With extreme weather fluctuations and climate change concerns, the imperative to ensure adequate protection against future tidal flooding has never been greater.
TIDAL FLOODING

Significant investment is required to ensure that these assets continue to provide protection against flooding into the next century, despite rising sea levels. Increased wall heights and a new barrier will be required later this century.

Program director Matt Kuhn anchors the TEAM2100 team’s efforts, working with more than 100 integrated teammates and The Environment Agency. “From data management and drone technology, to 3D augmented reality for safety applications, intelligent infrastructure and green infrastructure trials, working on a project like TEAM2100 that’s adopting leading-edge technologies to better understand how to manage risk, protect people and assets, meet regulatory requirements and offer long-term resilience against variability and change is a truly exciting, rewarding opportunity,” he says.

“Water resilience is about more than suggesting sea walls, higher levees, bigger tunnels and more reservoirs as solutions. At CH2M, we’re applying our integrated risk-based planning process up and down the world’s coasts to quantify risks and understand the asset vulnerabilities in a system context, so our clients can make necessary improvements for future-proof protection.”

Meanwhile, a full renovation of Peakirk pumping station on the River Welland on behalf of the Environment Agency has significantly boosted the effectiveness of flood defences in the area. Work carried out has included the refurbishment of the station’s pointing doors; the installation of an adjustable stoplog and automated weed screen; the total renovation of the pumping station itself; as well as an inspection and overhaul of existing pumps on site.

Since winning the Environment Agency refurbishment contract for the pumping station, ECS Engineering Services was able to complete the project within months, enabled by experience gained as an appointed framework contractor to the agency.

Peakirk pumping station plays an important role in protecting properties that lie upstream of the facility, so completing the work swiftly was of the utmost importance. The centrepiece of Peakirk’s flood defences are its pointing doors. Renovation work to these required their removal from the central sluice structure, so they could be transported to ECS’ fabrications workshop for re-engineering and painting. The existing mitre posts were also replaced, with the new alternatives trimmed to size during the reinstallation of the gates. However, challenges arose during the project when the existing stop log guides were deemed unsuitable for use during a dive survey, meaning the central structure could not be initially dewatered to remove and reinstate the pointing doors.

ECS tackled the problem by erecting a temporary dam, allowing engineers to install improved guides and a fully adjustable 5,000 kg stoplog. With adjustment from 6,800 mm to 8,000 mm, and motion enabled by a rack and pinion drive with a balancing gate, the new stop log provided a modern solution of increased versatility for the needs of the end user. Once the central structure
TIDAL FLOODING

had been dewatered, debris could be cleared and the gates could be removed. To operate the newly renovated pointing doors, ECS delivered a mechanical counter balance system, which utilises a weight stack to actuate the gates in the event of flood conditions.

SCREEN TIME
In addition, the existing weed screen cleaning system at Peakirk required attention. The system was unreliable and its effectiveness was further hindered by the fact that the automated grab systems were not compatible with the existing weed screen, increasing the build-up of debris. ECS duly replaced the weed screen to provide an appropriate fit with the automated grab, as well as incorporating new maintenance platforms, task lighting, level sensors and improved controls. The new controls were integrated into the existing framework by ECS, enabling a full electro-mechanical refurbishment that has greatly improved clearing efficiency and flood safety.

Peakirk operates six separate pumps on site: three diesel and three electric variants. All of the pumps required dismantling, inspection and assessment – with the Environment Agency requiring a full record of findings regarding each of the pumps. Refurbishment work could then be carried out, followed by subsequent reinstallation and testing.

DEFECTS UNCOVERED
The electric pumps had suffered particularly from wear, but were renovated and reinstalled to safeguard pumping capacity at the facility. Furthermore, a condition survey of the supporting infrastructure around the pumps and pump chambers discovered that the steel work was in a poor state of repair, so these elements were fully replaced.

To complete the comprehensive overhaul of the facilities, ECS turned its attention to the pump house. Due to an Environment Agency policy to reduce manual lifting at such facilities, ECS was required to upgrade the overhead lifting equipment. The addition of electrical drives and hoist systems, coupled with plug-in or radio remote pendant controls, eliminated any required manual involvement to operate the crane.

THE LIGHT TOUCH
Lighting was also a concern, as the existing installation was mounted on the ceiling, which made maintenance difficult. To remove the need for specialist access equipment, low-level, energy efficient LED lighting was installed in the diesel pump room, greatly improving accessibility.

Jamie Wesley, contracts manager at ECS, expands: “The project at Peakirk demonstrates our full breadth of electro-mechanical services, as well as the integrated approach, which has seen us tackle a number of high-profile projects on behalf of the Environment Agency. The state-of-the-art facilities at our headquarters, extensive knowledge of conducting on-site operations and the versatility of our product offering means we were able to deliver within a short time frame, even in the face of unforeseen challenges.”

The centrepiece of Peakirk’s flood defences is its pointing doors, which have received a complete renovation.

A temporary dam was erected, allowing engineers to install improved guides and a fully adjustable 5,000 kg stoplog.