

the newsletter from KGAL Spring 2020

Due to the COVID-19 pandemic we're adhering to government guidelines in order to minimise the impact of the outbreak. As a robust business, we are able to modify our procedures in order to protect our employees, partners and wider communities as the situation changes in order to continue to meet our clients needs. We'd like to reassure you that although our offices are temporarily closed, there will be no interruption to our services. All of our staff are working from home and have the appropriate equipment and facilities to continue collaborative working on projects. We all have access to video-conferencing, so communication continues and virtual meetings are going ahead, and all our team can be contacted by email. You can also stay informed and in touch with us via our LinkedIn page (KGAL Consulting Engineers Ltd).

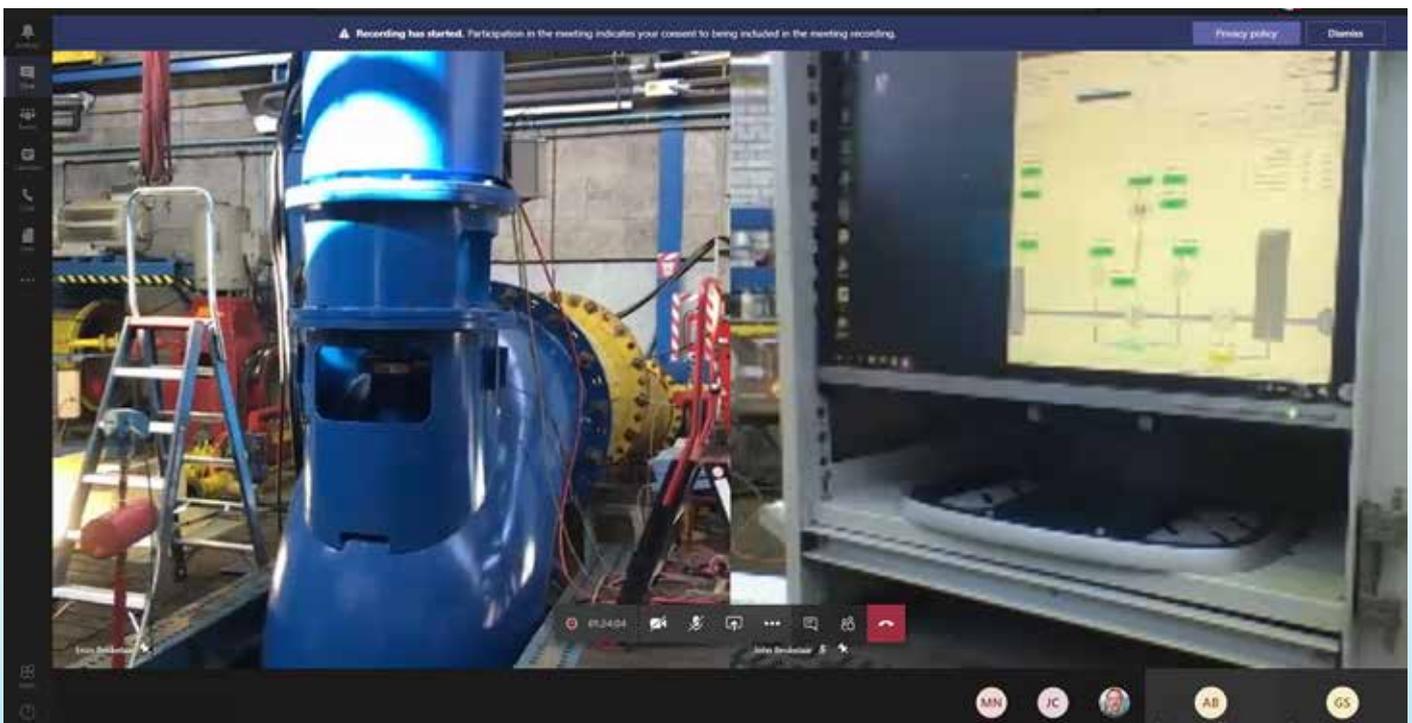
Virtual Acceptance

In difficult times some ingenuity and perseverance can really overcome what at first sight seems to be impossible.

Due to the restrictions imposed by Covid19, we were faced with the prospect of having to indefinitely postpone the factory acceptance tests on the first two pumps destined for the Environment Agency's Keadby Project.

With a little thought and lot of effort on the part of the project team, particularly John Beukelaar and his team at Pentair and Andy Bond at Black & Veatch, the FAT's were completed remotely in late March using a combination of laptop cameras, shared screens and handheld devices so that all participants could see what was happening step by step.

Maybe this is the future for FATs; more participants, a full video record and we'll all save on travel costs with less environment impact too.



Haven Bridge engine room inspection by Little & Large

Haven Bridge is a double-leaf, rolling-lift bascule bridge crossing the River Yare in Great Yarmouth. The four-lane carriageway of the A1243 crosses in both directions, along with pedestrian access. First commissioned in 1930, it largely retains the original M&E equipment, which, after almost 90 years, is now close to the end of its life.

When one of the motors recently failed, the bridge had to be closed to river traffic and KGAL was brought in to survey the engine rooms and replace the existing motors with their modern equivalent. There are two engine rooms, both sealed inside the bridge decks and classified as confined spaces.

It is hoped that the whole M&E system will eventually be replaced to comply with modern safety standards.



The long and the short of it; KGAL Technician Billy Owen and Engineer Yue He inside the bascule chamber. During lifting, the heel of the deck comes down into where they are standing.



KGAL provides outline design for TWAO on the Bridgwater Tidal Barrier

Progress was made in December on the proposed tidal barrier flood defence scheme at Bridgwater in Somerset, with the submission of a Transport Works Act Order (TWAO).

The TWAO is the precursor to gaining permission to build, being the means through which legal powers can be granted to construct the scheme. This is required due to navigation restrictions on the River Parrett when the barrier is closed. Developing the scheme would mean implementing changes that would affect people in the local area, so a TWAO must follow a formal procedure that allows people to give their views on the proposals.

The purpose of the scheme is to protect Bridgwater from the effects of flooding from the sea. The tidal barrier scheme will be constructed across the River Parrett, with gates that will be closed to prevent the very high water levels travelling upstream and flooding property and infrastructure. The scheme presents interesting issues in relation to building heavy engineering structures where roads and other infrastructure are less developed.

The Environment Agency and Sedgemoor District Council are working together on the project, with support from the Somerset Rivers Authority, to develop and fund the scheme. CH2M (Jacobs) were appointed to provide the consultancy input and KGAL was instructed as their specialist sub-consultant to develop a suitable outline design for the machinery and controls equipment. Fereday Pollard Architects produced the architectural solution that formed part of the TWAO submission.

KGAL has developed a basic mechanical design and worked as part of the wider team to develop an outline design that could be costed, define the civil engineering loads and functional requirements, and consider and develop a strategy for addressing the hazards and reliability issues.

Rachel Burden, Flood and Coastal Erosion Risk Manager for the Environment Agency, said: "Submission of the TWAO is an exciting milestone for everyone and is the result of a lot of planning and engagement with our partners, stakeholders and community groups. The barrier will better protect at least 11,300 properties and 1,500 businesses from climate change and future flood risk and we are on track to have it operational by 2024."



Artist's Impression of the Bridgwater Tidal Barrier scheme
(image courtesy of Jacobs / Fereday Pollard Architects)



AI virtual animation
(courtesy of Jacobs / Fereday Pollard)

Planning for the future at the Bann River Crossing

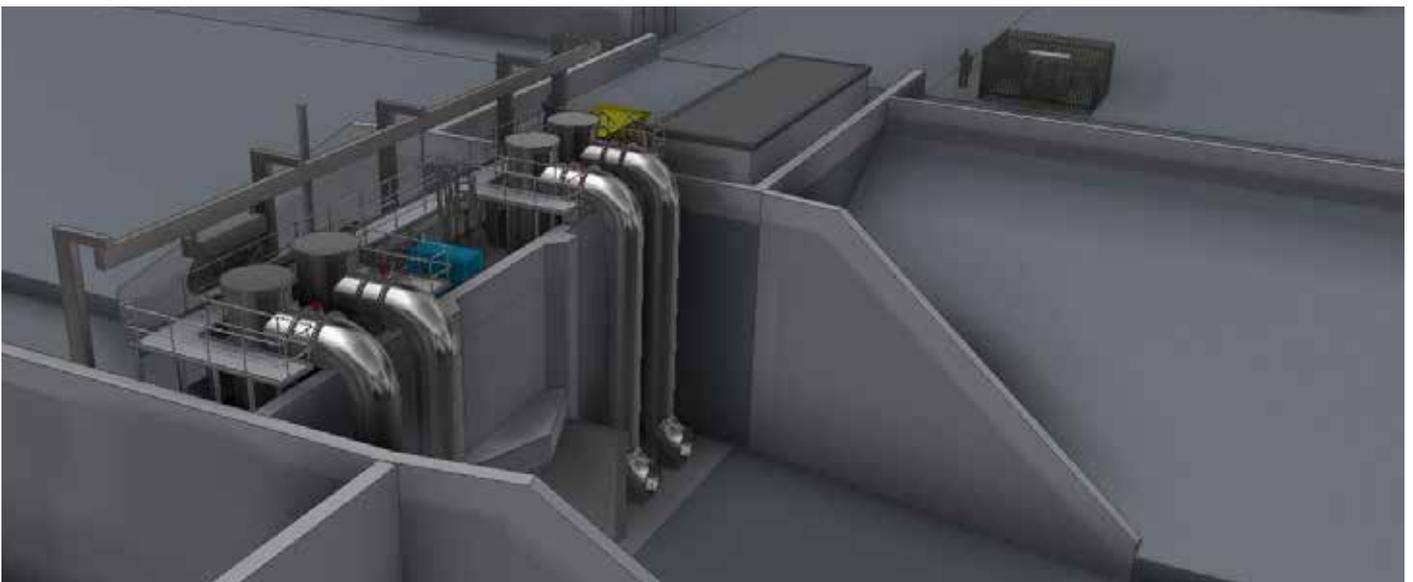
Running from the South East corner to the North West coast, the Bann River is the longest river in Northern Ireland. The Bann River Crossing carries the Belfast to Derry railway line over the river via an 800ft multiple span steel girder bridge with a single lifting section that allows commercial and private vessels to access the upper reaches of the Bann River, which is navigable to Loch Neigh.

The present bridge opened in 1924 and Translink, the Northern Ireland operator of all public transport, has been upgrading it structurally, including repainting, with AECOM as the consultant.

AECOM engaged KGAL to review the mechanical operating equipment and make recommendations on maintenance, upgrading and future developments in operation of the bridge, including possible automation. The bridge was inspected by KGAL in December 2019 and maintenance schedules have been produced for Translink. Further work on reliability improvements and upgrading is being discussed.



The bridge at the Bann River Crossing



3D models of the pumping station at the Holderness Drain

Aiding the EA's fight against fluvial flooding in Hull

KGAL is working directly with the Environment Agency (EA) as the independent mechanical and electrical technical advisor on the design and construction of a new 10m³/s pumping station located on the Holderness Drain, close to its discharge point into the Humber Estuary.

The pumping station forms part of the Holderness Flood Alleviation Scheme, a larger scheme including three other assets that is designed to improve the flood defences of a large area around Hull.

Under normal conditions, Holderness Drain empties itself into the estuary during low tide, being closed off by self-closing 'pointing doors' that close on a rising tide. The normal flow in the drain is low enough so that the levels do not build up during high tide. During flood events, the pumping station operates at high tide to keep the level of the drain under control.

KGAL was involved in the initial phase of the work with the contractor, JBA Bentley, to optimise design and lay out the whole scheme, producing 3D models such as those shown here.

A new lease of life for the shiplift at Buckie

The rusty old shiplift in the historic shipyard at Buckie Harbour has undergone a complete overhaul in order to meet the demands of a full order book for Macduff Shipyards Ltd.

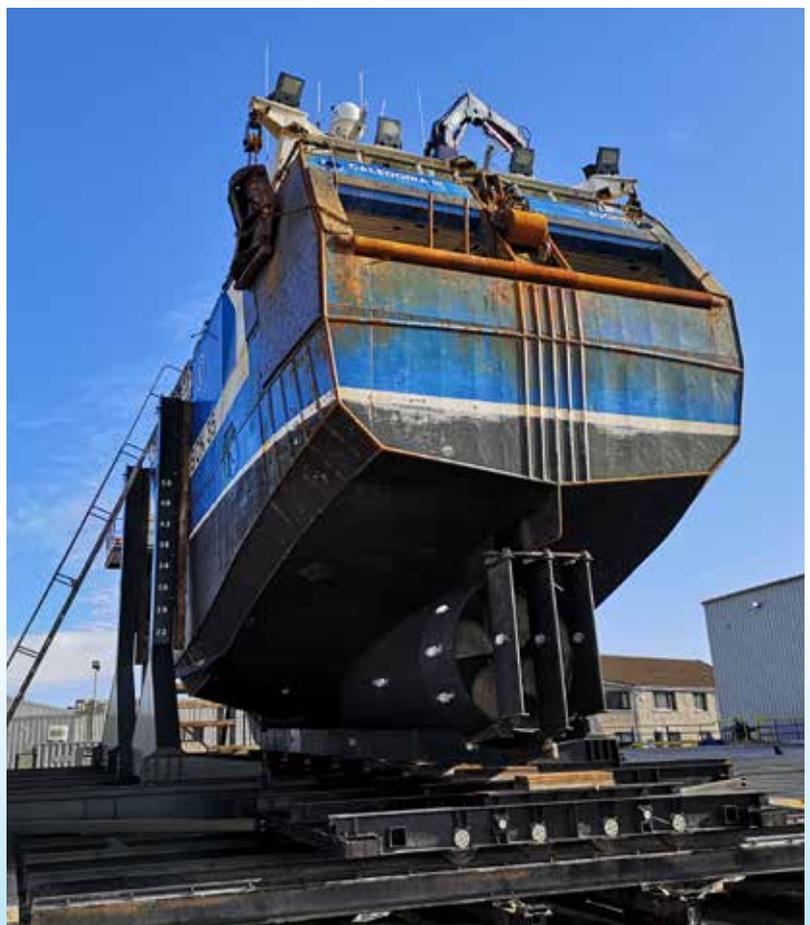
Macduff Shipyards undertook a proportion of the work themselves, including the refurbishment of the main carriage, contracting a consortium of expertise for the rest.

Arch Henderson took on the civil works, designing the concrete apron repairs and checks and providing the calculations for the foundations and main carriage.

KGAL designed the top cradles and bilge arms along with the tower and control structure, also providing designs for the electrics and hydraulics and control methodology. We later performed the PUWER Audit, compiled the documentation for the CE marking and took control of the HAZOP and HAZID assessments, which led to some design changes.

Qualter Hall manufactured the top transfer cradles and the main tower to KGAL's designs also providing outline designs for the electrics, hydraulics and control methodology.

Macduff Shipyards also refurbished the shed next to the shiplift, where they now have a facility to lift the vessels in order to work on them. Plans are afoot to extend and increase their capability and we continue to work closely with them on this project.

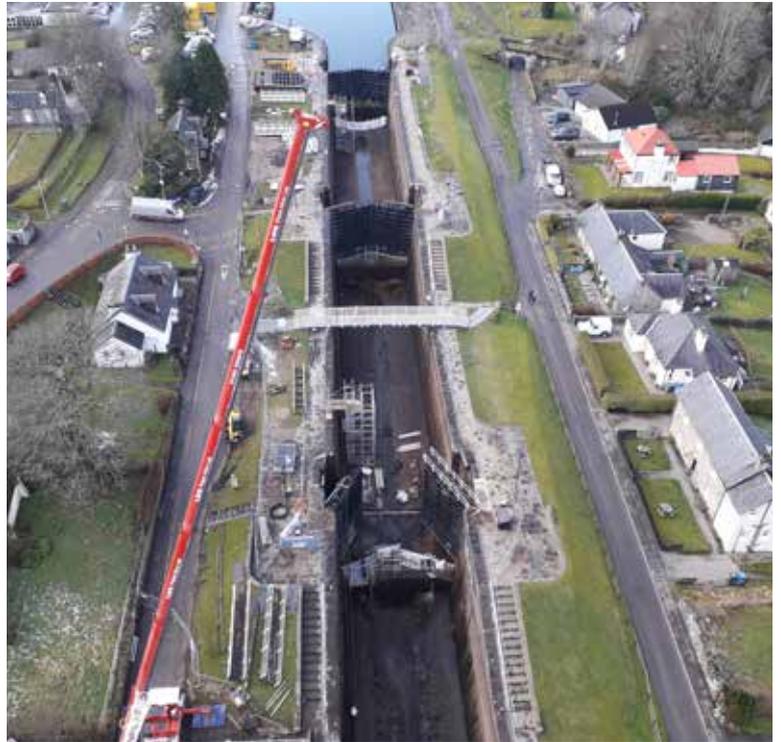


New gates linking Loch Ness with the Caledonian Canal

Six pairs of new steel mitre gates designed by KGAL have been successfully installed at the Fort Augustus flight of locks that link the southern tip of Loch Ness with the elevated section of the Caledonian Canal.

KGAL designed the gates for ECS Engineering Services Ltd, the M&E contractor working for Mackenzie Construction, the principal contractor to Scottish Canals.

Designed to modern codes, the new gates replaced existing gates that had reached the end of their serviceable life. The top anchors were replaced with engineered mechanical straps in order to maintain the heritage look of the scheme.



The new gates being installed
(photo courtesy of ECS Engineering Services Ltd)



And finally....

Associate Director, Andy McGhee, is itching to start the 2020 sailing season after completing his Royal Yachting Association Yachtmaster Instructor Course.

Five gruelling days of Solent sailing with an examiner on board during man overboard drills, night navigation, close quarter sailing onto pontoons, buoys and anchors gained him his well-deserved RYA Yachtmaster Instructor ticket. Closer insect of the endorsed ticket revealed that he can now skipper a vessel up to 200 gross tons - a scary prospect - and teach other sailors up to Yachtmaster level.

Andy spends his spare time teaching at sailing schools in Gosport, Portsmouth, Southampton and Lymington, already having clocked up a couple of weekends this year in The Hamble.

The old adage of a bad day on the water is always better than a good day in the office is, however, being tested. The Needles on a rainy night in a Force 10 gale with the wind against the tide could almost change his mind. Almost.

Joining the KGAL team.....

We welcomed Joseph Lodge, our latest addition to the KGAL team, earlier this year. Joseph is a Valve Design Engineer who grew up surrounded by engineering and has always liked to take things apart and put them back together again (sometimes successfully!) Joseph actively supports the deaf community; he has a good knowledge of British sign language and is keen to help deaf people get into science and engineering.



EXPOSURE

We're looking forward to getting back out to meet you all again once the lockdown is over. With many events being postponed until the Autumn, it looks like it will be a busy time. Here's an update with new dates, where known....

BDS 2020 (Nottingham, UK) 16-19 September - Our Regional Managing Director, Riss Digby, will be delivering a workshop, "Gated Structures on Dams" with Jonathan Hinks of HR Wallingford. Our Paper "Future-proofing old dam protection gates using modern techniques" by Brent Imisson and Yue He has also been accepted.

ICOLD 2020 (New Delhi, India) 26 September to 1st October - Ken Grubb will be attending as a Delegate.

HYDRO 2020 (Strasbourg, France) 26-28 October - We look forward to seeing you at our exhibition stand.

ASIA 2020 (Kuala Lumpur, Malaysia) 8 -10 December

Flood & Coast 2020 (Telford, UK) 8-10 December - We will be exhibiting at this event again and welcome you to visit our stand.