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Cleaning London’s river artery

BY MARK HANSFORD

S
ince legendary engineer Sir Joseph Bazalgette built his sewers the population of London has grown from just over 2M to 8M.

While Bazalgette had the foresight to design the system to serve 4M – and while only 6.5M of those 8M are directly contributing to the sewer flows – it is simple maths to see the system is well beyond capacity. Historically the result has been that 39M.t of combined sewage spills out into the Thames in a typical year. It is unacceptable and it is time to act.

“London is growing and the sewer flows are rising, whichever way you look at it,” says Tideway chief executive Andy Mitchell. “It is only ever going to get worse.”

The Tideway project, at a cost of £4.2bn (in 2014 prices), is a bold solution. But, says Mitchell, it is the only solution that deals with the legacy problem.

“If you were designing a system from scratch, would you combine perfectly good rainwater with sewer water?” he asks. “No. But we are where we are.”

And London is not alone, says Mitchell. “When you look around the world there are many cities that either have or are planning similar things. Singapore is currently procuring the second phase of its Deep Tunnel Sewerage System,” he explains. “And our system is designed to be what a lot of these systems are designed to be: transfer and storage.”

And that is why it is so big. “It’s a reservoir as well as a transfer tunnel. So the tunnel has to be the diameter it is to create the volume,” he says.

Starting in Acton in west London, the main 25km long tunnel generally follows the route of the River Thames to Limehouse, where it then continues north east to Abbey Mills Pumping Station near Stratford. There it will be connected to the Lee Tunnel, which will transfer the sewage to Beckton Sewage Treatment Works. Along the way it

A combined sewer overflow in Vauxhall
will connect to over 30 combined sewer overflows (CSOs) that are located along the riverbanks.

The main tunnel’s diameter grows from 6.5m to 7.2m diameter as it heads east, descending from 30m to 66m below ground in doing so, and the Thames Tideway Tunnel combined with the Lee Tunnel will have a combined storage capacity of 1.6M.m³.

But it will still sometimes not be enough to totally eradicate spills: “Today, around 60 times a year there is a spill,” explains Mitchell. “The Thames Tideway Tunnel will play a big role in reducing this to less than four. But if you look at what it would take to reduce this to no spills at all, it would have to be double the size and it gets to the point where it doesn’t make economic sense.”

He also points out that the tunnel will only hit capacity during pretty serious storm events, and only then after what was already sitting in the sewer system has been flushed into the tunnel – meaning what is left to overspill contains much more storm water and therefore is much more diluted.

“So if we are somewhere in the region of a 96% reduction in spills we are reducing the actual volume of sewage spilt into the Thames much more than that,” notes Mitchell.

That is, of course, if nothing changes. But if London continues to grow and rainwater continues to be allowed into the sewer system then the number of spills will increase. So for Mitchell the tunnel cannot be seen as a panacea. Sustainable drainage solutions (SuDS) must also come into play.

“The argument around whether we build the tunnel or look for SuDS became a binary argument,” says Mitchell. “The reality is we need to do both. The tunnel is the only volume fix we have to solve the problem we have now. But going forward, we need to do more with SuDS. London has got to get way smarter through planning. We have got to get more intelligent in how we deal with the resources we have and throwing good water into a sewer doesn’t make sense.”

Mitchell absolutely cares about the bigger picture and the entire Tideway project has to be seen as more than building a tunnel, he insists. “Our vision is a bigger one. London has forgotten the river and the significance it can play in the way London works,” says Mitchell. “Why is London not in love with its river like Paris is in love with the Seine?”

Tideway has a raft of initiatives in place to help make this reconnection a reality. Many of them are social in nature, but others have a clear commercial slant. One such is the Thames Skills Academy, which Tideway is supporting along with the Port of London Authority and Transport for London. “We are going to train some 300 new people to work on the river to do the work we are going to need,” says Mitchell. “In doing that we are going to prove you can support a time-critical 24/7 operation in a safe way using the river. And after that, the answer can’t be for that skills base to dissipate. These skills have got to be taken up by others.”

Mitchell and his team is also hugely aware of the need to be a good neighbour (see page 24). After all, unlike Mitchell’s previous project, Crossrail, where he was programme director, most of those affected by the seven years of construction stand to make no obvious gain. Indeed all that most will see is an increase in their water bills to pay for the project, although this increase has been significantly reduced.

And that desire to get in and get done was a major driver behind Mitchell’s push to speed up delivery and knock up to two years off the construction programme.

Being built from three main construction drive sites in Fulham, Wandsworth and Bermondsey, using six tunnel boring machines (TBMs), the project was expected to take up to seven years to complete. The geology varies with the western section in predominately London Clay, the Central section being bored mostly through Thanet Sands and the Eastern section largely through chalk. Work will require the use of 24 construction sites, 11 of which are located along the riverbank. Many are in residential areas. With the main construction work already scheduled to start in 2016, speeding up the programme was almost
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On every job I have been on the quicker you finish, the cheaper it is

“On every job I have been on the quicker you finish, the cheaper it is,” explains Mitchell.

And why? “Well as we see it, there are three reasons why it just makes sense,” explains Mitchell.

The first plays straight to the good neighbour message. “Frankly, we are a distraction to our neighbours,” he states. “No matter how good we are, the sooner we are gone the better.”

The second is cold commercial. “On every job I have been on the quicker you finish, the cheaper it is,” he says. “So bill-payers pay less and our shareholders do better.”

And finally, it’s back to the reason to be there in the first place: “Quite simply the Thames is cleaner quicker,” he states.

But shaving two years off of a seven-year construction programme is no mean feat. After all, innovative engineering in the design phase has already reduced the tunnel from the initial 32km proposed, down to 25km, and reduced the number of construction sites needed from 45 to 24.

A key aspect has been engaging stakeholders in the project through the Thames Tideway Tunnel Forum, comprising representatives of the affected local authorities and other statutory consultees and regulatory bodies.

“We have been very encouraged by the support that we have had from the consent granting bodies, who clearly understand the benefits of an early finish,” he says.

Some of the solutions to delivering faster inevitably mean more intensive, more visible construction works, particularly at the early stages.

For example, to construct diaphragm walls for shafts quicker you need to diaphragm wall more hours. So noise-containing sheds over certain shafts have been significantly enlarged, so that they can contain the rigs and allow them to work longer hours.

You also need more resources on the project, again particularly in the early stages. All that of course comes at a cost, and pursuing the earlier programme is costing in the region of £50M over the three construction contracts, all paid for by Tideway through variations in the contract terms.

“In the big scheme of things it is not a big percentage, but it is an intelligent thing to do and this investment will pay dividends in the long run,” says Mitchell. “And we have arrived at the very best place to be.”

The net result is the construction JVs are aiming for six months
earlier on site, a further six months earlier to start tunnelling, and an additional year has been taken out of commissioning and testing. Crucially, no time has been taken out of tunnelling at all, with the tunnelling programme set according to the long run average rate achieved in constructing the Lee Tunnel and Crossrail. That is crucial because it means no compromising on safety. And here Tideway is using the word transformational. Its “EPIC” safety induction programme is designed to be impactful and no-one – and Mitchell means no-one – is getting near one of his sites without having done the full one-day induction – even to change a lightbulb or fit a new filter on a crane. The day plays out a real-life scenario interactively and it is, says Mitchell “quite an impactful day”.

That induction day is followed up with a boat trip designed to familiarise everyone with the project and unite them in a common goal. “Everyone but everyone has a common first day and I want everyone to have a boat trip,” enthuses Mitchell.

“And then I want everyone once a year to take their family on the same boat trip to show them what they are doing,” he concludes.

“If we want people to feel differently about the job, we have to treat them differently; again, we believe that by investing in the workforce and how they think and feel every day, we will see the benefits in behaviour and performance.”

This is all part of a Right Way programme, through which Mitchell genuinely intends to make Tideway a new exemplar. “If you don’t do something meaningfully different why would you expect a different result?” he asks.

“We want the sites to have a sense of ‘my goodness, this is different’,” he adds. “So we are challenging contractors to say ‘what would be ideal?’; ‘what would the site have to say ‘what would be different?’.”

That desire to be different also feeds into Mitchell and Tideway’s powerful diversity message. The goal has been set for a 50/50 gender split in the project team by the end of the project. A raft of initiatives is in place and Mitchell is happy with progress. “A year ago we were 30% female across all areas and we ended the year on 36%. We have set a target to be 40% by the end of this year. So it’s alive and kicking,” he says.

The project has just welcomed its second batch of returnships after all seven in the first wave carried on at the end of the returnship programme. The contractors are involved in this second batch.

“Health, safety and wellbeing is a relentless task,” he says. “And then I want everyone once a year to take their family on the same boat trip,” enthuses Mitchell.

“Health, safety and wellbeing is a relentless task, you can never take your foot off the gas, and we need to be constantly thinking of new ways of doing things. Key to this is ensuring that all staff, no matter what role they play, feel like they are part of the family that helps us deliver that transformation. One example is our EPIC Day 2 induction, a boat tour on the river that introduces staff to our construction sites and brings to life our vision of reconnecting London with the River Thames. We want all our employees to see how they are part of the bigger picture in cleaning up London.

Another objective is being able to deliver the project in a way that the industry hasn’t seen before. We want to set a benchmark on how we can work together as an alliance to get things done, and to ensure people get rewarded for doing a good job. It is about doing it the right way and doing it together.”

Mark Sneesby is Tideway chief operating officer.
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VOLUMES OF DISCHARGES FROM LONDON’S COMBINED SEWER OVERFLOWS (CSOs)

**TUNNEL DEPTHS**

- **Acton Storm Tanks**
- **Carnwath Road Riverside**
- **Kirtling Street**
- **Chambers Wharf**
- **Abbey Mills Pumping Station**

- **Clay**
- **Sand**
- **Chalk**

- **West**
- **Central**
- **East**

**Total overflow:**
- Existing system Thames Tideway Tunnel and associated improvements: 39.5M.m³
- Hammersmith Pumping Station: 104,000m³
- Western Pumping Station: 246,000m³
- Greenwich Pumping Station: 573,000m³
- Abbey Mills Pumping Station: 2.04M.m³

**Total overflow:** 2.35M.m³
The £4.2bn Thames Tideway Tunnel will run 25km from Acton in West London to Abbey Mills in East London, where it will be connected to the Lee Tunnel. It will connect to the most polluting combined sewer overflows along the river banks.

### Volumes of Discharges from London’s Combined Sewer Overflows (CSOs)

#### Existing System

- **Hammersmith Pumping Station**: 2.2M.m³
- **Western Pumping Station**: 2.04M.m³
- **Greenwich Pumping Station**: 3.94M.m³

**Total overflow**: 39.5M.m³

#### Thames Tideway Tunnel and Associated Improvements

- **Hammersmith Pumping Station**: 104,000m³
- **Western Pumping Station**: 246,000m³
- **Greenwich Pumping Station**: 573,000m³

**Total overflow**: 2.35M.m³
Driving west

BY MARGO COLE

The Tideway’s West section runs 7km from Acton to Battersea, picking up six combined sewer overflows (CSOs) and incorporating seven separate work sites along the way. A three-way joint venture (JV) between Bam Nuttall, Morgan Sindall and Balfour Beatty won the £416M contract to deliver this section of the project last August.

“The reason we came together was that we had all had recent experience from either Crossrail or the Lee Tunnel, or both,” explains Bam Nuttall, Morgan Sindall and Balfour Beatty JV project director Chris Hughes. “It is an equal joint venture, with all three companies having a one third share, and we operate on the principle of ‘the best athlete’, for each staffing role, so it is fully integrated. This differs from a consortium approach, where each contractor undertakes a discrete section of the works.”

The JV bid for all three Tideway contracts. “That brings benefits because we have a good knowledge of all three sections, so we understand the issues that affect the alliance as a whole,” says Hughes.

The Tideway West section is using a JV of Arup and Atkins for route wide hydraulic and structural design, with UnPS undertaking the shaft and
The 6.5m diameter tunnel starts at Acton, where some existing storm tanks discharge to a combined sewer overflow (CSO).

Going downstream, it heads south beneath predominantly residential areas to meet the river just west of Hammersmith Bridge, passing under a short length of land to the south before joining the line of the river and following it to Carnwath Road in Fulham. Along the route it picks up existing outfalls at Hammersmith Pumping Station on the north side and then Barn Elms (Richmond), Putney Embankment (Wandsworth), Dormay Street and King George’s Park (Wandsworth) on the south, before meeting the Central section of the project at Carnwath Road on the north west side of Wandsworth Bridge.

The Dormay Street and King George’s Park overflows discharge into the River Wandle, a 14km long tributary of the River Thames that runs through south west London and joins the river at Wandsworth. These CSOs will be intercepted by a new tunnel – the Frogmore connection tunnel – which connects to the main tunnel at the Carnwath Road shaft.

“This project will largely eliminate overflows into the River Wandle,” explains Tideway West delivery manager Ben Green.

“A lot of the River Wandle was culverted and covered over, and there is currently a CSO from the park that runs into the River Wandle and from there into the Thames. This gives us one of our biggest opportunities to reconnect people with the Thames, its tributaries and its history.

“The project is not just about building a tunnel; it is about building a lasting legacy for local people, and a lot of the benefit of that will be seen in the West,” Green continues.

The section of the Thames between Putney and Hammersmith is one of the most popular stretches of water in the UK for leisure activities, and hosts around 80% of the country’s rowing – including the famous annual Oxford versus Cambridge boat race.

The Tideway West team plans to drive its section of the tunnel westwards from a shaft at Carnwath Road, and has just begun work at the site to strengthen the existing river wall in preparation for construction of the shaft.

“Establishing the drive shaft at Carnwath Road is on the critical path for the whole of the West section, then tunnelling to Acton,” explains Hughes. “The CSOs have some float, but the one at Hammersmith is fixed.”

Work at the Hammersmith Pumping Station is timetabled to fit in with a new residential development being built by developer St George on the site of a former distillery.

“When I joined the project two years ago, the developer effectively had one partly built block of flats. Now it has three that are occupied,” says Green.

“One of biggest environmental benefits of the project is that it transfers these flows into the main tunnel instead of on the doorstep of a new residential development – so the sooner we can get in and get out, the sooner it will benefit.”

The entire tunnel drive in the West section should be in London Clay, although the team is aware there could be anomalies in the form of “pingos” – air pockets in the strata that mean “one minute you’re in clay, the next in running sand”, according to Hughes.

Comprehensive ground investigation along the line of the West tunnel section has not picked up any unusual conditions, but Green says:
“It’s a known risk that we have mitigated for.”

The Bam Nuttall, Morgan Sindall and Balfour Beatty JV is close to placing an order for its tunnel boring machine, and anticipates that it should arrive on site in around 12 months’ time. But according to Hughes, the tunnel itself is not the biggest challenge: “The river logistics are probably the key challenge,” says Hughes.

“We are the furthest upstream section, and we will be using the most barges.”

He says the JV is putting a lot of thought into how to move spoil from the tunnel by river, and has also been challenged by the client to bring all the tunnel segments in on barges as part of its “More by River” policy to reduce congestion, noise and carbon emissions.

“We think the Tideway project will result in over three times as much river freight traffic as there is today, so that gives us a challenge in recruitment and training to make sure we have people ready for the ramp up with the right skills,” says Hughes.

Green adds: “This project is not just about building a tunnel; it is about building a lasting legacy for London – and that includes revitalising the River Thames for freight traffic.”

Hughes says the Tideway scheme is an opportunity to open up the river to greater freight use, and there are sufficient other projects planned or underway on the Thames – including the Garden Bridge, the Northern Line Tube extension and the redevelopment of Silvertown – that will make it worthwhile for freight operators to invest in people and boats.

The JV for the West has itself just bought two specialist tugs and is looking to procure some heavyweight barges to carry tunnel spoil and materials (see box).

Alongside this, it is working with an existing river logistics specialist to help bring in and train people to operate the specialist craft that will be required.

““The key skills are being able to navigate safely through all these bridges, with the tidal constraints of the Thames, at the same time as transport on the river is increasing as a result of all these schemes,” says Hughes.

“There are other industries that have people who can drive boats – like offshore wind, oil and gas, and fishing. We could take people from those industries and train them to navigate the Thames.”
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Across the centre

BY RUBY KITCHING

Tideway’s £750M Central section will meander beneath the River Thames collecting sewage from seven combined sewer overflows (CSOs) to keep the London river clean.

The Tideway project requires construction sites to be set up temporarily near each of the existing seven CSOs on the Central section to allow the accompanying upgrades and new infrastructure to be built. Eight of these sites require shafts between 9m and 30m in diameter and between 40m and 53m deep with varying lengths of connector tunnels 3m to 4m in diameter to create the path for sewage to flow from each CSO to the Thames Tideway Tunnel. Ferrovial Agroman Laing O’Rourke is the joint venture (JV) design and build contractor with consultant Aecom developing
At first sight Tideway is a tunnelling project, but it’s much more than that

ANDY ALDER, TIDEWAY CENTRAL DELIVERY MANAGER

The JV’s detailed design, all for client Tideway.

“At first sight Tideway is a tunnelling project, but it’s much more than that,” comments Tideway Central delivery manager Andy Alder.

Across the sites, river walls will be repaired and rebuilt, significant culverts will be constructed and land will be reclaimed from the Thames at the Albert, Chelsea and Victoria Embankments as well as at Blackfriars Bridge, in the City. This land will be created using a sheet piled cofferdam in the river, pumping water out, filling it with earth, sinking the CSO shaft, constructing the connector tunnel and building up a pavement for new public spaces that reinstate the capital’s relationship with the watercourse. One advantage of building on these reclaimed areas is that there will be fewer utilities or obstructions in the ground, unlike on the other Tideway construction sites.

At Blackfriars Bridge the CSO shaft will be built directly over the tunnel, along with challenging ground level works: significant infrastructure will need to be built close to Tube tunnels, as well as under and either side of the bridge.

“Building the culvert at Blackfriars is like building a two lane cut and cover tunnel,” comments Ferrovial Agroman Laing O’Rourke JV project director Tom Tagg.

Across the length of the Central section, the method of shaft construction varies according to the particular constraints of each site. Since the shafts pass through the Lambeth Group – strata known for their variability and pockets of water-bearing soil – careful consideration has also been given to prevent water inundation.

Engineers are currently weighing up the availability of land to store materials, the influence of ground conditions, noise sensitivity, access and programme requirements for each shaft.

“Diaphragm wall construction has good watertightness, but requires more land for concrete batching and a ready supply of bentonite,” says Alder. These ancillary items would not be required for a segmentally lined shaft, he continues, but there would be an added requirement for better groundwater control, “which can take some time to establish.”

Tunnelling for the Central section will begin at Kirtling Street in Battersea, located about half way along the route, where a 30m diameter, 48m deep shaft will be sunk to allow two tunnel boring machines (TBMs) to progress east and west. The tunnel will fall 15m from Carnwath Road to Chambers Wharf for it to be self cleaning.

Work at Kirtling Street began in March with demolition of existing buildings and site clearance. Since tunnel arisings will surface at Kirtling Street, work here will also involve building an overhead conveyor system and jetty to transport material away by barge.

Tideway is using river transport wherever possible and, at Kirtling Street, barges will also deliver tunnel segments, construction materials and plant to minimise disturbance to nearby residents and road users.

To minimise the use of dewatering, the Kirtling Street shaft (on the Central section’s critical path) will be built using a diaphragm wall. Phased construction concurrent with demolition has already saved £750M.

£750M
Value of the Central section contract
13km
Length of Central section

Above: At Blackfriars, significant infrastructure will be built close to Tube tunnels as well as beneath and on either side of the bridge.
The thought being put into each shaft’s construction demonstrates one of Tideway’s underlying philosophies – to use the most appropriate method for the job, rather than to use a “one-size-fits-all” strategy. The intention is then to yield programme savings, which will ensure the project can be completed two years earlier than originally planned (New Civil Engineer 10 December 2015).

“We made a conscious decision not to squeeze the construction programme, but to get the design done more efficiently and get consents earlier,” explains Alder. Maximum effort was also put into coordinating the 300 consents that needed to be in place prior to starting on site at Kirtling Street. These included protection of marine ecology, minimising disturbances and maintaining traffic flow, as well as some much wider aspects.

“Tideway isn’t just about improving the health of the river, it’s about improving a whole area by creating business opportunities and creating a legacy,” adds Tagg.

Meanwhile, engineers have also been concentrating on optimising construction methods to improve safety and productivity.

“Take the diameter of the connector tunnels,” says Alder. “Although the hydraulic engineering suggests they should be 3m in diameter, when we consider the size which would make it easier to build and size of machinery we need, we may opt for a bigger tunnel.”

The construction sequence at each site (except Blackfriars Bridge) involves first sinking the shaft, then excavating the connector tunnels by advancing 1m at a time and spraying fibre reinforced concrete to support the ground. A secondary cast insitu lining is then applied to complete each connecting tunnel and shaft. An earth pressure balance TBM will be used for the main tunnel. It will install 1.8m long segments, 350mm thick. Seven segments plus a keystone are required to complete each 7.2m diameter ring.

“The method of construction over 20 weeks on the programme, allowing shaft construction to begin in late summer 2016.

The tunnel boring machines (TBMs) are being designed and manufactured using building information modelling (BIM) so that they can be scrutinised more easily by the project team.

Tideway Central delivery manager Andy Alder and joint venture contractor project director Tom Tagg, and many of their team members previously worked on Crossrail. They have used their experience to drive greater efficiencies in the Tideway TBMs.

“Using BIM, we can check that access to all parts [of the TBM] are adequate and that there are no health and safety issues, which would need to be addressed when it arrives on site,” explains Alder.

“For example, we can make sure platforms are exactly where we need them to be for maintenance, instead of having to spend weeks erecting them on site.”

Carrying out this work in the fabrication yard is undoubtedly easier and safer than on a construction site.

He adds that to speed up and simplify TBM reassembly on site, the team has requested that the manufacturer ships parts in larger sections than normal.

This simple initiative is shaving another few weeks off the project’s construction programme.

The annual Chelsea Flower Show. At Chelsea Embankment, work will have to stop when the flower show is taking place. In Central, working patterns and deliveries will also have to accommodate events such as the London Marathon.

“We have to build in a way which also allows us to stop for certain events,” explains Alder. “Every site has its own challenges, but on the Central section, everything we are doing is very visible and, with very little space for us to do our work in, there is a heightened interest in what we are doing and how.”

There are a number of milestones during the course of constructing the Central section including coordinating connections to the CSOs with Thames Water and the tunnel’s western and eastern extremities. Running eight separate construction sites in parallel will be one of Tideway’s main challenges.

“Before this is a tunnelling project, it is a marine job and some of the most complex parts – coordinating with existing underground services and other ground works – take place before tunnelling begins,” comments Tagg.

Indeed, tunnelling for the Tideway’s Central section could prove to be considered its most straightforward operation.
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Engineering savings

BY JACKIE WHITELAW

In a nice nod to London’s first super sewer designer Joseph Bazalgette, the builder of the East section of the new Tideway scheme will be launching one of its tunnel boring machines (TBMs) from an original Bazalgette pumping station – at Greenwich. That TBM will be constructing a 5m internal diameter connector tunnel over 4.5km to link with the main Thames Tideway tunnel at Chambers Wharf, south of the river and just to the east of Tower Bridge. Chambers Wharf is where construction of the East section proper begins, and from where the main 7.2m internal diameter tunnel will be driven 5.5km to Abbey Mills in East London. There, it will connect with the existing Lee Tunnel, which will take the sewage collected by the whole Tideway scheme to the Beckton Sewage Treatment Works.

The contracting joint venture (JV) building both tunnels under its £605M East section contract comprises Costain, Vinci Construction Grands Projets and Bachy Soletanche. The JV’s designer is Mott MacDonald.

“The selection of the Greenwich connector tunnel option instead of continuing the main tunnel to Beckton saved 7km of tunnelling and hundreds of millions of pounds,” says Thames Water programme manager for Tideway integration David Whittaker.

Now the theme of savings in the east has been continued by the contracting teams building Tideway with another innovation that has been the direct result of working in alliance, he explains.

“The three contracting teams are operating on a single pain/gain share arrangement, so everyone benefits from beating targets and loses out even if just one party is off its game so as to encourage innovation and collaboration,” he said (see feature page 32).

As part of the East section contract, Costain, Vinci

The biggest challenge is going to be the competence of the chalk and dealing with flints

JACKIE ROE, TIDEWAY EAST DELIVERY MANAGER

Main image: Greenwich pumping station, Bazalgette’s only pumping station south of the river, built in 1860s
Construction Grands Projets and Bachy Soletanche JV will build a dedicated chamber for the Central section team of Ferrovial Agroman Laing O’Rourke in which to park its TBM when it completes its tunnelling journey at the Chambers Wharf site, rather than wait for the East team to clear out of its shaft, a decision that has cut a full six months off the original programme (see box).

In one move, that accounts for a third of the total 18 month reduction in the original programme that the alliance has identified so far after it was challenged by Tideway chief executive Andy Mitchell to get the scheme built two years quicker.

“At least another six months has also been predicted to be saved in commissioning by the mechanical, electrical, instrumentation and control alliance for Tideway and another six months in various preconstruction and advance works,” says Tideway East delivery manager Jackie Roe.

The East section will be the last to finish. “The stretch target is currently to complete tunnel construction by September 2021 instead of August 2022 and for it to be commissioned by July 2022 rather than March 2024,” says the JV’s deputy project director Mike Sawyer.

Sawyer’s two slurry TBMs are not scheduled to be in the ground until August 2018, with both drives carried out in parallel. They are going to be tunnelling through chalk at 60m depths, so there are no concerns about hitting underground services and Tube lines.

“The biggest challenge is going to be the competence of the chalk and dealing with flints,” says Roe. Vinci Construction Grands Projets and Bachy Soletanche were both part of the team that constructed the £635M Lee Tunnel at up to 80m depths, also through chalk, so are bringing the experience and learning from that project which opened in January 2016. In fact, the newly arrived project director for the East contract, François Pogu, was the Lee Tunnel PD.

“We are going to be working at 4 bar pressure, which is less than Lee (where the TBM face pressures hit 7.5bar at maximum depth),” Roe says. This gives the team confidence. “And there was concern on Lee about the potential for high pressure water to enter the tunnel when changing the cutting heads.

One of the main places the Tideway contractors looked for savings in the programme under the alliance was at the interface between contracts, often the Achilles Heel of major projects.

The challenge at the connection between the Central section and East section was that the Central team was due to arrive at the East a number of months before the East section would finish tunnelling.

“The Central team’s TBM was due to arrive at Chambers Wharf before we finished our drive, which meant it couldn’t get out and get on because the shaft would be full of our equipment,” says Tideway East JV deputy project director Mike Sawyer.

“So we came up with a different method of TBM launch and receiving which has knocked up to six months off the programme.

“We are building the Central team a chamber outside our shaft so it can drive its TBM into it and having done that can remove all the back-up plant and finish the secondary lining of its tunnel.

“Effectively they can park up and go.” The three contracting teams on the Tideway scheme have to date elected to be based in the same building to aid collaboration like this across the project.

“We can just walk upstairs and talk to each other,” says Sawyer. “That is so productive. There is no reason to compete; under the alliance arrangement we all need to succeed together.”

Other areas the teams are working together on include common testing facilities and common procurement of reinforcement and fuel.

“There is also going to be a common training regime for the boatmasters needed for the river deliveries,” says Sawyer.

INNOVATION USING THE INTERFACE
We are going to be working in a residential area, so we will be sensitive to the locals’ concerns

Mike Sawyer
JV Deputy Project Director

800,000 Tonnes of chalk to be removed from main East section tunnel drive

in poor ground, but this proved unfounded as they always found competent chalk in which to carry out that activity.”

Lee used a pressurised mixed shield slurry TBM built by Herrenknecht, but no decision has yet been taken on who will manufacture the Tideway East machines. “They will be ordered this autumn,” according to Whittaker.

The most pressing task for Sawyer is to create the work platform for the main east drive. This involves construction of a cofferdam in the Thames, measuring 145m by 60m, which can be filled with ballast to double what limited land was there but while still creating a very contained site. It will also allow for creation of a non-tidal berth, so secondary lining segments and aggregates can be brought in by river transport to reduce lorry movements and pollution in the capital.

“We are going to be working in a residential area, so we will be sensitive to the locals’ concerns,” he says. “We have strategies in place to reduce noise levels and monitor air quality. Working hours for surface work are restricted to 8am to 6pm Monday to Friday and 8am to 1pm on Saturdays, though we are allowed to carry out some activities up to 10pm on weekdays to take advantage of the tides.

“Noise sheds will cover the shaft, and tunnelling will be going on 24/7. We’ll have a treatment plant for the slurry on site where the chalk can be pressed to remove water and then taken away by barge to landfill. There’s going to be a lot of it – 800,000t from the main drive and 350,000t from the Greenwich connector.

“Our enabling period is longer than the other sections because we have to build the cofferdam,” Sawyer continues.

When the cofferdam is complete, construction of the shaft to create the launch pit for the TBM can start. This is going to be 60m deep, created using the hydrofraise method of diaphragm walling.

Hydrofraise is a Bachy Soletanche speciality and involves a reverse circulation drilling rig with two cutter drums that rotate in opposite directions.

Counter-rotating wheels dig into the ground and a pump within the cutter sucks solids away. As it is excavated, the trench is topped up with bentonite slurry to maintain the stability of the sides. “It’s a very accurate technique,” Roe says.

“Installing the diaphragm wall will take six months,” Sawyer says, “followed by another six to excavate the shaft. This then needs a secondary lining, so the TBM will be launched in August 2018 on the stretch programme.”

When the main drive TBM gets to Abbey Mills in 2021, arrangements are already in place to receive it. The Lee Tunnel project constructed two shafts at the pumping station, connected by a concrete plug. One shaft is currently in use, the other is the target for the Tideway East drive.

“We get there and then excavate the concrete plug to unite Tideway with Lee Tunnel,” Roe says.

Plans for where to fabricate secondary lining segments for shafts and tunnel are in place. “We are going to be manufacturing them ourselves and are in the process of awarding a contract.

Unlike the other Tideway sections, East is not troubled by too many combined sewer overflows. There are two on the Greenwich connector – at Deptford Church Street and Earl Pumping Station, along with Greenwich Pumping Station itself which have to be taken into the scheme. And on the main tunnel there is one combined sewer outfall at King Edward Memorial Park Foreshore in Shadwell.

At the park site, the work will create its own legacy when the job is completed – an extra piece of open space to become a permanent amenity.
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PHOTO: Bond St. Tunnels, Image credit to Crossrail

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he scale of Tideway as a project is evident from the statistics: from the £4.2bn being spent, to the thousands of construction jobs that will be created. But the scale of the project’s impact on Londoners is clear from the number of people who were engaged in the public consultation process.

“In 2010 we wrote to 300,000 people who either lived in or around properties close to the proposed construction sites or adjacent to the alignment of the tunnel,” says Tideway external affairs director Phil Stride.

“That’s when it first became apparent to people there was the potential for us to be working in their communities.”

That initial letter was the start of a huge public engagement and consultation process when the project team – at this stage under Thames Water – shared its plans for the scheme as a whole and proposals for work at each of the sites.

“We did 114 days of public exhibitions around each of the neighbourhoods, as well as 200 external or public meetings,” says Stride. “I am very proud that through the whole of that time, we have never refused to give a briefing to a community group, action group or society.”

Stride believes that one of the important decisions we took was to have project team members staffing these exhibitions and meetings, and doing their best to answer every question.

“The learning from all of this is that being open, honest and transparent is absolutely fundamental,” says Stride.

 Almost three years of public exhibitions and consultation generated 9,400 pieces of feedback from individuals and groups commenting on the proposals. “That was a really important stage of the consultation,” says Stride. “We listened to what people said and took their comments on board, and – whenever we could – we changed our proposals.”

The comments broadly contained two messages: where you can, use brownfield land instead of greenfield; and where possible use river instead of road transportation. The latter point has been addressed by Tideway’s “More by River” strategy that sets targets for the contractors to deliver materials and remove spoil using barges on the River Thames, which Stride calls “an underused motorway through the middle of London”.

Great work went into accommodating local concerns. For example, the main drive site for the West section was originally going to be in the Barn Elms playing fields in Barnes. Public feedback combined with evolving technical factors led to this moving to a brownfield site at Carnwath Road in Fulham.

Other changes included moving the main shaft for the East section from King’s Stairs Gardens in Southwark to nearby Chambers Wharf. “Following phase one of the consultation, we were questioned about having a large main shaft in a small park,” explains Stride. “These were very active protest groups, who pointed out that the owner of the Chambers Wharf site just along the way was not going to develop it. From there we went on and purchased that land.”

He adds: “In some way we changed every site where we’re going to maintain a presence. At King Edward Memorial Park in Tower Hamlets we dramatically changed the design to include a
sympathetic extension of the park. There was no other place to intercept the North East Storm Relief sewer, but through careful design and working methods, 80% of the park will remain open throughout the work.”

One of the original work sites at Druid Street was a small play area in the middle of a block of flats in Southwark. “Through smart hydraulic design, we worked out that we could control the sewage discharge without building at that site at all,” says Stride. While much of the consultation and engagement process has been about working with people living close to the work sites, Tideway is also keen to be a “good neighbour”.

More generally initiatives include employees spending, in total, an average of 75 minutes a day working in schools as science, technology, engineering and maths (STEM) ambassadors and providing educational tools for teachers; supporting London Youth Rowing’s programme to develop young people through physical activity; and supporting Thames 21’s Riverwatch initiative to raise awareness of the health of the river.

“Our engineering challenge is to build a sewer to help stop sewage getting into the river; but our vision is to reconnect London and Londoners with the river,” explains Stride.

Tideway wants to be transformational not just in terms of the end result – a cleaner river – but also in terms of the economy of London: creating over 4,000 direct jobs many more indirectly in the supply chain; permanently transforming the use of the river by tripling the amount of freight it carries and training 300 people to work on it; making sure 25% of the people employed on the project are from the 14 London boroughs it passes through; and providing opportunities for local SMEs.

At least one in 50 on site jobs will be apprenticeships; one in 100 roles will go to ex-offenders; and contractors are involved in local volunteering.

“We understand that this is a harder sell than Bazalgette experienced,” says Stride. “The river isn’t black, and people in East London don’t have cholera and typhoid. But in general terms, the vast majority of people get to a point where they want to work with us to get the best out of the project.”
Getting the right balance

BY MARGO COLE

Case Study
Fiona Keenaghan

“Tideway has tried to tailor the work I was doing in the office with what I was learning at college”

Fiona Keenaghan is a civil engineering technician who joined Tideway on its BTEC L3 Construction and the Built Environment – civil engineering apprenticeship programme in 2013.

What was the attraction of the apprenticeship?
“I liked the idea that I could work and study at the same time, and get paid to do it.”

What did the apprenticeship involve?
“The apprenticeship lasted two years. During that time I rotated around teams, starting with environment and consents, health and safety, field investigations, and finally Delivery East Engineering. I liked the fact that, whatever team I was in, Tideway has tried to tailor the work I was doing in the office with what I was learning at college. It meant I was able to see the practical side of the things that I learnt at college and get a better understanding of what I was learning. Also, if there was something I didn’t understand at college, there was always someone who would be able to explain it to me in the office.

“I studied one day a week and spent the other four days at work. I also had to complete an NVQ in civil engineering.

How has your career progressed?
“I stayed in Delivery East Engineering at the end of the apprenticeship and got promoted to civil engineer technician. In my job I could be working on calculations, working on the programme or assisting with reviews of the documents our main works contractors submit.

“I'm currently studying my HNC part time and I hope in the next five years I will be a fully qualified engineer.”

oon after being appointed in 2014, Tideway’s chief executive Andy Mitchell announced that he wanted to achieve gender parity on the project by the time it finishes.

He said: “We need women, and we need diversity. It’s a fact that a diverse workforce is a more productive one; and if we are to deliver infrastructure that is of most use to society, we are more likely to achieve that with a team that is representative of that society.”

Mitchell’s announcement coincided with a change in emphasis within the Tideway team, as head of HR Julie Thornton recalls.

“When I came on board, this project was very focused on the technical engineering side of things. Then, around Christmas 2014, we did an exercise around what our vision and values and behaviours should be. “One of things that came out was the importance of what we leave behind – the fact that we are cleaning up the river. That started to...
Focusing our vision on the river, rather than the engineering, allowed us appeal to a far broader range of people.

One example of this is the language used in job adverts. Instead of focusing on the engineering, Tideway’s ads now talk more about cleaning up the river and the legacy of the project.

But the organisation is not relying solely on traditional recruitment methods. It is also actively using job boards that specialise in attracting part time workers and those wanting to return after a career break. Tideway has given the alliance contractors targets around the percentage of their workforce that must be made up of local people, apprentices and ex-offenders – but has not insisted they achieve gender parity.

“In fairness to the main contractors, they’re doing some great things individually,” says Thornton. “A lot of this is about us learning from them. It isn’t just us dictating.”

“Tideway is using job boards that specialise in attracting part time workers and those wanting to return after a career break.”

12 weeks
Length of Tideway’s returners programme

12 weeks
Length of Tideway’s returners programme

CASE STUDY
CAROLIEN BATENBURG-SOONS

“I enjoyed being at home; however, after two years I was ready to get back to work”

Carolien Batenburg-Soons is assistant integration manager at Tideway, having joined in the first cohort to be recruited through the returners programme in April 2015. She trained as a civil engineer, and worked for seven years on projects in her home country, the Netherlands, before taking a career break.

What is your background?
“In 2012, when I relocated to the UK with my husband and four children. I chose to stay at home until everyone was settled. I enjoyed it, but after two years I was ready to get back to work. In 2014 I started to rebuild my network, with former university classmates and connecting with people I used to work with. My first job in London was a short project with the Greater London Authority (GLA) on sustainable drainage systems.

“I continued my search when the GLA project ended, and then I read about the returners programme with Tideway. It looked perfect for me, as I have a masters in tunnel safety and worked on many tunnel projects in the Netherlands.

“I was back at work again within a month. Once the returnship programme ended, I applied for the assistant integration manager job, and commenced my current role in August 2015.”

What does your job involve?
“The Tideway project consists of six organisations working together in an alliance. The objective of my team is to promote collaboration with all parties to ensure seamless delivery of the works. My role supports the alliance structure, ensuring interface issues are identified and monitored, and consistency of approach across delivery areas.”

What are the benefits of the returners programme for you?
“Tideway is using job boards that specialise in attracting part time workers and those wanting to return after a career break.”
Cutting out the CO₂

BY MARGO COLE

A key element of the Development Consent Order (DCO) granted for the Tideway project was the energy and carbon footprint report, which gave a snapshot of the predicted carbon footprint during construction and for the 120-year lifespan of the tunnel. This figure was based on the type of technologies and materials that were likely to be used, as well as the way the sewer system will be operated.

The total carbon footprint came out at 840,000t, of which 84% is embodied in the materials and products being used. Only 2.3% of that total comes from operating the system – compared with around 80% for that other London mega tunnel project, Crossrail.

Tideway environmental sustainability manager Darren White said: “It is designed to use gravity and the storm flow operation which means that it is predominantly self-cleansing and operates with minimal mechanical assistance, so main carbon input is over the next five years of construction. And it’s mainly the materials that go into building a huge concrete tunnel.”

The energy and carbon footprint report was prepared almost three years before the scheme’s contractors came on board, so Tideway has now set them the challenge of finding ways to bring the carbon footprint down.

“Effectively, that was the initial planning design – which was revised further for the tender,” explains Tideway delivery environmental advisor Philip Smith. “The contractors are revising it again as they go into detailed design.”

The tunnel has already been redesigned to make sure it is as short as it possibly can be while still capturing the most polluting combined sewer overflows (CSOs), and now Tideway is working with the contractors to see where other savings can be made. “We are looking at different products and seeing how they work in our challenging environment,” says White, who explains that the Tideway tunnel may look similar to Crossrail’s running tunnels, but has to perform a very different function: “A tunnel that carries a train is very different to a tunnel that carries our sort of material.”

He adds: “Performance is the key thing. We want it to be as low maintenance as possible over 120 years. We want it to last. So, for example, we don’t want to start increasing the level of alternative products and then find we have to replace it after 30 or 40 years.”

If we can include options that are more sustainable, we want to look at them, and we are working with the supply chain to look at what alternatives are available

DARREN WHITE, ENVIRONMENTAL SUSTAINABILITY MANAGER

Victoria Embankment Foreshore: Once it is built, the tunnel will operate with minimal mechanical assistance

840,000t Total carbon footprint for Tideway
84% Carbon embodied in materials used to build Tideway

BY MARGO COLE
“But if we can include options that are more sustainable, we want to look at them, and we are working with the supply chain to look at what alternatives are available.”

One area where Tideway is looking to reduce the overall carbon footprint of the project is by asking the contractors to find possible re-use options for the chalk and clay that will come out of the tunnel excavation.

The contractors have been set targets for the beneficial re-use of excavated material, as well as for construction waste diverted from landfill and the amount of material moved by barge rather than by road. But White – who previously worked for Olympic delivery partner CLM – says one thing he learned from that project was not to be too prescriptive.

“The contractors on the Olympic Park had to use 20% recycled content,” he explains. “But what they said to us was: ‘If you talk to us you’ll get better outcomes’. We need to work with the supply chain and research establishments to bring about the greatest benefits which may include leasing assets instead of procuring them.”

The contracting joint ventures have to measure all their activities using a carbon calculator, and report quarterly on their carbon footprint.

If any of the numbers increase, the contractors have to submit an intervention plan to Tideway for review, explaining the reason for the increase. And the DCO means that any changes to the original design have to be environmentally assessed to ensure that it is “not environmentally worse than” the planning design.

White believes the key to reducing the carbon footprint is to tap into all the knowledge at Tideway’s disposal. “We know what a lot of the contractors are capable of doing on projects like Crossrail and the Olympics,” he says. “Within our joint ventures, we’ve got the best contractors in the market, and we want to tap into what they’re doing in all their other sectors – like PFI hospitals and defence estates. “We want to see if there’s something we can use from another sector they’re working in.

“Pretty much all the best ideas are coming up from suppliers and the people doing the work. They know how it can be done more efficiently.”

**Tideway has adopted Crossrail’s innovation platform to encourage and disseminate innovation – including ideas that will help reduce the carbon footprint of the project. And it is trying to foster an environment that gives suppliers at all levels the confidence to bring ideas to the table.**

“It might be a tier three, four or five supplier who tells us how to do things more effectively,” explains Tideway environmental sustainability manager Darren White, giving the example of a supplier telling the contractor the best way to load and unload its products using re-usable packaging. “If that means all the concrete segments turn up whole, and there is no wastage because of breakages in transport, then we could have a 15% saving on materials just by working more effectively,” he says. “They’re the things we need to capture.”

White believes there has been an accumulation of knowledge about efficiency and innovation that runs from High Speed 1 to the Olympics, then on to Crossrail and now Tideway.

“We want to take what worked well on those previous projects and also see if there are ways we could have done it better,” he says. “And there will be ideas and products that come out of this project that High Speed 2 (HS2) and Crossrail 2 will want to be able to use. Hopefully we can take some of these things further.

“And if we are working on ideas with our research partners that might be a bit too late for us to use, Crossrail 2 or High Speed 2 could benefit.”
Understandably, much of the focus and excitement generated by the Tideway project is around the construction of the tunnel. But for Tideway head of asset management Siân Thomas, that is only part of the story. “We’re not here just to build an impressive new tunnel,” she says. “We’re delivering a sewerage system that has to integrate with existing infrastructure. Our job is to build on Bazalgette’s interceptor sewers and integrate the new tunnel system with Thames Water’s existing network.”

The importance of getting this integration right is evidenced by the fact that Tideway has already appointed a system integrator as part of the alliance team. “We are not due to start system commissioning for a few years, but we brought the appointment forward so they could be part of the Tideway alliance,” explains Thomas. “By having them on board now we can standardise as much as possible across the geographies and ensure design is progressed with the end in mind as well as making sure we will integrate our system with Thames Water’s network and controls infrastructure.”

The role of the system integrator is to specify, procure and install a SCADA (Supervisory Control And Data Acquisition) system that remotely monitors and controls all the discharges into the river. The main works contractors will install the mechanical and electrical equipment at their worksites with the system integrator installing the telemetry at each site. In addition to instrumentation at the other combined sewer overflows, as well as the work within Thames Water’s control rooms, the system integrator will be responsible for the telemetry and the SCADA operating system.

Amey won the system integrator contract, and it will work as part of the delivery team headed up by Tideway. “We were looking for someone with software capability and experience in delivering these kinds of systems, and Amey has got a strong history in delivering complex systems for railways,” says Thomas. “The technology of the monitors may be quite simple; it’s the software, and the relationship between our system and Thames Water’s and across multiple sites that brings the complexity. That is where the benefit of Amey’s complex rail capacity is valuable.”

One of Amey’s first tasks is to put together a user requirement specification. “There are a number of standard SCADA systems out there,” says Thomas, who adds that Thames Water already uses more than one, so the important thing is to make sure they can all talk to one another. “The specification has to include the needs of Tideway as the deliverer of the scheme, and we have got to prove we can operate it through system commissioning and acceptance. And then there are key things that Thames Water will require as the ultimate operator of the system. It will have particular requirements from an operational perspective and how it operates within its existing infrastructure.”

Thomas is conscious that technology moves on very quickly. “We do have to be aware about obsolescence,” she says. “We don’t necessarily need to decide today exactly what the technology looks like. But we do need to know what those options might be.”
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constructiontalent.co.uk/open
Tideway Tunnel will be one of the biggest employers in London. Here we introduce some of the key players.

**Sue Thomas**  
Noise and vibration advisor  
Qualified environmental health practitioner and acoustic specialist Sue Thomas advises on all aspects of noise and vibration on the project, including noise monitoring, noise predictions, and managing the noise impacts of the works. She also helps the regional delivery teams talk to regulators, stakeholders and members of the local communities about noise and vibration.

**Anne Richards**  
Head of property and facilities  
Chartered surveyor Anne Richards runs a team charged with ensuring that the main works contractors can access sites on the dates in line with their construction programmes. She is also responsible for compensation payments for any land take and to those affected by the works.

**Kelly Bradley**  
Legacy and community investment manager/chair of Encompass  
Kelly Bradley’s role is to ensure Tideway leaves a lasting legacy for London. Tideway has made more than 50 public commitments to leave London with lasting benefits beyond the construction of the tunnel, including pledges on jobs, skills, public spaces and community support, and it is Bradley’s job to monitor, review and report on its progress. Kelly also chairs Tideway’s inclusivity programme, called Encompass.

**Martin Stanley**  
Geotechnical construction manager (East)  
Chartered geotechnical engineer Martin Stanley is the contractor JV’s manager for geotechnical works including groundwater monitoring, unexploded ordnance risk management, additional ground investigation and construction works including diaphragm walling, piling, grouting and soil mixing. He also chairs the Tideway alliance’s transformational health and safety working group on diaphragm walling and piling.
Paul Morris  
Head of innovation

Town planner Paul Morris leads a major effort to ensure the Tideway Alliance has considered all significant opportunities for world class innovation in design and construction before Tideway mobilises on site. It is also his job to ensure all knowledge and ideas are shared in the pursuit of progress. He also chairs Tideway’s early career professionals network.

Gareth Thomas  
Tideway engineering manager (Central)

Gareth Thomas joined the project with CH2M in January 2008, with a plan to stay for first six months to get the project up and running. Eight years later he is working with design and construct partner Flo to ensure the design is delivered to the quality specified. He is also collaborating with and supporting designers including Aecom as they work through challenges of delivering such a complex project.

Dominic Molyneux  
Senior Engineer - responsible for the main tunnel (West)

Tunneller Dominic Molyneux looks after the technical aspects of the work at Carnwath Road, Putney and the main tunnel. His formal role is technical assurance where he checks that the work provided by the contractor complies with the specifications and meets the client’s requirements. He also acts as an educated contributor involved in workshops and offering advice.

Clare Donnelly  
Tideway’s lead architect and legacy design advisor

Clare Donnelly’s practice, Fereday Pollard, was appointed in 2009 to focus on architectural and urban realm design input for the surface works. She was embedded in the design team from 2010. She now leads a team of architects and landscape architects to oversee the contractor’s designers and make sure the project delivers to its legacy commitments to achieve world class public realm.

Elaine Alderton  
Skills & Employment Coordinator

Elaine Alderton is charged with looking after the welfare of Tideway’s apprentices and supporting the main works contractors to hit their skills and employment legacy targets. She has joined Crossrail where she set up and project managed its hugely successful apprentice programme.

Elaine Alderton is charged with looking after the welfare of Tideway’s apprentices and supporting the main works contractors to hit their skills and employment legacy targets. She has joined Crossrail where she set up and project managed its hugely successful apprentice programme.

Norman Reid  
Corporate social responsibilities manager for Changing Paths

Changing Paths is a charity and social enterprise, founded in 2010 to support those furthest from the labour market including ex-offenders, the homeless and ex-forces personnel to increase employability and provide access to vocational training and employment. On Tideway Changing Paths is supplying staff for the Sir Joe’s Cafe and Reid is responsible for creating positive systems which inspire intrinsic motivation in its team of voluntary and paid staff.

4,000  
Number of direct jobs Tideway will create

5,000  
Estimated number of supply chain jobs Tideway will create

4,000  
Number of direct jobs Tideway will create

5,000  
Estimated number of supply chain jobs Tideway will create

4,000  
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4,000  
Number of direct jobs Tideway will create

5,000  
Estimated number of supply chain jobs Tideway will create
Shared vision

BY MICHAILA HANCOCK

Tideway alliance board sit the three construction JVs, the systems integrator, Tideway and Thames Water.

“Our involvement covers the lifecycle of the project – the development, the delivery – particularly through the alliance agreement as well as the other contractual relationships we have with Tideway, and of course as the ultimate operator of the tunnel once it is built,” explains Qureshi.

The alliance is really in part an embodiment of the overall vision that Thames Water has been articulating for years.

“We wanted a bold vision, and the contracts reflect those values of being collaborative and focused on the interests of the customer.”

Thames Water, with the

Financed and being delivered by the newly created infrastructure provider Tideway, the massive Thames Tideway Tunnel project is breaking new ground.

“We developed the model in collaboration with our colleagues from the Department for Environment, Food and Rural Affairs and Ofwat and considered that it was in the interests of customers for the delivery company to be separate from Thames Water,” says Thames Water major projects director Amar Qureshi.

“This enabled us to get the best value for customers by putting out to competition all elements of the project – from financing to construction costs. Tideway therefore sits independently of Thames Water and uniquely is a regulated wastewater utility, with its own licence from [water regulator] Ofwat,” he adds.

Thames Water occupies a unique position on the project. It was responsible for its development – through the securing of consents including the development consent order, the acquisition of land, putting in place a phenomenal number the contracts required to deliver the project, and of course, running the competition for the right to own the new company. And it remains involved through Tideway’s alliance framework that sits on top of the construction contracts. On the

£25
Maximum cost of the Thames Tideway Tunnel to Thames Water customers each year, reduced from a ‘worst case’ £75

We wanted a bold vision, and the contracts reflect those values of being collaborative and focused on the interests of the customer.

AMAR QURESHI, THAMES WATER MAJOR PROJECTS DIRECTOR

£25
Maximum cost of the Thames Tideway Tunnel to Thames Water customers each year, reduced from a ‘worst case’ £75

government and Ofwat, structured the alliance agreement as part of the suite of commercial, contractual and regulatory arrangements which formed the economic heart of the project, ready to sell the proposition to the investor market.

“The way we ran the procurement process was probably a first for a mega-project like this,” says Qureshi.

“The overall timeframe was considerably shorter than traditional procurement processes, because we knew the type of process our target investor community was used to. They were used to doing deals in single digit months, so we had to reconcile our procurement process.”

The successful investor, Bazalgette Tunnel Limited (BTL), won the contract in August 2015. The consortium comprises fund managers Allianz, Amber Infrastructure, Dalmore Capital and DIF, and more than 1.7M UK pensioners through UK pension funds.

“The outcome of the competition for the financing resulted in the tumbling of the ‘worst case scenario’ cost of the project from £75 a year [per Thames Water customer] down to a maximum of £25. To save that off customer bills is incredible,” says Qureshi.

“But fundamentally the alliance is about creating the right environment for all the parties to make decisions in the best interests of the project,” he adds.
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