



Award-winning inland surf complex makes waves with intelligent design

CASE STUDY

The Wave is an inland surf destination situated near Bristol, offering year-round consistent waves for people of all ages, background and abilities. Like a scene from a science-fiction film, its crystal-clear lake and accompanying surf cove are set against the backdrop of the Bristolian countryside, a marvel of imagination and construction ingenuity.

Here, we take a look at how Hydrock (lead designer) and Andrew Scotts (principal contractor) tackled one of the most significant challenges of the project – surface water management – with the support of ACO Water Management.



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THE PROJECT

The Wave Inland Surfing, Bristol

THE BRIEF

To provide a discreet drainage system to be installed along the perimeter of the water, ensuring no contaminants enter the lake.

THE SOLUTION

ACO Qmax slot drainage

Gareth Hardwick, Senior Engineer Infrastructure at Hydrock, explains: “There’s no chlorine in there, it’s a very low chemical content – in fact to all intents and purposes its effectively drinking-quality water. This is crucial for ensuring the comfort of surfers, but it presents a challenge in terms of keeping the water completely clean.

“One of the key factors in this is to prevent contaminants from entering the lake, whether that’s from rainwater or from sources surrounding the lake, such as a spilled beverage from onlookers. This required a robust drainage solution all along the perimeter of the water, which could offer the hydraulic capacity to ensure no contaminants entered the lake.”

Surfing is a sport rapidly growing in popularity, highlighted by the fact it will be making its debut in the upcoming Tokyo Summer Olympics. However, its very nature means that there are inherent accessibility issues stemming from geographical location, weather, swell conditions, and tides.

Opened in November 2019, The Wave overcomes these issues by offering year-round perfect surf conditions. It is the first destination in the world to offer the Wavegarden Cove wave-making technology, and also contains a food and drink area, a surf shop, gardens and woodland, as well as a unique viewing area.

Crystal clear water

The sheer scope of the project presented a number of challenges to the construction and design teams, which needed to be overcome in order to deliver the ambitious vision. The lake itself needed to be inviting to would-be surfers, and the nature of riding waves means a sizable proportion of visitors will inevitably fall off their board – highlighting the importance of crystal-clear water. As such, it was decided that the water quality had to be absolute, with the decision made to opt for fresh water rather than saline.

Substance and style

The decision was made to opt for ACO Qmax, a high-capacity slot drainage system that offers flexibility in design and installation owing to its wide range of different sizes. Martin Smith, Regional Specification Manager at ACO Water Management, comments:

“When it comes to a project as unique as The Wave, which requires a very specific level of water attenuation, the Qmax’s versatility becomes very important. It benefits from a slimline design both above and below ground, which makes installation significantly more straightforward.”

This highlights two of the core challenges of the project: ensuring the finished product looks good, and navigating the below-ground network of pipes and services associated with the wave pool. The sleek finish of the Qmax made it the perfect option for the desired aesthetics of The Wave. It can be laid flat to the ground, which is particularly important in a location where visitors to the venue are likely to be walking around bare foot.





Installation of ACO Qmax slot drainage

As Rhodri Williams at Andrew Scott explains, it also offered advantages for navigating the existing underground pipework: “Whichever product we used, it needed to fit within the busy underground network of services. A host of pipes and landscaping considerations meant there was very little room to install the drainage.

“Because the Qmax has a carrier pipe that lies just below the slot itself, it is less obtrusive underneath the attenuation channel. This lack of space was something that was identified as a challenge right at the start of the project, which meant we could approach the issue with the right solution to hand.”

Collaboration

It was this level of planning and inter-discipline collaboration that helped to ensure The Wave project was completed efficiently and effectively. As Gareth outlines, it’s an approach that helped to navigate challenges before they came to fruition:

“Right from the very beginning, we knew that a project as unique as this would require a range of expertise to ensure success. We worked closely with Wavegarden – the team behind the wave pool experience – to get to grips with how that would function. We also collaborated with the architect, the structural engineers, mechanical engineers, technical engineers, indeed anyone who was involved in the project to make sure that no stone was left unturned.”

Martin concurs: “From ACO Water Management’s perspective, we were glad to be involved from the beginning of the project. Gareth approached us with the range of challenges, stressing the need for a high-performance solution that also looked the part and offered flexible design. Once we’d established the Qmax as the optimal product, it allowed design and installation to proceed seamlessly.”

Sustainability

One of the defining features of The Wave is environmental sustainability. It is powered by 100% renewable energy (99% from wind and 1% from solar), and this ethos was a critical element of construction. The designs for landscaping set out to increase biodiversity, planting over 16,000 trees and 13 acres of wildflower meadowland.

Crucially, this also extended to water attenuation. SuDS are an increasingly important factor in the design of any project, and with The Wave situated on a Greenfield site, sustainable collection and removal of rainwater was even more vital. This necessitated an innovative approach to water management.

Gareth comments: “Perhaps the most important element of drainage is how, and to where, you remove water once it has been captured. The location of the project meant that a large attenuation basin was required, in order to collect the water before discharging it into the estuary.

“We also diverted existing ditches to create two open swales, forming a habitat out of the collected water. This was in-keeping with the overall ethos of the project, and highlights the role that water management can play in ensuring a sustainable built environment.”

Success

Perhaps the greatest barometer of success has been the popularity of The Wave, bringing year-round surfing to those who may never have had the opportunity. The innovative approach to the design and construction of the lake and surrounding areas has facilitated this, and the string of subsequent awards is reflective of the ingenious approach:

- Michelmores Property Awards – Leisure & Tourism Project of the Year
- British Construction Industry Awards – Cultural & Leisure Project of the Year
- Business Green Leaders Award for the Green Building Project of the Year
- Institution of Civil Engineers Engineering Awards – People’s Choice Award
- CESW Civils Project of the Year Award

From a water attenuation perspective, The Wave is a triumph of engineering and indicative of the sustainable approach possible through careful planning and collaboration. Gareth concludes: “It was a completely unique project, and the sheer scale and complexity made it exciting.

“We actually found that many of the principles associated with residential developments could be applied here, particularly with regards to how you manage surface water in an environmentally-friendly way. I think the most satisfying aspect of this has been the extent to which there was ongoing collaboration. Working alongside Nick and the rest of the team at The Wave, with XXX at Andrew Scott, and Martin at ACO Water Management in that early design stage, really helped to make the whole process as smooth as possible.”

For more information, please visit:

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