



## Super Hero Drilling Rig To The Rescue!

**One of the most powerful drilling rigs in the UK – affectionately known as Hulk – was the unlikely hero called in when HBPW was asked to carry out quayside ground investigations in Porth Penrhyn Harbour near the Welsh city of Bangor.**

Construction work at Dinorwig Hydro Power Station and Pentir Sub Station, includes provision for huge 250 tonnes transformers which have to be landed at the 200 year old facility, run by Dickie's Boat Yard.

But all parties needed to know that the quayside was up to the job, fearing dangerous collapse of the ground or ancient walls if the combined weight of either a huge lifting crane – or Heavy Goods Vehicle - along with one of the massive transformers, put too much strain on the waterside structure.

Geoenvironmental Engineer Jay Fox from HBPW, explains:

"We had to consider two possibilities. The massive roll on roll off delivery vessels are able to carry a pre-loaded specialist Heavy Goods Vehicle, in this case with the transformers. It was a question of whether they could simply drive off the ship and go about their business, or whether we needed to make provision for a temporary lifting crane to remove each of the 250 tonnes transformers off the ship for onward transportation by waiting vehicles."

Either option needed proof that the quayside was up to the additional weight.

"The quayside is around 200 years old," added Jay "and was originally developed for

**Client:** Dickie's Boat Yard  
**Contractor:** Wynns Independent Transport Consultants

the international transportation of locally quarried slate. Whilst the make-up of the harbour is not well understood, we do know that most of it was constructed with slate wastes."

And therein lay the problem.

"Groundworks were required to ascertain the integrity of the quayside's construction, so we brought in 'Hulk', one of only four series 900 drilling rigs in the UK. Weighing in at 27 tonnes the '900's' are more used to drilling deep boreholes up to several hundred metres deep, meaning our 18m requirement was a walk in the park, taking just a few hours to complete instead of, potentially, several days with a lesser rig."

Local ground conditions were unknown but, thanks to the power of Hulk, and its ability to install the casing simultaneously with drilling, it proved ideal for the unstable ground at Porth Penrhyn.

"These rigs are normally used for installing deep water wells and geothermal ground source heat pump loops so the harbour job was barely even a challenge. The 900's are not suitable for all sites as they need to be delivered and collected on low loaders.

"Their sheer size and weight can also be a problem on softer sites but, in this instance, it enabled us to get the job right, completed on time, on budget and right first time."

Moving forward investigations have shown that use of the quayside is suitable for transformer delivery and other potential future assignments for the Porth.



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The debate against PR is that it often leads to diluted government, too many Indians and not one Chief! Surely that cannot be good for the country's infrastructure? We now have a majority government – love it or loathe it – and, to some extent, it's business as usual with continuing investment in UK infrastructure and a sense of calm in both the market and the world's money markets. Would the same outcome have happened if there'd been several parties at the helm? Possibly not.

So, with every perceived negative, there's always a positive; it really does depend on how you view things!

Now that I have got off my soapbox, welcome to this latest edition of our newsletter! Look out for the two 'monsters' in this edition, the monster crane we employed to help complete the job on York's Scarborough Bridge and that other monster, the Hulk, who made a welcome appearance in Bangor! 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](http://www.hbpw.co.uk)).

Meanwhile enjoy the read!

**PAUL WITHERS**  
MANAGING PARTNER  
HBPW LLP

## Welcome



Paul Withers - Managing Partner

Without doubt it's been controversial that's for sure; the General Election that is! The Electoral Reform Society described a "democratic crisis" in its analysis of May's General Election, estimating that almost three-quarters of votes, some 22 million, were effectively wasted and one in ten people voted for someone other than their favourite candidate.

The 2015 election saw David Cameron win a slim majority, 331 of 650 seats, with under 37 per cent of the vote. Meanwhile Ukip won just one MP despite being backed by 12.6 per cent of voters. And therein lies the controversy. Should we move away from a First past the Post voting system to one centred on Proportional Representation (PR)?

However, engineers might do well to ask whether or not there is a 'practical' outcome to this so-called skewed system?

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## Cash Saving Innovation for Veolia

**Client:** Veolia  
**Contractor:** Clugston Construction



Veolia's new waste transfer station in Newark

**Innovative engineering for one of the world's leading waste recovery companies resulted in significant savings thanks to a practical approach to overcoming challenges on two sites in Nottinghamshire.**

Clugston Construction has been charged with building two UK based waste transfer stations for French owned Veolia.

And, when HBPW was asked to become the lead designer for its large shed-like schemes in Newark and Worksop it was an opportunity to prove that value engineering really can make a difference.

Partner, Emyr Parry, said: "Both sites are very similar, each comprising large steel clad buildings and each with a 5meter high concrete wall to its perimeter, along with other facilities.

"The buildings, which are both located on brown field sites, have a history of industrial use, meaning that innovation was necessary if we were to accommodate and retain all excavated arisings on site," said Emyr.

Soil contaminated from historical

use can be costly to transport off site so careful planning of ground levels at both locations ensured that little if any removal of soil was necessary.

There was also the need to consider Sustainable Drainage Systems (SuDS) for the new facilities. Planning Conditions for both schemes meant that any water flowing from the sites would need to be restricted to less than the existing flows, through use of water attenuation.

"Typically this involves excavating soil to install large underground holding tanks so that in the event of a heavy downpour, water can be collected, stored and subsequently drained away into existing sewers in a more controlled way.

"Rather than do this, we chose to design above ground water storage on top of the surrounding external yards. By having the external yards set to gradients that effectively form large ponds, it now means that in the event of a heavy rain storm water is stored 'on top' of each yard.

"Effectively an area of each site becomes temporarily flooded, but in a controlled manner,

meaning operations at either of the facilities, or their neighbouring properties, are not affected. Also, by removing the need for large excavations for underground tanks, the removal of potentially contaminated soil from the site has also been avoided."

Emyr said there had been even greater savings at the Newark waste transfer site.

"Surplus water at Newark will flow into the nearby stream once the development is complete, however, had we opted for underground tanks, the difference in levels between the stream and the base of the tank meant that a pumping station would have been required.

"But, as water is stored at ground level, we will be able to utilise gravity to discharge water into the stream, saving even more money," added Emyr. Statistically both sites have enough storage to deal with the worst possible downpour within a 100 year period.



# Logistical 'Lifting' Challenge in Historic City

Client: Network Rail Contractor: Story Contracting Ltd

The Rebuilding of York's Scarborough Bridge

One of the biggest cranes in Britain swung into action as a 140 year old bridge in the historic city of York was given a £6m makeover, all thanks in part to the team at HBPW.

And the Network Rail job went so well that the main contractor, Story Contracting Ltd, even sent a big thank you email to all its key suppliers who made the successful operation possible.

But, before the huge task of replacing the original Victorian structures could begin, HBPW was employed to design the temporary works access and

support for lifting operations, which were a logistical exercise in their own right.

Engineer James Cable said: "The bridge carries the York to Scarborough railway line across the River Ouse and, whilst major structural bridge deck replacement work was required, the available access for the installation crane



Scarborough Railway Bridge



Removing the Old Scarborough Bridge



Jay Fox

Geotechnical engineer, Jay Fox, carried out ground investigation and slope stability modelling,

was very restricted, with the crane positioned in the small car park between the railway embankment and the residential bed and breakfast. To add to the challenge HBPW found that the existing railway embankment had historical slip failures founding on alluvial river deposits."

to establish the existing condition of the embankment slope. This helped to direct the design development so that the engineered solution for the crane access provided a long term benefit for the current embankment slope.

Two piled crane beams were installed to enable the large crawler crane to safely access the site for the demolition and reconstruction of the bridge and, in total, 200 piles were installed to depths of 14 metres.

Network Rail's route Managing Director, Phil Verster conceded that it was a challenge:

"The bridge spans the River Ouse and is in the middle of a residential area with narrow streets as well as being close to several important rail lines."

But everything came together leaving Mr Verster somewhat relieved. "Hopefully, many parts of the bridge will not need any further work for decades," he added.

And, in his email to all concerned, Project Engineer at Story Contracting, John Slee said: "Credit most go to you all for your proactive contribution to this project. "This is one of the biggest we have delivered and whilst it presented its fair share of challenges, through careful planning and excellent teamwork, we have proved together that we can deliver such large high profile projects on time and to budget. The client was delighted."

HBPW Partner, Paul Monaghan, who supervised the HBPW element of the work, said: "Network Rail can be justifiably proud of this project which was not only an engineering challenge for all concerned, but also a real team effort that seamlessly delivered an excellent outcome."

Photos: Yorkshire Evening Press & Mulhollandmedia.co.uk



One of the biggest cranes in the UK



Scarborough Bridge takes on a new life



Working through the night



The Supercrane concrete platform