



New Bridge Promotes Pedal Power In Castleford



The new bridge over the Normanton to Castleford railway line

Cyclists in West Yorkshire have been given a major boost with the opening of a new bridge over the Normanton to Castleford railway line.

The Castleford to Wakefield Greenway project is delivering a fully surfaced cycle path alongside the River Calder, that will eventually enable cyclists to safely transit between the two towns courtesy of a 16km route.

And, as part of the scheme, which is being partly supported by Wakefield Council and the walk / cycle charity Sustrans, Phase 2 has seen the construction of a new single span bridge over the railway, nearly 40 years on from when the old bridge was demolished.

Partner, Jon Livesey, takes up the story: "The cycleway runs along the trackbed of the disused Methley to Pontefract railway line which was closed in 1981. The

original bridge deck which carried one line over the other, was removed three years later leaving the stone abutments in place.

"However, whilst still in situ, these have not been utilised in the latest design meaning that the new 35m steel bridge is now supported on reinforced concrete bankseats with no reliance on the existing abutments," said Jon.

The new structure has been designed with a minimum working life of at least 120 years.

The Castleford Greenway scheme is part of the West Yorkshire Combined Authority's £60m CityConnect programme whose aim is to get more people travelling by foot or bicycle.

The first section of the new Castleford to Wakefield Greenway, a 2km stretch between Fairies Hill Lock and Methley Bridge in Castleford, opened almost 18 months ago.

Mike Babbitt, Head of Sustrans' Network Development, said: "We're very excited to be working with CityConnect and Wakefield Council on this new phase of the Castleford Greenway. The new bridge and links to the Greenway will allow thousands more local people to access a peaceful, traffic-free path for journeys to work, school or for leisure.

"It's a great example of how old railway infrastructure can be repurposed as a healthy 'active travel' route which also helps reduce traffic congestion and air pollution. Castleford Greenway will be an important 'breathing space' for local people and a haven for wildlife. It is part of a developing local cycle network and Sustrans National Cycle Network."

Client: Wakefield Council / Sustrans
Contractor: Amco



Connecting Castleford to Wakefield. PHOTO: City Connect



Getting the finishing touch in the factory

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look I can see civil engineering projects I have had a hand in.

Going towards the east coast the Immingham Rail Freight Terminal (IRFT) dominates the skyline. I spent weeks, and more than the odd sleepless night, working on that one; it is so big that the IRFT can be tracked by satellites above the earth!

Then there is the footbridge across the A1 at Great Ponton in Lincolnshire and the lifting bridge in Torquay's inner harbour, both of which felt the tip of my pencil on a drawing board more than two decades ago!

I had a work placement student with me recently and started to feel old. The further south we drove the more I found myself saying, 'that's one of mine..... oh, and that one!' When you put four decades between yourself and university graduation day, it stands to reason that you will have covered a lot of engineering ground over a lifetime.

However, it is quite nice to know that 20 or 30 years on from when you completed a particular job, it is still standing and in daily use. That, for me, is what engineering is all about. Anecdotal reminiscing done!

For now we continue to work on some great projects so please keep an eye on the HBPW blog to see what we've been up to (www.hbpw.co.uk).

Enjoy the read!

PAUL WITHERS
MANAGING PARTNER
HBPW LLP

Welcome



Paul Withers - Managing Partner

You might say that I did a double take not so long back when I travelled to Warwickshire to check out a new project.

Buckingham Group were tendering to build a new cable stayed bridge over the A45 at Whitley and asked me to provide engineering drawings as part of their bid. All rather innocuous I hear you say!

I travelled south to recce the site but, once there, had strong feelings of deja-vous after spotting Jaguar's Technical Centre nearby, and it took me all of 10 seconds to realise that it was the very job I completed drawings for nearly a quarter of a century earlier! There it was, standing proudly as if waiting for my return! I had been working as a young engineer in London at the time but spotting the large car facility got me thinking.

These days I travel up and down the UK and everywhere I

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Magnetic Attraction Of Sheffield's Water



Sheffield's new MIEX Water Purification Facility



In the early stages

An external perspective

Around 200,000 people in the Sheffield and Barnsley areas now have some of the cleanest drinking water in the UK thanks to a new treatment facility that is using pioneering technology to bring even greater purity to South Yorkshire's finest tipple!

In common with most other reservoirs in the Pennines, the water treatment works at Langsett near Stocksbridge, have experienced a deterioration in water quality over the years due to the peaty nature of the hills the water runs down before being collected in the reservoir.

To counteract this a new first stage treatment process called a Magnetic Ion Exchange (MIEX), designed to remove the slightly tinged peat colour from the raw water in Langsett reservoir prior to it being treated and sent out to supply customers, has been installed.

HBPW Senior Engineer, Shaun Strugnell, said: "Historically Langsett water treatment works received its raw water from the nearby reservoir and cleansed it using a Rapid Gravity Filter system (RGF).

"However, the efficiency of the RGF was gradually being reduced because of the increasingly peaty water, prompting the need for a MIEX.

"MIEX processes have the ability to reduce the Dissolved Organic Carbon (DOC) in water which, in turn, reduces the formation of harmful Disinfection By-products (DBPs) in the water treatment plant itself. This provides for much improved outcomes enabling the RGF system to, once again, achieve maximum efficiency. By working in tandem the MIEX and RGF now massively benefit the local population."

The new MIEX facility, measuring 38m by 22m, has been handed over to Yorkshire Water and features a 7m deep basement containing the process equipment along with contactor storage chambers for the treatment of water.

HBPW led the civil and structural engineering design on behalf of Clugston who delivered the project for the Morgan Sindall and SWECO Joint Venture (MS2JV)

"There were some early day challenges," added Shaun, "in

that restrictions on site meant that concrete had to be pumped in some considerable distance. However, all of the issues were overcome and I am delighted to report that HBPW has played a key role in helping upgrade Sheffield's drinking water for years to come."

Simon Balding, Yorkshire Water project manager, said: "Removing the deposits and colour makes it much easier to treat the water and will ensure customers in Sheffield and Barnsley continue to receive high quality drinking water. This is a big investment and demonstrates our commitment to providing the best quality drinking water for the area."

Contractor: Clugston (for the Morgan Sindall & SWECO Joint Venture)

Client: Yorkshire Water.

Innovative Partnership Of The Bogiemmen!



Craigentenny Rail Depot

Pro-active innovation and forward looking methods of construction have been playing their part in a unique 'Bogiemmen' partnership between Nationwide Engineering Group (NEG) and HBPW Consulting.

The two companies have recently been working together on a striking design at the Bluestone Centre close to Stonehenge in Wiltshire, and in the Edinburgh suburb of Craigentenny, NE Scotland where innovation has played a fundamental part in mitigating a key challenge at the district's rail depot.

Rob Hibberd, Director at NEG, said: "Network Rail needed to remove a carriage bogie from one of the depot

tracks, requiring the construction of a substantial 'bogie crane'. However, over and above the crane itself, was the added problem of restricted access which is why we called in HBPW's Paul Withers, certainly one of the industry's most experienced rail engineers."



Bluestone - Soon to be home to an iconic 'cube' structure

Paul, Managing Partner at HBPW, designed the foundations for the bogie crane but, rather than using several large anchoring piles, he decided to feature a series of mini piles in his resulting design.

"This removed the need for 760 diameter bored piles which would have been impractical within the site at Craigentenny. NEG were able to breathe life into my innovative approach and, by working together, we delivered a seamless solution for Network Rail, solving the lifting problem whilst ensuring that the rail lines themselves were not detrimentally impacted by an over toppling crane thanks to the use of smaller, but more versatile, mini piles."

Meanwhile, at the Bluestone Centre in Solstice Park – just five miles from Stonehenge - an iconic building design is emerging from the soil!

Nationwide and HBPW have been working together to design a huge 45mx45m cube-shaped building in the Wiltshire town that will be used

for self-storage. Paul Withers, also the man behind the engineering drawings, said: "From an aerial perspective the building is exactly square although it only has a height of 22m. Nevertheless, this will certainly take on a striking 'cube' perspective when built," he said, "and will feature around three and a half acres of mezzanine flooring across six levels. Each floor will be divided on a 5mx5m series of grids to provide self-store units.

"Viewed alone HBPW is the office based firm of engineers whilst Nationwide are the bricks and mortar. However, combine the two and, between us, we will soon deliver an amazing piece of architecture which, I believe, will be talked about in the locality for years to come. A perfect example of innovation through partnership."

PHOTO CREDIT
Craigentenny image courtesy of www.sw-gr.com

Client: Network Rail / Nationwide Engineering Group
Contractor: Nationwide Engineering Group

Keeping Scarborough Trains Moving

As Scarborough prepares to welcome 13 new five carriage trains, providing 700,000 extra seats a year for those travelling to and from the town, HBPW can reveal itself as the engineering firm behind the £7m servicing depot that will look after the new east coast rail stock.



Scarborough Depot. Picture courtesy of: Insider Media.

Construction of the new train servicing depot near Scarborough railway station is now well under way in preparation for the arrival of the new Nova trains.

Associate Paul Jacklin, who has been working on the project, said: "The facility, which will provide both maintenance services and fuelling for trains, represents an investment of time and commitment by three key partners, TransPennine Express (TPE), construction company GRAHAM and Network Rail.

"HBPW has been working alongside GRAHAM to design foundations for the structure which includes a canopy beneath which trains can be serviced away from the elements.

"There are also high-level access walkways for the purposes of rail stock cleaning in addition to a screening 'wall' which will shield local properties from any excess noise." HBPW engineers have also designed drainage and hard-standing requirements.

The new five carriage trains will run between Scarborough, York, Leeds, Huddersfield, Manchester and Liverpool and it is anticipated that

15 new jobs will be created when work on the depot completes later this year.

Leo Martin, Managing Director (Civil Engineering) for GRAHAM, HBPW's partner, said: "This project... is an endorsement of the calibre of works which we have previously undertaken throughout the UK. We have established a reputation for 'delivering lasting impact' and this scheme provides us with the

perfect opportunity to make a real difference to the environment and local communities where we will be operating."

Paul Jacklin added: "HBPW has a long pedigree with GRAHAM and we are again proud to be working on such a great project.



The Mayor of the Borough of Scarborough, Cllr Joe Plant formally launching the building of the new maintenance depot and infrastructure works.

PHOTO CREDIT
Photo courtesy of: www.railbusinessdaily.com

Client: Network Rail / TransPennine Express
Contractor: GRAHAM

Batman To The Rescue!

Senior Engineer Damianos Bouklas got more than he bargained for when he was asked to be part of a Network Rail (NR) demolition and bridge upgrade team.



Former station at Irchester!

HBPW's man is one of the professionals playing his part in the wider Midland Main Line Upgrade, which has seen an additional line constructed between Bedford and Kettering.

But Damianos didn't quite anticipate what he and colleagues discovered at Irchester's Station Road overbridge in Northants...nesting brown long-eared bats living in the remnants of an old railway station.

He said: "The Irchester overbridge, along with another similar structure –

the overbridge at Isham – had been identified for a range of demolition and / or upgrade work to pave the way for electric trains.

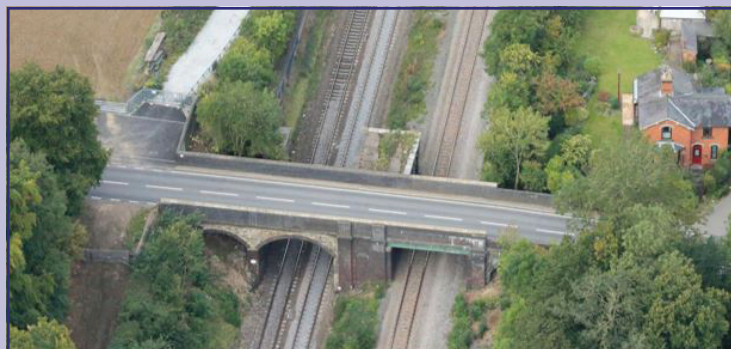
"Did we lower the track level or raise the height of the bridges to make way for power lines?"

At Irchester whilst the track level could have been lowered, the necessary engineering would have implicated structure foundations as well as a 1,000 metre stretch of line. The area was also prone to flooding and lowering the track at such a late stage, might have affected engineering work already completed to support an additional rail line planned for span four of the five span structure.

"The decision was taken to demolish and re-build arch four whilst raising



Modern remnants of the old Victorian station



The original bridge at Irchester

the height of the entire bridge simply because that approach had fewer implications for wider engineering disciplines," said Damianos.

It was decided that the new bridge at Irchester would be a composite structure with integrated steel beams and pre-cast concrete segments.

"We always knew about the remnants of the old railway station adjacent to the original bridge, however, what we didn't anticipate was bats which rapidly shifted our engineering thinking."

All works eventually went ahead but only after a string of surveys and detailed planning, lasting months, had taken place, enabling the

endangered creatures to be carefully moved.

"Bats are heavily protected in the UK," added Damianos, "so this was no mean feat. In the final event – following the demolition and re-build of arch four at Irchester - the remaining four spans were upgraded courtesy of a concrete overslab which waterproofed the structure from above.

"I think it is fair to say that this was one of my more challenging assignments for a variety of reasons!"

Client: Network Rail
Contractor: Amco

Bridge Key To Doncaster's £8m Waterfront Regeneration



An artist's impression of Network Rail's planned new waterfront building

An exercise in value engineering at a major £8m landmark development that will upgrade Doncaster's waterfront, has saved thousands of pounds.

Network Rail is developing a new depot on Marshgate, next to Friar's Gate Bridge, in order to create a major town centre base for its regional operations, currently spread across five sites in the town.

However, the bridge – a key point of access to the development area – failed its assessments and was deemed in need of strengthening.

Design Engineer, Ross Hardy, said: "Initial designs showed strengthening work was required to the bridge's underslung cross girders, however, the recommended method effectively reduced clearance between the

water level and the lowest point of the bridge deck.

"Allied to that the overhead bracing, on top of the structure, also failed its assessment, and initial thinking was that steel 'crucifix bracing' – from above they look like a series of large metal 'X's' spanning from left to right – should be used to give the structure renewed strength."

HBPW was asked to come up with some alternative, innovative thinking.

"Rather than working with the existing underslung cross girders – the original drawings sought to add steel pieces to the old metal work but, in doing so, reduced the water-to-bridge clearance level - we opted for temporary works.

"These enabled us to support and completely replace the old cross girder hangers, avoiding the need for metal strengthening 'plates' and the consequential reduction in water-to-bridge height, a much better solution that was acceptable to all vested parties."

New extra-strong horizontal sway beams running the length of the bridge were also added to the top

of the structure, and the addition of height increasing steel stools paved the way for the 'new' bridge to take bigger and heavier vehicles.

"Initial designs showed strengthening work was required"

"Instead of using Crucifix Bracing, which we knew would be a challenge to fit because it has to be craned into place pre-assembled and drilled at four corners, we opted for single fabricated steel strips – half of a cross if you like – running corner to corner

and requiring drilling and fixing at just two points."

This alternative engineering approach took time, material cost and effort out of the implementation process, and the bridge will be good for use by vehicles up to 40 tonnes across each of its two lanes.

Doncaster Council say the improved Friar's Gate Bridge will help unlock wider commercial development in the surrounding area.

Client: Network Rail
Contractor: Amco



Friar's Gate Bridge - Gateway to Doncaster's Marshgate