

Restoring Manchester's railway heritage

GHA Livigunn has been appointed by principal contractors, Galliford Try Rail, to act as project engineers for the challenging task of restoring and refurbishing the seventy-metre-long railway colonnades at Deansgate Station, in the centre of Manchester.

Grade 2 listed and dating back to the early 1800s, Deansgate Colonnades are largely of riveted steelwork construction, are significantly corroded and were manufactured and erected using techniques rarely used today.



Refurbish or replace

As part of the refurbishment programme, each of the main supporting beams of the colonnades will be removed over the next few months and either be extensively refurbished or replaced. In accordance with the structure's Grade 2 status, as much of the original steelwork as possible will be retained, with all newly manufactured beams being cast with aesthetic rivets in order to maintain the vernacular of these railway archways that have, for so long, provided a significant landmark in the heart of Manchester city centre.

As part of the works programme, the existing railway building will be propped up and a temporary walkway will be provided for passengers accessing the station.

With Form A (Approval in Principle) and Form B (Certificate of Detailed Design) both secured, GHA Livigunn are now in the process of securing Form C approval for the temporary works on site. At this stage, the steel beams will be removed for reparation, supporting columns will be retained in place for blast cleaning and treatment, prior to the fitting of refurbished and replacement beams.

Experienced partners

For this demanding refurbishment project, Mabey Support Systems will be providing all temporary works and propping; scaffold design is by Rhodes Technical Solutions and Taylor & Sons Structural & Mechanical Engineers and Founders, of Cardiff, have been selected to fabricate, refurbish and install all structural steelwork.

Minimum disruption

The whole replacement programme is scheduled to take 6 months, during which time Deansgate Station will remain fully operational. To minimise disruption to city-centre traffic and commuters, all major works will take place at the weekend and in accordance with the requirements of the city's highways department. An intricate system of beam removal has also been developed to enable beams to be lifted from the structure during the working week, then removed from the propping system for transportation to Cardiff at weekends when the city centre is much quieter. ■



3D visualisation for Blackpool outfall

Working alongside KMI+ and Montgomery Watson Harza (MWH), GHA Livigunn has supplied highly detailed 3D visualisation for a new pressure chamber and discharge pipe system at Blackpool's Manchester Square Outfall Pumping Station.

Following the recent refurbishment of the pumping station, a unit located beneath the Promenade, an issue with high surge pressures was identified. As a result, the need for re-sealing and pressurising the system was highlighted to reduce the possibility of premature wastewater discharge during poor weather conditions and to minimise the likelihood of tidal ingress into the pumping station.

For this challenging project - one governed by changing weather and frequently dangerous tidal conditions - MWH, working with United Utilities' Lingley Mere Solutions & Engineering team, developed a solution to construct a new pressure chamber with a backfilled discharge pipe system comprising of four separate pipelines capable of resisting surge pressures. The design also included reinforcement of the associated land shaft and reducing the likelihood of seawater ingress.

Long design life criteria

Although initially considering ductile iron for the pipework, the specification was upgraded to super duplex stainless steel in order to meet United Utilities' long design life criteria, provide maximum saline resistance and account for the fact that all the pump discharge lines would be encased in concrete as part of the construction process.

With the design specification now involving the use of exotic materials, KMI+ plus approached GHA Livigunn in November 2006 for specialist engineering and mechanicals advice regarding the use of super duplex stainless steel.

3D visualisation

Comments GHA Livigunn's Chris Edwards, "The higher costs associated with super duplex stainless steel meant there had to be absolutely no likelihood of any manufactured pipe not being fit for purpose. Additionally, in light of the highly complex nature of the task, involving working in environments that could be filled with storm water at a moment's notice, it was felt that the numerous different parties involved would have a clearer understanding of how outside influences could lead to a temporary cessation of works if 3D visualisation was employed."

In addition to providing a far greater appreciation of complex geometry and installation issues surrounding the task, GHA Livigunn's 3D visualisation of the pressure chamber and discharge pipe has proved especially useful when used as a presentation to interested parties for approval and to those with a limited ability to interpret engineering drawings.

Aided calculations

3D has assisted in calculating precise pipe wall thicknesses, establishing the most suitable areas for pipe jointing, calculating required levels of concrete support and establishing precisely where the project will be at any given point in time. The need for an emergency bypass channel during the initial construction stages was also highlighted and the ability to show the effect of storms and their impact on the construction sequence has proved extremely useful.

Concludes Chris Edwards, "With an extremely tight operating window, the 3D visualisation provided by GHA Livigunn has significantly enhanced the ability for all parties to deliver on this most demanding of tasks." ■

new appointments

Please join us in extending a warm GHA Livigunn welcome to Peter Dawson and Neil Park who have further strengthened our team.



Peter Dawson

Previously employed by Capita Symonds Peter joins our Cheadle office as Principal Engineer.



Neil Park

Bringing extra skills to our Frodsham office, Neil joins us from Unilever at Port Sunlight, where he worked as a Project Manager on the detergent tablets and powders plant.



Is it a bird?
Is it a plane?
No, it's
Kevin Honeysett

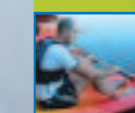
Frodsham-based Process Engineer, Kevin Honeysett, is rapidly gaining a reputation around the office as a real man of steel. A regular competitor in gruelling adventure sports, Kevin has just completed Gaelforce 12, a punishing 4 x 12 hour adventure race on the west coast of Ireland.

Competing with three other members of team Team Accelerate, Kevin raced to third place over a course which covered some 260 kilometres of mountain biking, 60 kilometres of hill running and 20 kilometres of kayaking - and that's if you get the navigation right...!

The punishing stages of Gaelforce 12 adventure race involved orienteering, abseiling and even archery. "The hill running stages over Irelands Holy mountain, Croagh Patrick and the Twelve Pins mountain range were especially tough" says Kevin. "The terrain really was wild and breathtaking."

Sponsored by GHA Livigunn for the GaelForce 12 challenge, by means of a 'thank you' Kevin and his Accelerate team mates will be helping to organise the 2008 GHA Livigunn challenge.

"With experienced orienteers, climbers and adventure racers on our squad," adds Kevin, "we intend to make the 2008 GHA Livigunn challenge one to remember." ■



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Edition No1

GunnSight



The magazine of GHA Livigunn

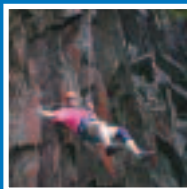
Welcome to the very first edition of GunnSight, the twice-yearly newsletter of multi-disciplinary design consultancy, GHA Livigunn.

When we created GHA Livigunn last December (through the merger of George Hutchinson Associates Ltd with Livingston Gunn Projects Ltd), our objective was clear: to establish one of the region's most-experienced, independent multi-disciplined design consultancies; a truly one-stop resource, committed to good design, cost-effective solutions - and with experience across a wide range of Civil and Engineering Design disciplines.

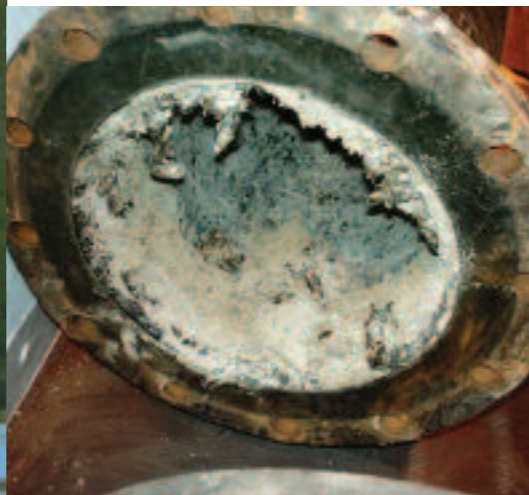
Through the pages of GunnSight, we aim to keep you up-to-speed with our activities. To contribute to the next edition, please email: mail@ghalivigunn.com ■

In this edition...

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The fouling experienced by existing coated carbon steel pipework was having a detrimental effect on the system's performance



'World First' design



As a direct result of the considerable vision shown by Mike Craddock, System Health Engineer at Heysham 2 Nuclear Power Station, GHA Livigunn - in association with main contractors, Boultings Nuclear - have developed a metal-free Polyethylene (PE) Reactor Sea Water (RSW) cooling piping solution that is all set to offer wide ranging safety, cost, reliability and longevity benefits across the nuclear generating industry.

PE design capabilities help revolutionise Reactor Sea Water (RSW) pipeline management

GHA Livigunn's development of polyethylene Reactor Sea Water piping came about after Mike Craddock embarked on an investigation into establishing a more effective means of RSW cooling water transportation than traditional vylastic coated carbon steel; a material requiring frequent replacement because of corrosion, lining failure and bore reduction through infestation by molluscs and other sea life.

Contracts awarded

Following a small-scale test, and after attending a symposium hosted by the Sizewell team, Mike Craddock, along with Dave McKenzie of British Energy Barnwood Engineering Division, had collected sufficient data to begin the task of RSW pipeline replacement.

A contract for the design, manufacture and installation of replacement pipework in the Cooling Water (CW) Pump House and Reactor Basement of Heysham 2's Reactor 7 RSW cooled turbine system was then awarded to Boultings Nuclear with GHA Livigunn being subcontracted to take full responsibility for all aspects of design of the PE pipeline, and Plasflow Ltd being selected as the pipework fabricator.

Tight shutdown window

As an additional complication to an already complex task, British Energy also stipulated that if the replacement PE material was to be used, the project would have to be successfully designed within five weeks in order to allow installation to take place during a 25-day outage window. Working to a comprehensive design brief, GHA Livigunn was also tasked with ensuring that all wetted parts used should only be manufactured from polyethylene, with neoprene to be used as an effective gasket material.

The PE solution used at British Energy's Heysham 2 Nuclear Power Station is attracting considerable interest from other nuclear power sites across the British Isles. At time of going to press, GHA Livigunn, in association with Boultings Nuclear, is in the process of designing a metal-free Polyethylene (PE) Reactor Sea Water (RSW) cooling system for British Energy's Torness Nuclear Power Station at Dunbar, East Lothian, on the east coast of Scotland.

Metal-free RSW cooling solution for Torness



Flying high

– site surveys and design work for refurbishment of Manchester Airport rail link

One of only a small number of specialist contractors approved to work with Galliford Try Rail (GTR), GHA Livigunn, has provided all site surveys and design work for the £multi-million refurbishment of the railway platforms along the extremely busy Styal line linking Manchester Airport with Piccadilly Station.

Commented GHA Livigunn Director, Stewart Tennant, "Our work commenced with middle-of-the-night possessions of the five stations on the Styal line and involved optioneering and surveys at each station. Working in tandem with GTR and their suppliers, we then provided the designs for a steel-reinforced modular platform system that could be manufactured off-site for maximum speed and convenience, prior to installation."

As a result of the investigations carried out by GHA Livigunn – which also involved slope stability studies of several Victorian embankments – the need for temporary propping of several platforms was highlighted due to deterioration of the aging prefabricated concrete platform system in place. ■



The first of its kind at Heysham, the new RSWTAB cooling water pumps polyethylene pipework system

Detailed survey

Embarking on a thorough survey of the RSW system, GHA Livigunn began a programme of research to investigate the various PE materials and fittings available complete with the associated manufacturing constraints. Taking into account various geometrical considerations, the thermal characteristics of PE and all necessary

seismic likelihoods, 3D modelling then commenced; a process requiring mimicking the existing pipework, analysing the mechanical properties of the PE material to be used and compensating for the difference in characteristics between the existing metal piping and the proposed PE. ■

GHA Livigunn Challenge Raises £10,000 for Water Aid

All set to take place during September 2008, at an undisclosed venue in the North-West of England, the eighth GHA Livigunn challenge aims to raise even more valuable funds for WaterAid, plus other worthwhile charities.

Taking place at Coniston Water in September 2006, the last GHA Livigunn challenge provided the chance for teams of architects, engineers and contractors to get involved in orienteering, mountain biking, kayaking, yomping, archery and other outdoor pursuits. More importantly, no less than £10,000 was raised for WaterAid.

"Our annual challenge has become something of a landmark event for our customers and colleagues," commented GHA Livigunn Director, Stewart Tennant. "In 2006 we had about 75 participants and marshals, with teams including KMI +, J. Murphy & Sons, Balfour Beatty Civil Engineering, and Taylor Young and Partners.

"For each GHA Livigunn challenge," he continued, "we select a worthy cause then invite participants to gain sponsorship prior to embarking on a weekend of lively outward bound activities. Back in 2004, I had the pleasure of meeting Ruth Strangeway, of WaterAid after the CIWEM Dinner where she had been speaking about the valuable work done by the charity. We used our 2004 Yorkshire Dales challenge to raise funds for WaterAid, and have been supporting the charity ever since."

"I'm delighted to announce that as a direct result of our 2006 challenge, a staggering £10,000 was

raised to fund WaterAid's extremely worthwhile activities in Malawi, one of the poorest countries in the world."

At the end of the challenge weekend, the Taylor Young team secured first place for their outstanding achievement in each of the trials, whilst Balfour Beatty were recognised for their role in raising the greatest amount of money for WaterAid.

A cheque for the £10,000 raised as a result of the 2006 GHA Livigunn challenge was presented by Stewart Tennant, of GHA Livigunn, to Simon Knight, Chairman of WaterAid NW Region, at The WaterAid Ball, held at the Midland Hotel, Manchester, in October 2006. To see the legendary Murphy's stranded kayak, search for 'Uboat on Coniston' on YouTube! ■

To find out how you can take part in the 2008 challenge – and help raise even more funds for our nominated charities – please contact: mail@ghalivigunn.com

"We were delighted to be invited to design this highly significant polyethylene installation at Heysham 2 - especially as the project has provided the necessary technology for other nuclear sites to consider the benefits of upgrading their pipework systems," commented GHA Livigunn's, Craig Stockton. "The installed system has proved itself to be wholly reliable and robust. It is a 'seismically design safety rated' installation – one which British Energy believes is the first of its kind in the world. It won't corrode and, as even the sea life which previously attached itself to the old pipeline doesn't like it, there's also the added advantage of consistently better sea water flow."



true colours

Created following the formation of GHA Livigunn, our striking new corporate identity reflects the integration of skills brought about by the joining of George Hutchinson Associates (GHA) with Livingston Gunn Projects Ltd and underlines our dedication to a partnership approach with each of our clients.