



PROJECT SUMMARY:



Gloucestershire Hospitals
NHS Foundation Trust

CLIENT

Gloucestershire Hospitals
NHS Foundation Trust

PROJECT

CHP Energy Centre

TIMESCALE:

September 2017 - 2018

CONTRACT VALUE:

£13.1m

PROJECT OVERVIEW

The Gloucestershire Hospitals NHS Foundation Trust operates both Gloucestershire Royal Hospital and Cheltenham General Hospital, and has made commitments to lower the carbon emissions and energy costs across the two sites. We have previously worked at Cheltenham General Hospital providing a CHP led energy centre solution to help the Trust meet their reduction targets, with the upgrade of Gloucestershire

Royal Hospital's energy facilities being their next project.

Gloucestershire Royal Hospital is a district general hospital located in Gloucester, and provides acute services to Western and Southern Gloucestershire and parts of Herefordshire. We were asked to provide a solution that will help lower the Trust's energy costs and carbon footprint whilst improving energy supply resilience.

VITAL SOLUTION

Our solution entailed the design and installation of a 2.5MWe CHP system, with a waste heat recovery boiler generating steam to be used as the primary source of energy supply across the hospital estate. The project also included the installation of a complex Low Temperature Hot Water distribution system which uses hot water that is recovered from the CHP's cooling systems to generate heating and domestic hot water services.

Collaborating with specialist contractors to provide the best solution

To install the CHP system, we worked

closely with M&E specialist service partner, PIMS (Process Installations and Maintenance Services Ltd), to provide the M&E design and installation services for the CHP and associated ancillary equipment. The design entailed the installation of a 2.5MWe CHP engine, plate heat exchange skids, a waste heat boiler, two hotwells and two DAC fans which will be installed into the existing energy centre adjacent to the hospital. The equipment was sized with consideration of the 24/7 energy demand of the hospital to ensure that this solution would be efficient to meet their requirements.

THE BENEFITS:

- > Collaborating with key industry contacts to provide the best solution for the Trust
- > Careful planning to elevate disruption to the general operation of the hospital
- > Delivering the project within strict timescales
- > Guarantee the Trust net savings of over £750,000 and carbon emission reductions of 2,800 tonnes per annum

▶ The savings are guaranteed under an energy performance contract for 15 years which sees savings of over £750k in energy costs and 2,800 tonnes of carbon per year.



‘ *Good knowledge of the project and understanding of client’s objectives, I have a lot of confidence in the design and quality of the work.* ’

ANDY HEYSMAN, GLOUCESTERSHIRE NHS TRUST

Significant improvements were also made to the building management system to improve the resilience and efficiency of the energy production. Additionally we installed a site wide metering system to control the system more efficiently, as well as providing more efficient monitoring in the future.

Utilising our dedicated in-house electrical department to design the electrical services

Our electrical department worked closely with the mechanical design team to produce an electrical solution to suit the requirements of the hospital. The new system will serve the entire hospital and so it was important to provide a solution that would cater for the demand without issues.

The project saw the installation of a new 11kV high voltage electricity supply to the hospital from the electricity distribution operator’s (Western Power Distribution) main sub-station which was approximately 3km away. This new supply would improve the resilience of the electricity supply to the hospital, allow future capacity to the hospital when required, and allow connection of the new CHP system.

Detailed planning to ensure an on-target project execution meeting projected timescales

The scheme had a structured and inflexible six month delivery timescale which required precise planning

to ensure an on-target project implementation. With the necessity to handle some large items of plant and equipment, we had to schedule the deliveries with precision over a 24 hour period to maintain timescale expectations, and without disrupting the hospital’s operation.

The delivery of the high voltage switchgear posed particular issues due to the 20 week delivery period, therefore we pre-scheduled the procurement prior to commencing onsite to abide by the strict timescales and align with the projected delivery plan.

Protecting the hospital’s energy supply to prevent disruption to its operation

The project required a lot of careful planning due to the necessity to install the scheme within and around existing live equipment, and on the site of an operating hospital whose operation and energy supply was not to be disrupted at any time. Therefore, we had to ensure that the new CHP system would be integrated into the hospital’s high voltage and heating networks whilst maintaining heat and power supplies at all times.

There were particular challenges around the installation of the high voltage equipment while ensuring there was no disruption to supply. We worked closely with the hospital to isolate sections of the high voltage

network and install specific switchgear and protection equipment to allow the CHP to connect and disconnect to the network automatically. This proved challenging when testing the new system to ensure that there were no issues with the network and existing standby generation equipment.

Guaranteed projected savings over a 15 year operation and maintenance agreement

We have entered into an Energy Performance Contract with the Trust which will guarantee them net financial savings of over £750,000 per annum and carbon emission reductions of 2,800 tonnes per annum over a 15 year term. Additionally, the project will be financed over a 15 year period which allows the Trust to see financial savings straight away without using any of their capital.

This agreement will also see us provide operation, maintenance and lifecycle services for the new CHP system and existing steam and hot water boiler plants. Using our highly skilled in-house engineers, we will perform day-to-day active maintenance regimes, as well as providing reactive services should there be any issues. We currently maintain 49 different sites and therefore have the knowledge and experience to provide a high quality service, assuring the client that the scheme shall operate as expected.