

Water to the future

MTM

Design and Build
MEICA Delivery of
Ceramic Membrane Filters

Project Update

1.0

Hampton Loade WTW Refurbishment Largest Ceramic Membrane Treatment Plant in the UK.

RSE is undertaking the MEICA delivery to increase the capacity of Hampton Loade WTW, introducing a third water treatment process utilising PWNT ceramic membrane technology as an effective filtration solution.

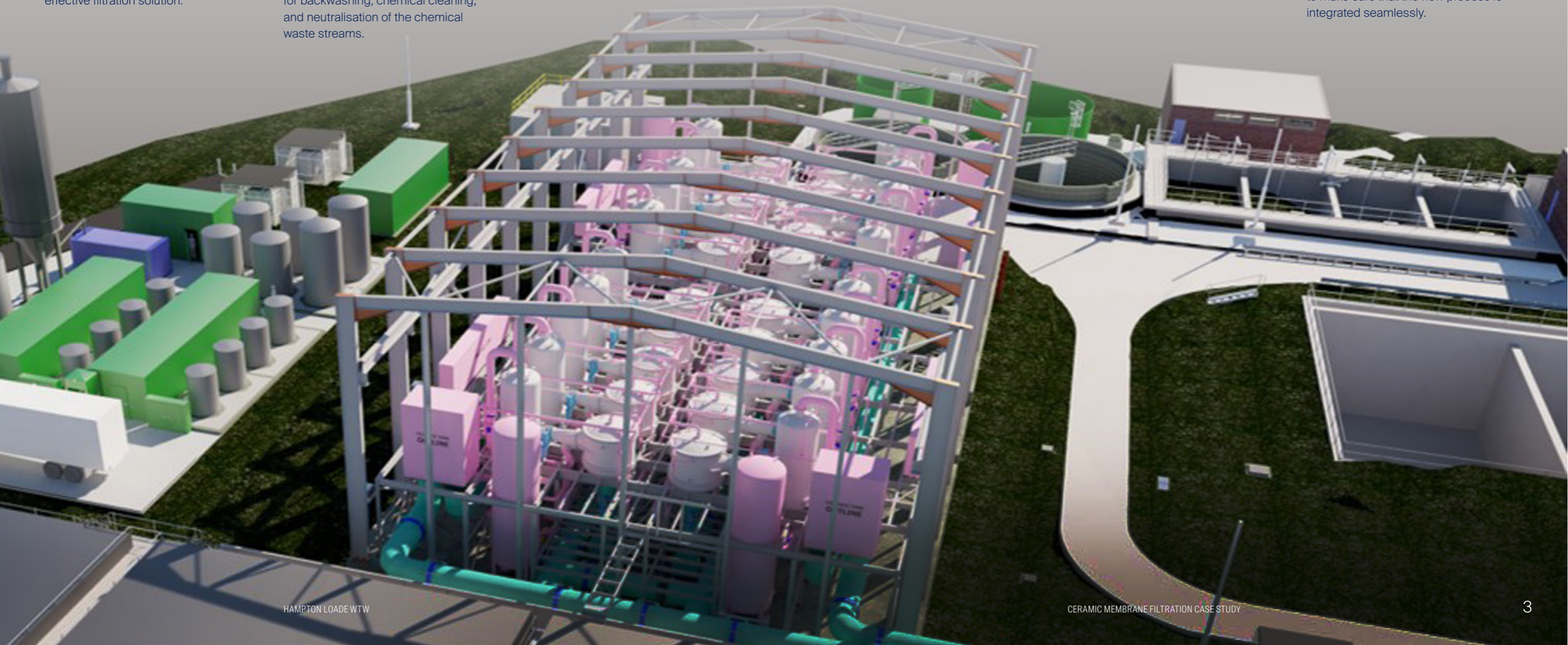
The project will add an additional filtration stage to the existing process at Hampton Loade, retrofitting 20 No. ceramic membrane filters complete with all ancillary equipment required for backwashing, chemical cleaning, and neutralisation of the chemical waste streams.

RSE has been engaged by South Staffs Water to design, build, install, and commission the world's largest ceramic membrane plant at Hampton Loade Water Treatment Works (WTW), part of a £57 million pioneering refurbishment project.

Hampton Loade WTW is located near Bridgnorth in Shropshire and has a capacity to produce 210 million litres of high-quality water a day to supply around 700,000 customers.

The project will also require integration and upgrading of the existing wash water treatment system to deal with the additional waste streams associated with the PWNT ceramic membrane process. The new process will also be integrated into the existing site control and SCADA system making it an integral part of the current process.

The new PWNT ceramic membrane process is being installed downstream of the existing clarification process and upstream of the existing granular activated carbon (GAC) filters to provide a barrier, enabling South Staffs Water to remove the current ultraviolet (UV) process, which is becoming more and more environmentally and financially unviable. The existing process operates using gravity, so the additional pressurised filtration stage has required the RSE Design team to look in fine detail at all parts of the process, including the hydraulics and controls to make sure that the new process is integrated seamlessly.



2.0

Chemical Dosing System Additions and upgrades to existing systems to produce high quality filtrate.

Alongside the new filtration process, RSE will also be responsible for adding further chemical delivery handling, storage, and dosing kiosks for 5 No. additional treatment chemicals required as part of the membrane cleaning process. RSE teams will also move the existing duty only Powder Activated Carbon (PAC) dosing plant and add a new 60m³ storage silo. These changes will greatly improve access and loading for the PAC system, whilst providing space to add a standby PAC dosing system in the future.

Working on the existing site will provide unique challenges and will require various integrations with the existing processes, control system and SCADA. In total RSE will be undertaking 20 No. diversions on site for large process pipes, LV cables, HV cables and pressurised drains.

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CAD Design Drawing
of Modular Building



3.0

Ceramic Filtration

Introduction of a third water treatment process solution.

As the new ceramic membrane filtration stage is to be integrated into the existing WTW, the space available to locate the new ceramic membrane process is limited, requiring an innovative approach to ensure all 20 No. ceramic membrane filters fit within an area that was originally earmarked for only 10 No. filters in the original concept design.

Modular Build of 17 No. TTUs

RSE has managed to resolve these challenges without compromising the operational and maintenance requirements for access, egress, and removal of the kit. Tailored lifting equipment has also been integrated within the building frame, utilising the various steel members within the works where practical.

All process equipment and chemical dosing systems will utilise modular designs and Design for Manufacture and Assembly (DfMA) and are being built and assembled off-site, before being reassembled within the portal frame building to reduce construction and commissioning durations on site. This offers significant reductions in

the overall environmental impact and carbon emissions associated with the project. Further innovations for the refurbishment of Hampton Loade WTW will be achieved through the application of IO-Link technology for the first time within South Staffs Water, which will improve the connectivity, whilst reducing the installation time, costs and carbon output.

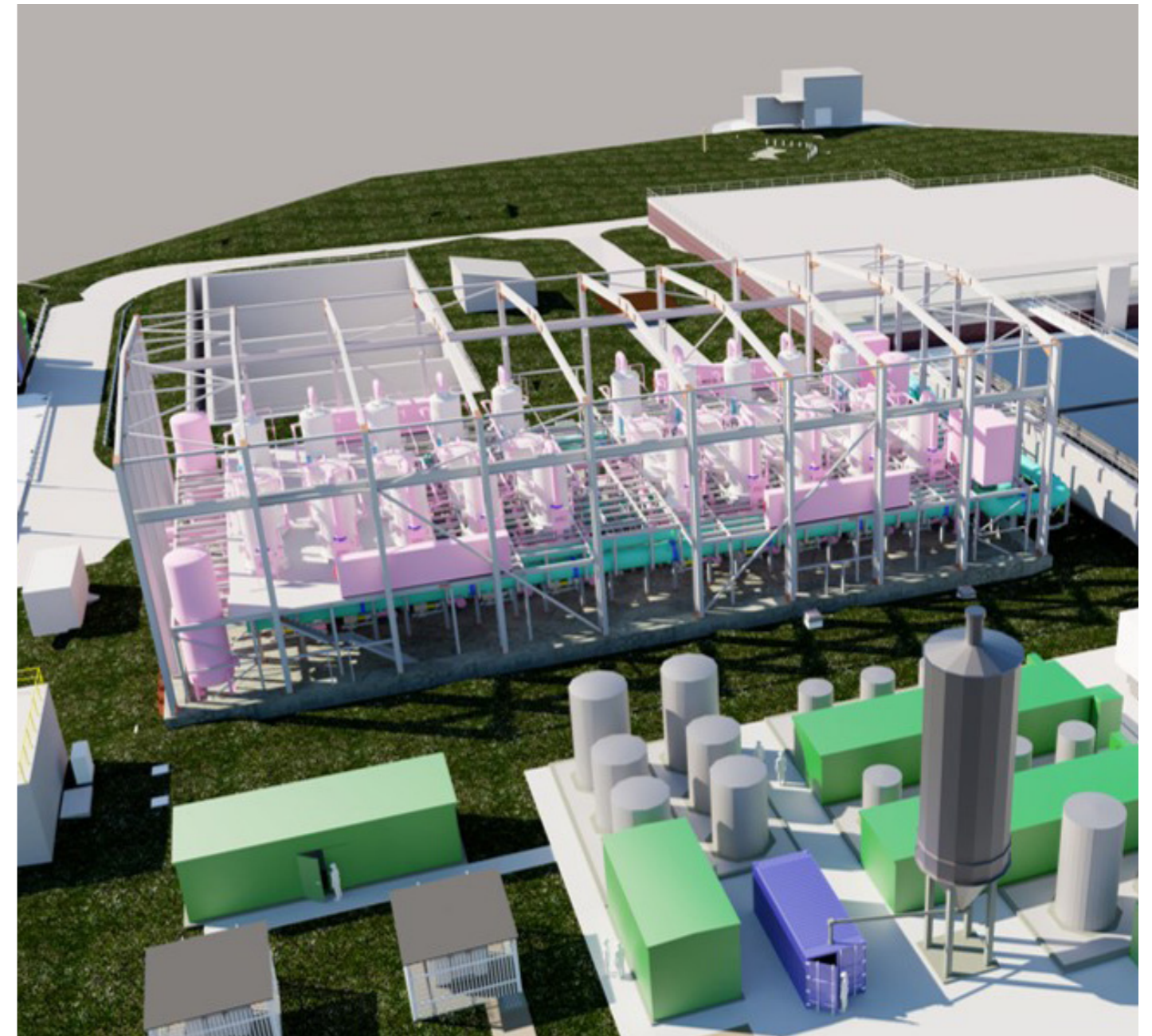
Once the installation is complete, RSE will embark on a phased commissioning strategy ensuring that the commissioning process is completed while minimising the interfaces and risk to the existing works, which must always remain in service. Due to the large volumes of

water required to commission the ceramic membrane filters, re-use of the commissioning water is being considered to help minimise the impacts of the commissioning process. The commissioning strategy is being developed in collaboration with South Staffs Water's Operations team to ensure its success.

Allan Dallas, RSE Operations Director commented: "RSE is genuinely excited by the opportunity to work collaboratively with South Staffs Water and its Delivery team with the upgrade to the Hampton Loade Water Treatment Works.

Ceramic membranes are an innovative new technology that are transforming how the water sector will filter water now and into the future. We pride ourselves in being a business at the forefront of introducing new water treatment and water recycling technologies which support the sustainable and secure growth of the UK economy."

The refurbishment project at Hampton Loade WTW is part of South Staffs Water's current investment upgrade programme, designed to develop existing water treatment sites to continually improve water quality for customers across the region. The construction, installation, and commissioning of a ceramic filtration stage is due to be completed by April 2025.





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