



Breakwaters

Thought Leadership

Magazine April 2023

Coastal adaptation:
Redefining our
coastlines for
the future

Keeping the
Caribbean
dream alive

Galvanising
green ports

ATKINS

Member of the SNC-Lavalin Group

From the editor

Welcome to the latest edition of Atkins and Faithful+Gould (F+G) thought leadership magazine, prepared especially for the ICE Breakwaters conference in Portsmouth – I do hope you will find the articles thought-provoking.

In the UK we face some significant engineering challenges to protect our coastal communities as a result of rising sea levels, storminess and accelerated coastal erosion. The article on coastal adaption discusses how we will have to redefine our coastlines for the future and the feature on cliff stabilisation explains how we are using our engineering skills to work with nature. Further articles illustrate our engineering approach to de-risk the design and build of the breakwater at Cowes and demonstrate how F+G is playing its part in the UK's largest local authority-led coastal defence project at Southsea. We also explain how we are delivering beach rehabilitation and marine conservation techniques in Barbados,

and explore into how Atkins is using innovative techniques, energy optimisation and intelligent asset management to design more sustainable ports.

It's the first time I have attended the conference and I'm really looking forward to hearing about all the great things that are happening in the global marine and coastal engineering community over the next few days.

I encourage you to make some time during the conference breaks to come over to our exhibition stand for a chat with the Atkins F+G team. I hope you have an informative and enjoyable ICE Breakwaters conference!



Simon Leek
CLIENT DIRECTOR
WATER MANAGEMENT AGENCIES

Our services

As one of the UK's largest design consultancies working in the Water and Environmental sector, we bring an unparalleled range of services and the ability to mix these services to work collaboratively and deliver a more sustainable and nature positive future for our clients and wider society.

01 Data Analysis

Using Digital Twins as a basis for decision making

02 Structural & Civil Engineering

Designing, maintaining and improving flood risk management infrastructure

03 Zero Carbon Design

Understanding current and future assets

04 Climate Adaptation

Improving the resilience of communities and assets

05 Natural Capital & Environmental

Working with nature to benefit society, the economy and environment

06 Landscape & Masterplanning

Creating sustainable and inspirational outdoor spaces



Stephen Fort
CHIEF GEOTECHNICAL
ENGINEER



Paul Canning
WATER AND
ENVIRONMENT



Graham Broome
REGIONAL
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Steve Barge
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Ray Pickering
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Steven Wade
ATKINS FELLOW AND
TECHNICAL DIRECTOR
CLIMATE FUTURES



Iain Roberts
CHIEF MARITIME &
COASTAL ENGINEER

- > Flood risk management
- > Climate change & adaptation
- > Civil & Structural engineering
- > Landscape & masterplanning
- > Planning, consenting & licencing
- > Asset management
- > Flood risk assessment
- > Heritage archaeology
- > Incident management
- > Biodiversity Net Gain
- > Nature based solutions
- > Social value consultancy
- > Net zero carbon
- > Blue Green infrastructure
- > Ecology
- > Sustainability management
- > Geotechnical
- > Business case appraisal
- > Economics, Funding & Financing
- > Stakeholder engagement
- > Decarbonomics
- > Environmental assessment
- > Water quality
- > Coastal processes
- > Transport planning

Business as usual in an unknown climate

In an increasingly climate-conscious environment, organisations need to get to grips with business risks and be able to demonstrate how they can operate successfully in the face of more extreme weather events.

Following three rounds of reporting under the Climate Change Act (2008) Adaption Reporting Power (ARP), many government departments are now implementing the Greening Government Commitments (GGC), including requirements to adapt to future climate change, and private organisations are embracing the recommendations of the Taskforce for Climate-related Financial Disclosures (TCFD) which include the assessment of physical climate risks and material impact on business.

Understanding the potential impact of climate change on flood risk for big businesses is challenging, particularly when dealing with a large number of assets across the UK, and even more so when global supplies extend to areas with significant flood risk, such as South East Asia or the Southern USA.

Unlike heatwaves, cold-snaps, drought and many other risks, exposure to flooding is site specific and requires the best available local information to estimate potential damage and disruption. It's also important to consider the impact of surface water, river and coastal flooding for a range of events, over different time periods and different geographies.

All these factors mean a robust assessment can be a data-intensive task, but new frameworks and the development of digital tools are making the process more efficient. They support quicker and cheaper appraisals of extensive national and international asset portfolios, and can provide the evidence base needed to prioritise, plan for and deliver effective climate action.

Atkins' work with the Department for Work and Pensions (DWP) provided key insights into how digital tools can accelerate climate strategy development and action, undertaking a national flood risk assessment and mapping climate vulnerability of around 900 properties across different return period events.

By integrating our PANGEA GIS tools with Ordnance Survey Mastermap, we were able to find building footprints for any UK address, giving us precise information on locations and other relevant building attributes.

Utilising publicly available national flood maps from the Environment Agency (EA) and Natural Resources Wales (NRW) in combination with third party data and elevation data, we conducted a detailed analysis which enabled us to estimate flood depths. Our FloodDamaGIS tool supported a rapid and robust assessment of the potential economic damage of flooding across the DWP's extensive UK-wide portfolio. This enabled us to incorporate the potential impact of climate change under various scenarios and work with DWP to develop a data-driven climate risk adaptation plan.

The big challenge is, we don't know what kind of warming we'll be dealing with, and the levels of investment may need to increase significantly in order to control the risks, which will vary from business to business, depending on location, exposure, and sensitivity of assets.

The latest Climate Change Risk Assessment indicated that flood damage could increase from £2 billion today to £3.5-£3.9 billion under the 4oC warming scenario, underlining just how crucial a robust assessment and comprehensive plan is to ensuring business stability.

Climate change is likely to cause uplifts in extreme sea levels, as well as increased frequency of surface water and river floods. We are able to incorporate these risk multipliers into our assessments by linking increases in peak flow or level to increases in frequency, for example, identifying events with an annual probability of 1 in 100 that could rise to 1 in 50, under specific climate change scenarios. Using the best available data, we can develop frequency factors for a range of flood and other hazards that can be used to estimate future impact and influence planning.

When organisations assess flood risk for the first time, they are often astonished at quite how devastating a severe weather event could be on their assets, operations and productivity. While they may have anecdotal evidence of risk, a full assessment provides the detailed evidence needed to raise the profile of the flood risk, which is often put on the back burner in favour of net zero.

Climate resilience and net zero planning need to go hand in hand – no matter how much effort we put into reducing or eliminating carbon emissions,

there's no getting away from the fact that climate change is happening, and extreme weather events are becoming more severe and more frequent. As the pace of investment in flood risk management struggles to keep up with growing risks, every organisation needs to prioritise action to increase climate resilience and protect their business.



Steven Wade
ATKINS FELLOW AND
TECHNICAL DIRECTOR -
CLIMATE FUTURES



Coastal adaptation:

Redefining our coastlines for the future

Time for change

The latest climate change predictions, reinforced by ongoing media reporting of storms and floods around the world, make for sobering reading. On the coast, this is exacerbated by the combined impact of rising sea levels, increased storminess and the possibility of accelerated coastal erosion.

The culmination of these factors requires a wide-ranging response – and a step change in approach – to adapt coastal communities, their infrastructure and their environment at a strategic scale and on a local level.

But there is inherent resistance to changing something that can easily be seen as intrinsically unchanging. The unique majesty of the British coastline encompasses a natural environment with a historic legacy of infrastructure that often has Roman, medieval or Victorian origins, and represents centuries of investment and land ownership.

Often, the primary aim of coastal management is broadly to preserve and retain coastal communities and infrastructure – to keep things the same, as much as possible. But the intensity of our climate emergency, and the speed at which we are feeling its effects, means that in some places around the UK coast we increasingly need to manage the coast in a different way.

A new epoch for shoreline management plans

The second round of shoreline management plans (SMPs) were published over a decade ago and focused mainly on coastal management with no intervention, holding the line using a combination of hard and soft engineering solutions, and where possible, managed realignment of sea defences to compensate for loss of designated habitats.

As we head towards the end of the first 'short-term' epoch of the SMPs, a large number of these relatively easier schemes have successfully been delivered. However, the challenge now is that future schemes will need to achieve even more complex drivers and balances across the natural and built environment.

In the UK, the National Flood and Coastal Erosion Risk Management Strategy has brought together and reinforced current industry thinking around the need to adapt to climate change. It's clear that as we review and develop coastal management policies for forthcoming decades, we must shift the focus towards broader adaptation around the coast. We cannot simply kick the can down the road. As we face an uncertain and potentially extreme future, earlier and continual engagement with communities, and greater pace, scale and complexity of schemes will be required to respond to accelerating sea level rise and erosion.

Looking to the future

So how do we respond to and plan for this future? Coastal adaptation in this context will continue to require, in some locations, the continued strengthening of hard sea defences. But even then, increased storminess is likely to render a single line of defence inefficient, with secondary or more landward defences needed to manage residual risks.

In other locations, coastal adaptation will require much harder or nuanced decisions to be made, working closely with coastal stakeholders to enable meaningful change that makes time and space for coastal processes, as well as the natural and man-made coastal features that rely on them. For example, this could include early engagement to influence planning policy and ensure critical community infrastructure such as new schools or medical centres are located away from the areas most at risk.

We are making strides towards this already, for example with our ground-breaking work at Bude on the north Cornwall coast. This involved early discussions with communities well before any decision-making, to understand how they want to be engaged, what they value and what their concerns are. In response to these conversations, we developed an interactive tool that explains

the policy environment, ongoing monitoring of coastal risks and the state of climate and coastal change science. Photo-realistic visualisations of combined flood and erosion predictions across a range of scenarios to clearly demonstrate the potential scale, pace and uncertainty of change ahead.

The example at Bude points towards a future of smarter, data-driven and evidence-based coastal adaptation, where we have the information we need to drive significant coastal change, the tools to create meaningful engagement and the experience to enhance understanding and ownership across the stakeholder community.



Interactive tool comparing present day and future coastal and climate change impacts at Bude.

All systems go

Further changes will be needed. A planning and legislative framework that more easily allows change is essential, and broader engineering solutions need to be considered, that take the whole nearshore to terrestrial area into account, such as wider spatial buffers for change or multiple forms of flood and erosion management.

These changes, along with new, smarter engagement techniques will facilitate broader and long-term solutions that embrace coastal adaptation and create a sustainable future along the coast.



Paul Canning
WATER AND ENVIRONMENT

World-class potential

At the head of the Medina River, Cowes sits in a strategic location with direct access into the Solent, making it a world-class sailing destination. As such, the harbour and its facilities are compelled to live up to the world-class standards expected by its clientele.

Following years of planning, the Cowes Outer Harbour Project (COHP) set out to install a 300m breakwater on a soft soil sea bed, to transform the Medina Estuary into a sheltered harbour. Crucially, this would facilitate the expansion of permanent and temporary berthing facilities, strengthening the town's reputation among the sailing community, and open up business opportunities in the area.

The project development included options assessments, numerical modelling and environmental assessments all leading to the creation of a scheme layout. After preparing concept designs, Atkins was brought in as project manager for the client, overseeing operations and ensuring successful delivery of this challenging design and build project.

Breakwaters on soft soils:

A risky business

De-risking the tendering process

Although the location and length of the breakwater was fixed by the client, the form of construction was to be determined by the tenderers. Finding a reliable engineering solution for this particular breakwater was always going to be risky, with precarious ground conditions made up of soft and compressible clays up to 19m in depth. It was obvious that the foundation design of the breakwater was the most problematic issue, and that tenderers would need a high degree of confidence in the derivation of design soil parameters if they were to submit efficient designs. There was a genuine concern that no one would actually want to take it on, particularly in a design and build context where any risk is transferred directly to the contractor.

In a bid to instil confidence among potential contractors, we used an unconventional procurement methodology aimed at de-risking the project. In a sidestep from standard procedure, we conducted the site investigation in parallel with the tendering process to allow tenderers to influence the soils data, and building a relationship to help them feel comfortable with the risk. They were able to request specific tests, comment on specifications and borehole locations, and attend site operations to get a better understanding of the conditions and what might be involved, in order to amass sufficient evidence to assure themselves they could deliver. While this approach did build confidence, it also led to several potential tenders pulling out of the process, realising that they just couldn't perform on this occasion – or that they weren't willing or able to take on the level of risk involved.

Building with confidence

In the end, we only received four submissions for tender, and among them, there was an overt tendency to overdesign in response to significant challenges presented by the terrain. The successful contractor's simpler and more effective design involved the construction of a low crested rubble mound breakwater to reduce wave transmission into the harbour so that good berthing conditions could be achieved.

The basis of the foundation design was to consolidate the underlying soft soils and improve their shear strength through pre-loading and drainage. A staged construction approach meant there would be a significant consolidation period using dredged gravel core before the final rock armour was placed.

Sophisticated modelling techniques predicted how much the initial structure would sink, and give us a timeline for how long it would need to settle, before laying the armour layers to complete the breakwater. We ended up having to wait two years – even longer than the 18 months predicted – before it was stable enough to proceed. Getting that wrong and acting too soon could have resulted in total collapse – realising the risk the team had worked so hard to avert.

A more stable future

COHP was successfully delivered in 2017 and has operated effectively over the past five years, validating the methods used and proving that this construction approach is suitable – and indeed optimal – for installing breakwaters on soft soil. Based on the number and quality of proposals we saw, it's clear that undertaking ground improvement of the sea bed using a marine floating plant is uncommon, requiring specialist design, and employing engineering and construction techniques that are not widely used.

As part of the breakwaters on soft soils PIANC working group, Atkins is involved in the development of new guidelines – with this project being an example of best practice.

The guidelines, set to be published later this year, will set out how best to manage the risk associated with soft soil construction methods. They will instil confidence and foster competition in this area of work, supporting easier and quicker developments amid rising sea levels and increased demand for breakwaters on challenging terrains.



Iain Roberts
CHIEF MARITIME &
COASTAL ENGINEER



Galvanising green ports

A Stormy seas ahead

As a cornerstone of the UK economy, our ports are vital players in the green revolution. Their significant environmental impact in terms of air, noise and CO2 pollution, means they have the potential to make a huge difference – if they can up their sustainability game.

With climate change in full swing, and 2030 and 2050 targets drawing ever-closer, the industry is playing catch up when it comes to going green, and quickly needs to take action to bolster its preparedness for the decades to come. Not only does the industry need to start focusing on how it can reduce its environmental impact; it must secure its own resilience against extreme weather events, fossil fuel shortages and a changing global economic landscape.

The good news is, developments in green technology and innovations in smart solutions position our ports on the cusp of environmental transformation – incorporating improved efficiency with reduced environmental impact.

But, while progress has been made on greening the operations of ports themselves, little attention has been paid in the UK to the much more damaging emissions from maritime vessels using the ports. A thriving port for the future requires us to harness the power of innovative solutions around port automation, energy optimisation and intelligent asset management to fully realise the benefits of a green revolution. This requires holistic, long-term planning, encompassing everything from renewable energy infrastructure to emissions management, and from green supply chains to social value. The technology is there, but to fully seize the green port opportunity, we need cohesive thinking, and systemic changes in our approach to port developments.

Money matters

While green, intelligent ports would seem to offer the full environmental and economic package, a short-sighted system hinders planning and limits long-term investment, dampening progress in the UK.

Ports across Europe – and much of the rest of the world – are semi-municipal, integrated with local and central governments, and are therefore more in step with the green political agenda. In the UK, ports are generally privately owned and operated, and so ultimately, the focus is on value for money. Port owners lease out terminals to port operators for set periods, which often leads to short-term, solution-based planning and can make long-term outcome-based planning difficult.

We're at risk of falling behind. We need to move at pace to clean up our act and stand up against international competitors. Our economic model means it's imperative we entice global ship operators into the UK port infrastructure, implementing innovative technology to boost efficiency and drive down emissions. With a maritime industry pushing towards cleaner fuels, such as electric or hydrogen-powered vessels, we need to ensure we have the right facilities and infrastructure to meet commercial expectations and keep UK ports afloat in an evolving international market.

A beacon of light

Ports are slowly implementing changes, but, in the current climate, they're just not going far enough. The sort of change we need to see is huge, and in the current UK context, we've got a real challenge ahead.

To fully electrify the port of Dover would require using the equivalent of Dover's entire energy supply. It's clear we need to think about the bigger picture and capitalise on innovation to make progress possible. But with short-term leases in play, it's unclear how we can secure the long-term infrastructure investments needed to turn things around, particularly when low-carbon materials are at a premium. With recovery of full outlay at the end of a lease period unlikely, as things stand, it doesn't make financial sense to go green.

One option would be to encourage port owners to invest in the long-term energy infrastructure and sustainable asset management required to transform UK ports. But as private companies, port owners need financial incentives to make this change. International market forces will no doubt play a part, but it's likely that obligations associated with green investment will be the real game-changer. In the not-so-distant future, ports will need to market themselves as a green opportunity in order to get the investment they need, so there will be no choice but to green up.

Even with these incentives in place, time is running out, and there's a mammoth task ahead.

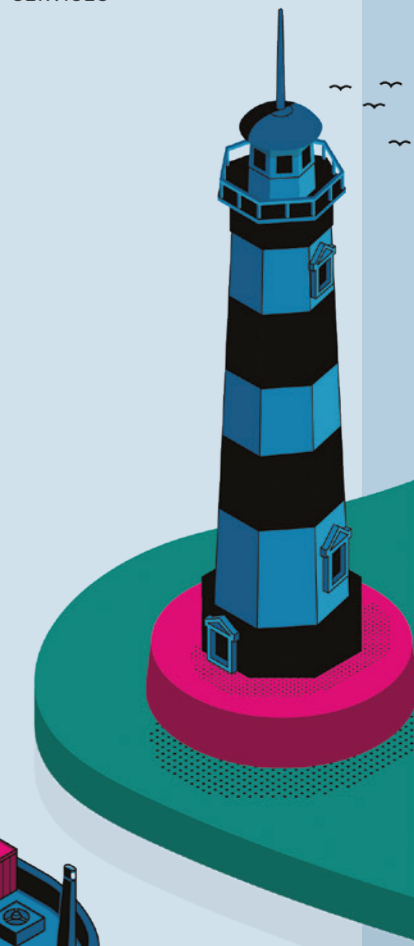
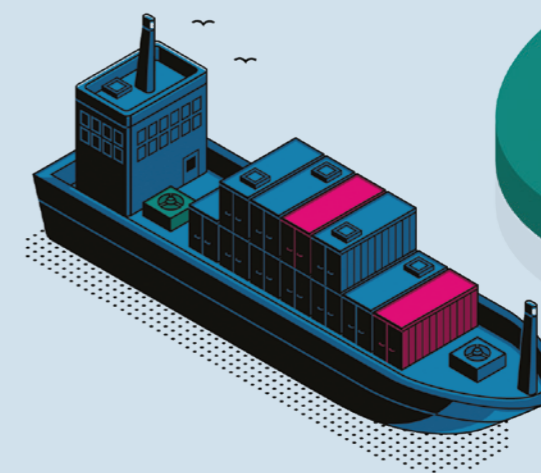
This transformation is a real opportunity for port operators, with multiple environmental, social and economic benefits, and there's real promise of change. But with substantive environmental impact and 2030 fast-approaching, a clear plan of action is needed, which will require collaboration across the industry.

Longstanding relationships with ports and other key stakeholders put Atkins in a unique position to drive green solutions and encourage a fundamental change in approach. Our understanding of client needs and challenges, and our position of trust, means we have a pivotal role to play in instilling a collaborative culture.

Bringing port owners, operators and shipping companies together to understand and implement innovative and targeted interventions is the key to securing green investment and creating enduring benefits for the environment, our clients, and the global port industry.



Don Lamont
HEAD OF RIVERS,
DAMS & MARITIME
SERVICES



Keeping the Caribbean dream alive

A Wish you were here?

Sandy Lane represents the picture perfect Caribbean idyll. As an upmarket beachfront hotel in Barbados, clients have high expectations of a luxury experience that invariably involves crystal clear waters, and – without exception – a beach.

Market pressures mean the hotel is compelled to deliver on this dream in order to uphold its reputation and bring in business. But more than that; while an attractive beach is integral to the prosperity of the hotel, the hotel is a pivotal player in the economy of the resort, and the island more generally.

Tourism is at the core of the Caribbean economy, and for as long as visitors have a Caribbean dream, the islands must do all they can to make it come true.

Climate change – and in particular – rising sea levels, are threatening the natural beauty of the Caribbean that we often take for granted. Increasing sea levels and storminess are bringing higher-energy waves closer to shore, accelerating the rate of erosion, resulting in a coastal squeeze that, at best, puts resorts like Sandy Lane at risk of forfeiting their most valuable asset, and at worst puts them at risk of collapse.

Restoring nature's beauty

Unsurprisingly, landowners and businesses across Barbados (and beyond) are investing heavily in coastal management programmes in a bid to protect their prized beaches and coastal assets, and preserve the levels of tourism their economy depends on.

At Sandy Lane, Atkins was brought in to deliver a beach rehabilitation and marine conservation project on a 700m stretch of coastline that falls within the Folkstone Marine Reserve – a designated area. The sensitively designed project needed to generate multiple benefits for the community and the environment, through improved beach recreation potential and protection of important economic assets, as well as preservation of marine biodiversity and rehabilitation of key habitats.

Works included one emergent breakwater 100m from shore combined with beach nourishment to recharge 250m of beach using 15,000m³ of sand. Together, these interventions will intercept waves and minimise future erosion, while addressing damage already done. Along with efforts to restore the relic reef in the area through careful polyp transplantation, the programme has covered all bases in terms of trying to recreate the beauty of the not-so-distant past.

Fighting a losing battle

But the story certainly doesn't end there. The odds are stacking up against the viability of traditional engineering techniques to keep the Caribbean dream alive.

As the climate emergency unfolds, and the impact of rising sea levels is felt across the globe, privately-funded coastal management projects are springing up along coastlines around the world, each trying to solve the same problem for their patch of land. Strong regulatory planning and environmental regulations are vital to ensure developments do not adversely impact surrounding land and communities. But in many parts of the world, regulatory enforcement and joined-up thinking are lacking. Without sufficient regulation and oversight, individual landowners will continue to protect their own stretch of coastline however they see fit, without thinking about the bigger picture. This has the potential to cause unintended shifts in littoral sand movements, leading to counterproductivity and risking damage to neighbouring beaches.

The race to preserve the beach idyll will continue for as long as the climate emergency threatens it. While projects like those at Sandy Lane can give us peace of mind for the next decade or so, ultimately, ever-increasing sea levels and subsequent erosion means we will need continuous interventions to abate the coastal squeeze.

Reimagining the dream

Ultimately the rate at which climate change impacts our coastlines will determine what happens next – something we can't accurately predict. But we know there's every chance we will need to radically re-think our approach to projects like Sandy Lane in the future, whether that's through managed realignment, innovative artificial beach design, or wholesale transformation of coastal tourism.

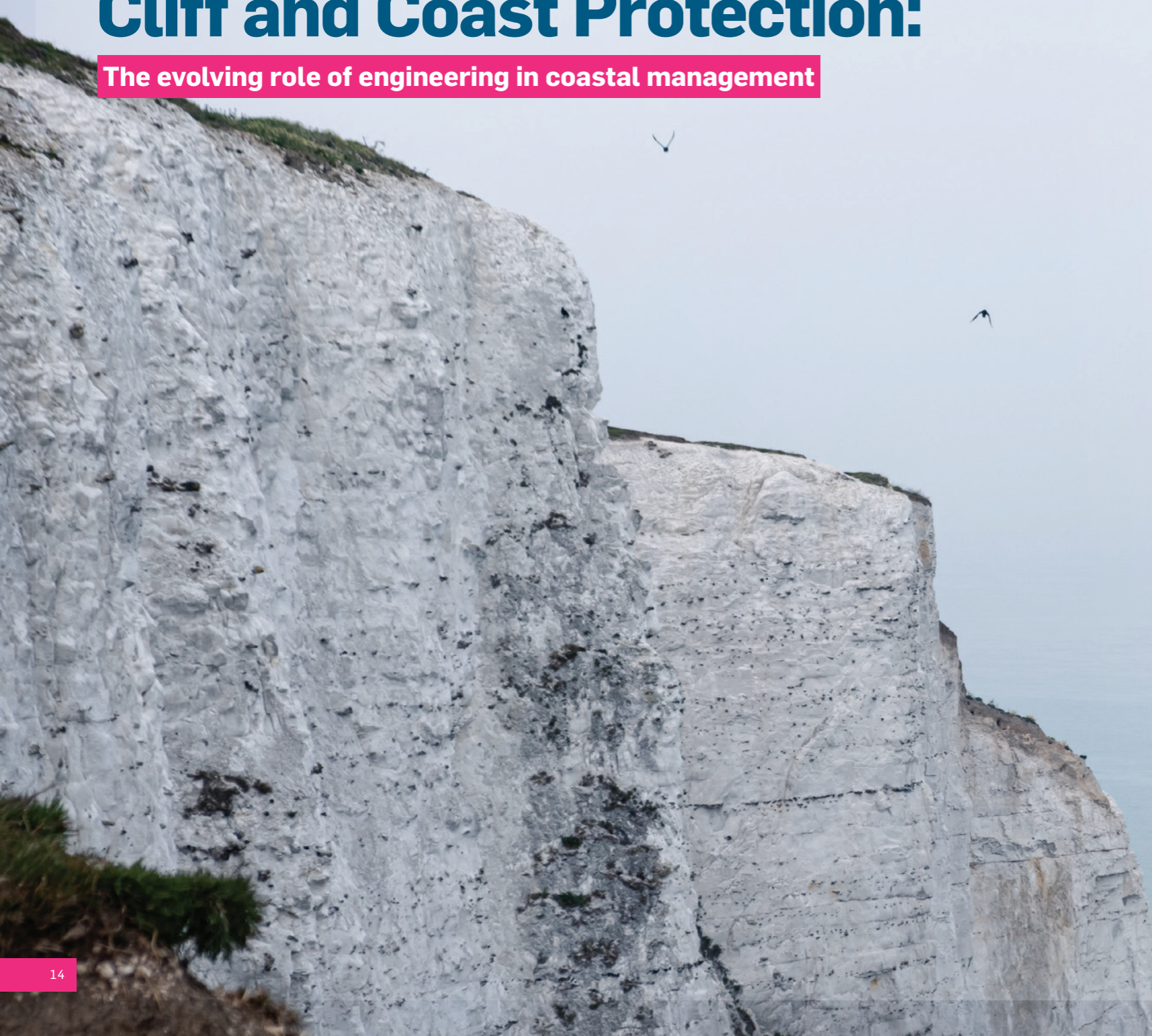
Whatever we do, at some point in the future, we're going to have to accept the loss of many beautiful beaches across the world. With unrelenting climate change and significant sea level rise expected in the coming years, we can't keep fighting it – eventually, resorts like Sandy Lane will have to find another sell. Perhaps it's time to dream a new Caribbean dream.



Steve Barge
HEAD OF SERVICE LINE
CATCHMENT MANAGEMENT

Cliff and Coast Protection:

The evolving role of engineering in coastal management



Keeping up with climate change

As climate change accelerates, we are witnessing the power of nature more and more – not least on our coastal landscape. Increased storminess, more rainfall and ever-rising sea levels all mean one thing: erosion. Erosion, of course, has always taken place, and it is generally something we accept as a natural, ongoing and inevitable process. It has transformed the landscape of our planet throughout history, and will continue to do so.

But climate change has disrupted this process, escalating erosion and fast-forwarding the deterioration of our coastlines. We've all heard of Happisburgh – the Norfolk village 'crumbling into the sea'. There, the coastline is retreating at such an alarming rate that residents' houses are literally falling into the sea, with 34 homes being destroyed in the past 20 years. And earlier this year we saw homes being demolished in nearby Hemsby after high tides cut into sandy cliffs. Climate change means this is likely to get worse, fast.

With around 10% of the UK's 11,000km-long coastline composed of soft cliff geology, including the Norfolk coast, much of the Yorkshire coast and also the south coast, the magnitude and rate of coastal recession and cliff instability is significant, as is the risk of damage and total loss.

Engineering solutions have been incredibly successful at protecting our coastlines to date, and as technology advances and we increase our understanding of geomorphological, geological and coastal processes, there is a huge amount we can do to continue to preserve them as we head into an uncertain future.

But many existing assets need attention if they are to stand the test of time, with some reaching their end-of-life, others requiring costly maintenance and increasing numbers becoming damaged or destroyed by stormy weather, waves and the resulting coastal erosion; defeated by the very power they were designed to abate.

While there is no doubt that engineering interventions are an integral part of any coastal management scheme, it is important we understand their limits. They have a defined life-span and require regular and often significant maintenance to stand

up to the force of nature. We must understand our coastal protection assets not as ends in themselves, but as part of a broader, technical scheme that incorporates the right studies and investigations with the right understanding of processes to create well-designed interventions for the long-term.

A balancing act

There are some serious and compelling reasons why cliff stabilisation is essential. Instability can threaten people, property and infrastructure. But it's also prudent to consider why certain engineering interventions may not always be appropriate. By their very nature, eroding and unstable cliff lines generally form areas of great scenic value. Many have become major tourist destinations, and may also be of scientific interest for their natural characteristics and flora and fauna. As such, many coastal sites are protected by one or more environmental designations.

In these areas, some engineering solutions may devalue the site in terms of its natural capital and could diminish biodiversity at a time when there's a clear call from environmental campaigners and government to do precisely the opposite.

For this reason, certain engineering solutions are sometimes met with significant resistance, and can create conflict between different stakeholders with valid, yet incompatible interests. Before jumping in with intrusive solutions, we need to consider all the various aspects of a site and the implications of different interventions to find optimal solutions in a given set of circumstances. It's all about balance.

Human safety and infrastructure issues usually warrant intervention, but it would be wrong to assume they always take precedence. Particularly when there is a specific designation, the protection of natural assets can override that of its man-made counterparts. In such cases, natural assets must be prioritised through good technical design. Roads can be moved, residents relocated and histories changed, but nature can be lost.

Whatever design we choose, ultimately, nature holds the cards. There's a great deal we can do to mitigate against damage, danger and loss, but we can't stop erosion,

rising sea levels and wave surges. Cliff stabilisation for the future must marry engineering with nature to develop appropriate and effective engineering solutions that can continue to protect us, and our natural and built environment.

The power of engineering

The role of engineering in coastal management is evolving – in line with our coastal landscape. Rather than a catch-all solution that will single-handedly stop erosion or protect coastal assets, engineering should be seen as an invaluable tool that supports a wider scheme for sustainable change.

Increasingly – as in the village of Happisburgh – engineering solutions are being constructed, not to halt erosion per se, but to slow erosion and protect the community against serious effects for a limited time. This time can then be used to implement broader and more long-term schemes such as managed realignment, where facilities and infrastructure will be relocated, and people rehoused.

It is important to get a full understanding of any site, and consider why certain engineering interventions may not be appropriate – whether it's environmental protection, low cost-benefit ratios, lack of funding, or simply the magnitude of the problem. Well-designed engineering interventions should form part of a complex approach that involves monitoring and predetermined response procedures.

We must use engineering to work with nature, not fight against it. While we can largely protect our built and natural assets by understanding our environment and utilising smart engineering techniques, sometimes coastlines will need to evolve – and our approach needs to evolve in tandem. Coastal management schemes for the future need to harness the considerable power of modern engineering, while planning realistically and addressing the problem holistically, accepting – and managing – inevitable change at the hands of nature.



Stephen Fort
CHIEF GEOTECHNICAL
ENGINEER



Southsea Coastal Scheme:

Preserving a proud history for a prosperous future



Graham Broome
REGIONAL DIRECTOR

A stormy outlook

The Southsea seafront in Portsmouth is steeped in history, making it an attractive and inspiring place to live and work, as well as a fascinating site to visit. But its coastal location puts it at risk, and without effective and sustainable coastal defence mechanisms, its proud heritage could itself become history.

Coastal defences are time-limited, and the current defences at Southsea are coming to the end of their lifespan, increasing the risk of flooding, particularly against the backdrop of rising sea levels and increased storminess. With an entire community of homes and businesses – not to mention a significant number of historic artefacts and architectural assets – dangerously close to the threshold, exposure to powerful waves and vulnerability to flooding has the potential to destroy everything we love about Southsea.

Protection, preservation and prosperity

The Southsea Coastal Scheme is the UK's largest local authority-led coastal defences project, and is worth more than £160M. It will stretch for 4.5km from Old Portsmouth to Eastney, and help to reduce the risk of flooding to more than 8000 homes and 700 businesses. The ambitious programme of works will upgrade and replacing existing defences, through a mixed-method approach delivering masonry-clad seawalls, stepped revetments, raised promenades, embankments, rock structures and beach replenishment.

These interventions should protect the site for more than 100 years, and with the design going beyond just flood resilience to incorporate new amenity, landscape and public realm features, it will enhance and enrich the area, and support ongoing prosperity well into the future.

Securing value for money

Faithful+Gould (F+G) was appointed by Coastal Partners (acting on behalf of Portsmouth City Council) in 2017 to provide Cost and Commercial Management services. We consulted across the entire design development, from concept through to construction, challenging and negotiating target prices for each frontage, and informing decisions that facilitate best value for money. We continue to meticulously review applications for payments and negotiate the value of compensation events to ensure the scheme remains within budget or adjusted to match any change. Our expertise and scrutiny at every stage has resulted in millions of pounds worth of savings.

Much of the value in this project is derived from the fact it goes beyond a standard flood defence scheme, enhancing multiple aspects of the area and contributing towards its prosperity. As well as cost efficiencies identified by F+G, the sustainability inherent in this project created savings in landfill costs by using recycled materials, and the social value generated through the protection of 700 businesses from flooding speaks for itself. The overall rejuvenation of the area, beach replenishment activities and new accessibility features will secure Southsea's status as a pleasant place to live, and a desirable place to visit. They will encourage more tourism, stimulate the local economy and ultimately, contribute to improved prospects.

The cost of unearthing relics

Although F+G ensured savings were made across the project, unexpected circumstances meant additional funding was required. We can plan and budget for what we can see, but it's impossible to know what's buried underground. Big excavation projects on or near historical sites often unearth surprises, and Southsea is no exception. During the works, we have come across historic walls, monuments and obstructions, which meant the project needed to pause while the items were assessed by heritage experts. Once they ascertained if and how these needed to be preserved, the design and project plan was then adjusted to manage the new discoveries.

A compensation event due to an unexpected discovery always means more time and more money, but our rigorous approach to costing, applying consistently high levels of scrutiny, meant costs were kept to a minimum. This approach means we can be sure we're getting the absolute best value for our client, with not a penny is wasted, which is particularly salient when seeking additional funding.

A bright future

Our experience at F+G means we have the knowledge and the confidence to challenge prices at every single opportunity. It's this relentless and exhaustive approach that makes sure, even when the unexpected happens, we still deliver for our clients and local communities.

With the primary aim of protecting Southsea seafront and surrounding areas from flooding, the ongoing Southsea Coastal Scheme has already achieved much more than that. It's enhanced the area for residents, tourists and nature, and in doing so, created multi-benefit outcomes across the board, socially, economically and environmentally.

Safeguarding the historical splendour and bygone relics of this special coastline is no doubt an important and worthy achievement; but the breadth of this project has ensured Portsmouth won't simply be loved for its proud history, but also for its impressive future.

What makes us different is the way we work, and the way we think.

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Breakwaters Thought Leadership

Magazine April 2023

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