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*Keeping you up to date with **KGAL Autumn** | **Winter 2024***

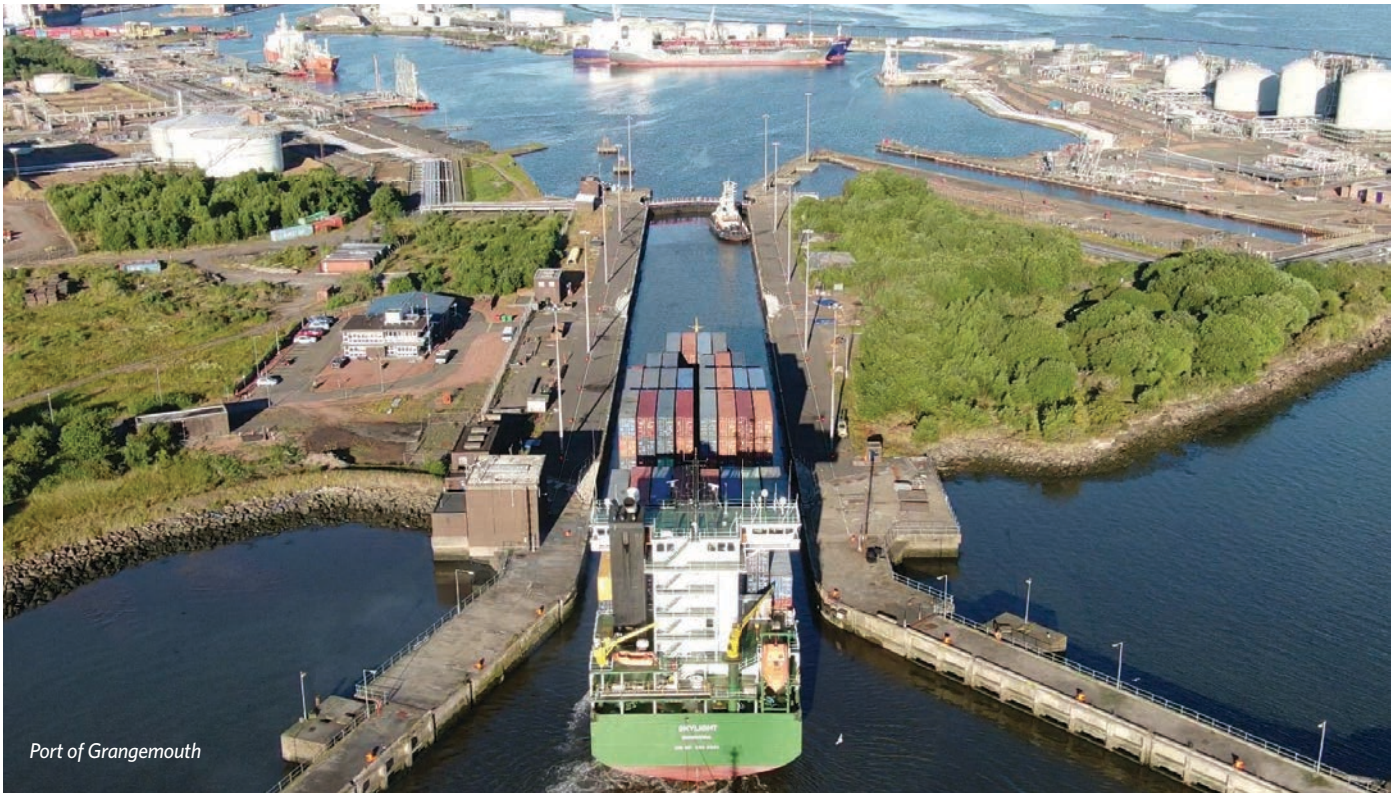
As we approach the end of another busy year, we can look back at a variety of projects, at home and abroad, covering new build and rehabilitation.

The never ending challenge of maintaining and improving our UK Flood Defence assets is always at the forefront of KGAL's scope of services along with overseas projects in South East Asia and Africa.

We're looking forward to supporting our clients into 2025 on another set of challenging projects. It's what we do!!

Dave Griffiths** | **CEO

Inspecting the gates at Port of Grangemouth



Port of Grangemouth

KGAL has been retained by **Forth Ports** to carry out mechanical, hydraulic and electrical inspections on the outer, middle and inner mitre gates located in the entrance lock for the **Port of Grangemouth**, which are owned and managed by **Forth Ports**. The gates serve as a means of equalising the water level with the dock to that of the tidal River Forth, allowing various types of vessels to transit the Port.

Site survey inspections were carried out over the course of a week in mid-June. In addition to the gates and associated equipment, we also carried out confined space inspections of a penstock and the cross lock pipe and cable culverts.

Subsequent to the inspections, detailed condition reports were successfully produced and submitted to **Forth Ports** for review, all within the agreed timeframe.

Further to the original inspections scope, **KGAL** has been instructed to produce a **Scoping Document** outlining the work required to maintain service life for a five-year period and support a strategic lifecycle management program, a **Support Options Appraisal** in terms of technological developments in gate design, monitoring or maintenance, or change in operational controls, and a **Work Scope** to enable recommissioning of the middle gate.

Forth Ports has also shown an interest in the production of a detailed 3D model of the complete lock with gates and operating equipment, which **KGAL** is more than happy to assist with.

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Original Intake Tower under construction

Intake Tower today

Cofferdam design for refurbishment works at hydro dam

KGAL has been appointed to design a cofferdam and provide fabrication drawings for **AJT Engineering** to manufacture and install.

The dam is in a remote location with very limited vehicular access. All fabricated parts must be delivered to site by helicopter with strict weight limits for each sub assembly. As it's not possible to dewater the site, surveys have been undertaken by divers to determine the 'as built' dimensions. Installation will also be carried out 12m below the surface by divers, appointed and supervised by **AJT Engineering**.

The cofferdam is required to sit over the existing coarse intake screen to isolate the pressure tunnel whilst the works are completed on the service gates.

New equipment for Bedford Lock

KGAL has been commissioned by **Jackson Civils** on behalf of the **Environment Agency** to design stoplogs and a replacement mitre gate with new built in parts at **Bedford Lock**, Bedford.

Bedford Lock

The lock is used to allow passage of navigation on the River Great Ouse, bypassing the water level control weirs located to the east and west of the lock within Bedford Park. It is composed of a steel framed guillotine gate on the upstream end, and a timber mitre gate with timber balance beams at the downstream end.

A site survey of the existing stoplog guides was carried out in May to enable the design and fabrication of the stoplogs. The mitre gate channel was successfully dewatered to allow a detailed dimensional survey of the gate and related civils to be carried out in July.

Following the mitre gate inspection, **KGAL** is currently designing a manually operated steel mitre gate, with new stainless steel quoins, pintles, sill and top anchor arrangements. Construction and installation is expected in 2025.

Work continues at Leigh Expansion and Hildenborough Embankment Scheme

Following on from the previous issue of **Fluid**, **KGAL** continues to carry out vital flood defence works with **JBA Consulting** on behalf of the **Environment Agency** at the **Leigh Expansion** and **Hildenborough Embankment Scheme (LEHES)**.

Construction commenced this year with the installation of the south radial gate, which has been successfully located, and the winch drive is now due to be installed and tested. The moving platform will then be installed. All gate components have been brought to the site, including the gate leaf in two pieces for transportation. These have all been welded together on-site, then encapsulated and painted.

Installation of the centre gate and north gate is planned for 2025.

Birdseye view

Installation of the south radial gate at LEHES

Fly through the workshop at Luang Prabang!

Work is gaining pace in the **Whessoe** workshops at the **Luang Prabang Hydro Power Project**.

The fully integrated workshop facility is in full swing now and our **'fly through' video** gives a good indication of the size of the facilities, with numerous sections of the 21 Power Intake Gates being fabricated, each gate will be circa 12m span x 17m high.

News in brief

Bridgwater

In support of the lead designer for the **Bridgwater Tidal Barrier**, **AtkinsRealis**, we are preparing the **Essential Health and Safety Risk Assessment (EHSRA)** for the **MEICA** equipment. This documentation is required in order to provide the **UKCA Marking** of the barrier in accordance with the requirements of the **Machinery Directive**.

Glasson Dock

We have been appointed by **Jacobs** to undertake inspection works on a bottom hinged dock gate at **Glasson Dock**, which is owned and operated by the **Lancaster Port Commission (LPC)** and forms part of the **Environment Agency's** flood defence system.

The gate is of flap type, pivoting on a fixed axis at the sill and operated by a single hydraulic ram on the West side. The **LPC** did not have confidence to operate the asset and there were concerns around asset failure at high tides. The gate has now been removed and placed on the dock side awaiting cleansing and inspection. The objective of this project is to provide recommendations for interventions to extend the life of the dock gate and associated ancillary equipment.

KGAL engineers have had a long association with the gate; **Dave Griffiths** provided the original outline design and tender proposal to **LPC**, via main contractor **Harbour & General**, **Stewart Wingrove** provided the detailed design, and **Brent Imisson** generated the detailed drawings in the mid/late 80s. Stewart and Brent were involved in increasing the height of the gate in the late 90s, when the gate was incorporated into the wider flood defence scheme.

Mica Dam

We have been retained by **BC Hydro** to carry out an extensive **Reliability Study** pertaining to the gated assets at **Mica Dam** on the Columbia River in British Columbia, Canada - a project that will run until 2026.

Our work scope includes carrying out a detailed **Hazard and Operability (HAZOP) Study**, followed by a **Failure Modes and Effects Analysis (FMEA)** and, finally, a **Fault Tree Analysis** to determine any areas for improvement that might be required.

Twerton

As part of our ongoing support of **Mott MacDonald**, the lead designer on the **Twerton Scheme** for the **Environment Agency**, we have completed a series of predictive flow calculations to inform decision making on the control modes of the asset, and created a 3D model of the entire installation to aid with future maintenance and BIM-related activities.

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Exposure

BDS Conference 2024

Risk Management Workshop delivered

As part of the 22nd biennial **British Dam Society Conference**, held in September, our **Regional Managing Director, Russ Digby**, led a very well-attended workshop entitled **'Risk Management Techniques for M&E Equipment'**.

The workshop enabled the participants to gain first-hand experience of carrying out a detailed **Hazard and Operability (HAZOP) Study** and a **Failure Modes and Effects Analysis (FMEA)** for a typical industry electric actuator operated vertical lift gate/penstock.

HYDRO 2024

18-20 November 2024 Graz, Austria

We're looking forward to exhibiting alongside **Whessoe Sdn Bhd** at **HYDRO 2024** in Graz, Austria on 18th to 20th November.

It will be great to join friends, colleagues and partners, both old and new, at this important annual event in the international hydropower community calendar.

Make sure you come to our stand (032) to say hello!

Expanding KGAL's Expertise

There's always something new to learn, and our diverse engineering team have been expanding their expertise.

Associate Director Paul Jones (electrical) and **Mechanical Engineer Ross Strickland** have been updating their knowledge on a University certified professional development course on European (EU & UK) Machinery Safety requirements, largely based on the Machinery Directive 2006/42/EC.

Having both successfully completed a five-day online course, they have sixteen weeks to complete an assignment using a virtual reality software package, which depicts numerous machines along with their technical files and other relevant documentation, requiring them to complete PUWER checklists and a minimum of 25 risk assessments.

Mechanical Engineer George Stacey CEng IMechE and **Senior Mechanical Engineer Yue He CEng IMechE** attended a Fundamentals of Corrosion course presented by the Institute of Corrosion in October.

The course will aid their ability to assess potential or actual corrosion situations to enable them to build anti-corrosion measures and strategies into projects, and help them understand mechanisms and causes of common premature failures.

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Congratulations!

Career Progression for Joe!

We're pleased to announce that Joe Lodge has been promoted from CAD Technician to Engineer.

Having joined the team in March 2023 with a degree in Mechanical Engineering and four years' experience designing hydraulic cylinders and systems in the oil hydraulic industry, Joe has taken every task in his stride and demonstrated the potential we believed he had as a designer of hydraulic steel structures. We're hoping this is only the first step towards a long and successful career with **KGAL**.

New faces...

Chris Sharpe

Poole Office

We welcomed Chris Sharpe to our team in Poole in July.

Chris has joined us as a CAD Technician and we're sure it is the start of a great career.

Farewell to Mark

Mark Ashby

Poole Office

Mark Ashby retired from his position as a KGAL Engineer in August.

Mark had been responsible for creating 3D models and detailed manufacturing drawings of a wide variety of hydraulic steel structures and moving bridges during his six and a half years working in our Poole office.

We enjoyed a meal and a drink out with Mark and, as an AFC Bournemouth Season Ticket holder, he was very happy to receive a gift voucher to spend in the Club shop. Enjoy your well-earned retirement Mark, you will be missed.

Mark receiving his gift from Regional Managing Director and fellow Cherries supporter, Russ Digby

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Hydro Power | Water Control | Moving Bridges

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