



Diamond Awards 2022

27th October 2022

Munich (GERMANY)

Dymacore Limited

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Listed Big Arch Bridge gets an industrial scale facelift!



Introduction



Name of the job:” Big Arch Bridge” Ebbw Vale situated in the historic county of Monmouthshire, Wales, United Kingdom

Companys’ description:

Dymacore Ltd Offer a fast friendly and professional award winning service to the Construction/ civil engineering/ and development industries nationwide. Dymacore specialise in not on the day to day diamond drilling services and structural alterations but we specialise in Coastal defence Works protecting our costas from storm damage and repairing and our restoration division specialising in Listed buildings and structures of significant heritage and historic importance, such as the Roma Baths/ Westminster Abbey to name but a few. Dymacores founder Edward Taylor has 22 years industry experiance and started in the industry as a Labourer, with a military background also and a passion for business development Dymaocre Ltd has gone from strength to strength year on year and Dymacore has typically grown by 25% annually for nearly every year trading to date

Job finish: 27/05/2022

Place: “Ebbw Vale ”



Job description



Big Arch Bridge, built in 1813, strides Steelworks Road and is part of the Ebbw Vale heavy industrial heritage. The grade II listing reflects the bridge's importance in the context of the area and is unmistakably massive.

The arch measures 23m in length by an evolved intrados cross section of approximately 13m. The single span had an arch ring approximately 550mm in thickness comprising sedimentary stone laid with the bedding perpendicular to the line of thrust.

Goldhawk Ltd were invited by Blaenau Gwent County Borough Council to undertake trials of a methodology termed 'interstitial grouting' to determine the feasibility of injecting suitable resinous materials into and above the arch ring to provide a water-resistant barrier. The aim being to arrest the progress of freeze thaw damage to the arch intrados. The trial was carried out from 9th March until 13th March 2020. During the trial the weather was variable with frequent periods of heavy rain. Temperatures were around 6° on average with some frosty mornings and some sunny intervals. The trial was carried out following a period of exceptionally prolonged and heavy rainfall.

Following the trial it was determined that not only was the water control installation required, but also a mechanical means of retaining some of the loose and friable masonry in place. Goldhawk Bridges Restoration, the sister company of Structural Repairs and Specialist Services were therefore engaged to design and install a retaining 'MARS' reinforcing grid system into the soffit of the arch alongside the water control installation.

Following issuance of the instruction to proceed in November 2021, STRESS engaged the services of Dymacore Ltd Drilling through a competitive tender process based upon their previous exemplary performance on other such contracts in the Reading, Bristol and Bath areas. On commencement of the contract, CADW (Welsh Heritage Board) required the Local Authority to take the repair further than the original scope, through advising the need for the installed injection and retaining systems to be camouflaged into the structure. This in turn lead to numerous trials and deepening of the required installations in the soffit of the arch barrel.



Job description

At this point effectively Dymacore were required to double the depth of cutting to achieve the required end result and leave the work in the original condition/ thus no visible repairs

Dymacore Ltd were instructed to complete-

3,884m of inverted cutting to a depth of 85mm Circumferential to form channels to suit system

3,840m of inverted cutting to a depth of 85mm Longitudinal to form channels to suit system

4,528 number holes upto a depth of 1.2m

Dymacore again showed exceptional flexibility and adaptability in their approach to the works, where Ed and the team worked with STRESS site and commercial management to ensure the needs of the client were met.

Overall, regardless of the challenges put in front of the collective team, the project has been a huge success and the client/CADW exceptionally pleased and impressed with the results”.



Planification



"The Planning of this task took place well in advance and required lots of method trials- due to the nature of the environment, the material and the quantity of work we had to utilize the Hilti TS5 remote controlled track/wall saw to allow cutting of the channels this did however create its own issues as typically this systems channels are cut using a hands sawing tool. We had to think outside of the box, we ran some off-site safety trials to establish feasibility of using the TS5 on a number of factors.

- The fixings- to secure the Track to the circumference- best type-most strength-safest-cost effectiveness
- The blades- We were concerned the channel would be too narrow to allow two parallel cuts thus not giving the required 16mm width to suit the system.
- The Saws require regular services and maintained; therefore, we required more machines to rotate services.
- The angle of the angle of the barrel- how many m of cutting we could achieve using straight tracks (for example in the circumferential).



Protection and techniques used



Dymacore Ltd Trialed the possibility of using Loop cutting blades- these have a wider segment for creating single channels typically for sensors on roads/traffic lights etc. The concerns regarding this method would be a number of things that we would have to test-

The blade width (typically wider) if it would suit the flange on the saw? Inevitably some of the sawing may have to be done by Hand.

The segment being 6 or 7 times wider than the standard blades for this saw- how would this react to the material- would there be excess wear on the machines- would it cause excessive wear on the blades? Would the machine be able to run the blade?

After extensive safety trails we found due to the softer nature of the material we were cutting this countered the width of the blade issue. The saw itself handled the blade very well as we used a smaller blade reducing the weight. The blades provided by Andrew Johnson of Diaquip Uk were manufactured to assist us and performed faultlessly throughout the project. The end result was effectively a perfect channel exactly the correct width.



Difficulty and complexity



In my whole career on a project I have never come across so many day-to-day challenges- it required forward thinking- trials- consistent adjustments as the tunnel angles were different every time- the material was uneven meaning we had to use angle feet, but this created its own set of problems- twisting of the track at certain angles- ensuring balanced heights and levels on every setup.

Due to the complexity of the task actually supervised the whole project side of our operations- I loved the challenge of the daily problem solving- although sometimes stressful my whole team made me very proud and all of them relished the challenge of working on this high pressure but prestigious project.



Waste management and sustainability



During the process as you can imagine, quite a lot of water was used for cutting- where possible this was recycled and reused by the main contractor.

Due to our look cutting method, we eliminate all Dymacore waste



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Level of specialization of the company



Stuart Roberts (Project Management surveyor) from Stress said “Dymacore again showed exceptional flexibility and adaptability in their approach to the works, where Ed and the team worked with STRESS site and commercial management to ensure the needs of the client were met”. “Overall, regardless of the challenges put in front of the collective team, the project has been a huge success and the client/CADW exceptionally pleased and impressed with the results”.

Steve Clark (Contracts Manager) Dymacore said ”A challenging project for all involved, with changes to scope throughout the duration of the project. The site team, led by Mike and Ian, dealt with all aspects of the work in a very professional manner.”

Ed Taylor Managing Director of Dymacore Ltd said “ My staff worked tirelessly on this project, sometimes working weekends, going above and beyond to give the customer exactly what we aimed to produce- a perfect end result”.

During the project we had one operator gain further qualifications and a local student come and do her work experience also on site!

Videos

<https://www.youtube.com/watch?v=emHilctnRQ8>

<https://www.youtube.com/shorts/3xpYlOu-3vw>



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