

Tony Gee News

"Diversity of views is what Tony Gee is all about"



3

Transforming the passenger experience in Luton...

Two mammoth teeth unearthed during excavation work in Dover



2

3D solutions aid Ely



Tony Gee is working with VolkerFitzpatrick to deliver the preliminary and detailed design of the new A142 Ely Southern Bypass.

The scheme aims to alleviate traffic problems and cut the large volumes of heavy goods vehicles currently going through Ely, Cambridgeshire. There will be two new roundabouts with the road built up on an embankment, a 300m-long viaduct structure crossing the River Great Ouse floodplain and a 100m-long bridge crossing two railway lines.

A key design challenge was the geometrically complex V-shaped piers on the viaduct, addressed by fully exploiting Tony Gee's 3D reinforcement detailing software: *Design for Manufacture and Assembly*. This included clash detection and produced an animated reinforcement

fixing sequence in NavisWorks to aid the contractor, cut congestion and improve site safety.

VolkerFitzpatrick estimates this process saved a significant amount by avoiding re-work, reinforcement wastage and delays. Throughout the design stages, the team was consistently surprised by the cross-sections cut through the 3D model of the V-piers. It would have been close to impossible to detail the reinforcement using conventional 2D methods.

The new bypass is due to open by autumn 2018, with the railway bridge and most of the highways elements near to completion.

Landslip award



The Maerdy Mountain Landslip project has won the Roy Edwards Award in the ICE Wales Cymru Awards 2018.

Tony Gee worked with Alun Griffiths to repair a slipping section of the A4233 Maerdy Road, on a steep mountainside near Aberdare. The team used a 145m-long reinforced concrete edge beam founded on a double row of staggered piles and offset to combat the push-pull effects of loading on the carriageway. The scheme also involved construction of a 200m-long reinforced retaining wall and drainage, which buffered flash inundations regularly experienced in South Wales.

The judges said the project was notable for its community benefits and innovative design and construction. They were impressed with the way the works had been carried out on an exposed and steeply sloping hillside, with minimal local disruption.

Investing in the future

Tony Gee is stepping up its support for some of ICE's major events following a successful collaboration at the Bridge Engineering Exhibition.

The company will sponsor ICE's Invisible Superheroes Exhibition, being staged at the ICE HQ in London to mark its

200th anniversary. The year-long exhibition addresses the skills shortage in the industry by showcasing unsung heroes behind some of the world's most iconic engineering projects.

Tony Gee is also sponsoring

the inaugural Global Engineering Congress in October. This five day event invites delegates worldwide to discuss the vital role engineers play in addressing climate change.



COMMENT CORNER



Chris Young

Executive Managing Director

Amazingly I am already half way through my first year at the helm of Tony Gee. Attending Graham's retirement celebration at the end of May was a great occasion as it confirmed to me what an amazing group of people I work with. However, for me, it also reaffirmed that we need to transform our industry and really change the landscape of equality and diversity. Looking around the room, I didn't see a great deal of diversity in our senior management.

"We need to transform our industry and really change the landscape of equality and diversity."

Diversity of thought is key to innovation and progress. After I took over the culture changed overnight. People are more likely to challenge my views because I'm not seen as the fount of all knowledge like Graham was!

This means I have to work even harder to be informed about the world in which we work. Diversity of views and promoting challenge and debate is what Tony Gee is all about. It's great that we are challenging the established view of what makes an engineer – white, middle class, university-educated British men.

Tony Gee has always had a good mix of nationalities, cultures, ethnicity and gender, in most cases better than the industry average. But those averages are poor, and I'm convinced that we will prosper and offer an even better service by improving them.

These issues are important to all of our clients so I would encourage you all to push us to do more. Don't let us be satisfied with being better than the averages, push us to improve them overall.



Battenhall's balancing act

The new extension to the existing Battenhall Railway Bridge was successfully installed over the Spring Bank Holiday weekend under the watchful eye of Tony Gee engineers.

The bridge carries the Oxford Worcester Wolverhampton railway over the A4440 Worcester Southern Bypass.

Tony Gee was initially involved in the scheme following their appointment by Worcestershire County Council to undertake the independent check on the bridge design. Following on from that Alun Griffiths appointed Tony Gee to undertake numerous temporary works designs to enable the construction of the bridge.

The temporary works designs were principally related to the installation of the bridge by Self Propelled Modular Transporters. Additionally Tony Gee looked at the impact on the adjacent existing bridge undertaking an assessment to determine the effects of the temporary

works on the bridge pre and post construction.

There was potential for the existing bridge to move during construction and Tony Gee determined the safe limits of potential movements. Our engineers were then on site throughout the rail blockade to monitor and advise on the bridge movements. In order to mitigate the risk of unacceptable movements occurring Tony Gee designed temporary ground anchors to restrain the existing bridge.

The installation of the new bridge was achieved ahead of programme and the existing bridge stayed well within its limits.

The extension to the railway bridge has created two 'uphill' lanes from Norton to Whittington to run beneath the existing railway bridge and two new 'downhill' lanes – from Whittington to Norton to run under the new bridge. Dualling the whole route has improved journey times and reliability for both road and rail users.

Battenhall Bridge in numbers...



13.3m span made of reinforced concrete portal structure



34m wide from the tips of the wingwalls



Live monitoring provided analysis every 15 minutes



6700m³ was excavated -mostly completed in under 14 hours



Battenhall Bridge total weight: 1500 tonnes

Foundations for Hinkley Point C

Tony Gee has been working in collaboration with BYLOR – a Bouygues TP and Laing O'Rourke joint venture, to design a reinforced concrete tower crane foundation at Hinkley Point C.



The 500m foundation will support a massive rail-mounted crane specially designed to lift the heaviest elements of the new nuclear power plant. Much of the reinforcement will be prefabricated on-site and lifted into place. Tony Gee has designed the cages to be lifted including reviewing the lifting beams, the reinforcement ties and specifying additional clamps where necessary. Only at more complex intersections is the reinforcement fixed completely in situ.

Tony Gee has adapted our processes to meet BYLOR requirements as they order

reinforcement and fix the prefabricated cages directly from the 3D model.

To do this we learnt the client specific modelling procedure, working with the DFMA developers, the 3D reinforcement detailing software, and IFC format models were uploaded in accordance with EDF document control to a cloud database.

Tony Gee quickly responded to client requests and designed a bespoke shear connection to join the elements of the concrete foundation together whilst trying to minimise changes to the reinforcement cages.

Supporting regeneration

As part of the joint venture of designers with the Midland Metro Alliance (MMA), Tony Gee is helping to deliver an integrated transport system for the West Midlands. With the overall cost of £1.5bn, these works will extend the existing tram network by approximately 34km to improve transport links and provide economic regeneration across the area.

Formed two years ago, the MMA has already completed the design and construction of the Bilston Road track replacement. This included the design of a new type of fibre-reinforced track slab for the metro, created to promote rapid construction and with benefits to long-term performance.

Currently work on site is progressing to extend the tram network in Birmingham and Wolverhampton City centres. These schemes have benefitted from the development of various alternative designs as part of value engineering and development by the MMA.

Tony Gee has been part of a team securing the technical approval for over 1,000 drawings for the Birmingham scheme alone. Other works have included preparing preliminary designs for another four routes, including one with up to 17km of highway and drainage. Another route has over 30 structures including significant viaducts up to 150 metres long and interfaces with numerous stakeholders including Network Rail and many local authorities.



MIDLAND METRO ALLIANCE

There is set to be a significant increase in the programme in the next couple of years and Tony Gee will be an important part of the MMA team ensuring the schemes are delivered successfully through system-wide, innovative design solutions.

IN BRIEF

• TAKING A LEAD DOWN UNDER

Tony Gee has been named as John Holland's lead designer for the recently awarded Batemans Bay Bridge in Canberra, Australia.

The 422m long precast segmental replacement structure will provide reliable connectivity across the Clyde River, improving traffic flow and access to Batemans Bay and the surrounding areas. This will reduce delays during peak holiday and weekend periods for local and through traffic. It will also provide access for larger heavy vehicles and freight connectivity along the Princes Highway.



3D model of Batesman Bridge

Award recognition as work progresses at Dover Western Docks

Works are advancing on the £115m Dover Western Docks Revival (DWDR) development, where Tony Gee is working with VSBW – a joint venture between VolkerStevin and Boskalis Westminster.

The Port of Dover (client) is beginning to take delivery of the new Marina Pier which consists of 360 individual pre-cast concrete units weighing a total of 13,350t.

Tony Gee's designs ensure the pier is in keeping with the surrounding harbour area, is aesthetically pleasing to the local community and provides habitats for macroalgae and epifauna in the wave wall - an initiative approved by the Environment Agency.

Each segment of the pier is supported on a 16t corbel unit and attached to a tubular steel pile. The lower 45t base unit spans between two corbels. The base unit is followed by a 45t wave wall which also spans over two piles. With the base unit and wave wall in place an in-situ concrete pour locked the units in place. The final precast components comprised 22t deck units to create a walkway.

The boundary of the Marina Pier and Marina Curve will house a new marina with up to 250 berths for yachts and pleasure craft. It connects to the existing Wellington Dock via a new 120m Wellington Dock Navigational Channel.



During channel excavation historic and archaeological heritage was unearthed, including two mammoth teeth (pictured).

Construction of the berths is well advanced using Tony Gee designs focused on sustainability, safety and ease of manufacturing and assembly.

The project has been awarded an 'Excellent' CEEQUAL Whole Team Interim Award with 100% scores on historic environment, ecology and biodiversity and water environment activities.

The £21m pavement and infrastructure works follows.

• INSPIRATIONAL AFRICA

Tony Gee and Knights Brown have teamed up once again to build another bridge in Africa in conjunction with the charity Bridges to Prosperity.

This partnership has been in place for the last two years and has seen the team successfully complete two bridges in Rwanda over dangerous river crossings. These new structures have helped to save lives and provide improved access to essential amenities for the local community.

This year, 10 volunteers are heading out to Uganda to construct the Namakhokolo Suspended Bridge across the River Passa. This new 90m pedestrian footbridge will provide safe, year-round access for 4,000 local people saving lives and helping to lift nearby communities out of poverty.



2017's team of volunteers

IN BRIEF

• ON THE ROAD

Tony Gee is delivering the planning, design and construction support for four of the 10 road schemes over a two-year period.

Wokingham Borough Council with Balfour Beatty are delivering a £124m major highways programme consisting of 10 road schemes. This four year programme will upgrade vital infrastructure to benefit the local community and also provide access to 12,000 new houses.

• TONY GEE HELPS THAMES VALLEY GET BACK ON TRACK

Tony Gee is the lead designer alongside HOCHTIEF (UK) for the Thames Valley Area Station upgrade. The scheme involved the extension and upgrade of 13 stations to accommodate the new eight-car rolling stock used on the overhead electrified routes.

The adopted solution for these works was to use precast concrete modular platforms for the extensions. This is in contrast to the traditional front wall platform construction used for the majority of the stations on the route.

The design uses piles and concrete beam support with precast concrete slabs making up the new platform. This helped minimise route disruption and construction costs due to the rapid installation of the piled platform system.

All station designs have now been successfully delivered and are in the construction phase with Tony Gee providing continued design support.

• SCOTTISH MOVES

Tony Gee has stepped up its services for clients based in Scotland. The office has recently moved to a larger and more central location in Glasgow. The new offices allow the team to offer additional resources and capabilities to clients in the region.



Sustainable designs for wind

Tony Gee has completed the civil, structural and geotechnical detailed design of Brechfa Wind Farm on behalf of Farrans. Innogy UK engaged Farrans to construct a wind farm of 28 wind turbines in the Brechfa Forest, north of Carmarthen, in South Wales.

Along with the turbines and their associated foundations this scheme included an access road from the A485 to the site, wind farm site roads and a substation. Overhead power cables connected the main substation to the local electricity distribution network (operated by Western Power Distribution).

Using its extensive BIM capabilities, Tony Gee's team

was able to provide integrated 3D models throughout the detailed design phase. By combining REVIT models, used for wind turbine generator bases and buildings and Civils 3D models, utilising the Infracore software package, accurate models of the final design were produced.

Tony Gee is committed to collaborative working and believes the use of models such as these in design reviews promotes clear communication between all key stakeholders. The replacement of extensive paper drawings with integrated 3D models supports the company's continuous drive towards more sustainable project delivery.



Driverless DART takes shape in Luton

Tony Gee is lead designer on the £200m Luton Direct Air to Rail Transit (DART) project. Working for VolkerFitzpatrick / Kier Infrastructure, the designs are for a mass passenger transit system connecting Luton Airport with the Luton Parkway rail station.

DART will be a fully-automated driverless system, approximately 2.1km in length, and providing fast, frequent and reliable

transfers between the station and the terminal in under four minutes.

DART's airport terminal is largely underground accessed by escalators, lifts and stairs beneath a canopy of linked, gold coloured steel parasols. The overall cost, including the civil engineering work, transport system and major station upgrade is £225m. The system is expected to be operational by summer 2021.

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