BAM NUTTALL X LYNCH

BLACK POTTS WEIR FLOOD ALLEVIATION SCHEME

INTRODUCTION

Lynch is proud to be working with BAM Nuttall on the Environment Agency's River Thames flood alleviation scheme.

The Jubilee River is a manmade river, which was built by the Environment Agency and opened in 2002. The river is 11.6km long, with 326 hectares of wildflower grasslands to encourage new species and 193 hectares of native woodland planted.

This is part of a flood alleviation scheme which protects approximately 3,200 homes from flooding. Since its construction, the weirs on the river have been opened over 30 times to reduce the flood risk from the River Thames.

Black Potts is one of the six weirs along the river, that helps to keep the water at the same level as the River Thames. Divers had previously spotted scouring – water damage caused by erosion.

The Black Potts Weir repairs is part of a framework for the EA, and this will ensure protection of the weir and railway bridge for up to 100 years.

Lynch have supported our customer BAM Nuttall, supplying operated plant hire equipped with GPS machine control technology to accelerate efficiency on the project.

LOCATION

The works were very close to Windsor Castle in Home Park. Works needed to demobilise, and all machines were brought back to the compound on event days.

The site compound was in Home Park, but the site itself was on a barge in the Jubilee River and was only accessible by vessel. Machines needed to be delivered to work on a barge in the river.

As we were working in the water from the barge, we used bio-oil on all machines. This is non-hazardous or toxic if spilled and much safer for the natural environment around the river.

KEY STATISTICS

6 WEEKS

COMPLETED AHEAD OF SCHEDULE

£500,000

COST SAVINGS ACHIEVED

100 YEARS

PROTECTION FOR THE WEIR AND RAILWAY BRIDGE

2800+ TONNE

ROCK ARMOUR STONE PLACED TO PROTECT THE WEIR FROM FUTURE EROSION

360

ROCKS PLACED

3,200

PROPERTIES IN MAIDENHEAD, WINDSOR, ETON AND COOKHAM WITH REDUCED FLOOD RISK

2,132

LYNCH OPERATED HOURS ON THIS PROJECT

15

LYNCH MACHINES WENT OUT ON HIRE

WORKING WITH

bam nuttall | Environment Agency

SAFETY FIRST MINDSET

A survey of the topography of the riverbed saved a lot of manual work and negated the need for a scuba team of divers to assist with accurate positioning of the rock armour bags. This increased safety as we were not putting anyone in the water when they didn't have to be.

We were also able to provide remote assistance where needed, which meant that Lynch fitters didn't need to be on site, working around machinery.

SUSTAINABILITY AT HEART

The Long Reach was able to finish works 6 weeks ahead of schedule. As well as time saving, this led to cost savings and most importantly fuel savings: reducing emissions and helping to lower the carbon footprint of the project.

Our customer, BAM Nuttall, estimated they saved £500,000 in costs associated with completing the job early.

DIGITAL BY DEFAULT

The Technology

GPS machine control was used for placing rock armour bags underwater to protect the riverbed from further erosion. Usually, a scuba team would be required, and this could take months. Initial collaboration and consultations with BAM Nuttall's technical team and Lynch's project manager lead us to find a more efficient solution.

We fitted a 22T Long Reach Excavator with a GPS machine control dredging upgrade kit that allowed the machine to work underwater. A hook attachment was then calibrated in place of a typical bucket allowing for accurate placement of rock armour bags. The 50T Excavator used for moving the rocks was also fitted with machine control and a grab attachment was calibrated in place of a bucket, allowing accurate rock placement underwater.

A simple model was then created with points specifying the location of the centre of each rock armour bag, this allowed the operator to highlight a point and the GPS would guide him to correct bag location underwater. The technology also allowed the operator to capture as-built data for each bag placed and report this data back to the engineering team remotely via a cloud based service.

GPS machine control technology was important as it helped us to get the job done right first time. This reduced any need for rework, providing the operator and site engineers with instant feedback.

THE LONG REACH WAS ABLE TO FINISH WORKS 6 WEEKS AHEAD OF SCHEDULE

DIGITAL & TRAINING

Full training on the GPS machine control technology was given to operators and site engineers, to ensure we got the very best out of the system. Lynch's Technical Support Managers trained the operator to review the As-Built data, showing exactly where he had placed the rock armour bags in real time. This helped with accuracy and saved the need for a scuba team going under water.

The GPS team also spent time with BAM's team on site, interacting with the system and setting up the models. The project team were shown how access and process data and upload new models to the system. We also provided training on correctly setting up the base station every morning, to ensure this could be moved and secured at the end of each working day.

CONNECTIVITY

Early engagement was key to the success of the project and the machine control team spent time preparing before the project kicked off.

We used the cloud based ConX system which allowed us to easily collaborate and share information with the team on site, allowing us monitor the construction data in real time and make data-driven decisions.

The remote support software allowed all project team members to see the location of the machines, see the time frames and see the models that they are working towards. Data sharing allowed the site teams to download the As-Built data and process this through the system.

The ConX system saved downtime and our engineers from driving to site, because an engineer could diagnose and fix faults remotely through the system.

WOW

"Paul Smith has been a Varied Plant Operator with Lynch for many years and worked on this job. Paul's skills and abilities as an operator are superb, especially given the small footprint on the barge that he had to work in.

As the project progressed, and we were dredging and placing over 2800T of rock armour, Paul was pivotal to carrying out the works. He was dredging from the pontoon with a Long Reach Excavator, and then with a second pontoon, placing the rock armour using a 50T Heavy Excavator fitted with a rock grapple.

Because we could only do one exercise at a time, Paul operated both machines. Paul is one of the finest operators I have worked with."

- Adrian Macdonald, BAM Nuttall

"By using the GPS Machine Control along with Leica Icon, we had instant feedback. This gave us the ability to constantly check the works as they were progressing. We could be sure that an area was correct before we installed rock bags and rock armour. This reduced unnecessary barge movements as we didn't need to go back over the areas previously dug.

We could use the data taken each day to compare against the design levels and sign off areas with the ECC Site Supervisor, ensuring quality work. A massive win was that the As-Built excavation line never really deviated from the design line. GPS was 100% the right choice and without it we wouldn't have been able to collect the quality of data we did.

The service from the Machine Control team was first class. We received remote support when we needed it which lead to less downtime and James King was very knowledgeable and easy to get hold of. We had next to no downtime with the Excavators which lead to us finishing ahead of schedule and beating the programme."

- Tom Shilling, BAM Nuttall

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