

Engineering Solutions

Portora Barrage Gate Replacement

The Erne is the second largest River in Ireland and during the 1950's became the power source for the Erne Hydro Scheme. Two power stations at Cliff and Ballyshannon present a combined capacity of 55 MW. Along with other improvement works at the time, a Control Sluice Structure was built at Portora, to reduce the risk of flooding to surrounding areas at times of high river catchment. Portora barrage is located at a narrowing of the river between the Upper and Lower Loughs. The barrage incorporates a navigation lock and 4 "lift and turn" sluice gates, each being approximately 13m span x 4.3m deep and 14 tonnes in weight. KGAL were appointed by Scott Wilson to carry out a detailed site survey of the existing gates, design and detail of replacement gates and provide



a suggested method of gate removal and installation. The client's intention is to refurbish the existing operating machinery; therefore it was necessary for the new gates to be of the same overall weight, with a similar centre of gravity to the existing gates.

Without the facility to isolate the gates, it was necessary to carry out the survey from a work boat. With site access being severely restricted for craneage, it is envisaged that the gates will be removed and replaced utilising barges and bridge mounted winching systems.

Lowestoft Bridge Refurbishment

As Principal Contractor on the Lowestoft Bridge refurbishment, Bosch Rexroth has appointed KGAL to carry out a category 3 check of the operating and control systems, including verification of Safety Integrity Levels. The twin leaf bascule bridge carries the busy, 3 lane, A12 trunk road across the navigable entrance to the inner harbour of ABP's Lowestoft Port facility and, as such, forms a key component in the traffic system of Lowestoft, for both road and water traffic.

The strategically important bridge is operated by multiple hydraulic motor driven pinions on curved racks at the heel of the bridge below the road deck.



Kings Lynn Improvement Works



ABP have appointed KGAL to carry out a detailed structural analysis of the Sector Gates at the entrance to Alexandra Dock, Kings Lynn. The gates were installed within the lock barrel in 1989 to provide a means of maintaining the water impounded within the dock and as a tidal defence structure to exclude high flood water from the port and surrounding area. Previously the port operated a conventional lock arrangement with 2 pairs of traditional mitre caisson gates, but due to siltation in the approach channel and a general increase in vessel sizes, most commercial navigation only occurs when the tide is equal to, or higher than, the impounded water level. The sector gates have not been without problems since their installation and KGAL's scope includes identification, design and detailing of modifications required to improve the performance and extend the life of the gates. The work is to be jointly funded by ABP and the EA.

Boston Waterways Link—Phase 1

The Environment Agency has been commissioned by Lincolnshire County Council, East Midlands Development Agency and the European Regional Development Fund to construct a major new lock to re-introduce navigation to the South Forty Foot Drain, at Boston, in the heart of Fenland. The Boston Waterways Link – Phase 1 includes a new lock and sluice structure, upstream and downstream moorings for navigable craft and new visitor facilities on the site of redundant service buildings. The scheme forms part of a long term initiative to link the cathedral cities of Lincoln, Peterborough and Ely with an inland navigable waterway.



Halcrow were appointed to design the works with Jackson Civil Engineering being selected as constructors. KGAL have been retained as specialist sub-consultants to provide detailed designs for the lock gates and control systems comprising; upstream Mitre gates, downstream Sector Gates, maintenance stoplogs, access footbridge, modifications to an existing sluice gate and a complete integrated control system. The site is located at Black Sluice in Boston, where the South Forty Foot Drain passes beneath London Road and discharges into the tidal Haven. When complete, the project will re-open the SFFD to navigation for the first time in around 40 years and will also provide a fish and eel pass into the SFFD.

News in Brief

- KGAL have been appointed by Halcrow to prepare outline design and cost estimate for a feasibility study into the redevelopment of Gravesend Basin river entrance and adjoining canal lock.
- Following on from the detailed design of Selby canal lock floodgate, KGAL have been appointed by Black and Veatch to project manage the works on behalf of the Environment Agency.
- KGAL received an instruction to prepare design and detailed manufacturing drawings for a Radial control gate at Minworth STW.
- With an ever increasing workload KGAL are pleased to welcome Jasper Taylor and Arash Farahani who have recently joined the Bournemouth office as Engineers and Rob Pitt who has also joined the team as an Associate. Collectively, they not only increase our capacity but improve our versatility.