

## Happy New Year - will 2022 be our best year yet?

We've all faced some unprecedented challenges over the last two years, but for KGAL Consulting Engineers Ltd it has been a time of high efficiency and growth. We could not have achieved such success, however, without the support of our clients and partners, nor the efforts of our dedicated team, and for this we extend a huge THANK YOU and wish you all the very best for 2022.

## Milestone achieved at Kariba

The first of the two cofferdams for the Kariba Dam spillway rehabilitation was installed on sluice 6 in October and dewatering was successfully achieved at the beginning of November. This marks a major milestone in progress, with the first deployment of the KGAL designed 35m high by 10½m span needle cofferdam.

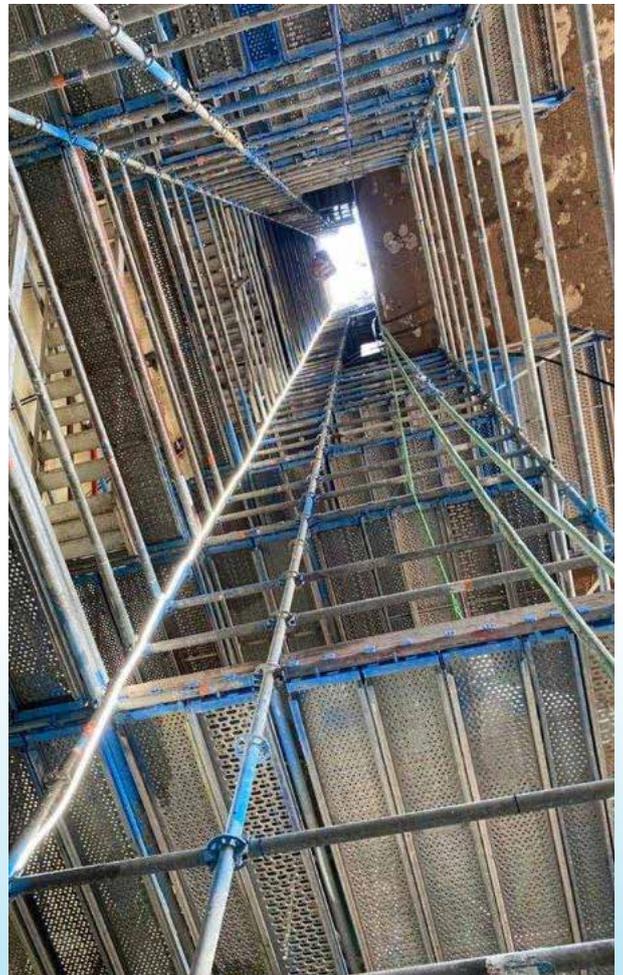
The area downstream has now been equipped with access scaffolding to allow the existing built-in parts to be replaced. The new built-in parts, also designed by KGAL, have started to arrive at site.



Upstream view of the cofferdam



Sluice 6 with scaffolds downstream



Inside the scaffolds

## Seamless inaugural deployment of the Boston Barrier

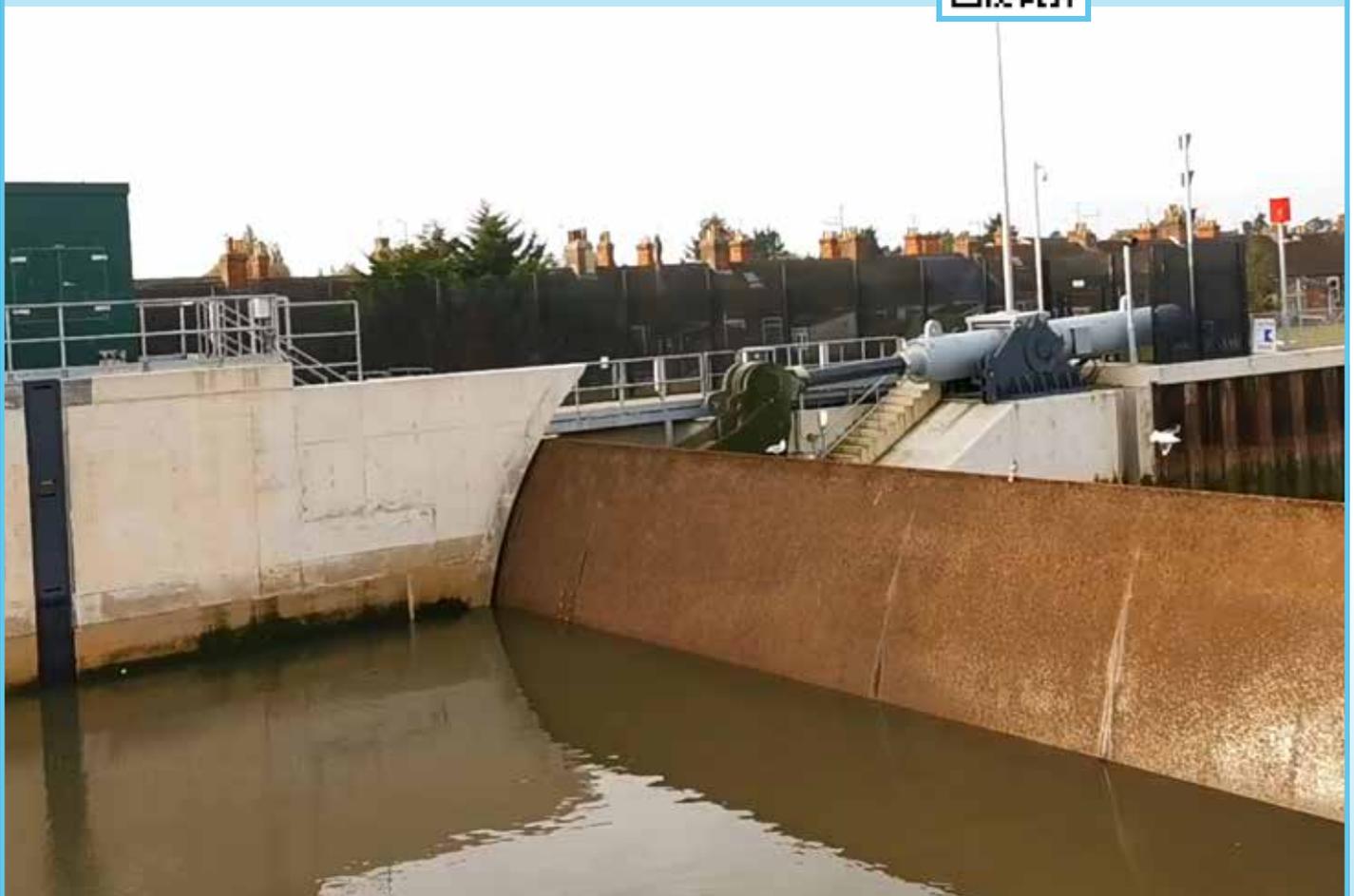
We were delighted to hear that the inaugural deployment of the Boston Barrier in November went without a hitch. Appointed by Jacobs as Independent Technical Advisers to the Environment Agency, it was great for us to receive such positive feedback.

The barrier was raised into position in 22 minutes, ready for the forecast high tide. The Agency's Project Director, Adam Robinson, stated "Water levels came in a bit below the forecast but you can still see the huge impact the barrier had when looking at the upstream to downstream levels, where there was a water level difference of 3.7m across the barrier."

The event was picked up by both local and national media and Environment Agency Chair, Emma Howard-Boyd, used it as an example of great climate adaption infrastructure at the recent COP26 in Glasgow.

Arriving on site from Hollandia only two years ago, the barrier came online less than a year ago. Now that the primary barrier scheme has been delivered successfully, we're all looking forward to the next phase, the Wet Dock Entrance.

To view this video, take a look at our e-magazine at  
[www.tinyurl.com/Fluid-Winter-2022](http://www.tinyurl.com/Fluid-Winter-2022)



Boston Barrier opening after tide peak (time-lapse)

## Moving Assets at St Katharine Docks

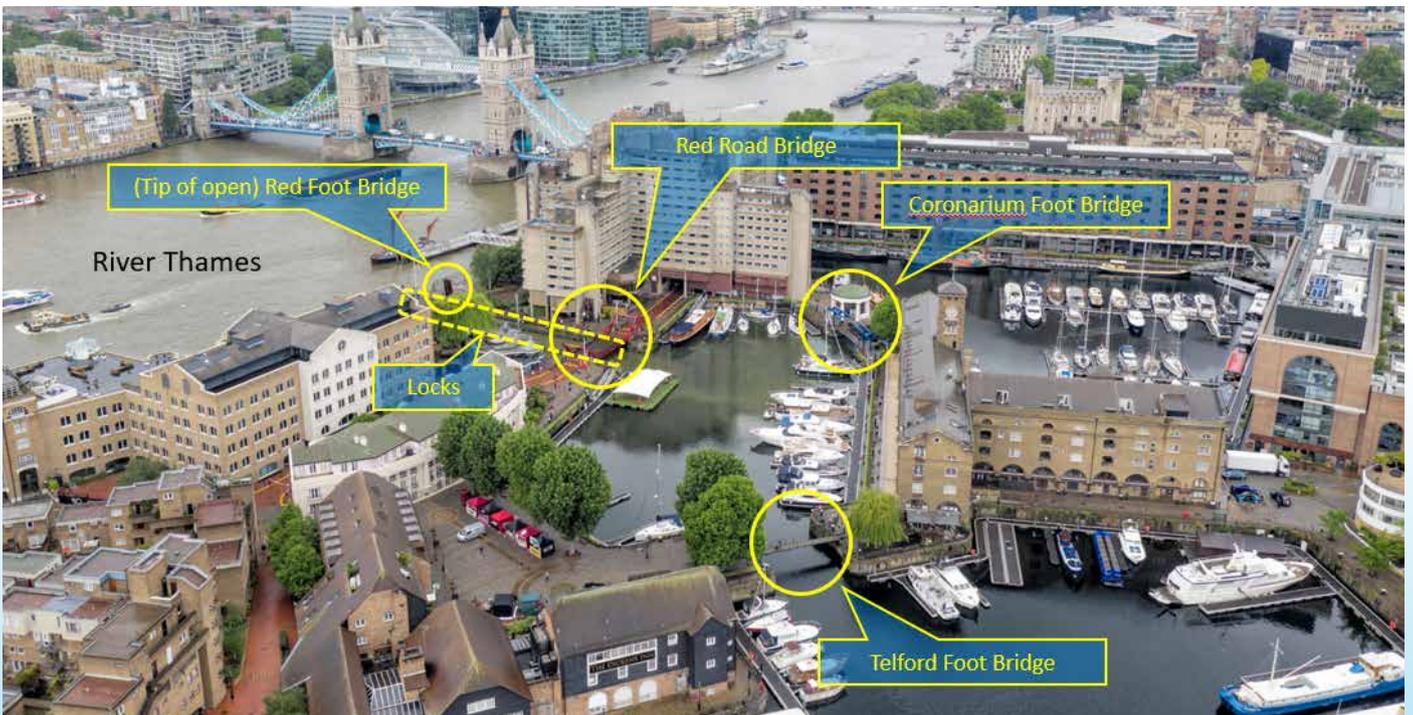
KGAL has been appointed by Revantage to provide consultant engineering support to the supervision and management of the routine inspection and maintenance works undertaken on the moving assets at St Katharine Docks, Central London's only marina. The marina operator, IGY Marinas, acquires, manages and services luxury yacht marinas around the world.

The assets comprise inner and outer flap lock gates and associated penstocks, a twin leaf bascule road bridge, two twin leaf bascule footbridges and a twin leaf retractable footbridge.

We are reviewing reports produced by servicing contractors and insurers and advising on remedial action, urgency, budgets and refurbishment and upgrade options, where appropriate.



Overview of St Katharine Docks (courtesy of St Katharine's Docks)



Aerial view (courtesy of Lucy Young)

## Building Bridges

In addition to St Katharine Docks news and following up from our 'Bridging The Gap' feature in our Autumn 2021 issue of Fluid, here is an update on some of our other current bridge projects.

### Haven Bridge

The project suffered a major setback this summer following the news that Cleveland Bridge, the MEICA main subcontractor, had gone into administration. A new subcontractor, Volker Laser, has now been appointed and work on the refurbishment has recommenced. KGAL is continuing its long involvement in the project, providing checking and reviewing roles as well as the role of Principal Designer. It is now expected that the bridge will be recommissioned in April 2022.

In parallel with this, KGAL has been undertaking a feasibility study into a future drive system upgrade, which would see the open gear train in the machinery spaces replaced by enclosed gear reducers connected by Carden shafts. We are currently in discussions with a number of gear transmission suppliers to establish budget costings.

### Great Yarmouth Third River Crossing

Construction of the main pier foundations on the East and West abutments are continuing apace with main trunnion piles driven to depth. Another long-established project association via WSP, KGAL is acting for the client, Norfolk County Council, and we're about to commence the review and acceptance of the MEICA design. Future involvement will include witnessing FATS and SATS on behalf of the client.

A programme of regular site visits started in November and will increase in frequency to bi-weekly during the main MEICA construction period.

### Partick to Govan Swing Bridge

The main detailed design stage was completed by KGAL earlier this year for Jacobs who have been engaged alongside Glasgow City Council. KGAL has been supporting Jacobs and GCC through this process answering TQs and dealing with the CAT 3 checker queries. KGAL's continued involvement in the project will see us acting for GCC and Jacobs in supporting the Construction Phase. The detailed design of the hydraulic and electrical system will be undertaken by the contractor and is expected to result in KGAL acting on behalf of the client in the review and acceptance of these designs.



Partick to Govan Swing Bridge

## Lake Lothing Third River Crossing

Another of KGAL's long established WSP projects, the current stage now sees us acting for the Main Contractor, Farrans, as CAT 3 checker for the MEICA systems. Our role has also extended to include undertaking HAZOPs, the first of which took place a few weeks ago in Lowestoft.

We're also currently performing an hydraulic simulation of the main bridge lifting system, which has already started to yield some interesting results and is helping the sub-contractor, Oilgear Hydraulics, to fine-tune the hydraulic design. Our engineers, Graham Fowler and Yue He, are working closely to ensure the efficacy of the simulation.

The main construction period for the MEICA system is 2022/23.

## Clyde Crossing Yoker to Renfrew swing bridge

A few years ago, KGAL undertook for SWECO the exemplar design of the MEICA elements of a long span cable stayed double leaf swing bridge with a total span of some 160m. We are now expecting a contract with Jacobs for the technical desktop support during the constructions period.



## Building Bridges Continued

### South Dock Bridge

During 2020 and 2021, KGAL has been working with Arcadis and Knight Architects on a new bascule bridge across Canary Wharf's South Dock for the London Borough of Tower Hamlets. We successfully completed the stage 3 design at the start of the Covid pandemic and KGAL is continuing this relationship into Stage 4, which will entail the detailed design of the MEICA systems alongside Arcadis and Knight Architects. It is a challenging design, which required close collaboration in Stage 3, and that will continue to be the case as we progress through following stages. We expect to start the detailed design early this year.



South Dock Bridge closed



South Dock Bridge opened

## Shaldon Bridge

Shaldon bridge is a small, little-used bascule bridge forming part of a road crossing of the estuary in Teignmouth in Devon. KGAL was approached by Devon County Council following work we undertook on the Exeter canal bridges.

Currently the owner of the bridge, Devon County Council, provides a mobile crane to be brought in every time they open the bridge to safeguard the span from falling in an uncontrolled manner, should the drive system fail. The drive system is hand-operated, with the crane brought in to de-risk the situation, so they approached KGAL to design a more robust and secure attachment point in the deck.

We have received further instruction since submitting our designs to review the drive system with a view to understanding the failure modes and to provide a powered solution to take out the need for manual operation.



## News in brief...

KGAL has been retained by Bristol City Council to undertake a mechanical/electrical/hydraulic review of the existing Underfall Yard sluices equipment. We will be carrying out a HAZOP study and, based on our findings, will prepare an Options Report to identify recommended improvements for the long-term relabel operation of the over-all system.

## Welcome to our newest team member...

### Paul Grist, Senior Engineer

Paul (CEng MIMechE) joined us as Senior Engineer late last year. Paul has worked for several blue chip companies, including Johnson Matthey (Davy Process Technology), Honeywell (UOP) and Meggitt (Heatric). His career in mechanical engineering has spanned the Oil & Gas, Chemical, Nuclear, Offshore and Marine industries and he has designed heat exchangers, static equipment, reactor internals, piping and electromechanical skid equipment.

Paul has extensive experience with full PLM, R&D, NPI and product certification and compliance with ASME BPVC, MED, CE & ATEX.

When he's not working, Paul enjoys sailing, piano and house renovation.



Paul Grist joins us as Senior Engineer

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