

## PROJECT SLOW SAND FILTER BED REFURBISHMENT



Stonbury were asked for their involvement with an Investigation and Design (I&D) project, aimed at understanding the poor performing slow sand filters at a Water Treatment works in the Essex supply area. With both the expertise in civil engineering and operational structures within the water supply network, Stonbury were suitably selected to provide an added value solution for these challenges. For the initial investigation and design, Stonbury employed Amec Foster Wheeler, to review the particular issues around the slow sand filters, whilst providing a full market appraisal.

The scope of the project required understanding the issues with the slow sand filters, to develop a solution that would increase the overall output of the WTWs. With the information from the investigation reports, Stonbury, leading the constructability element of the project, whilst also developing budgetary and programme options, were able to provide the client with the best options for delivering the programme.

### The Solution

After on-site investigatory work, it was apparent that the existing brick floors, common to many slow sand filters of this age, had silted up, causing the output of the filters to be limited. This ultimately led to the conclusion that the slow sand filter floors were in need of a replacement, with a like-for-like brick floor. The concerns with this solution, included a high risk repeat of performance issues. Instead, a solution was considered for the installation of an alternative 'brick' floor. This method would require the lifting of the original bricks, to be replaced with an accepted market flooring system for slow sand filters. Stonbury proposed the use of a 'U' block by which met the design parameters and most importantly, DWI approved for installation within the water supply system.

With the decision confirmed on the preferred solution, and using the progress from the investigation and development stages, Stonbury officially tendered for the construction phases of the project, achieving an approved final costed solution for the initial 4No. filters of

2500m<sup>2</sup> each. At the end of January 2017, we were delighted to be informed that the award had been approved to Stonbury.

### The Works

The clients operational site team at Layer WTWs were responsible for removing the media and once completed, works begun in earnest to remove the existing brick floors. The old brick 'waste' was subsequently re-used by a third party as infill material, substantially reducing landfill waste volumes.

During the brick removal process, it was noticed that the central collection channel cover slabs, had received damage over the years and were also in need of replacement. Due to the necessity for structural capacity of plant movement, we opted to design and construct the slabs on site in a specially made formwork arrangement, reducing both transport and procurement costs and manufacturing time.

Each slow sand filter of 2500m<sup>2</sup> required the laying of approximately 48,000 new 'U' blocks. With a singular block weighing 14kgs and at 140mm x 250mm x 215mm deep, the dedicated Stonbury operatives laid just over 2500 tonne of blocks by hand. The challenge was the manual handling element for laying the blocks by hand, so a small telehandler was used to enable operatives to position the blocks as close to the work area as possible, with a team of 8 working on a rotation system to manually lay the blocks.

With the commitment of all our stakeholders involved in the programme and the greatly efficient methodology developed in the early stages of the scheme, Stonbury are pleased to report that all 4No. slow sand filters were successfully completed ahead of schedule, completing almost one month ahead of programme.

For any further information on the project or slow sand filter refurbishment schemes, please contact [stuartbrooks@stonbury.co.uk](mailto:stuartbrooks@stonbury.co.uk)