

Essential for life

Innovative, sustainable solutions
for water supply, wastewater
recycling and water management



Meeting your challenges

The water sector faces unprecedented challenges – ageing infrastructure, population growth, water scarcity and climate change. Our specialist teams can guide you through them all.

We search for the opportunity to add value – technical, economic, environmental and social. We constantly stretch our thinking to cut costs, increase efficiency, reduce risk, and improve resilience and reliability.

Connecting and understanding

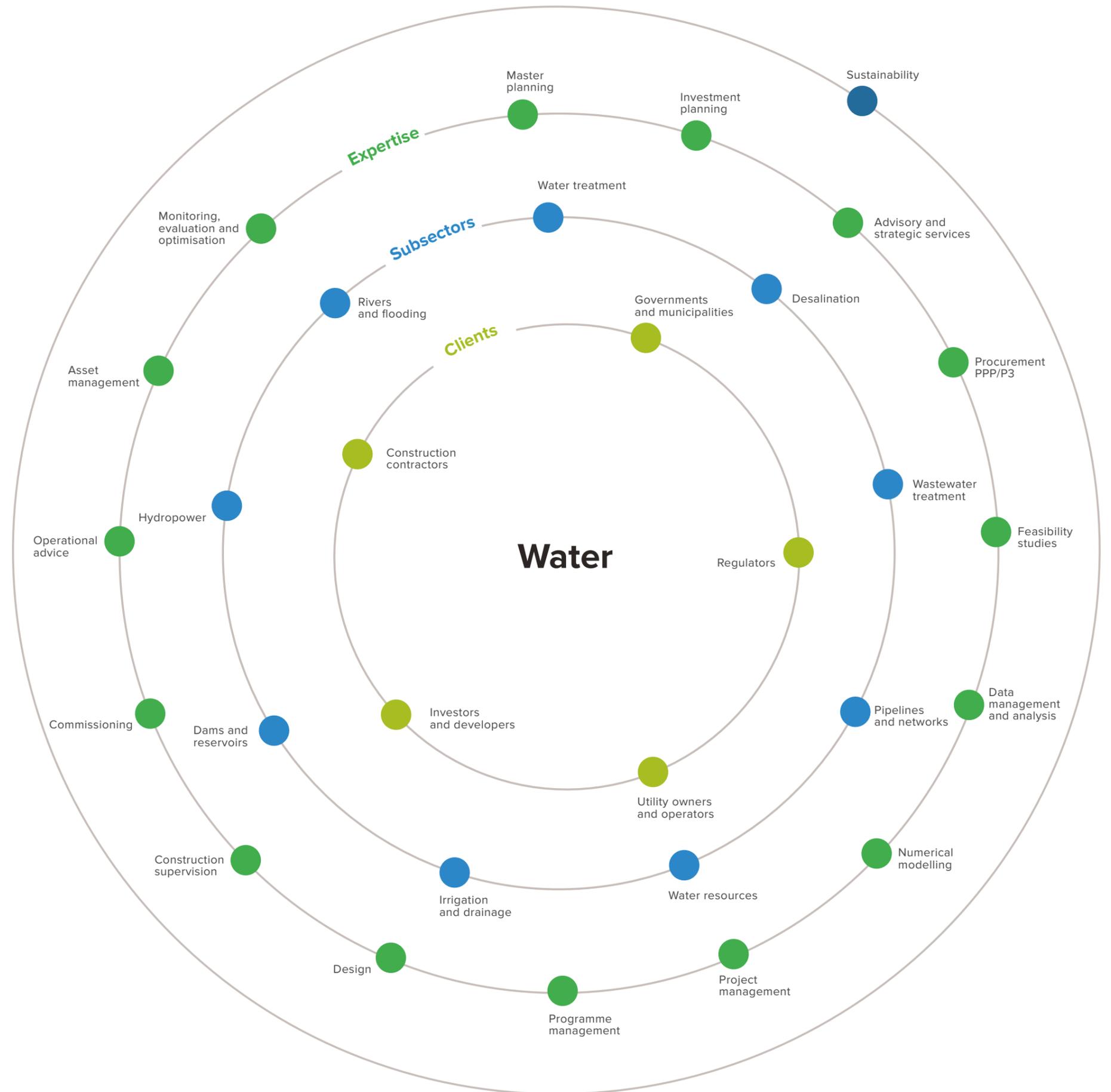
We do this through close collaboration with our clients – we understand their business environment and the needs of their end users. We also do this by working with others in our clients’ supply chains, harnessing our collective skills and ingenuity to forge delivery models that provide end-to-end service and support.

This ethos of teamwork and partnership is important to us. It is central to our success in delivering high-volume programmes of work through integrated co-located joint ventures.

Giving the right advice

As the world’s leading technical advisor on public private partnership (PPP/P3) projects, we know how to unlock investment to get projects off the ground. We advise on projects to realise new assets, and keep existing ones running, through our detailed understanding of the technical and commercial factors affecting the water sector.

In developing and emerging nations we co-operate with governments, municipalities and multilateral funding agencies to plan and implement water management projects that increase service coverage, safeguard water supplies and improve sanitation.



Helping you to maximise value and improve performance

Our asset management experts assist owners and operators to maximise the long-term value of their infrastructure, increase resilience and improve service delivery for their customers. We have a proven track record of reducing risk, optimising maintenance expenditure and improving the performance of water assets.

Smart asset management

Using our asset information models, we can provide you with new insights into the condition of your infrastructure. We will help you identify cost-effective enhancements to extend the working life of ageing assets and make them more resilient – and deliver those projects with minimal or no impact on operations. At whatever stage of your improvement journey, we can support you to implement smart asset management to create sustainable, resilient infrastructure in accordance with the new international standard ISO 55000.

Helping you to cut carbon

Work with us and you will receive support from practitioners with unrivalled knowledge of developing carbon-efficient solutions for the infrastructure industry – we've been a leader in this field for 20 years. We jointly developed PAS 2080, the world's first standard on carbon management in infrastructure. We will show you how to achieve low carbon, lower cost outcomes systematically, and in a way that is repeatable and changes your business for the better, permanently.

Bespoke, integrated solutions

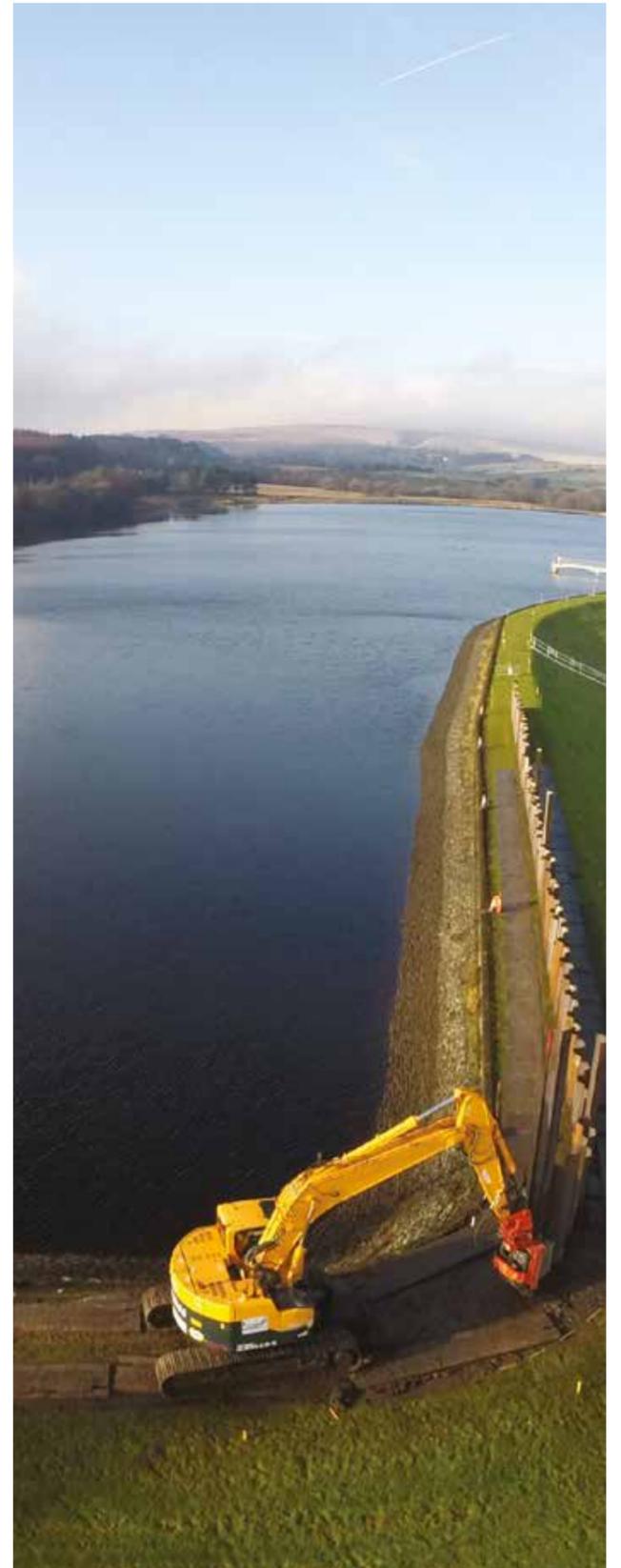
We devise bespoke, integrated water resource management solutions that enable communities, even entire countries, to meet increased domestic, industrial and agricultural water demand. We accomplish this through established analytical frameworks and by building capacity, strengthening institutions and developing robust practices. All our projects are designed to be sustainable and environmentally responsible, and support the aims of stakeholders.

Objective know-how

If you're aiming to deliver improved outcomes on a reduced budget, or seeking guidance on where to target investment to drive up efficiency, you can rely on our advisory services. When you have to make the tough decisions that can mean the difference between service failure and delivery excellence, our objectivity and know-how will give you a balanced view of the risks and rewards.

At the leading edge

Our multidisciplinary teams will work closely with you to plan and implement your proposed investment or transformation challenge. We provide leading-edge solutions for change management, optimised engineering and process remodelling. We will support you at every step and throughout our goal remains the same: that you receive value for money.



Innovation comes as standard

Innovation sets our services apart from the rest. This is because we have always been among the first in the water industry to adopt next-generation technologies that drive down capital and whole-life costs and offer added value.

Higher product quality

We're a world-class practitioner of building information modelling (BIM), which we use to deliver higher, more consistent product quality, and cut carbon and waste from the design stage through construction to asset operation. As a pioneer of design for manufacture and assembly (DfMA), we're introducing the many benefits of prefabrication and factory processes to water engineering. We have slashed onsite construction times by up to 90%, which translates into quicker returns on investment for our clients.

'Drag and drop' design

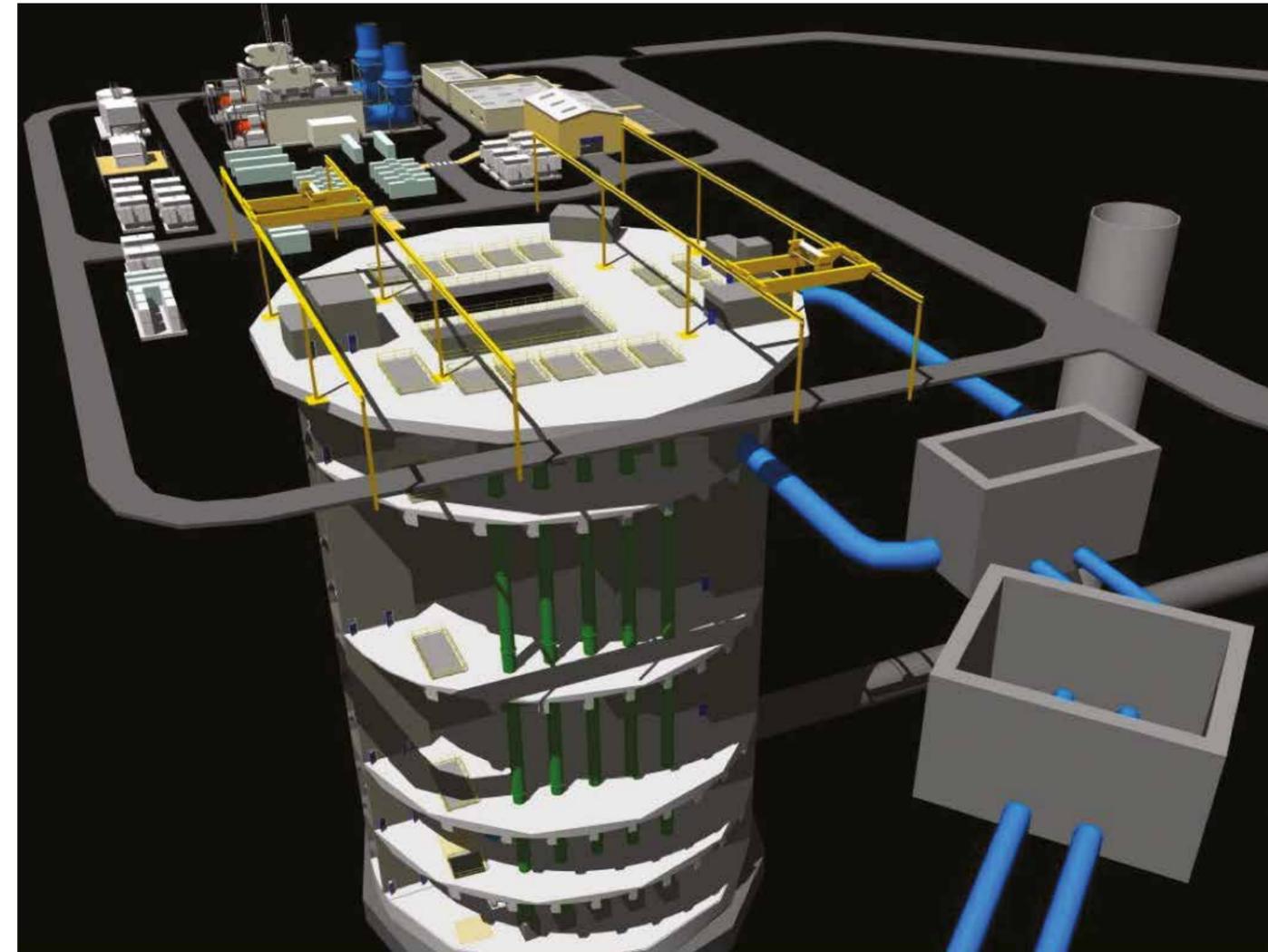
All the elements we design are added to our digital component catalogue, lending 'drag and drop' speed to design and creating standard products that can be used many times across whole programmes of work. With several thousand items in our catalogue, we are making it possible for clients to go 'shopping' for all the parts they need to build complete assets. Even though we're using 'off the shelf' components, we can still devise solutions that meet individual demands.

Digital expertise

Now we're developing our own algorithms to automate design processes and make further savings. Using our new Create software application, we have been able to reduce design times and deliver projects faster. Automation will free our engineers to focus on what they're best at: innovating and working alongside customers to gain a deeper understanding of the challenges they face, leading to better solutions.

Big data

We're also experts in big data analysis, asset information management and the development of decision-support tools. Our mantra is 'digital by default' and it is integral to the way we do business.



We have slashed onsite construction times by up to 90%, which translates into quicker returns on investment for our clients.

Solutions for building resilience

We can help you prepare your assets to minimise the impacts of climate change and extreme weather events.

Stronger infrastructure

We design infrastructure with inbuilt resilience. We also work with owners and operators to identify the vulnerability of their existing infrastructure to flooding, and then strengthen their assets to maintain continuity of services even during worst-case flood events. While protecting your individual assets from flooding is important, it is essential that the infrastructure they depend on is equally resilient in order to prevent cascade failures. Our experts can help you plan and implement a systems-based approach that covers your whole infrastructure dependency chain.



Flood risk management

Not all floods can be prevented and we have developed a suite of intelligent tools that are breaking new ground in flood forecasting. These calculate the water and wave overtopping rates for long stretches of coastline for high tide and storm scenarios. The real-time data produced pinpoints which areas will be most affected by coastal surges, allowing the emergency services and local authorities to plan their response and direct their resources to where they are needed most, helping to save lives and livelihoods.

Multiple skillsets

Dam and river engineering are areas where we demonstrate the added value we can provide by combining the different skillsets of our worldwide network of experts. Not only can we plan, model and design new build projects and remedial works, we also have the people who understand the commercial and legal drivers needed to bring projects to a successful financial close. For hydropower schemes this enables us to offer a complete 'water to wire' service, helping to bring the benefits of clean, renewable energy to more parts of the world.



10 reasons to choose Mott MacDonald

1.

Work with a company you can trust

From the Lee Tunnel in London to the Tarbela Dam in Pakistan, we are trusted to work on some of the world's biggest and most challenging water infrastructure projects. Our track record is second to none.

2.

Advance safety

As well as rigorous processes that manage technical, environmental and social risk, we also use cutting-edge analysis, modelling and delivery techniques including design for manufacture and assembly to promote a safe working environment for all.

3.

Use sustainability to maximise benefits

We will help you reduce your use of energy and water resources, and engage effectively with local communities and interest groups. Across the many sectors we work in, we have shown that sustainability delivers efficiencies that benefit society and the environment, and also the profitability of your business.

4.

Leave a lasting legacy

With vast experience in international development, we can help your water infrastructure project to leave a positive environmental and social impact, helping improve the quality of life today and sustaining resources for tomorrow's generation.

5.

Collaborative approach

We work closely with all stakeholders to understand needs and constraints, find opportunities, optimise solutions and achieve the best outcomes.

6.

Added value

At the start of every project, we search for the opportunity to add value in our designs and outcomes. We interrogate the project brief to achieve the most cost-effective outcome, taking into account both capital and whole-life costs.

8.

Make the most of our modelling expertise

We have built and verified numerous hydraulic models, in varying degrees of complexity and size, with different drivers, project focus and catchment-specific requirements.

10.

Cut carbon to cut costs

Carbon is a good proxy for cost. We are renowned in the industry for our work on carbon reduction; we wrote the infrastructure industry standard for carbon management, PAS 2080, and developed the first BIM-enabled carbon calculator. Let us cut the carbon footprint and cost of your assets.

7.

Benefit from an integrated approach

Our multidisciplinary expertise means we can develop an integrated project plan, with synergies between infrastructure disciplines, and across the phases of a project – ensuring maximum efficiency.

9.

Reach new levels of efficiency

Digital management systems will optimise new assets while bringing efficiencies to existing assets. Talk to our Smart Infrastructure team about how they can streamline your project and operations.





Abu Dhabi takes big step towards sustainability

Opportunity

Management of wastewater is a critical component of Abu Dhabi's strategy to achieve long-term sustainability. The Strategic Tunnel Enhancement Programme (STEP) is designed to manage stormwater flows and enable water recovery and reuse to meet projected increases in demand throughout Abu Dhabi. Abu Dhabi Sewerage Services Company (ADSSC) needed global water infrastructure and geotechnical expertise coupled with local presence to help deliver the programme.

Solution

STEP involves one of the world's biggest underground pumping stations, over 100m deep and 50m in diameter. Our specialists are managing its construction, including contractual, cost, health and safety and environmental aspects, while also providing high-level overview of the contractor's design. A project of this scale requires very broad-ranging skills which we're providing for ADSSC by connecting our global experts.

Outcome

We have contributed to a world-leading sewerage solution by being able to identify potential technical issues early, provide rapid and timely responses for onsite queries and engender an ethos of collaborative working. The project's excellent safety record – 6M man hours without a lost time incident – has helped earn our client a Gold Award from the Royal Society for the Prevention of Accidents, the first to be awarded to a public sector company in the Middle East.

Project

Strategic Tunnel Enhancement Programme

Location

Abu Dhabi, UAE

Client

Abu Dhabi Sewerage Services Company

Expertise

Project management and site supervision

Power to Peru

Project

Chaglla Hydroelectric Power Plant

Location

Chaglla, Peru

Client

The Bank of New York Mellon (on behalf of senior lenders)

Expertise

Technical, financial and contractual support

Opportunity

One of the world's largest concrete-faced rockfill dams has been constructed at Chaglla, Peru, and will provide 13% of the country's total hydro capacity. The project includes 34km of access roads, a 17.3km long reservoir and more than 23km of tunnels up to 12m in diameter. The project's sheer size and complexity, along with the dam type and the challenging topography, posed significant potential risks that needed clear identification and management to reassure the lenders.

Solution

We performed regular site visits with an expert team of tunnel, dam and power plant specialists to review construction status and progress, identify and discuss risks, and review the implementation of risk mitigation activities, which included modification of the spillway design to pass the probable maximum flood level. We also supported the lenders during the project's operations and maintenance phase.

Outcome

By scrutinising all technical and contractual components we achieved successful financial close of this US\$1.2bn project. Besides generating 6% of the total electricity produced in Peru, Chaglla has brought positive social benefits to the area. Overall, the project has provided free skills training to 1500 local people and created 2500 direct jobs and 10,000 indirect jobs. The new access roads have also had a major impact, improving local residents' access to health services, education and employment opportunities.



Deeper siphon opens up port to new super ships

18,000m³

The quantity of water the new siphon can provide per day under normal conditions

567,000m³

The quantity of water the new siphon can provide per day in an emergency

Project

New York Harbor Water Siphon

Location

New York, USA

Client

New York City Economic Development Corporation

Expertise

Engineering design, project management



Opportunity

The Port of New York and New Jersey is the third largest port in the USA, handling almost 40% of the East Coast's shipping trade. With the widening of the Panama Canal, it needed to deepen its approach channel to accommodate the next generation of super cargo ships or risk losing trade to rival ports that could. But two ageing water mains (known as siphons), built to carry drinking water from Brooklyn to Staten Island, lay just below the seabed. Before dredging could start, they had to be replaced with a larger, deeper siphon.

Solution

We recommended the use of a 1.8m diameter steel siphon inside a 2.9km tunnel with an overall diameter of 3.6m. Our design was accepted and we were retained to provide overall project management for a joint venture tasked with the project. Using trenchless techniques, the outer tunnel was bored through highly variable clays and sands at a depth of 30m – requiring an earth pressure balance tunnel boring machine to be used for the first time in New York City – and constructed with precast segmental lining. Our engineers also oversaw the design and construction of a chlorination station on Staten Island, able to treat 567,000m³ of water per day.

Outcome

The new siphon will provide 18,000m³ of water per day under normal conditions and up to 567,000m³ per day in an emergency. Ocean shipping is one of the most economical and environmentally sustainable means of transporting freight. The new water siphon will enable new and larger 'Post-Panamax' vessels – which offer additional environmental benefits by carrying more cargo and making use of cleaner fuel technology – to navigate New York Harbor. Cargo volumes are expected to more than double over the next 10 years.

Major upgrade for New York's water supply network



Opportunity

Every day the Catskill and Delaware Aqueducts deliver more than 3.7Mm³ of drinking water to New York City from six reservoirs located in the Catskill Mountains. As heavy rainstorms cause turbidity in the water supply from the Catskill Aqueduct, the New York City Department of Environmental Protection (NYCDEP) launched a project to create an interconnection between the two aqueducts, giving it greater operational flexibility to maintain water supplies without the need for filtration.

Solution

The interconnection depressurises water from the Delaware and transfers it into the Catskill system and has a maximum flow rate of 1.3Mm³ of water per day. As part of a joint venture we conducted the geotechnical investigations and provided the structural, architectural and landscape designs. We also carried out technical reviews of the entire interconnection and used BIM to optimise a cost-effective design based on the expansion of an existing shaft structure.

Outcome

The interconnection allows NYCDEP to reduce the use of water supplies from the Catskill Aqueduct during periods of high turbidity. This will reduce the need for chemical water treatment while maintaining high-quality water supplies to millions of New Yorkers every day.

Project

Catskill-Delaware Aqueduct Interconnection

Location

New York, USA

Client

New York City Department of Environmental Protection

Expertise

Geotechnical, structural, architectural and landscape services, BIM modelling

1.3Mm³

The quantity of water per day that can flow through the interconnection

Shaping Hong Kong's waste-to-energy journey

Opportunity

T-PARK is Hong Kong's first self-sustaining wastewater sludge treatment facility and one of the most technologically advanced facilities of its kind in the world. The client was seeking to appoint an independent consultant with a detailed understanding of the economic, technical, environmental, procurement and social issues associated with developing such a scheme.

Solution

Located in the city of Tuen Mun, T-PARK is capable of treating up to 2000t of biosolids per day. It comprises power generation, desalination, educational and ecological facilities to showcase the benefits of the waste-to-energy approach to waste management. Our role involved reviewing and certifying all designs, drawings and methods of construction.

Outcome

Officially opened in July 2016, T-PARK is incinerating the sludge produced at Hong Kong's 11 sewage treatment plants, reducing the volume of waste that would otherwise be dumped in landfill by approximately 90%. Heat generated during the incineration process is recovered for electricity generation to meet onsite operational needs, while excess electricity is exported to the public power grid, providing power for up to 4000 households at maximum capacity.

Project

T-PARK

Location

Tuen Mun, Hong Kong

Client

Veolia/Hong Kong Environmental Protection Department

Expertise

Independent engineer services

90%

The reduction in waste volume that would otherwise go to landfill





Super sewer is a clean winner for London

Opportunity

Rising commodity prices, squeezed budgets and the introduction of new regulations formed the backdrop for the design and construction of three out of the five huge shafts on London's Lee Tunnel super sewer – among the deepest in the capital. Added to which, our client Thames Water was looking for whole-life cost savings. Fresh thinking was needed to deliver the performance criteria and sustainability benefits required.

Solution

One of the many innovations was the ground-breaking design of the shafts – 70m from top to bottom. Conventionally, hundreds of tonnes of steel reinforcement would be used to resist hydrostatic pressures. The project team engineered a slip-formed fibre-reinforced solution with an external cement grout behind the lining. This enabled almost all the steel to be eliminated. Meanwhile, above ground, the pipeline linking shaft to treatment works was designed with a slight fall, enabling sewage to flow under gravity, with no need for intermediate pumping.

Outcome

Rethinking the shaft design saved 1500t of steel, cut construction time and reduced the risk of damage to the shaft linings due to steel corrosion over the 120+ year working life of the sewer. A multi-barrel gravity-fed flow transfer pipeline saves long-term maintenance and operating costs associated with a pumped alternative. Commissioned in January 2016, the Lee Tunnel has cut the amount of untreated sewage discharged into the Thames by 40%. In conjunction with the yet to be built Thames Tideway tunnel, it will enhance the quality of life for all who live and work in the capital for generations to come.

Project
Lee Tunnel

Location
London, UK

Client
Morgan-Vinci-Bachy joint venture for Thames Water

Expertise
Detailed engineering design



Engineering News-Record Global Best Projects Awards
– Global Project of the Year, Water/Wastewater category



39Mm³

Together the Lee Tunnel and Thames Tideway will prevent an average of 39Mm³ of untreated sewage mixed with rainwater from being discharged into London's river network every year

Getting under infrastructure's skin

Opportunity

When water and wastewater assets fail, we tend to find out when the taps run dry or when the sewers overflow. Establishing what the fault is and its exact location takes time, as much of the infrastructure is buried below ground, leading to unacceptable loss of service. By applying data-based systems we can get a much better idea about how efficiently water assets are performing.

Solution

Our H₂knOw-how product comprises sensors installed at critical points of the water or wastewater network, collecting real-time information on flow rates, water levels and pressures. This is combined with core asset information and performance data sourced from BIM and geographical information systems (GIS) models, asset management systems, hydraulic models and external sources such as supervisory control and data acquisition (SCADA) systems and CCTV. A powerful middleware application scrubs, analyses and cross-references data, creating an accurate visualisation of real-time performance. Asset managers are automatically notified of any anomalies in performance, and H₂knOw-how can facilitate automated responses such as pipe closures or redirection for pre-defined incident scenarios.



Outcome

More than a dozen authorities use H₂knOw-how to actively monitor their water and wastewater assets, optimising performance and providing a better and cheaper service to end users. H₂knOw-how also aids asset recovery in the event of a natural disaster. In Christchurch, New Zealand, following the devastating earthquake in 2011, H₂knOw-how helped to identify breakages in the city's wastewater network by comparing current with historic data. Faults were easily located, and data analysis enabled us to measure the level of damage sustained – differentiating between severed pipes and those which had suffered less extensive damage – and allowing action to be prioritised.

Project

H₂knOw-how

Location

Australia and New Zealand

Client

Local authorities

Expertise

Software development and application design

Think water management is just about water? Think again.

Project

Blue Gold

Location

Bangladesh

Client

Bangladesh Water Development Board and Bangladesh Department of Agricultural Extension

Expertise

Technical advisory services

Opportunity

Almost 40% of people in Bangladesh's south-western coastal region live below the poverty line and face food and water insecurity. Their hardship is exacerbated by cyclones, storm surges, contamination of land and drinking water by salt water, droughts, river siltation and land erosion. Managing the country's abundant water resources and fragile land are crucial to long-term development.

Solution

The Blue Gold programme, covering an area of 115,000ha, is increasing the safety of local people by strengthening dykes and boosting crop productivity by clearing silt from drainage channels. We supported the formation of water management organisations (WMOs) – a third of whose members are women – to give local people control over the water resources affecting their lives. We are building the capacity of WMOs to plan, operate and maintain infrastructure, improve harvest yields and find new markets for produce.

Outcome

The WMOs have empowered local people, promoting a democratic approach to water management interventions. The new skills taught to villagers have improved the quality and diversity of their produce, and the project has fostered strong linkages between them and the private sector, creating new streams of income, much of which is reinvested to boost the productivity of land. Blue Gold's greatest legacy will be the self-sufficiency of the area's communities once the programme closes.



Khalid Hossain Ayon and Anis Parvez

Better weather forecasts on the radar

Opportunity

Gathering and analysing information on the timing and location of extreme rainfall is one of the most important aspects of stormwater flood management. In most urban settings in New Zealand, city authorities make use of rain gauges to understand rain events but it is difficult to know if the heaviest rain has fallen on a rain gauge or elsewhere in a catchment. Auckland Council, serving an area with extremely high rainfall variability, identified a need for more accurate short-term rainfall forecasts to support customer requests for service, emergency flood management operations and predictive hydraulic modelling.

Solution

We further developed our existing operational rainfall radar platform and incorporated a short-term (0-2 hours) nowcasting service for Auckland Council. Nowcasting takes in real observations of approaching rainfall and, by estimating direction and velocity, predicts where rain is likely to occur, allowing more accurate estimates of potential flooding issues. The system will be hosted on our H₂knOw-how web platform, which will allow easy access for any authenticated stakeholder to all radar data generated both in real time and retrospectively for post-event reporting and planning models.

Outcome

Access to complete, continuous, and consistent rainfall radar data across the region will assist in managing day-to-day operational issues and support Auckland Council's real-time response to major flooding events, helping it to inform customers and mobilise ground staff as required. In addition, the system's ability to archive data will provide significant benefit when analysing historic events for long-term strategic flood risk management and prioritising investment in large-scale capital infrastructure projects.



Project

Rainfall Radar

Location

Auckland, New Zealand

Client

Auckland Council

Expertise

Weather nowcasting, smart infrastructure, hydraulic modelling, software development

Unlocking investment in Amman's infrastructure

Opportunity

The rapid increase in the population of Amman placed increased pressure on wastewater infrastructure, one of the impacts of which was the discharge of untreated sewage into watercourses. Jordan's Ministry of Water and Irrigation turned to the private sector for support and the delivery of a modern full-scale wastewater treatment system. Affordability was a real issue so innovative financing was needed to realise the scheme.

Solution

The facility, with a throughput capacity of nearly 360,000m³ per day, provides full wastewater treatment and biosolids management and achieves 75% energy recovery. Delivered through a design, build, finance and operate (DBFO) contract, the Samra Project Company will operate the plant for 20 years with full responsibility for asset management and driving down whole-life costs. We provided technical and commercial due diligence to the lenders to achieve successful financial close of this complex project, which involved viability gap funding, followed by construction assurance and operation monitoring services.

Outcome

The project has delivered multiple environmental benefits by reducing odours and pollution at the treatment plant, tanker reception centre and satellite pumping stations. Treated water is being used by local farmers with the remainder safely discharged into the Zarqa River. The power requirements of intensive wastewater treatment have been minimised by installing hydropower turbines and generators that run on gas recovered from treated biosolids. This private public partnership (PPP) model has attracted the interest of local stakeholders and international funders as a template for delivering similar infrastructure projects – in Jordan and around the world – that lead to more efficient, more resilient utility services and a cleaner, healthier environment.

Project

As Samra Wastewater Treatment Plant

Location

As Samra, Jordan

Client

Arab Bank

Expertise

Lenders' technical advisory services



360,000m³

The daily throughput capacity of the plant at As Samra

Generating green energy in Albania

Project
Devoll Hydropower Project

Location
Banja, Albania

Client
Devoll Hydropower Sh.A

Expertise
Owner's engineer services



Opportunity

Albania needs new energy resources to meet the growing demand for electricity. Its mountainous terrain lends itself to the development of hydropower schemes. The commissioning of a hydropower plant at Banja, on the Devoll River in southern Albania, is the first phase of the wider Devoll Hydropower Project, which once completed will increase electricity production in the country by 17%, all of it through clean, renewable energy.

Solution

The Banja hydropower plant has a clay core rockfill dam measuring 940m long and 80m high. The reservoir has a surface area of 14km². With an installed capacity of 73MW from three Francis turbines, Banja will have an annual production capacity of 256GWh. We were the lead firm in a joint venture that supervised construction of the scheme, provided project, commercial and quality management services, and assisted with commissioning.

Outcome

The Banja hydropower plant was completed on time and on budget despite the challenges of unstable geological formations and limited infrastructure and communications. We also supervised the installation of 50km of transmission and distribution lines and the building of 50km of access roads. The project has contributed to regional economic development, job creation and other benefits to local communities and the environment including new agricultural activities, afforestation, and refuse and sewage treatment facilities.

73MW

The installed capacity of the Banja hydropower plant

Developing power-water cogeneration in Qatar

Opportunity

One of Qatar's strategic goals is to create infrastructure for economic development by leveraging local and international investment in strategic sectors such as water and power. Umm Al Houl Independent Water and Power Project (IWPP) forms a key part of Qatar National Vision 2030. It is being developed by Qatar Electricity and Water Company, K1 Energy (a joint venture made up of Mitsubishi Corporation and Tokyo Electric), Qatar Petroleum and Qatar Foundation. The project company, Umm Al Houl Power, decided to rely on our technical expertise during the construction of the plant.

Solution

The facility's advanced hybrid desalination configuration comprises six 280MW gas turbines with heat recovery steam generators and four 260MW steam turbines, along with five multi-stage flash distillers and a complete seawater reverse osmosis plant. Acting as owner's engineer, we are responsible for design review of all systems, technical support, supervision of construction and commissioning, and project management.

Outcome

Umm Al Houl IWPP will be one of the largest power-water configuration plants in the world, capable of generating 2520MW of power and producing 620,000m³ of drinking water per day. Construction work on the US\$3bn project started in 2015 and commercial operations are scheduled to begin by 2018.



Project

Umm Al Houl Independent Water and Power Project

Location

Umm Al Houl, Qatar

Client

Umm Al Houl Power

Expertise

Owner's engineer services

Reducing greenhouse gases and improving efficiency in NZ

Project

Rosedale Wastewater Treatment Plant

Location

Auckland, New Zealand

Client

Watercare Services Limited

Expertise

Concept and detailed design

Opportunity

The Rosedale wastewater treatment plant in Auckland currently has capacity to process wastewater from a population of 240,000. It was designed to be expanded to serve a population of up to 320,000 and peak flows of up to 4m³/s. We are acting as the principal engineer for the upgrade, which includes expansion of the primary tanks, odour control equipment, modified Ludzack-Ettinger bioreactor, digester, UV disinfection and associated electrical infrastructure.

Solution

We have designed a new digester with interface to a new gas engine and flare, which adds additional sludge retention time to the anaerobic digestion process, providing more resilience. It has the added benefit of reducing greenhouse gases and improving the yield of biogas, a by-product of the wastewater treatment process which is used to power engines that currently meet more than half the electricity needs of the plant and a sister facility.

Outcome

More advanced technologies have been incorporated as well as a reconfiguration to futureproof the entire digestion process. We are assisting with the integration of sustainable practices which will help Watercare achieve its goal of running the plant on 100% self-generated electricity by 2025, a target that will see it reduce its electricity demand on the grid by approximately 37GWh every year.



Cover image

Turning up the power in Pakistan

Tarbela is the largest earth-fill dam in the world and expansion of its hydroelectricity generating capacity is essential to meet Pakistan's rising demand for energy. Sedimentation could severely reduce its operating capability and our sediment management study has been critical in understanding how best to maintain and manage this key asset, which also provides water for irrigation and vital regulation and flood control of the Indus River. The study informs our overall design work for the fourth Tarbela power plant extension – the construction of which is currently taking place under our supervision – and the fifth extension project, which will significantly increase the plant's total generating capacity to 6.3GW.

Project

Tarbela Dam Extension

Location

Indus River, Pakistan

Client

Pakistan Water & Power Development Authority

Expertise

Sediment sampling and data analysis, numerical and physical modelling, detailed design and construction supervision

Opening opportunities with connected thinking.

For more information, search 'Mott MacDonald, Water' or contact water@mottmac.com

mottmac.com