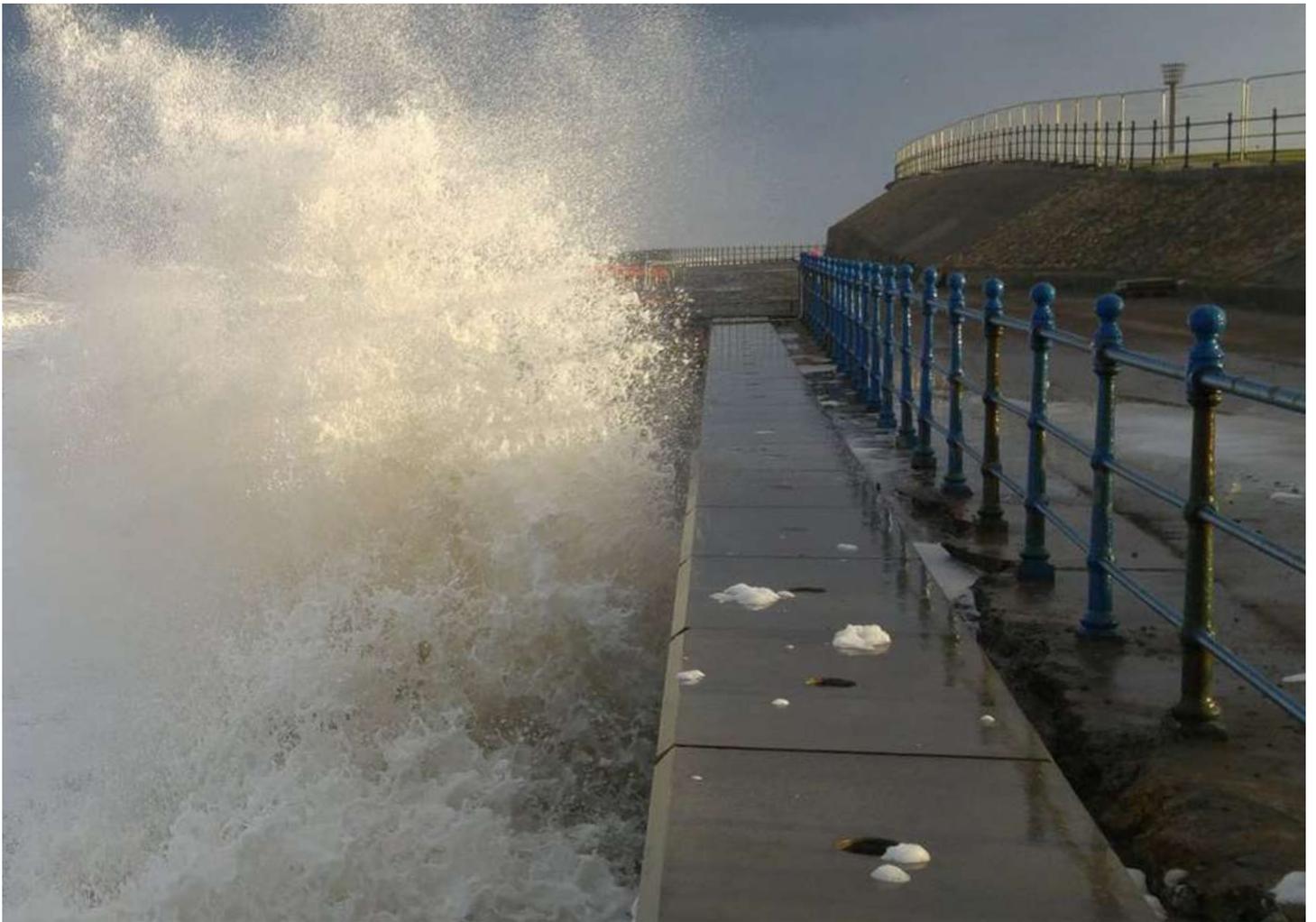




Protecting Britain's
coastline with precast
concrete solutions



Coastal Sea Defences

Britain's shoreline is continually evolving. Constant pounding by waves and increasingly volatile storm activity mean our coast is forever under threat.

Estimates suggest over 3,000 km (17%) of the UK coastline is currently eroding.

In areas where human life and other valuable features are at risk, coastal defences protect houses and infrastructure from being lost forever. Indeed, this vulnerability has already resulted in an estimated 2,300 km of UK coastline being artificially protected. This is the longest protected area in Europe.

Poundfield Precast have considerable experience in producing bespoke precast concrete coastal sea defence solutions for our customers, having participated in a significant number of projects over many years. Our precast concrete sea defence walls are designed to perform with outstanding durability



and combine the aesthetic quality of factory produced elements to provide structures capable of withstanding the demanding environmental conditions experienced in marine and coastal applications.



Concrete can make the difference

In areas where the land is protected, precast concrete is an excellent choice. Particularly suited to the harsh tidal environment, precast concrete units are especially effective due to their resistance to impact, and ability to withstand the constant wetting and drying caused by the tides.

Experienced in creating precast units for a number of sectors and uses, our dedicated design and manufacturing teams are able to work from technical drawings, or create solutions from scratch, in partnership with our customers own designers or technical specifications.

Once designed and tested electronically, we create bespoke moulds in which to cast the concrete for your project. Repeat casting requires a substantial, fully engineered steel mould. These moulds are capable of



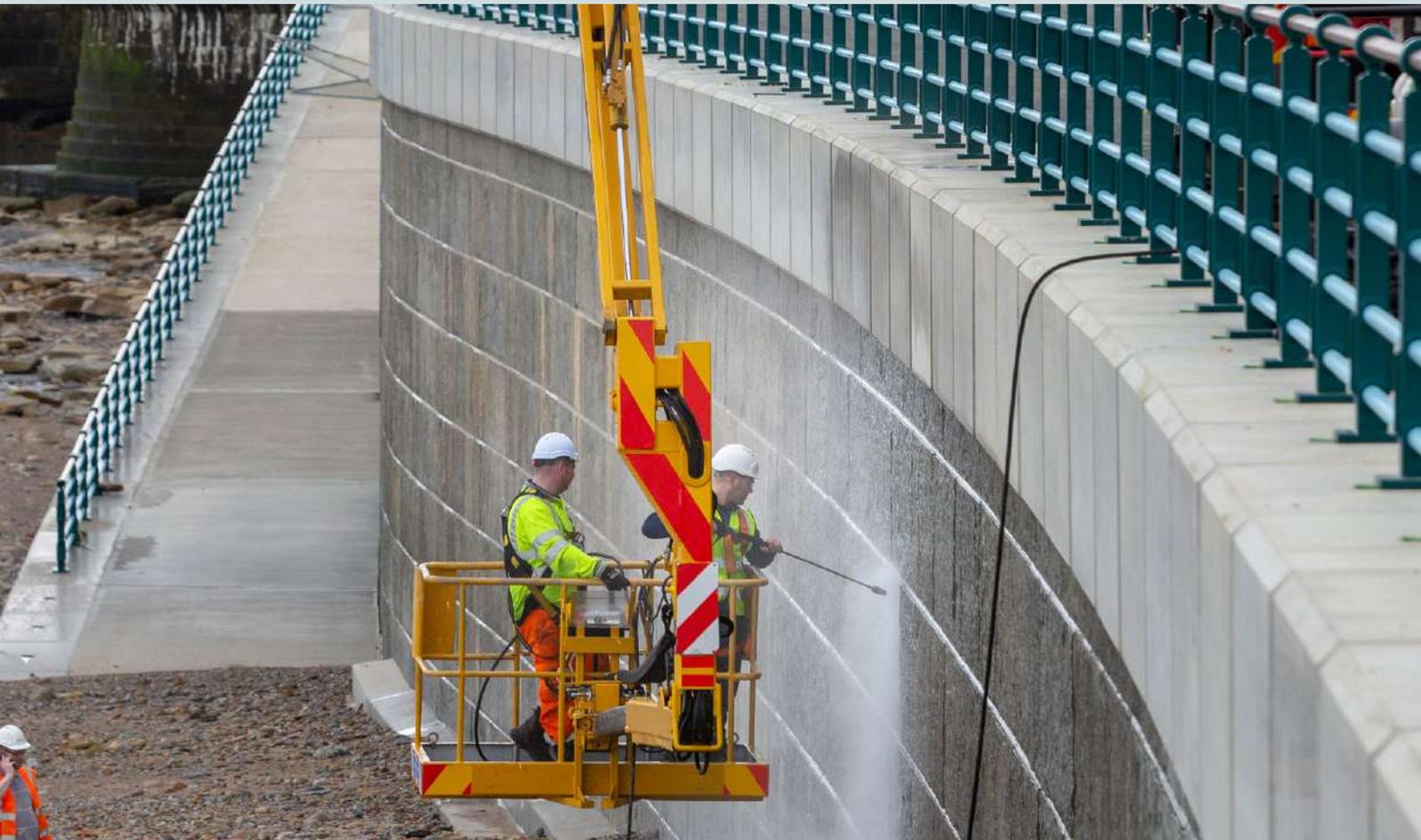
producing an unlimited number of repeat casts, each one identical to the one before it.

We can create unique pieces of any shape and with specialist finishes that can be applied during the casting stage.

For added resistance to the corrosive attack by salts in sea water, glass reinforced plastic (GRP reinforcement) can be used in place of stainless steel mesh. With an equal or greater tensile strength to steel, GRP is an excellent choice for marine uses.

In certain situations, planning may require that a specialist finish be applied to allow the wall to blend in with the marine setting. By applying these finishes in a factory-controlled environment, the effect can be replicated time and again.

Examples of projects we have been involved in



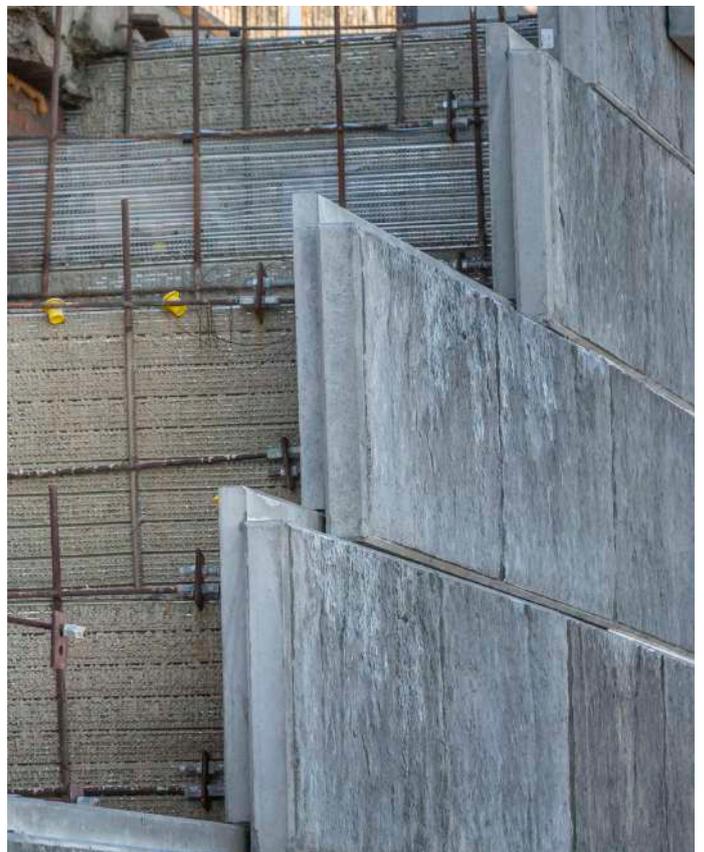
Whitley Bay – Bespoke Sea Defence Wall

Background: The 100-year-old Central Lower Promenade had severe structural problems and was approaching the end of its serviceable life. The existing two-tiered promenade protected the infrastructure above, but needed to be replaced to be better able to cope with the depredations of the North Sea.

Solution: A new rear wall was built, and the original lower wall strengthened, protecting the homes, businesses and roads above.

Other issues: The installation of the lower wall had to be completed by the end of autumn to allow works to be off the beach level before the onset of winter.

What we supplied: 1,800 bespoke sea defence wall panels.





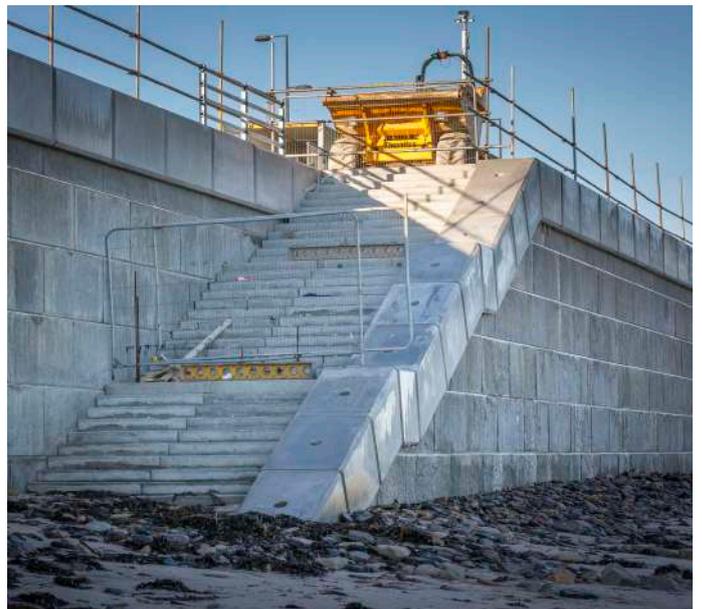
After decades of neglect following the collapse of the UK tourist trade in the 1980s, the aim of North Tyneside Council's 'Whitley Bay Seafront Masterplan' was to regenerate the area, making it even more attractive for visitors, residents and businesses.

The plan involved work on several ambitious projects between St Mary's Lighthouse and Cullercoats Bay, including restoring the landmark Spanish City Dome, demolishing derelict buildings, constructing new houses and updating the Northern and Central Lower Promenades.

Protecting the coastline along the central promenade stretch, the new sea wall will ensure there is no erosion into Whitley Bay in future years – a key consideration of the masterplan. While the project had to be compliant with modern health & safety standards, a traditional look was required, as much as possible, to fit in with the surrounding areas and developments. To achieve this, a patterned form liner was used during the casting process.

"This scheme has been challenging for our site team, so the continued partnership working with Poundfield has certainly assisted us in progressing the works."

Stephen Bromley, Business Development Manager, Hall Construction Services

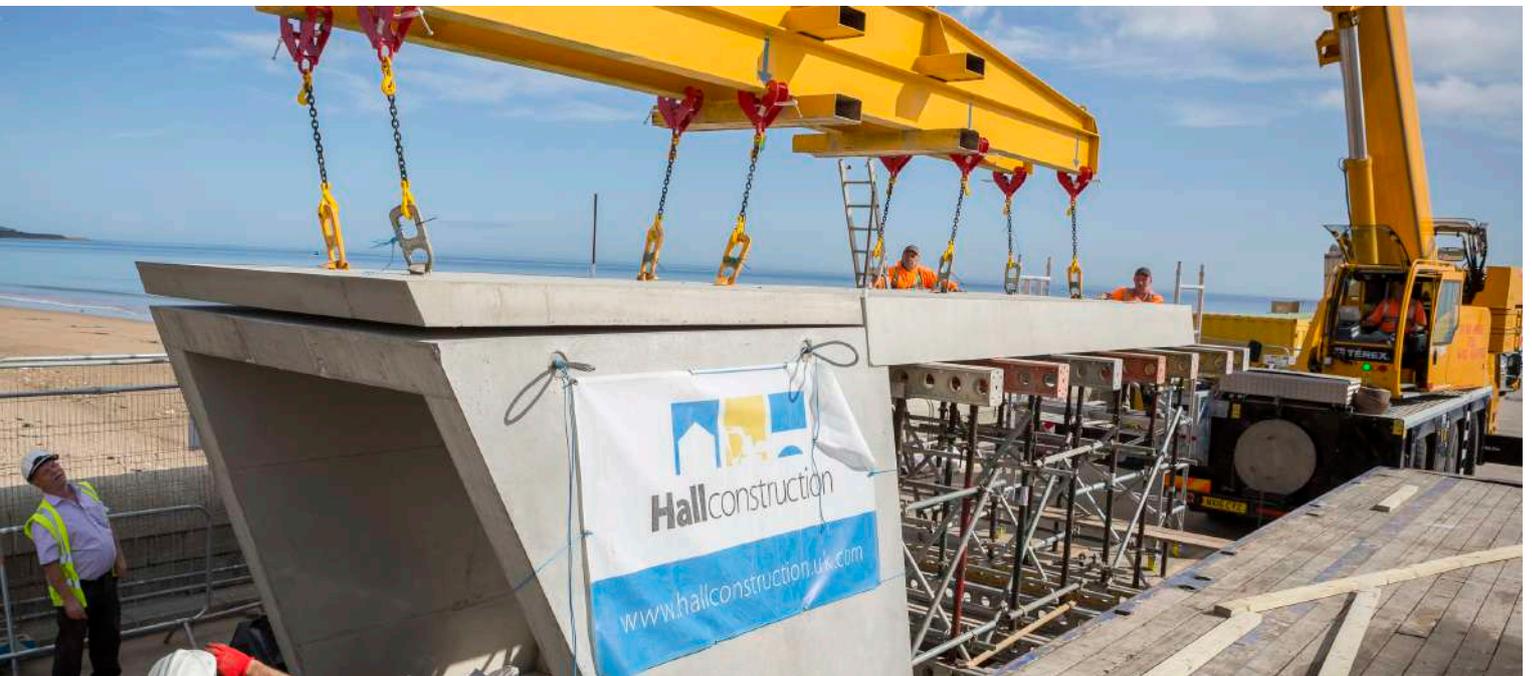


Alongside its sea defence duties, the promenade will also be used to host leisure events. To enhance the visitor experience, there is an open space with seating and provision for pop-up stalls or units.

An initial 250 bespoke wall panels were delivered to the Central Lower Promenade in June 2017, to be secured closest to the sand. These needed to be in place before the winter tides and weather made work on the beach too hazardous.

Despite having to create a myriad of one-off moulds, including special coping units running up the stairs, the work was completed on time.

Adapted steel moulds allowed the copings to be cast as one-off units, while exacting measurements ensured there were no imperfections, which would have been unacceptable for health and safety reasons.



Roker Pier

Background: New public access to the tunnel at Roker Pier was required to allow it to open for tours for the first time in its history. To facilitate public access to the pier tunnel a new building was required to allow safe access.

Solution: We created and supplied specially manufactured pieces for a new building. Made up of six sections, we created the units using four different and complex moulds.

Other issues: A special lifting frame had to be manufactured to lift the large 9.5m roof slab.

What we supplied: 6 units: 2 pod sections; 1 roof section; 2 roof thickening beams; and one end beam.

One of Sunderland's best loved landmarks, Roker Pier and lighthouse has protected the entrance to the harbour for over 100 years. Since falling into disrepair following decades of disuse, work began in 2012 to restore the Grade II listed structure. One of the final stages was creating a tunnel entrance to allow public tours for the very first time.

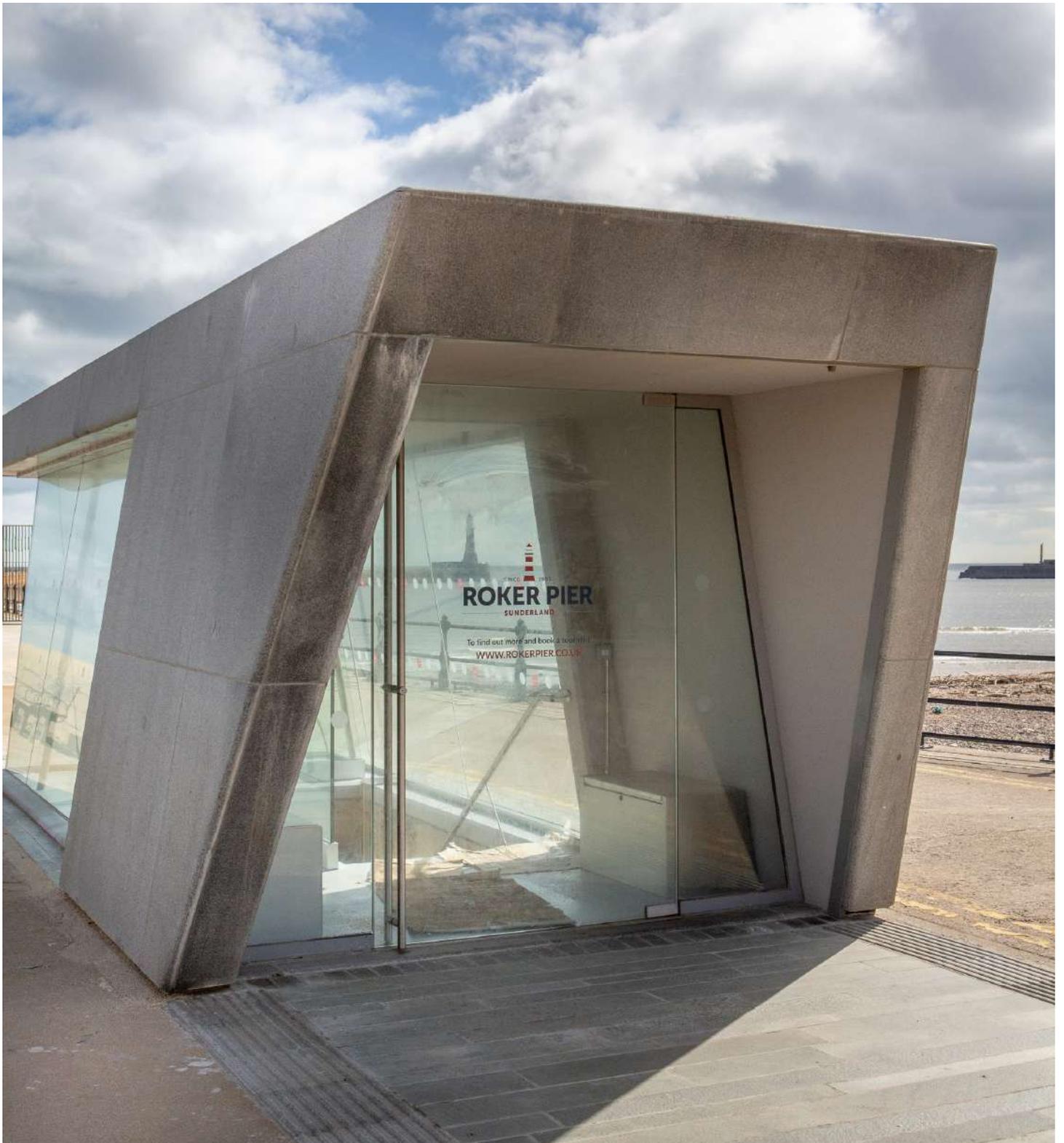
We were selected to supply the precast concrete required to create this new structure. Converting the architects' and engineers' drawings into a factory construction issue format, accuracy was key, with measurements having to be absolutely precise, right down to the last millimetre.

Once approved, the pieces were cast and delivered in just three weeks, allowing them to be installed on schedule before cladding and glazing work could begin.

Four complex moulds had to be created to create the six precast units, including a 9.5 m roof slab.

This slab also required careful coordination with our lifting and fittings supplier. To allow it to be removed from the delivery lorry and onto the pier a special lifting frame had to be manufactured. Tested and certified ahead of delivery, this special frame enabled the roof section to be lifted into place, completing an interesting but complex project.

The restoration and regeneration of Roker Pier and Lighthouse has since been nominated for the prestigious RIBA (Royal Institute of British Architects) North East Awards.



“[I was] confident in Poundfield’s capabilities to produce such bespoke sections through experience of working together on other projects”

Stephen Bromley, Business Development Manager, Hall Construction Services





Hartlepool Headland Sea Defence Walls

Background: The existing sea defences were 100 years old and crumbling. With rising sea levels, the existing walls were often overtopped during storms, as well as being susceptible to storm damage and erosion. Previous attempts at patching areas of the wall were deemed unsustainable going forward.

Solution: As part of the coastal protection development plan, 2 km of sea wall will be strengthened over a five-year period.

Other issues: Many 'site specials' had to be cast in order to keep the project on track.

What we supplied: Nearly 4,000 individual pieces, including 1,075 concrete capping beams.





Hartlepool Borough Council's five-year coastal protection development plan at Hartlepool Headland commenced in April 2015. Over the course of the works, 2 km of new sea defence wall will be installed, reinforcing the existing structure.

The existing sea wall at Hartlepool Headland was 100 years old and crumbling in places. Due to the age of the wall, reinforcement was required to ensure it effectively protected the 500 homes on the headland.

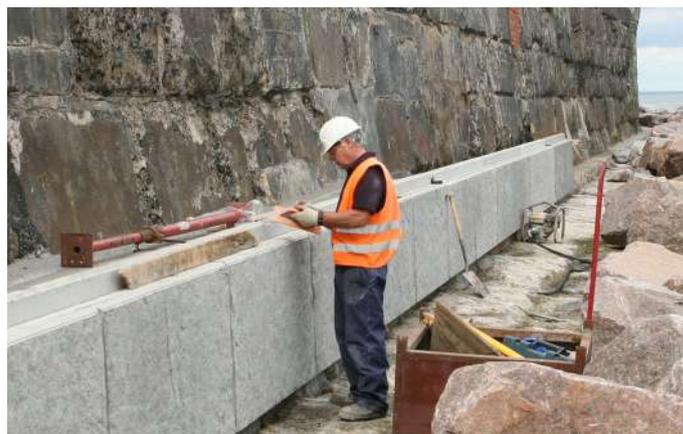
To help reinforce the structure, we supplied 200mm thick decorative panels in heights up to 6m. These panels were then anchored into the existing structure before being back-filled with concrete. This resulted in a new wall which had a minimum thickness of 450mm.

Alongside the reinforced wall, 27,000 tonnes of rock armour was excavated and installed at its base to help break the waves hitting the surface.

During the installation, powerful high tides blasted a hole through the front of the original wall, highlighting

"The design and installation; along with the quality of the Precast Concrete Panels and associated Precast Concrete copings have impressed all visitors"

*Phil Flett, Senior Project Manager,
Hall Construction Services*



the need for reinforcement. One year later, the new slabs withstood the winter storms without damage.

To resist the corrosive effects of salt water, the panels were built using glass reinforced plastic (GRP) rebar. An alternative to steel, GRP has an equal or greater tensile strength than the metal rebar, as well as good impact resistance and the important corrosion resistance to chloride ion attack. Using GRP should ensure the panels have a life expectancy of 200 years.

As part of the regeneration of the area, the panels all featured a decorative finish. As well as the standard panels, a number of bespoke units were created to suit the ramp areas.



The Regent Cinema - Redcar

Background: The Regent Cinema, formerly the New Pavillion, has been a Redcar landmark for more than 100 years. In April 2018 the cinema was shut due to concerns for public safety and following structural and building surveys it was decided to demolish the building in 2020. The new cinema stands on the beach front which posed some issues for the construction, requiring a sea defence structure to be constructed from the beach to the promenade level.

Solution: We supplied a total of 42 reinforced L-walls and capping beams to protect the building from the sea. Each L-wall was 2.9 metres high and weighed 6.52 tonnes. The capping beams, which weighed 8.5 tonnes each, were specially designed to sit over sheet piles which had been driven into the sand. Bespoke steel moulds were produced to ensure consistency between all the units. The units were sand coloured to match the existing parts of the wall already on site and several samples were created to ensure the match was as close as possible.



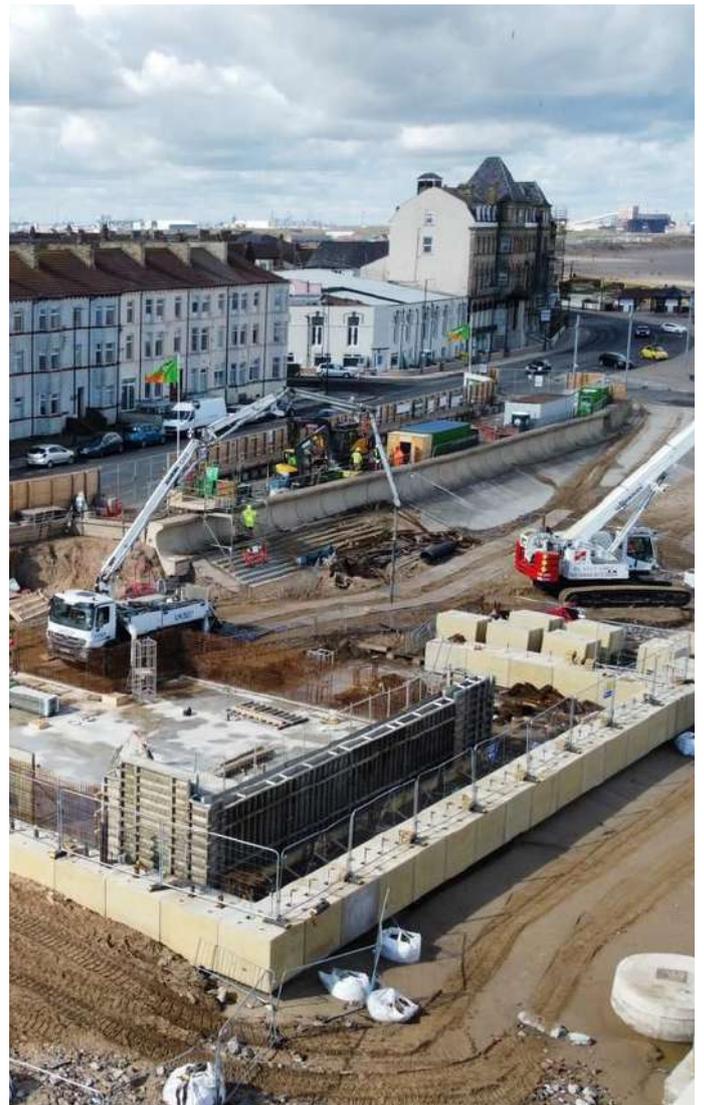


“A pleasure to be welcomed by Poundfield Precast yesterday to view our prestigious precast concrete sea defence elements for the Regent Cinema development.

It was a breath of fresh air to see the high standards of quality assurance and the real sense of employee satisfaction!

A family business setting the standard for off-site manufacturing.”

Mark Laidlaw, Senior Site Manager, BAM Construct UK





“The team at Poundfield made the process seem effortless and we are delighted to report that the sea wall has been installed and completed to our, and our client’s, satisfaction”

*Stuart Bass, Contracts Manager,
Hart Builders*

Cockenzie – Sea Defence Structure

Background New housing development to protect.

Solution: We manufactured and developed 43 L-Blocs to create a sea wall above the tidal break.

Other issues: Had to have a specialist finish.

What we supplied: 43 L-Blocs.

Working with Hart Builders, we delivered 43 L-Blocs to Cockenzie on the Firth of Forth along Scotland’s east coast. The site is 400 miles and seven hours away from our Suffolk base, making this an impressive feat of logistics.

To fit in with the local area and comply with planning requirements, the L-Blocs were all cast incorporating a Reckli or rough surface finish.

A major design change midway through the project was also overcome, with external engineers reacting swiftly to incorporate seven already cast units into the new design.

Revetments and Canewdon Blocks



We manufacture a range of revetments and Canewdon blocks which have been designed to provide a cost-effective alternative to flood walls. Being made of concrete they have a much longer design life than timber revetments and have very low maintenance costs.

The advantages of revetments are that they are a cheaper solution and are less intrusive than a sea wall, as well providing unrestricted access to people walking along the beach. In addition, less beach material is eroded.

Canewdon blocks have channels built into them which are designed to absorb wave energy and to reduce the effects of wave rebound. As the water hits the blocks and travels up the sloping structure the waves lose their energy. The channels can also encourage sea dwelling organisms which can be advantageous to the local ecosystem as well as greening the grey.

They are typically laid parallel to the shore and will often protect areas such as dune areas and they can also provide supplementary protection to existing sea defence structures such as sea walls.

Canewdon blocks help fix the location of the shoreline and help reduce damage to vulnerable back-beach environments.

As part of our strategy to reduce carbon footprints we manufacture Ultra Low Carbon Concrete (ULCC) Canewdon blocks where the amount of eCO₂ is up to 70% lower than using OPC (Ordinary Portland Cement). We are also able to offer alternative reinforcement options including Basalt rather than steel or fibreglass to provide greener alternatives for our customers. Basalt offers several advantages when used in maritime environments where the corrosion capability of sea water can have a detrimental effect. It is estimated that by using basalt rebar that the CO₂ emission will be up to 60% lower and combined with the use of ULCC (Ultra low carbon concrete) the reduction in CO₂ is significant.



Aquacast blocks

The Aquacast Flood Defence System is an innovative interlocking retaining wall system for use in flood defence and river bank reinforcement.

By overlapping at half block lengths in alternate directions the reverse slots provide a rigid format with a uniformly pitched centrally located aperture. These cavities can be filled with various materials to form permanent or temporary constructions. Steel pilings can be used through the centre of each cast to add additional reinforcement and strength when required. Further blocks can be added to or taken away from the original structure at a later date if required.

Aquacast blocks are ideal where a fast and flexible solution is required as they are simple and quick to install. They are able to be placed on any surface as they don't require foundations and are a cost-effective alternative to gabion baskets. Aquacast can be easily constructed into curves to accommodate bends in a river and can be submerged in water making them an ideal solution for rapid water and river bank reinforcement to combat flood and land slides.

Aquacast blocks can be manufactured using OPC (Ordinary Portland Cement). However, if you are looking for a lower carbon option we are able to produce these using Ultra Low Carbon Concrete (ULCC), resulting in CO₂ savings of up to 76%.



Aquacast is available in various colours and textured patterns which can promote bio-diversity and support local habitats.

Aquacast has been tested by Aquobex and achieved PAS1188:2009 part 4 (for temporary and demountable or temporary flood barriers erected away from a property). Aquacast achieved a leakage rate of zero litres/hour over a 24 hour period (the standard allows for a leakage rate of 40 litres/hour per linear metre of the flood defence).

Various colours and textured patterns are available to promote bio-diversity and support natural habitats.





Leading the way in Ultra-Low Carbon Concrete

With many companies committing to a net zero future the importance of having more sustainable options for the construction industry has become an even greater priority.

As a major precast concrete manufacturer, we recognise the contribution we can make to help our customers lower their carbon footprint and since January 2022 every product currently manufactured by Poundfield Precast is available in an ultra-low carbon concrete option which can save up to 76% in embodied CO2 compared to a conventional concrete.

As a group we introduced Greenbloc in 2021 which set the bar for bringing a cement-free alternative to a traditional building material into mainstream use, but it was only ever the start of our low-carbon journey. The market is changing and understands the need to acknowledge, address and action a tangible approach



to decarbonisation. We want to give architects, contractors and specifiers the choice of using an ultra-low carbon concrete to precast cementitious products.

The reaction from our customers has been extremely positive and we will continue to deliver real solutions working with our innovative technology partners.

To find out how our ultra-low carbon concrete can help to reduce the carbon footprint of your next construction project get in touch with the team at Poundfield Precast.

Poundfield Precast

Our bespoke precast concrete department offers a comprehensive service from design through to finish, providing a wide range of solutions for many different projects throughout a variety of industries.

We work closely with you to understand your requirements and offer advice to ensure the best method of construction and unit design is achieved.

Our dedicated team has the knowledge and expertise to deal with the challenges of your project.

SigmaRoc

Poundfield Precast are part of the construction materials group SigmaRoc Plc. An AIM-listed company, SigmaRoc brings together a team of construction materials, mining, contracting and investment experts who focus on niche markets within the heavy construction material sector.



For further information please contact us on 01449 723150 or email enquiries@poundfield.com
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