The clay is a by-product of the cement-making process and in being used for the embankment is eliminating the need to import material, significantly reducing the scheme's carbon footprint.

**Project:** South Ferriby Flood Alleviation Scheme

**Expertise:** Flood defence; re-using materials

## Bentley helps protect...Bentley ►

The pumping station at Bentley Ings requires a major upgrade to increase its capacity following previous flood events. We commissioned a temporary pumping arrangement to enable works to begin on a permanent solution.

These temporary pumps were tested when torrential rain hit parts of Yorkshire and the East Coast in November, with water levels on the River Don at Bentley Ings the highest ever recorded. Our temporary pumping arrangement helped to prevent large scale flooding to Bentley (pumping water from the 'dry side' back to the flood corridor), but as water in the River Don continued to rise and with more heavy rain forecast, our team stepped in to work with the EA, RAF, Army and emergency services to help with local relief efforts, preventing a major flooding incident and any further damage to our site.

Senior figures from the EA praised the efforts of the team, with a mitigation plan implemented to keep generators going. We began back working on site in January 2020 once water subsided.

**Project:** Bentley Ings Pumping Station

**Expertise:** Temporary works; emergency response







# The Coal Authority

The Coal Authority has been working to make a better future for people and the environment in mining areas for 25 years.

The Coal Authority keeps people safe and offers peace of mind by providing a 24/7 incident service for coal mining hazards – including what are commonly known as sinkholes – and repairing homes that have been damaged by subsidence caused by historical coal mining. It also protects and enhances the environment by treating mine water to reduce pollution in local communities.

We first started working with the Coal Authority in 2004 and are now completing our third consecutive long-term framework. This framework has seen us design and construct new mine water treatment schemes across the UK, tackling some challenging engineering scenarios on both coal and metal mines. Over the course of the framework we have delivered over £18.5m worth of work, £5.8m of which was in 2019.

**At full capacity, Lynemouth will enable the treatment of more than six billion litres of mine water each year, the equivalent of 2,400 Olympic-sized swimming pools.**

## Increasing capacity

Our £4m expansion scheme at Lynemouth – one of the Coal Authority's largest mine water treatment schemes – came to an end in 2019.

The former Lynemouth colliery is part of a larger mining block that worked reserves under the North Sea and extended inland close to Morpeth. Since mining ceased in 2005, water levels in the workings have been rising. The levels have been monitored closely by the Coal Authority who designed a flexible treatment approach which could be expanded in phases, the first of which became operational in 2015.

Water levels continued to rise, meaning the pumping and treatment capacity on site needed increasing by 2019. To achieve this we have constructed two new cascades, five treatment lagoons, an ochre sludge drying bed and associated infrastructure. The works involved transferring flows beneath railway sidings that serve a nearby biomass power station, and the installation of new pumps 70m down the existing shaft.

**With this increased capacity, the scheme will help to protect the local environment by removing 300T of iron and protecting around 1.6m cubic metres of drinkable water.**

Our team overcame many challenges that come with working on a redundant mining site: they encountered numerous buried structures and pockets of asbestos; railway lines and 100,000T of contaminated soils. Over three acres of trees had to be felled, producing 200T of trees shredded and taken off site for biomass.

To reduce the environmental impact and increase efficiencies, the team utilised one of our own 21T hybrid excavators. The excavator uses around 25% less fuel than traditional machines and are quieter to operate, reducing fuel consumption and noise pollution.

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### Project

Lynemouth Mine Water Treatment Scheme

### Expertise

Mine water treatment; innovative plant



# Cadent Gas

Responsible for transporting gas to 11 million homes and businesses in the West Midlands, North West, East of England and North London, JN Bentley and Cadent Gas have been working together since 2018.

In 2019, we picked up our second batch of work under Cadent Gas' five-year Strategic Valve Remediation plan. Awarded off the back of 81 schemes delivered across the North West and East of England in 2018/19, the second phase of work is worth over £1.5m and sees us operating at 120 different locations.

The gas valve remediations are critical to ensuring the safe operation of the Cadent Gas network, helping our client maintain compliance with Pipeline Safety Regulation 13.

The programme is fast-paced, with 109 valves being safely replaced across a large geographical area in just six months. We survey each site, gathering all relevant location and condition data, before returning to undertake the remedial works required.

Many of the sites are within public highways, footpaths and verges and require detailed planning with local authorities to obtain the necessary licences and then maintain the safety of the general public.



## National Grid

JN Bentley is a partner on a framework with National Grid and continues to bid for work with this important client as we build our presence in the energy sector.



# Rolls-Royce

We're proud of our long association with Rolls-Royce, which dates back to the 1980s. Having delivered over 100 design-and-build and commission-only projects in the years since, the relationship was renewed in 2017 with the award of a new framework, a framework set for further renewal in 2020.

2019 marked the third year of the new framework. In this time, JN Bentley has fully-established itself within the Rolls-Royce business: the contract started as a national framework which saw us take on schemes from Scotland to the south coast of England; it has since evolved to see us awarded specific Rolls-Royce facilities at which we are establishing high-performing teams and strong relationships.

# 60

The JN Bentley Rolls-Royce team grew in 2019 as we expanded our design capabilities, tapping into expertise in the wider Mott MacDonald Group. The mechanical, electrical and process (MEP) resource also developed, and we now have up to 60 people working in the framework delivering a diverse portfolio of design-and-build schemes with a prestigious client.



Working diligently with their environmental colleagues to ensure ecological compliance, the team at Ansty was named Be Recognised winners.



## Highways expertise

Highlighting our highways capability, at Ansty we formed a new network of roads and carparks to improve access on site.

Ansty lies on a former RAF base where Rolls-Royce developed their early jet engines. Here we constructed two new access roads, tying them into an existing roadway. We also built car parks, new three-sided swarf store and associated drainage and ducting.

It was critical that Rolls-Royce could continue day-to-day operations unimpeded by our works. By holding regular collaborative planning sessions and carefully phasing the work, the project was programmed to achieve this.

**Project:** Ansty Roads and Car Parks

**Expertise:** Highways; ecology

Our geographical spread with Rolls-Royce is growing: we're working together at facilities in:

- Barnoldswick, Lancashire
- Winsford, Cheshire
- Derby
- Denby & Trentham
- Birmingham
- Raynesway, Derby
- Ansty, Coventry
- London Heathrow



### ◀ Ready for take off

Rolls-Royce's Heathrow facility is home to their 'Engine Overhaul Services' (EOS) team.

In 2019 we completed the installation of two new cranes. Following a clash detection survey, we raised and diverted services in an already congested roof space to accommodate two 20T overhead cranes, one spanning 37m.

Spending months working in this live operational environment, security and cleanliness was key. The team underwent specialist training to ensure safety was never compromised by 'foreign object debris'.

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**Project:** London Heathrow

**Expertise:** Working airspace; precision engineering



# Looking ahead

**As we approach the end of the AMP6 regulatory period (2015-2020) company turnover is now stable at around £300m/year.**

Before looking ahead it's worth reminding ourselves of the growth journey that we have been on over the last 5 years – in 2015 our turnover was less than half what it is today at just £134m.

Whilst we still seek growth in the next five-year period we do not expect this to be at the same rate, and it may be preceded by a small dip as we transition across from AMP6 to AMP7 – a usual consequence of our clients planning the delivery of their next capital programmes.

Consequently, we have set a 2020 budget of £290m against the 2019 out-turn of £312m. At the time of writing 88% of this budget is already secured, with further work expected to come from successful tenders and direct allocation of work from within existing frameworks.

In 2020 some of the big projects we have been working on will be approaching completion, including Hallbank pipelines (United Utilities) where we are working to improve water supplies in the north-west. We will also be busy starting new work, including a thermal hydrolysis plant (THP) at Stoke Bardolph (Severn Trent), a project

similar to that delivered so successfully at Five Fords (Dŵr Cymru Welsh Water).

At a framework level, 2019 saw us secure new multi-year deals with Yorkshire Water and Severn Trent that extend our relationships with these long-term clients until at least 2025. These wins sit alongside extensions of existing contracts with Anglian Water, Dŵr Cymru Welsh Water, and United Utilities and an expectation of the same at Northumbrian Water. These clients will provide a solid base for AMP7. We will also look for appropriate opportunities with Thames Water – a client for whom we priced our first tender in 2019.

In the environment sector, JBA Bentley's work for the Environment Agency is expected to peak at £50m in 2020, with nationally important flood defence work being done across the Yorkshire and Anglian regions including flagship schemes at York and Great Yarmouth.

Our focus will be on winning new work for JBA Bentley following the completion of the Water and Environmental Management (WEM) framework. This includes bidding for frameworks with the

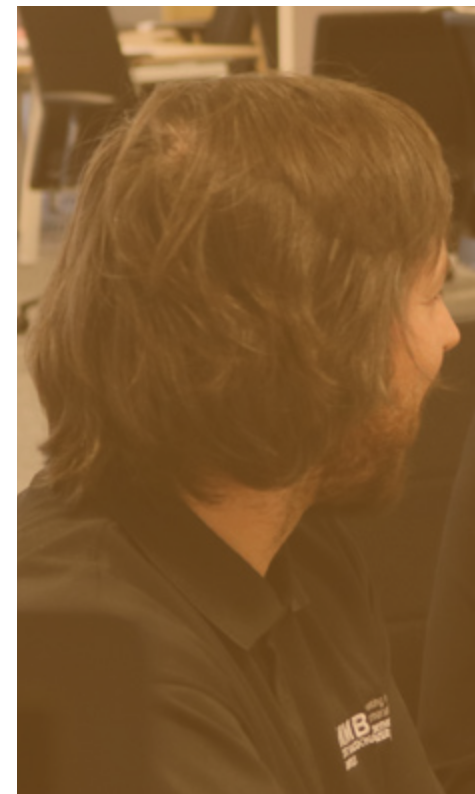
Coal Authority – a process that started at the end of 2019.

Elsewhere we expect a growing pipeline of work from Rolls-Royce, following turnover in 2019 of £8.4m. In the gas sector an impending framework opportunity with National Grid is likely to align well with our design and build delivery model – so building capability by delivering work for Cadent Gas becomes an important task in 2020.

At the time of writing we are delivering our first job for new client Magnox in North Wales, and are using this experience to bid a small engineering framework for another Nuclear Decommissioning Authority (NDA) client in Cumbria. We have framework bids pending with airport operator Manchester Airports Group, North Yorkshire County Council, and Cumbria County Council – all indicators of our future work winning intent.

In summary, the outlook for the company continues to be positive as we look forward to the start of AMP7 in April 2020.

**Steve Tetlow | Bidding & Strategy Director**



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**care.**

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