



Cardiff Harbour Authority
2000-2025



Front cover images

Main: Artea Photography

Small: Visit Wales

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Introduction

Cardiff Bay is one of the UK's most remarkable regeneration success stories, transforming the city's former docklands – once the heart of the global coal trade – into a vibrant, modern waterfront.

After heavy industry declined, leaving the area derelict, a bold vision and strategic investment revitalised South Cardiff, creating a thriving hub for business, leisure, and culture.

At the centre of this transformation, Cardiff Bay Barrage has reshaped the landscape, enhanced water quality, and fuelled economic growth.

Yet few visitors stop to consider the vision, planning, and ongoing management that make it all possible.

While the stunning surroundings are sometimes taken for granted, behind the scenes, the dedicated team at Cardiff Harbour Authority works tirelessly to maintain, develop, and protect this iconic setting – ensuring Cardiff Bay remains a world-class destination for generations to come.



The history of Cardiff Bay

Black gold

Cardiff originally developed as a port to serve the local iron industry.

In 1794, the Glamorganshire Ship Canal was completed, linking the city to Merthyr. An extension to the Sea Lock was completed in 1798 and the Taff Vale Railway followed in 1841, bringing coal as well as iron down to the coast from the Valleys.

Coal soon supplanted iron as the main export, and by the 1880s, booming demand for “black gold” had transformed Cardiff into Wales’ largest town.

Among the new inhabitants were seafarers from all over the world who settled in the cosmopolitan community of Butetown. Home to more than 50 nationalities, the northern part became known as ‘Tiger Bay’, a nickname said to come from sailors likening the rough waters entering Cardiff Bay to raging tigers.

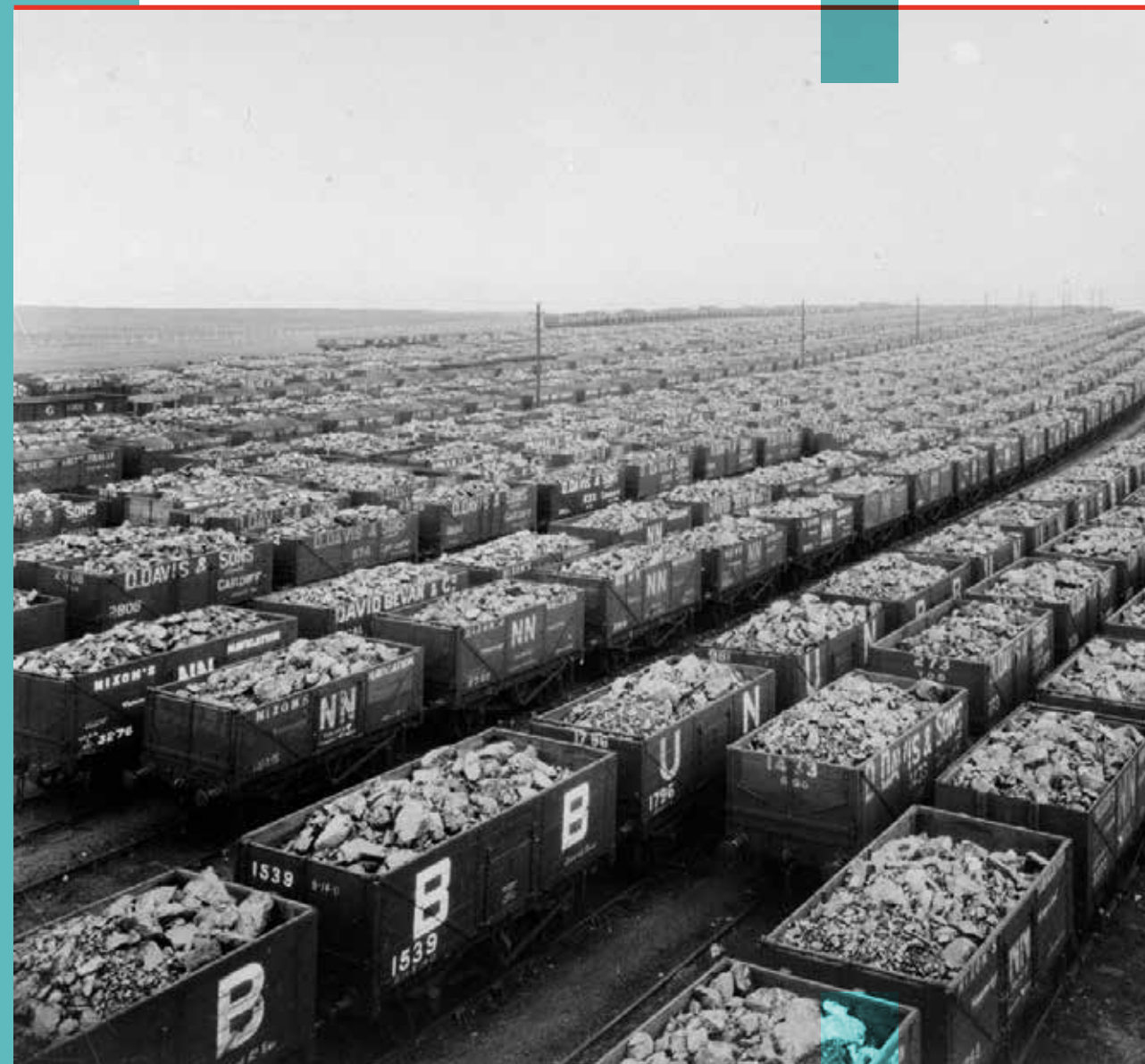


Image: People's Collection Wales



Images:
People's Collection Wales

Decline and disinheritance

In 1905, Cardiff was granted city status by King Edward VII, and soon after became the world's pre-eminent coal port.

Exports peaked at over 13 million tonnes by 1913, before two world wars, the Great Depression and the transition to oil power saw demand for coal slump.

The consequences of this shift were twofold as oil-fuelled ships soon became too large for the West and East Docks to handle. However, after the Second World War, the port was successfully revitalised by imports which eventually amounted to about 80% of total trade. Goods arriving on the quayside included Norwegian timber, South African fruit and dairy products from New Zealand.

Ultimately though, this wasn't enough to prevent creeping decline.

While the last coal export in 1964 marked the end of an era, the closure of the East Moors steelworks in 1978 dealt a hammer blow to South Cardiff.

By the 1980s, the docklands had become a derelict wasteland, disinherited by the city it had helped to transform.



Image: People's Collection Wales

Redevelopment and renewal

Cardiff's experience wasn't unique. Industrial decline across the UK instigated a national Urban Development Programme to revive run-down inner city areas.

The Cardiff Bay Development Corporation (CBDC) was set up in April 1987 by the UK government to regenerate 1,100 hectares of the old docklands from South Cardiff to Penarth.

Plans were drawn up for a waterfront where people could live, work and play, overlooking a 200 hectare freshwater lake created by Cardiff Bay Barrage.

Overcoming environmental concerns, political machinations and funding rows, the redevelopment was largely complete by 2000, reuniting the city centre with its waterfront and helping Cardiff emerge as one of the UK's leading urban centres.

Passing the torch

Once its work was complete, the CBDC was wound up and management of the area passed to five successor bodies, including Cardiff County Council, which took on the role of the Harbour Authority, assuming responsibility for the management of the Bay and Barrage.

Today, it manages the environment of the Bay and promotes a wide range of water-based activities and events.

Alongside tourism and leisure, Cardiff is still a commercial port, owned and controlled by Associated British Ports. The port exports steel and scrap metal and imports timber and minerals, manages a busy container and storage business, and is also a port of call for cruise liners and other visiting ships.

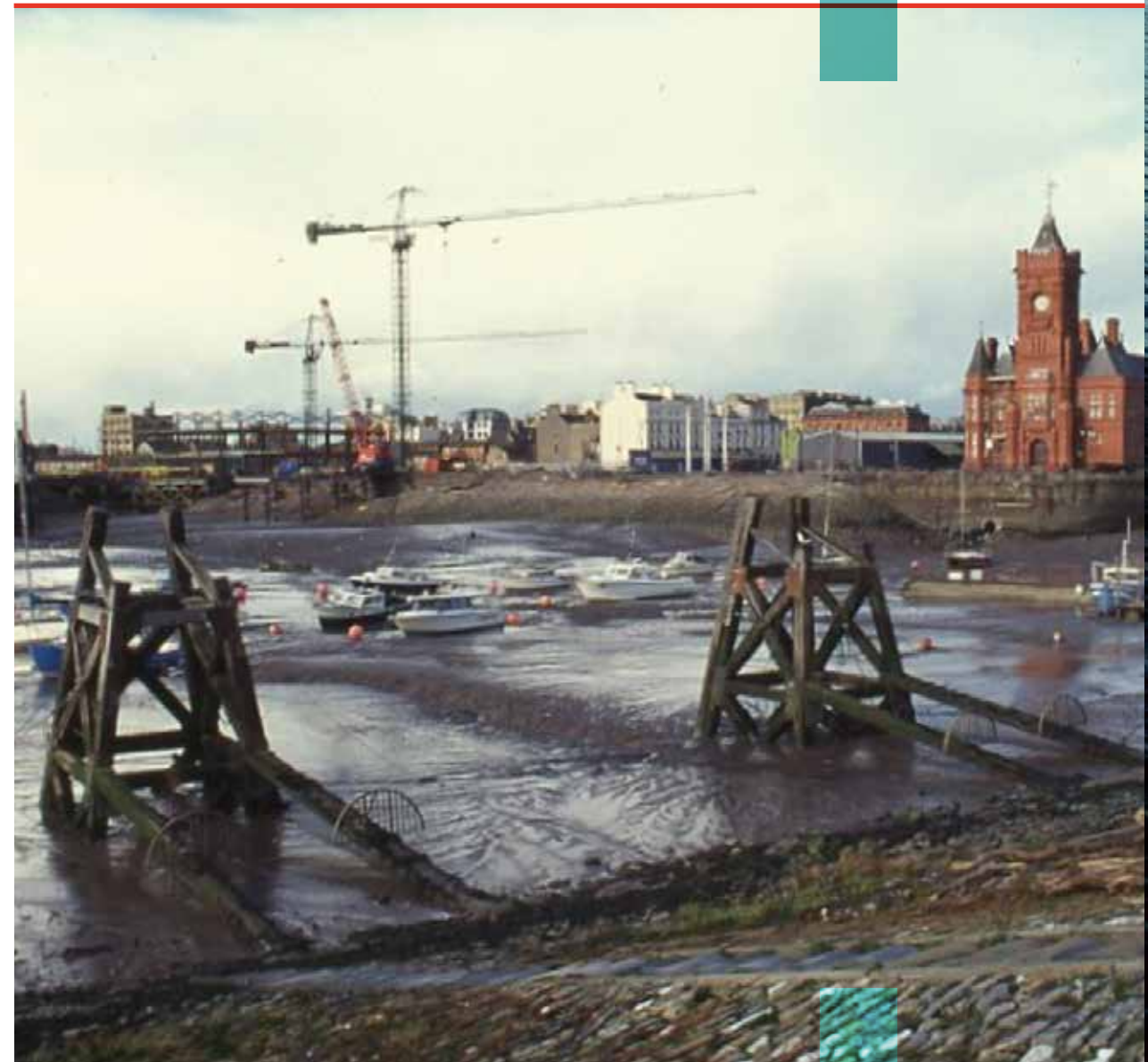


Image: People's Collection Wales

Barrage construction

A new waterfront

The tidal nature of Cardiff Bay meant that mudflats were exposed at low tide, limiting its potential for development. This made the construction of Cardiff Bay Barrage a key element of the area's regeneration.

By sealing off the Bay from the Bristol Channel and impounding the rivers Taff and Ely, the Barrage would create a 200 hectare freshwater lake and eight miles of waterfront, providing an attractive setting for Bayside life and leisure.

To function effectively, the structural plans incorporated five computerised sluice gates to regulate water levels, three locks to allow small boat access, and a fish pass to enable salmon and trout to reach their upstream breeding grounds.

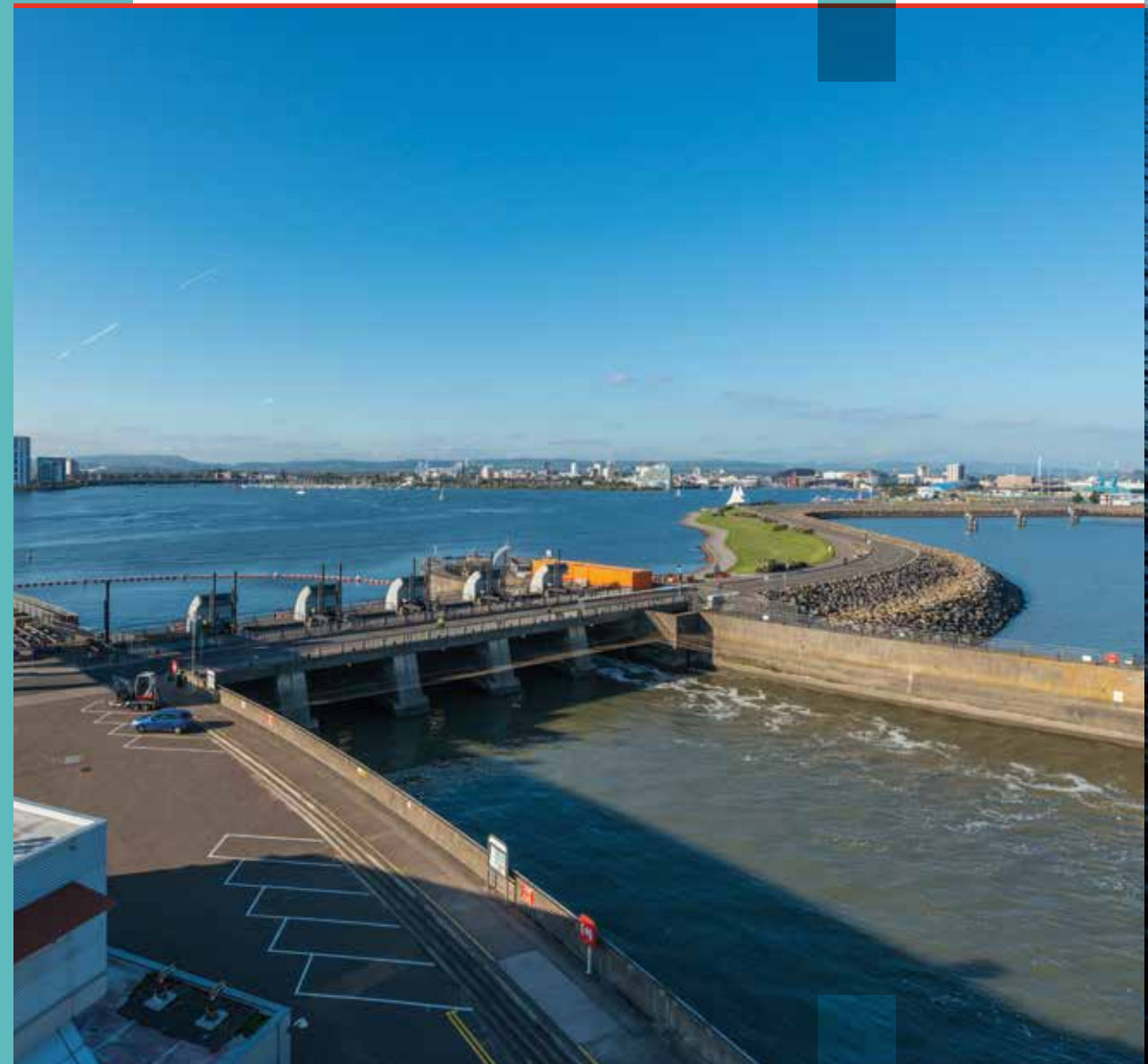


Image: Antea Photography

Engineering innovation

Balfour Beatty and Costain were appointed joint contractors, and work commenced in 1994. Extending from Cardiff Docks to Penarth, the main part of the Barrage consisted of an 800 metre long, 100 metre wide concrete embankment, resting on a foundation of locally sourced sand and gravel.

It was the largest construction project in Europe at the time and involved extensive use of materials, including 135,000 cubic metres of concrete, 250,000 cubic metres of rock armour, 1,700,000 cubic metres of sand, and 2,000,000 cubic metres of dredged silt.

Because of the Bay's extreme tidal range, innovative engineering solutions were necessary. A crucial element was the construction of a sand cofferdam, using sand dredged from the Bristol Channel to create a stable and dry environment for construction. This temporary structure remained in place for two years while work progressed.

Establishing the Bay

The Barrage was completed in November 1999 at a cost of £220 million, but the process of establishing the Bay took longer. Initially, the sluice gates were closed at high tide to retain seawater from the Bristol Channel.

The transition from estuarine to freshwater necessitated continuous draining and refilling, and this programme, along with the installation of an extensive aeration system, allowed the freshwater lake to be completed.

With this in place, the Barrage was officially opened to the public in 2001. The project marked a dramatic transformation of the area, and was later recognised for its public value and technical excellence with the prestigious Institute of Civil Engineers' Brunel Medal.

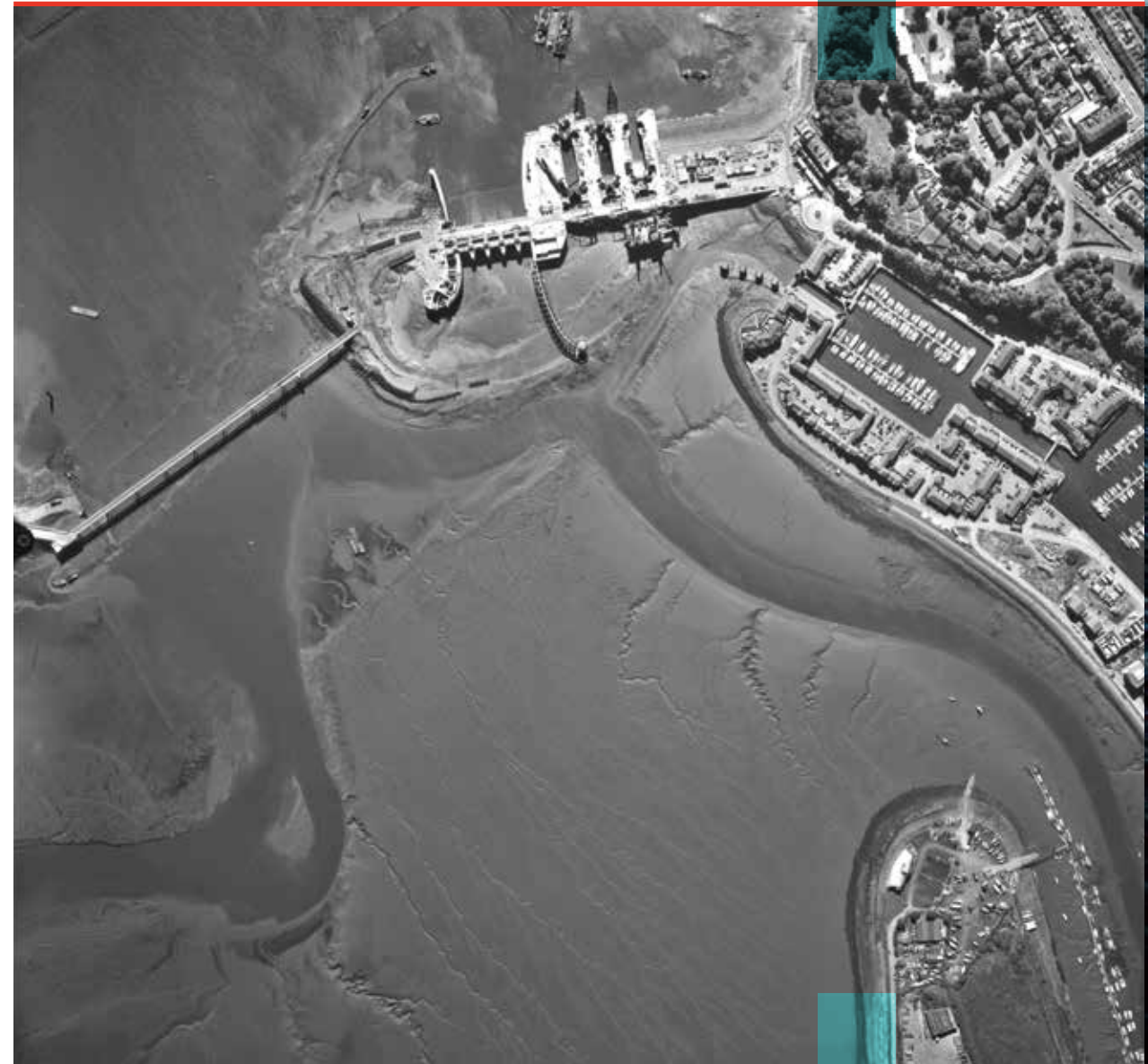


Image: © Crown copyright

What we do

The Harbour Authority comprises several teams working together to ensure Cardiff Bay remains an attractive, safe, and sustainable area for residents and visitors alike. Although much of our work is unseen, it's vital to the Bay's day-to-day function.

Environmental management is a major part of operations, from monitoring water quality and managing flood defences, to protecting biodiversity across the Bay and the Severn Estuary.

Linked to this, our teams carry out essential dredging to keep waterways navigable, remove debris to maintain cleanliness, and oversee complex lock operations that regulate water levels. Ongoing wildlife conservation initiatives and water quality monitoring help safeguard the delicate ecosystem.

Beyond maintenance, the Harbour Authority also supports major events, watersports, and public amenities, ensuring that the Bay remains a thriving visitor attraction.

Managing key infrastructure – including the Barrage, transport links, and public spaces – our teams work continuously to balance the need for economic growth with environmental protection.



Barrage Control

Turning the tide

Most people stroll or cycle past Barrage Control on the Penarth side of the Barrage without giving it much thought, but for us, it's the nerve centre of the entire Bay.

Inside, our 15-member team works around the clock to manage the vital connection between the freshwater Bay and the tidal Bristol Channel.

We operate 24/7, 365 days a year, overseeing the three locks that allow boats to pass safely, while maintaining stable water levels – no small task given the Severn Estuary has the highest tidal range in Europe.

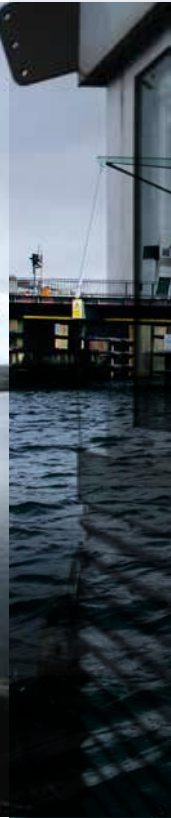
From our vantage point, we're constantly monitoring tidal conditions and adjusting the Barrage gates to prevent flooding and keep the Bay at a safe, consistent level. We also operate the sluice gates to release excess water when needed, helping to protect the surrounding infrastructure. Even small fluctuations can affect navigation, flood risk, and local ecosystems, so every decision we make requires careful coordination.

The Barrage is a cornerstone of Cardiff's flood defences. When tides are high or storms roll in, we're here to stop excessive tidal water from pushing up the rivers Taff and Ely and flooding low-lying parts of the city.

Our work is part of a much wider flood management system, working alongside river embankments and drainage systems to protect homes, businesses, and key infrastructure.

Beyond flood protection, the Barrage plays a key role in supporting the Bay's urban development and leisure activities. It's not just a workplace – it's a critical asset that keeps the city safe and thriving.





Safe passage

We also manage the fish pass, a specially engineered system that allows migratory species like salmon and trout to move between the Bay and the river system, supporting biodiversity.

Unlike typical fish passes, ours is a bespoke system that functions during all tidal states and prevents saltwater from entering the Bay. Migrating fish pass through an inlet gate into a series of freshwater pools, providing them with a secure route to return home and spawn.

In addition to the fish pass, we carry out routine maintenance on the Barrage's complex mechanical systems, conducting regular inspections and addressing technical issues promptly. And we also manage public access areas, ensuring walkways, cycle paths and visitor facilities remain safe and well-maintained.

A lot of our work goes on behind the scenes, but it's all vital to keeping Cardiff Bay functioning properly and sustainably throughout the year.



Image: Rudi Winter

Image: Dave Mee

Barrage Engineering team

Round the clock

Rain or shine, day or night, the Engineering team at Cardiff Bay Barrage plays a crucial role in keeping this complex infrastructure operational around the clock.

Led by a Principal Engineer, our close-knit team of three Mechanical and two Electrical Engineers works diligently to ensure everything remains functional. From routine maintenance and continuous monitoring, to emergency repairs in all conditions, we constantly strive to keep our systems running efficiently.

The key features of the Barrage that we look after include five computer-controlled sluice gates that manage water levels, three locks for vessel passage, and oxygenation systems that maintain water quality.

These systems demand regular servicing and prompt responses to emerging issues, especially as the infrastructure ages.





Sluice gates and locks

The five sluice gates and three locks are operated by hydraulic systems that regulate water levels and support marine traffic.

We carry out scheduled servicing of the hydraulic rams, sensors, and control systems, ensuring smooth, safe, and efficient operation.

Oxygenation

To prevent stagnation and support aquatic life, the Barrage uses oxygenation systems that inject air into the water.

Adapted from similar systems at Swansea Barrage, they require regular calibration and pump maintenance, to allow monitoring of dissolved oxygen levels by the Environment team. Saltwater ingress is managed through a drainage basin and shaft that remove the denser saltwater that settles at the bottom of the Bay.

Structural maintenance

Spanning 1.1 kilometres, the Barrage includes reinforced concrete structures, bascule bridges, and sea-facing rock armouring.

Our Structural Engineers perform routine inspections for signs of wear, corrosion, and cracking. Repairs include concrete restoration, seal replacements, and protective coatings to prolong the life of the structure.

Supporting migratory life

The fish pass supports migratory species and is dependent on high-quality engineering.

We work closely with Environmental Scientists to monitor ecological conditions, clear debris, and maintain regulatory compliance – vital in sustaining the health of the Bay's ecosystem.

Control room

A 24/7 control room oversees all Barrage operations – from sluice gate activity to vessel movement and emergency procedures. From here, we regularly upgrade software, replace aging hardware, and test backup systems to maintain robustness and reliability.

Through a combination of proactive and reactive work, we ensure that the Barrage remains safe, functional and environmentally responsible, every single day of the year.

Personal story:

Gareth Ballett, Principal Engineer



“I started working at Cardiff Bay Barrage in 1996 during the early stages of its construction, initially with a marine company providing safety vessels.

I soon moved on due to a vacancy within the Site Management team at Balfour Beatty-Costain, the main construction contractor. Based in the site control room, I assisted with the management of vessel navigation and site traffic during the build. I also worked closely with the on-site concrete batching plant, the largest in Europe at that time, capable of producing 95 cubic metres of concrete per hour and delivering it anywhere on site, along with ordering and managing the distribution of the concrete.

In 1998, I moved over to the specialist contractors who were tasked with testing and commissioning the Barrage and meeting all the regulations, prior to the Environment Agency Wales issuing the licence to impound the Bay with freshwater.

The Commissioning team at the Barrage then assisted with forming the structures required to set up Cardiff Harbour Authority, which came together in April 2000, when I joined as a Shift Manager.

In 2015, I was promoted to Principal Engineer and currently manage the Barrage Engineering team, which carries out all the preventative maintenance and inspections, and deals with any breakdowns on a call-out basis – 24/7, 365 days a year.

Some of my most memorable moments are hosting large events, such as P1 Powerboat Racing, the European and British Water Ski Championships, Extreme Sailing Series and Volvo Ocean Race, to name a few.

I am proud to have played a part in the rejuvenation of the area I grew up in for generations to come. It has been a very interesting and challenging 29 years!”

Environment team

Setting the standard

Since the Bay was impounded in 1999, we've been operating one of the world's most rigorous water quality monitoring systems to keep its aquatic environment in good health.

Across the Bay, we've deployed six Xylem YSI floating buoys that continuously measure key parameters like dissolved oxygen, temperature, pH, turbidity, and nutrient levels. These real-time readings give us the ability to act quickly whenever conditions change in a way that could impact water quality or aquatic life.

Alongside water quality monitoring, we also track water levels in the rivers Taff and Ely, in the Bay itself, and outside the Barrage in the Severn Estuary.

Our on-site weather station records rainfall, air pressure, and temperature too, giving us a complete picture of the conditions that influence groundwater levels.

Maintaining oxygen levels is especially critical – if they drop too low, the entire ecosystem could be at risk.

Thanks to the data that we collect, we're able to run a submerged aeration system that uses diffusers to boost oxygen levels as needed.

It's all part of our proactive approach to keeping the Bay healthy and resilient.



A thriving ecosystem

While the construction of the Barrage inevitably changed the natural habitat – particularly for wading birds and migrating species – we've worked hard to offset those impacts through focused conservation efforts.

We've introduced floating reed beds and artificial nesting sites at Cardiff Bay Wetlands Reserve, which provide important habitats for birds, fish, and invertebrates.

Regular ecological surveys guide our work to maintain sustainable fish stocks and bird populations, while pollution controls help us protect the Bay from contamination.

We also enforce strict regulations around boating and construction activities to minimise disruption to wildlife. Water quality remains a top priority for us, not only for the health of the ecosystem but also to support safe water-based recreation.

The data we gather informs swift action when needed, ensuring that the Bay is safe, clean, and welcoming for everyone.

From clean-ups to classrooms

Caring for the environment is central to our work. In the early years, we tackled seasonal challenges, such as midges, head-on.

However, thanks to improved ecosystem balance, these issues are no longer a concern. Litter, though, remains a persistent problem.

To address this, we partner with several organisations to support and lead regular clean-up campaigns along the rivers and around the Barrage. These efforts help ensure that our Barrage and Wetlands Green Flag sites remain clean and enjoyable.

Since the disbanding of the Community Education Team, we've taken on the responsibility of educating young people across the city. Through a range of educational programmes, we explore topics such as river ecology, pollution, pond dipping, and the heritage of the Bay.

We've also deepened our partnerships with environmental groups and research institutions to tackle emerging challenges, including biodiversity loss, climate change, and the pressures of sustainable tourism.

These collaborations are helping to shape a strong, inclusive future for the Bay – one that benefits both residents and visitors alike.

Through a mix of advanced monitoring, hands-on management, and a deep commitment to both the environment and the community, we help the Bay to remain a thriving ecosystem and leisure destination all year round.



Personal story:

Dave Evans, Technical Officer

My day

"Each morning, I gather data, assess monitoring stations, and update the water quality forecast on cardiffharbour.com.

The Environment team receives a daily report outlining conditions and proposed actions.

The rest of my day varies – sampling, maintenance, equipment installation, financial tasks, resource planning, technical development, meetings, data analysis, report writing, and handling enquiries".

Memorable moments

"The highlight for me is perpetual. Growing up in Grangetown during the 1970s, I've witnessed profound changes in Cardiff's docklands area. Once a neglected remnant of the coal industry, it was often seen as dirty, rundown, and forgotten.

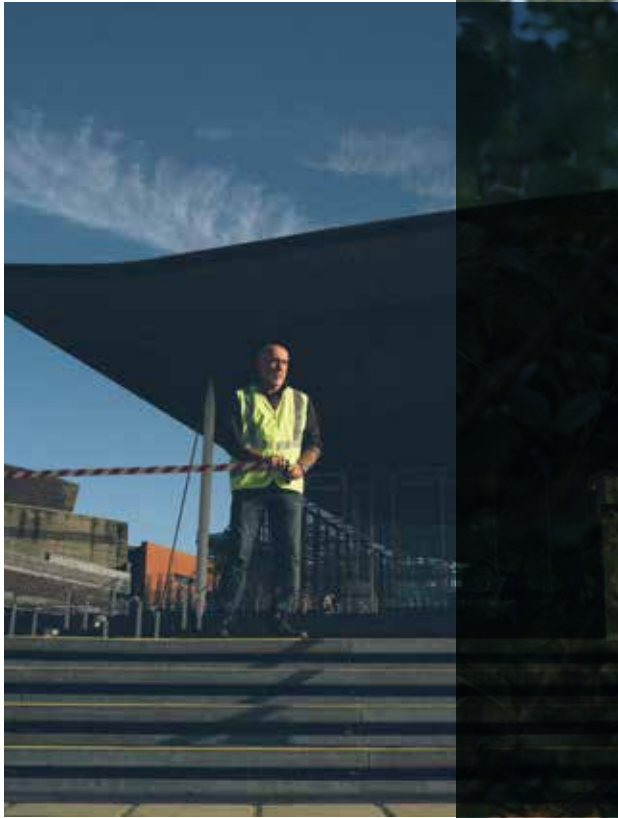
While some argue that the area's regeneration has fluctuated over the past 25 years due to economic pressures, I remain optimistic. The transformation has already made a vast difference, and I believe the best is yet to come".

Strangest issue faced

"A Yacht Race Director, visiting from British Columbia, fell ill just before the start. With no time to improvise, I found myself holding the radio and flag, counting down and launching an internationally televised race – fortunately, no false starts, just a few puzzled crew members!".

Key changes over 25 years

"Trust in our ability to manage Cardiff Bay has grown. It wasn't instant – we've made mistakes – but through innovation and sound judgement, we've adapted. We recognise that our work is ongoing, and we remain committed to evolving and improving for the benefit of all".



The Harbour team

Standing by

The tranquillity of Cardiff Bay can be deceiving. Behind the scenes, the Harbour team – led by our Harbourmaster – is always on standby, ready to respond to emergencies and enforce regulations.

Our work is wide-ranging. On any given day, we're coordinating leisure boats, passenger services, and the occasional dredger – all while working to prevent congestion and maintain safe navigation.

Events such as races and regattas bring big crowds to the waterfront, and that's when our role becomes even more critical. We coordinate closely with local authorities and emergency services to make sure that everything goes smoothly, both on and off the water.

But even on quieter days, we're hard at work – implementing counter-pollution measures, managing waste disposal, and dealing with wrecks or unauthorised vessels that don't belong in the Bay.

As the designated Local Lighthouse Authority under Trinity House, we're also responsible for conservancy – keeping hazards in check and maintaining navigation aids, so Cardiff Bay stays safe and accessible.





On patrol

To carry out all these responsibilities, we operate a fleet of specialist workboats.

Our regular patrols help manage the often-busy water traffic and support the upkeep of pontoons and moorings across the Bay. We also oversee the fee-paying vessels that transport passengers, and keep a close eye on all sorts of water-based activities – offering advice and assistance whenever it's needed.

Keeping the Bay safe is central to everything we do. That means enforcing Harbour Authority byelaws and marine legislation, and stepping in whenever rules aren't being followed.

We're also hands-on with environmental work – carrying out pollution control and clearing debris that storms often wash down from the rivers Taff and Ely into the freshwater lake.

Whether it's ensuring public safety, protecting the environment, or managing day-to-day operations, we aim to keep Cardiff Bay safe, clean, and open to all.

Personal story:

Annie Middleton, Boatmaster

My day

"As Boatmaster for the Harbourmaster team, my job keeps me on the water most days – patrolling the Bay and rivers, enforcing byelaws, and making sure everything and everyone stays safe.

I skipper a range of specialist vessels, often in tough conditions, to clear debris, maintain navigation aids, and assist boats in distress.

I work with a tight-knit crew, and the camaraderie out on the water is one of the best parts of the job. We deal with everything from stranded kayakers to larger vessels needing tow-ins.

Every shift brings something different, and I thrive on that challenge".

Memorable moments

"It's been 25 years since I started my career with Environment Agency Wales, helping set up the Harbour Authority's environmental approach.

Back then, we were breaking new ground – shaping what the Bay would become.

After Covid hit, I realised how much I missed hands-on, team-based work. That's what drew me back into a more operational role – and into the Boatmaster's seat.

I've had some unforgettable experiences along the way. Helping deliver the Volvo Ocean Race in Cardiff was a standout – knowing our team helped showcase the city on a global stage made me proud.

I've also had my fair share of unexpected moments, like being invited on a seaplane test flight. Not something you get to do every day! And being part of the World Rally Championship super stage on the Barrage was surreal – watching the cars fly past as we managed the safety zones from the water.

Another thing I'm especially proud of is my work controlling the Bay's midge population. It's one of those behind-the-scenes efforts that makes a huge difference to the visitor experience, but rarely gets noticed".





Strangest issue faced

“One of the strangest situations I’ve faced came during the pandemic. Almost overnight, Roald Dahl Plass became an unofficial party spot. Hundreds of people gathering every night, drinking, leaving mountains of litter – it was a real challenge to manage. Trying to maintain safety and order in that environment really put our team’s resilience and diplomacy to the test”.

Key changes over 25 years

“So much has changed since those early days. Our team’s smaller now, but more agile. We’ve embraced new technology, new systems, and we’ve streamlined how we work. Standards haven’t slipped – if anything, they’ve sharpened.

One of the biggest shifts I’ve seen is environmental. There’s less plastic in the water, though we’re getting more tree debris. The Bay itself has changed too – it’s now a major attraction, with over a million visitors a year. It’s great to see more public engagement, more events, more ways to connect people with the water.

But I still think we’ve got more to do, especially around awareness, education, and sustainability.

That’s what keeps me motivated. Every patrol, every rescue, every small win out on the water – it all adds up to something bigger”.



Community Liaison team

As Cardiff Bay evolved, so did we.

Being part of the Community Liaison team during the Bay’s transformation – from neglected docklands into the lively waterfront we see today – has been an incredible journey.

Our role has grown and changed, right alongside the Bay itself.

Early years

When the redevelopment plans were first published, they sparked a great deal of concern – especially around environmental impact, flood risk, and social exclusion.

Back then, our main priority was to build trust. We focused on listening to local residents and businesses, making sure that their concerns were heard and genuinely included in every phase of the regeneration process.

One of our key early efforts was delivering educational programmes that helped people understand the environmental and economic benefits that the Barrage would bring.

We also placed a strong emphasis on inclusivity – encouraging communities to take pride in the Bay's transformation and feel a real sense of ownership in its future.

Expanding engagement

Once the major regeneration works were completed, our focus shifted to supporting the Bay's growing residential communities and the increasing number of leisure users.

We developed strong partnerships with schools and colleges to promote education and sustainability, and set up forums to give residents a real voice in shaping what came next.

We worked hard to improve access, safety, and facilities across the waterfront, while also promoting the Bay as a destination through a packed programme of events – from cultural festivals to international sporting competitions.

In the early years, to keep everyone informed, we introduced a bi-annual newsletter, which highlighted everything from new developments to environmental initiatives.

We've also played a key role in delivering a wide range of outdoor installations, including The Age of Coal, the Captain Scott Exhibition, the Roald Dahl book bench and Enormous Crocodile, and the Mining the Bay interpretation panels. Alongside these, we've collaborated with arts organisations to produce theatrical performances focused on water safety.

We've also led walking tours that explore the rich heritage of Cardiff Bay – including a special tour this year to mark our 25th anniversary.

By engaging people of all ages through diverse formats, we ensure that our stories and messages reach as wide an audience as possible.

It's always been about striking a balance: fostering growth and recreation while protecting the natural beauty and biodiversity of the Bay.

New challenges, new tools

More recently, we've embraced digital tools and new ways of working to keep pace with the changing needs of our community.

This has included taking our engagement online, using social media, interactive websites and virtual tours to connect with people wherever they are.

From managing the Visitor Centre in The Tube, through its relocation to the Wales Millennium Centre, to now offering touchscreen information at Bay venues and strengthening partnerships with Visit Cardiff and the Waterfront Partners – we've continually evolved to meet public needs and embrace the digital age.

We're proud of how far the Bay has come, and even prouder to play a part in what comes next.



Image: Magenta



Image: Fernleigh Design



Personal story:

Natalie Taylor, Team Leader

My day

“As Team Leader for Environment, Groundwater, Contracts, Community Liaison, and Flat Holm, every day brings fresh challenges.

Mondays, Wednesdays and Fridays start with check-ins with our Digital Marketing apprentices – planning content, offering support, and reviewing progress.

Throughout the week, I can be out on site, for example meeting residents at Cardiff Bay Wetlands, working on Community Liaison projects or coordinating logistics for Flat Holm, including supplies and transport, as well as overseeing the Flat Holm National Lottery Heritage Fund project to restore heritage buildings and strengthen community links.

My role involves a mix of regular meetings: chairing Community Liaison and Environment sessions, weekly Flat Holm ops, monthly health and safety and quarterly stakeholder security forums, as well as representing Cardiff Harbour Authority at Severn Estuary and Welsh Government meetings.

The diversity keeps my job highly engaging, and I’m proud to help protect our environment while supporting the local community”.

Memorable moments

“Living full-time as Flat Holm Warden (2000-2002) was unforgettable – remote, immersive, and deeply rewarding.

Highlights included meeting John Craven and Iolo Williams during filming visits.

Joining Cardiff Harbour Authority in 2005 marked a turning point. My role expanded to include leading Community Liaison, and later Environment, Groundwater, and Contracts – an exciting period of professional growth.

Other standouts include meeting Olympic silver medallist, Hannah Mills, at the Extreme Sailing Series, and collaborating with Arts & Business Cymru and Theatr na nÓg to bring the award-winning Just Jump production to schools, using theatre to teach about water safety.

In 2025, I was also part of a world record for the most people litter-picking in an hour, when we hosted a school group on the Barrage as part of the truly rewarding Taff Tidy event”.

Strangest issues faced

“During Covid, Roald Dahl Plass suddenly became a nightly hotspot, with huge crowds drinking and littering, presenting a public space management challenge like no other.

A truly bizarre incident that stands out happened back in 2001. While on Flat Holm, a ship unexpectedly veered off course and grounded itself on the beach – spotted first by visiting A-level students. It remained until the next high tide, before being refloated with help from the RNLI. A surreal day, to say the least!”.

Key changes over 25 years

“The Harbour Authority has evolved significantly over the last 25 years. While staff numbers have reduced, we’ve streamlined operations and embraced technology to maintain high service standards.

Visitor numbers to the Barrage have increased dramatically, soaring past one million a year.

We’ve boosted engagement with more events, improved accessibility, and stronger collaboration with partners, making the Bay a vibrant, inclusive destination”.



Image: Natalie Taylor



Groundwater Monitoring and Control team

Rising water

When the Barrage was first proposed, questions arose about how a four metre rise in water levels might affect South Cardiff.

The concern was clear: if groundwater rose too far, it could damage homes, businesses, and infrastructure.

To address this, the Cardiff Bay Barrage Act 1993 required a detailed monitoring and control system to be in place before and after construction.

Six at-risk areas were identified, and, by 1995, a network of boreholes and sensors was installed to monitor four distinct hydrogeological units.

In places where protective clay layers were thin or absent, pumped wells and field drains were introduced to keep groundwater levels within safe limits.

This formed the foundation of the Groundwater Compensation Scheme – a 20-year programme designed to protect property and respond to any damage claims.





Concerned callers

In the early years, our team was large – around 30 people at its peak, with 25 dedicated to the Groundwater Helpline.

Every call meant someone was concerned, and we took that seriously. Queries were assessed using monitoring data, and on-site surveys were carried out when needed.

Basements, foundations, and structural features were examined for signs of water-related damage.

Over the life of the scheme, we processed around 10,000 cases to completion. While none were proven to be caused by the Barrage, each was investigated thoroughly, providing reassurance to residents and businesses.

Robust protection

The monitoring network grew to 236 instruments across 196 boreholes, covering roughly 15 square kilometres – the largest urban groundwater monitoring network in the world.

Alongside groundwater, we tracked water levels in the rivers Taff and Ely, in Cardiff Bay, and in the Severn Estuary.

Our on-site weather station recorded rainfall, air pressure, and temperature, giving us a complete picture of the environmental conditions influencing groundwater behaviour.

A lasting legacy

By the time the scheme ended in 2019, the legal requirement was over, but the expertise and infrastructure remained.

Most boreholes were transferred to the British Geological Survey for geothermal research, while two stayed under our care.

The calls and surveys may have stopped, but the work lives on – in the data, the knowledge we've built, and the quiet confidence that we've protected Cardiff for a quarter of a century.

Personal story:

Phil Hart, Buildings and Groundwater Manager

My day

“A typical day usually involves inspecting the Harbour’s building portfolio – checking structural integrity, assessing wear and tear, and identifying potential maintenance issues.

With each inspection, the list of tasks grows: weathered facades in need of repainting, damp creeping into basement walls, and faulty heating ventilation air conditioning systems requiring urgent attention.

Throughout the day, the phone buzzes with contractor updates. Scheduling repairs, coordinating servicing contracts, and ensuring compliance with safety regulations become the priority.

Site visits follow – supervising ongoing work, addressing unforeseen complications, and balancing efficiency with cost-effectiveness.

My day also includes team meetings to plan projects and review progress”.

Standout achievement

“One standout achievement remains the Groundwater Protection Scheme – managing surveying consultants to deliver 28,000 property condition reports within 12 months, a statutory requirement. The tight deadline was a formidable challenge, but the teamwork behind scheduling and executing the surveys made it a massive success”.

Strangest issue faced

“One case still stands out – the investigation of a damp complaint in a cellar. The owner was convinced that rising water levels in the Bay were to blame, pointing to what they described as ‘seashells’ scattered across the floor. On closer inspection, however, the reality was far less dramatic – these ‘seashells’ were actually snail shells, a clear indication of prolonged damp conditions creating the perfect habitat for the unwelcome guests!”.

Key changes over 25 years

“Over the decades, there’s been a major reduction in Harbour Authority staff, shifting the dynamics of operations and resource management.

At the same time, the increased use of Barrage facilities has transformed the area, bringing in new opportunities and greater engagement with the Harbour’s infrastructure.

The landscape continues to evolve, demanding constant adaptation and the upkeep of our buildings for the years to come”.

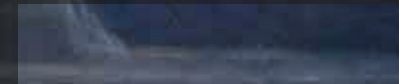
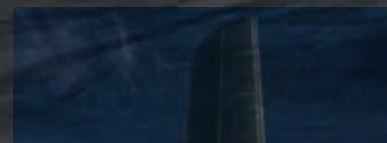
Contracts and Public Realm team

Over the past 25 years, the Contracts team has played a central role in shaping Cardiff Bay into the vibrant waterfront it is today.

From day one, our focus has been on delivering transformational projects – both large and small – that improve infrastructure, support the community, and help the Bay evolve to meet new challenges.



Image: Natalie Taylor



Supervision and accountability

In the early years, much of our work revolved around procuring civil engineering and construction services, maintaining vital infrastructure, and ensuring the reliable supply of key goods.

As the Bay developed and the needs of the area shifted, so did our responsibilities.

Financial monitoring has always been at the core of what we do. We're responsible for preparing detailed cost estimates, developing project budgets, and keeping a close eye on expenditure throughout the lifecycle of each project. Making sure that public funds are used effectively and transparently is paramount.

Engineering and maintenance

We've also played a key role in the technical development of engineering designs.

Our team has been hands-on in exploring alternative design solutions, drafting detailed specifications, and producing the comprehensive contract documentation needed to deliver high-quality infrastructure projects.

Beyond the paperwork, we're involved in evaluating tenders, overseeing construction works, managing payment assessments for contractors, and advising on any contractual claims that come up along the way.

Despite the team reducing in size, we continue to manage the maintenance, repair, and refurbishment of the Harbour Authority's land interests and critical infrastructure. That includes the iconic Water Tower at the top of Roald Dahl Plass and overseeing the regular maintenance dredging of the Outer Harbour – a statutory responsibility under the Cardiff Bay Barrage Act 1993 – to keep it navigable and safe for everyone who uses it.

Identity and infrastructure

Some of the Bay's most recognisable features have seen our involvement behind the scenes.

We supported the development of the waterbus stops across the Bay and along the rivers, which helped boost public transport and tourism. We also played a major role in delivering the Environmental Building and Quay – key assets that support our environmental and educational outreach.

Our portfolio includes the construction of the boat storage facility at Channel View Leisure Centre, which has become an important hub for local boating activity, and the refurbishment of Roald Dahl Plass – now one of Cardiff's premier venues for large public events. We've also contributed to major city landmarks, including the Pont y Werin bridge, Cardiff International White Water, Alexandra Head event area, and the scenic Barrage link path that connects with the wider waterfront.

Today, our work is increasingly shaped by sustainability, climate resilience, and community benefit. We're using smarter technologies and better data to inform procurement, and focusing on delivering infrastructure that supports long-term economic regeneration and social value. It's a challenging and exciting role, and we thrive on the impact that our work continues to have across the Bay.

Personal story:

Chris Voyce, Contracts and Public Realm

My day

"As a Project Engineer overseeing contracts and maintenance works within the Harbour Authority, my typical day involves a mix of technical tasks, coordination, and problem-solving.

I work across various phases of planned engineering projects, while also addressing emergency maintenance issues. My time is divided between working online from home or the office, and being on-site within our land areas in Cardiff Bay, ensuring smooth project execution and resolving challenges as they arise".

Key responsibilities

"Throughout the day, I tackle technical and site problems, serving as a vital link between internal and external engineering, procurement, site teams, and management. I ensure that project records are clear, organised, and up-to-date, while also verifying that all deliverables meet technical and regulatory standards".

Memorable moments

"One standout experience was when an airline company approached the Harbour Authority to explore the feasibility of seaplanes operating in the Bay. As part of the evaluation, I had the opportunity to fly in one. It was a thrilling experience, taking off and landing in the Bay. However, while we confirmed that seaplanes were viable, none have returned since that day.

Another highlight was my involvement in the pre-construction phase of the Cardiff International White Water project. This was a uniquely challenging civil engineering endeavour, and being part of its journey from initial planning to completion was a defining moment in my career".

Strangest issued faced

"One of the strangest challenges I've encountered was figuring out how to install a temporary bridge to access a floating football pitch in Cardiff Bay. This was needed to host a match featuring former international football stars when Cardiff hosted the Champions League Final. It was certainly an unconventional engineering puzzle".

Key changes over 25 years

"Cardiff Bay has undergone a dramatic transformation from a neglected dockland into a dynamic, iconic waterfront. There has been a significant increase in public visitors – not only to the Inner Harbour and Mermaid Quay, but also along the Bay edge, with many now making full use of the walkways and cycleways that link to the Barrage".



Activities in the Bay

The Bay boasts a varied leisure offer, providing a wide range of activities throughout the year.

Currently based on the Barrage, Cardiff Sailing Centre has been part of the Welsh watersports scene since 1968. Recognised by the Royal Yachting Association, the centre provides training in dinghy sailing, keelboating and powerboating, and has introduced many people to the sport, from beginners through to Olympians.

Cardiff Rowing Centre has operated on the River Taff for more than 20 years. With direct access to both the river and the Bay, the centre caters for all levels of ability. Thousands of individuals, families and school groups have taken part in rowing programmes delivered by nationally qualified instructors.

Alongside sailing and rowing, watersport enthusiasts can also kayak on the Bay's calm waters or take on the rapids at Cardiff International White Water.

For a more relaxed experience, picturesque boat tours, walks, and cycling routes provide a leisurely way to explore the attractions.

As the nation's cultural hub, the striking Wales Millennium Centre hosts world-class theatre and music performances.

Next door is the Senedd, the Welsh Parliament, which offers guided tours.

Families flock to Techniquest, an interactive science centre, as well as the International Sports Village for swimming and ice skating, while history lovers can explore landmarks like the Norwegian Church, the Coal Exchange, and the Pierhead building.

With atmospheric dining and nightlife, the Bay is also home to waterfront restaurants, bars, and cafés, where visitors can enjoy stunning views with their drink or meal.



Cardiff Bay events

Over the years, Cardiff Bay has provided a scenic setting for many water-based activities and events, hosting everything from the Volvo Ocean Race stopover and the spectacle of the Extreme Sailing Series, to the Cardiff Dragon Boat Festival, where teams in fancy dress take to the water in a fun-filled competition. Other similar events include the Head of the Taff rowing race, the Welsh University Boat Race (Cardiff vs Swansea), and the Welsh National Rowing Championships.

Spectators have also enjoyed the thrills of the European Water Ski Championships and the Welsh Canoe Polo Championships, with many vantage points offering fantastic views across the Barrage and Mermaid Quay.

Cardiff Bay also delivers a diverse mix of cultural events that take place along the shoreline.

Food lovers flock to the popular Cardiff Food & Drink Festival, while music fans head to the Bay Series, where Alexandra Head transforms into an outdoor concert venue. Major artists including Nile Rodgers & CHIC, Liam Gallagher, The Chemical Brothers, and McFly have performed here, adding to Cardiff Bay's lively atmosphere.

Other highlights include the family-friendly Cardiff Harbour Festival, the WOW On the Waterfront event, and the Urdd National Eisteddfod, celebrating Welsh culture and talent.

In the past, the year rounded off with Christmas at Cardiff Bay, packed with festive markets, music, and family entertainment, including a spectacular firework display.



Image: Lloyd Images

Achievements

The regeneration of Cardiff Bay has been transformative, economically and aesthetically.

By the time the Development Corporation was formally wound up in March 2000, the project had created 16,750 new jobs, built 4,800 new homes, and completed 695,000 square metres of non-residential development. It also reclaimed 327 hectares of land, established 79 hectares of open space, and constructed or upgraded 42 kilometres of road.

The redevelopment has been the catalyst for a new era of economic success, laying the foundation for Cardiff's transformation.

It celebrates the city's industrial heritage, honouring its coal-exporting past, while forging a bold, modern identity.

Landmark institutions like the Senedd, home to the Welsh Parliament, and the Wales Millennium Centre, a world-class arts venue, have solidified Cardiff's status as a cultural and political powerhouse.

Meanwhile, Mermaid Quay thrives as a lively social hub, The Red Dragon Centre offers entertainment aplenty, including an IMAX Laser Experience Odeon cinema, and the Bay's green spaces and water-based activities boost its appeal.

Today, Cardiff Bay stands as a powerful testament to renewal, ambition, and Welsh pride.

Future plans

Already a mecca for culture, leisure, and business, Cardiff Bay continues to evolve.

Future development opportunities, such as a new 15,000-seat indoor arena, are set to enhance the city's thriving cultural scene and bolster the economy in the area.

To protect the beauty of its waterside setting, sustainable initiatives – such as a new tramway linking the Bay to the city centre – aim to create a greener, more accessible space for residents and visitors.

As these projects take shape, Cardiff Bay will undergo a dramatic transformation, cementing its status as a vibrant, contemporary destination, while preserving its rich maritime heritage and protecting the natural environment that makes it such a special place to live, work and visit.



Image: Visit Wales

Thank you / Acknowledgements

As we celebrate 25 years of Cardiff Harbour Authority, we extend our sincere thanks to our staff, partners, volunteers, and funders, the Welsh Government, for their invaluable contribution to this journey.

We also offer special thanks to everyone who has helped create this commemorative book, capturing the spirit and story of the Harbour over the past 25 years. Your contributions reflect the pride and passion that define our organisation.

Here's to the next chapter.