

The Norton Pumping Station project, led by the Waveney, Lower Yare & Lothingland Internal Drainage Board (WLYLDB), has made remarkable strides forwards. Through dedicated efforts, in challenging weather, the team has successfully installed two Archimedes screw pumps. The upgraded station will boost the region's flood resilience, protecting local ecosystems and communities.

Work commences on the pump chamber

In February, despite above average rainfall our contractor, BAM Nuttall, forged ahead, following the installation of a sheet piled cofferdam in December 2023.

Before the cofferdam could be excavated dewatering wells had to be installed to reduce the ground water level. The soft and porous nature of the ground conditions meant that ground failure, as a result of groundwater uplift pressures had to be addressed. The reinforced concrete slab has been designed to withstand these uplift pressures in the permanent condition, however temporary dewatering wells were required prior to works progressing.

Temporary propping had to be installed as the excavation progressed to support the cofferdam until the slab had reached its design strength.

Following excavation a formation layer and blinding layer was installed beneath the slab. A waterproof FPO (flexible polyolefins) membrane was placed on top and shear studs welded to the steel sheet piles to fix the slab in position.

Battling the challenging elements, the reinforcement bars and formwork were completed for the inlet. The intermediate and outfall slabs, along with the dividing walls were formed with concrete pours taking place during March.



Concrete forming for pumping stations inner workings. Photo credit BAM UK



The Archimedes Screw Pumps arrive & The Board visit to see the project progress. Photo credits: WMA

Archimedes Screw Pump Arrival

By the end of March, with the weather clearing up, the reinforced concrete works were complete.

Works then focussed on preparing for the arrival of the two Archimedes Screw pumps from Holland.

Each pump weighed 14 tonnes, increasing to 20.5 tonnes when the pump is in operation and full of water. A carefully planned lifting operation involving a 90 tonne crawler crane successfully offloaded each of the 2 meter diameter screw pumps and positioned them in place.

CONTACT US

Water Management Alliance, Pierpoint House, 28 Horsley's Fields, King's Lynn, Norfolk, PE30 5DD | t: 01553 819600 | e: info@wlma.org.uk | www.wlma.org.uk

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The Outfall, during the wet testing of the new pumps.

Photo credit WMA

Testing and Commissioning

August marked a pivotal month as the team carried out Site Acceptance Testing and the commissioning of the new pumping station.

The commissioning phase did identify a few issues that were soon resolved. These included the pump motors overheating on a hot summer day due to insufficient ventilation in the motor cover. This was swiftly resolved by installing forced air ventilation intake fans. The ventilation outlets have also been increased in size and no further issues have been reported.

During the operation of the pumps it has been noted that the 900mm diameter flap valves were restricting water exiting the outlet chamber causing the pump to operate

against a higher head of water (approx. 200-400mm). Over the whole life of the asset this will result in significant additional energy consumption. New 1800mm wide and 900mm high tidal flaps are being installed to ensure the pumps operate at maximum efficiency. This work is scheduled for completion in February 2025.

Decommissioning the old pumping stations

Following successful commissioning, the works to demolish the old Norton and Raveningham pumping stations could commence. At Norton a line of steel sheet piles has been installed across the outfall to ensure the integrity of the flood defence embankment.

Surveys indicated that the old pumping station building had bat roost potential and so the works needed to be carefully planned and supervised by a qualified ecologist to ensure no impact to this rare protected species. We are pleased to report that no bats were identified within the building.

Community Engagement

Alongside technical accomplishments, the Norton Pumping Station project has incorporated initiatives to enhance Social and Local Economic Value (SLEV). Efforts included community engagement activities such as hosting site visits for the parish council, local schools, and apprenticeship talks at career fairs. The BAM UK team also welcomed a T-level work placement student and an apprentice on-site, donated a community bench, and completed repairs at the parish church. Local employment and supply chain involvement have been maximised whenever possible.

Working closely with the local primary school, the project helped highlight the role of pumping stations in flood management with site visits. A STEM competition is planned for the autumn term, where students will have the chance to name the pumps—a meaningful way to connect the project's purpose with the community's future.



Students from the local Primary School Visit site.

Photo credit BAM UK