

# Tony Gee News

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Tony Gee has successfully completed the design of a challenging 11-span overbridge reconstruction at the throat of Bolton railway station.

**R**lando Street Bridge in Bolton was reopened this summer following the successful reconstruction of its 11-span structure. The original bridge required replacement as it was life expired and could only be used by vehicles weighing three tonnes or less, despite being on an important traffic corridor.

Working in close collaboration with contractor Murphy and rail infrastructure owner Network Rail, Tony Gee developed a bespoke design

solution that enabled a challenging scheme programme to be delivered on time.

The new bridge design replaced six original spans over the railway with a single 38m span. A segregated pedestrian walkway and cycleway is cantilevered from the main beams which eliminated the need for temporary works to stabilise the main girders.

In addition to the main span, the works included a 9m side span comprising filler beams and infilling of arch structures under the road approaches.

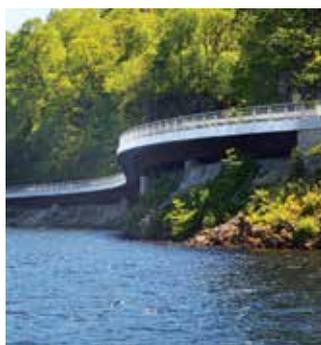
## Award winner



Tony Gee's Executive Managing Director Graham Nicholson has been named Medium Firm CEO of the Year at the ACE European CEO Awards.

The judges were impressed by Graham's hands-on attitude and his eagerness to innovate and hone business practices. They said: "With a strong commitment to developing future engineers and engaging in projects with high engineering content, Graham's leadership has seen Tony Gee grow from a small to medium-sized, profitable organisation with specialised offerings for global developers and contractors.

He has been highly involved in the ACE as past treasurer and chair, and is now an actively engaged leader of the Technician Apprenticeship Consortium a leading body which has grown from six initial apprentices to over 1,000 today."



## A82 Saltire Society Awards

The A82 Pulpit Rock scheme was honoured at this year's Saltire Society Civil Engineering Awards, winning the Infrastructure Award.

The scheme involved the construction of a new viaduct running parallel to the shores of Loch Lomond, widening the

existing road and carrying a new section of two-lane carriageway.

Tony Gee, with McLaughlin & Harvey, delivered an environmentally sensitive design for the viaduct and associated highway and geotechnical works for Transport Scotland.



**Graham Nicholson**  
Executive Managing Director

The second half of 2016 has certainly brought surprises and whilst surprises can be good they can also be disruptive.

The UK's vote to leave the European Union was certainly unexpected and triggered much national concern for the economy. Would clients, the government and business generally lose confidence and retreat into a period of prolonged inaction?

We have seen some projects delayed but government's welcome support for investment in infrastructure does seem to have kept work flowing. We have increased turnover and our future works look encouraging.

**As engineers we need to react and deal with change and adapt with new ways of working and better solutions**

We are relieved to see the Brexit vote hasn't been nearly as disruptive as some predicted but disruptors will continue to affect us, whether they be from political shocks, as seen in the US recently, or through evolving technology, or from ongoing climate change.

As engineers we need to react and deal with change and adapt with new ways of working and better solutions. Being flexible and responsive to change is key to all of us at Tony Gee.

So despite global political uncertainty, we remain optimistic and plan to expand our business at a measured rate in the UK and overseas, investing more in BIM training than at any other time and advancing all our technical and soft skills to ensure staff feel supported and valued in their work. With luck, it will be a busy year ahead.

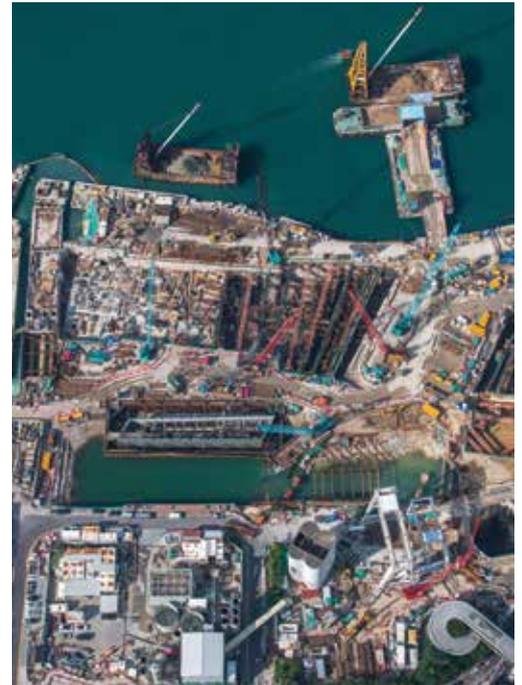
# Cost-effective urban solutions

**A**s part of the Wan Chai Development Phase II project, the Hong Kong government appointed the China State – Leader joint venture (JV) for the construction of an approximately 400m long cut and cover tunnel structure and other associated works. The JV appointed Tony Gee to produce a cost-saving design for the tunnel structure and for all the temporary excavation and lateral support works.

As the project involves deep excavation works in an urban area, the stability and integrity of the adjacent structures, including the MTR Tseun Wan Line tunnels, utilities and roads were primary concerns during the construction. The retaining system adopted comprised 1.2m thick diaphragm walls with up to four layers of temporary struts. The tunnel excavation was up to 28m below ground level with the MTR line still fully operational only 20m away. Tony Gee also designed an alternative foundation system with a combination of socketed H-piles with temporary diaphragm walls and an in situ tunnel box. This had the effect of reducing costs, time and materials required to carry out foundation works. The temporary diaphragm wall panels typically took five days to construct, whereas some of the permanent panels took up to 30 days.

At the eastern end of the Central Wanchai Bypass, Tony Gee is providing design services for the Chun Wo – China Railway JV. These works involve construction of a ventilation building, a cut and cover tunnel structure and other associated works. The cut and cover tunnel excavations are typically 18m deep, but the east ventilation building has a maximum excavation depth of 33m below ground level.

The outer edge of the diaphragm wall structure is just 8m from the piled foundations of the Island



Eastern Corridor viaduct and stringent movement criteria were imposed to prevent any damage. Finite Element Analyses were undertaken to evaluate the effects of ground movements on the viaduct foundations using PLAXIS software.

To control wall movements, Tony Gee designed closely spaced preloaded struts in the cofferdam, and T-shaped diaphragm wall panels were installed next to the most sensitive existing structures to increase the wall stiffness and thereby reduce ground movements.



## Wind farming in Wales

Tony Gee's expansion in the onshore wind market continues with a commission for the Brechfa Forest West Wind Farm in Wales.

Working with Farrans Construction, Tony Gee will draw on its team's onshore wind farm design and 3D digital modelling expertise to undertake the civil, structural and geotechnical

detailed designs for the turbines, an access road from the A485, on-site roads and a substation.

Construction work on this scheme for Innogy Renewables UK Ltd is currently underway and the 28 Senvion MM92 wind turbines, with installed capacity of 57.4MW, are due to be energised in late 2017.

Image: Celebrating the new bridge in Rwanda



# Making a difference

**A** team of five engineers from Tony Gee, in collaboration with contractor Raymond Brown Construction, recently returned from Kigohe in Rwanda where they participated in a Bridges to Prosperity initiative.

Aided by a local workforce, the team successfully erected a suspension bridge over a two-week period. Then, with time left over, the group also helped build a road to an isolated village as part of the National Holiday of Umuganda, a day dedicated to supporting community projects.

An opening ceremony was held in the final days of the initiative, attended by the 2,000-strong local community including government officials from the county's capital, Nyanza.

Chris Young, Executive Director at Tony Gee and Partners, commented: "This initiative was an opportunity that allowed some of our staff to experience the practical construction of a suspension bridge while at the same time bringing huge benefits to the local community. We are very proud of their achievements."

## Suspending belief: the Rwandan bridge in brief



The footbridge is a 29.4m span suspension bridge that crosses the river Mwogo, located in the south of Rwanda in the Nyanza district



There are two 5m steel towers on reinforced concrete foundations. Reinforced concrete anchors for the main suspension cables are buried underground



The steel cross beams are hung from the main suspension cables using steel reinforcement bars bent to suit the varying height along the bridge



The previous crossing became impassable during the rainy season and has claimed the lives of several children in the last few years as the route is used for access to school



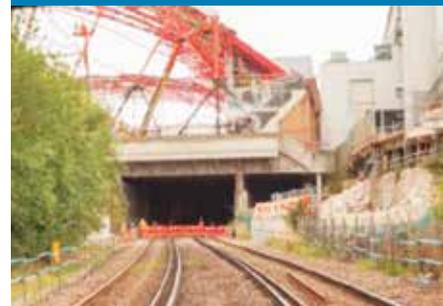
The bridge will serve 6,500 people from the communities of Nyagisozi and Cyabakamyi, who will now be able to trade marketable goods all year round

## IN BRIEF

### Earls Court redeveloped

Tony Gee has been appointed by BAM Nuttall to design an encapsulating structure over the West London Line, part of the redevelopment of the Earl's Court exhibition centre by Capital and Counties Properties PLC. An open space for future development will be created above the encapsulation.

Tony Gee engineers produced an alternative to the outline design utilising a reinforced concrete winged portal structure, cast in sections above the tracks and developed by a bespoke travelling form. This innovative construction method will allow work to proceed above this busy rail line, reducing programme risk and duration.



### An Ely design with a view

Cambridgeshire County Council has awarded the £35million contract to design and construct the 1.2km Ely Southern Bypass to contractor VolkerFitzpatrick with Tony Gee as lead designer. The scheme includes a 300m long viaduct with an architectural walkway cantilevering from its northern girder to provide views of the iconic Ely Cathedral. Construction is due to begin in 2017.

### UAE's Dubai Mall to expand

One of the world's largest malls, The Dubai Mall is undergoing multiple extensions including a new 450m-long building on the Zabeel side of Financial Centre Road, joining to the mall via a pedestrian and road bridge. Working with Multiplex, Tony Gee designed the bridge over an existing structure using innovative articulation measures and different structural forms to manage load transfer.



## Chernobyl arch slides into place

Some 30 years after the Chernobyl nuclear power station accident, a key milestone for its



confinement structure has been reached. As seen on national media, an arch shielding the radioactive waste caused by the 1986 accident has started sliding into place.

Chernobyl's New Safe Confinement is the largest moveable land-based structure ever built, with a span of 257m, a length of 162m, a height of 108m and a total weight of 36,000 tonnes. It will now be moved into its final resting place, set over Chernobyl's Reactor 4 which was destroyed in the accident.

Working for Bouygues Construction, Tony Gee has supported this project by completing a design check for the arch in both its temporary and permanent positions as well as during the structure's movement.

## IN BRIEF



Image: Steel arches erected prior to installation of cross girder and concrete deck slab construction

### Landmark university link

Tony Gee has provided detailed design services to VolkerFitzpatrick for a road bridge and mirrored S-shaped weathering steel footbridge for the University of Northampton's new Waterside Campus. The client's aspirations and the planning requirements were set to maintain the character of the existing landscape while creating an appropriate landmark structure linking the town with the new campus. Tony Gee developed an alternative design using a steel-concrete composite deck solution which forms a lightweight economical flat arch structure. The project is due for completion by the end of 2016.

### Rail link back on track

Train services between Dover and Folkestone recommenced in September – three months ahead of schedule – after major damage to the sea wall forced the line to close last Christmas. The newly-repaired track is part of a £39.8million Network Rail rebuild. Tony Gee was the lead designer for the civil and coastal works on behalf of Costain, and worked collaboratively with Network Rail and a team of track, power, signalling and other specialists.

### New office in St Albans

During the summer our Luton-based team successfully relocated to a new office in the centre of St Albans, Hertfordshire. With excellent travel links to and from London, the team has settled into their new environment successfully and are welcoming new and existing clients to the new premises.



# Inspiring the next generation

**T**ony Gee is sponsoring the Institution of Civil Engineers (ICE) Bridge Engineering exhibition, which features the world's longest Lego Bridge. The exhibition is being held in the headquarters of the ICE in London and takes visitors on a journey to find out how civil engineers are able to create the longest spans the world has ever seen.

The Lego Bridge has recently made the *Guinness Book of World Records* as the longest spanning bridge comprised solely of Lego bricks. Its length has been recorded at 54ft and eclipses the previous record holder by an 8ft margin. It was created using 262,550 Lego bricks and weighs three-quarters of a ton.

For the general public and future engineers, the exhibition is an opportunity to get an insight into the creative minds of civil engineers

and how bridges are created from concept to design to construction. It also tells the human, social and engineering story of bridge building and demonstrates the value that infrastructure delivers to the communities which surround each project. This learning experience is achieved through interactive displays, quizzes and games, model-making challenge kits and a dedicated virtual reality display.

The exhibition is now open at ICE's Infrastructure Learning Hub; entrance is free to the public and runs until April 2017. It is part of a five-year programme of infrastructure-focused exhibitions, which will seek to combine science and engineering together in a fun, informative way that will help to inspire the next generation of engineers. For more information on the exhibition visit [www.ice.org.uk](http://www.ice.org.uk)

## Historic viaduct restoration in Wales

**Tony Gee has been involved in a restoration project on the Cynghordy Railway Viaduct.**

The viaduct is a Grade II listed structure in Llanfair-ar-y-Bryn Wales, built for the Central Wales line in the 1860s. It is 305m long and 33m high.

Tony Gee first inspected the viaduct for Network Rail in 2010 and designed masonry repairs for the identified cracking and spalling.

In early 2016 remediation

by Dyer & Butler was begun and extensive scaffolding was erected to allow Tony Gee's engineers full access for a touching distance inspection of the arches and piers.

The key work comprised chasing out bedding joints and the installation of helical stitching bars into joints on all faces of the piers. Cracks found in the masonry have been sealed by grout injection.



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