



orwell design associates

PRECISION DESIGN IS EVERYTHING

MULTIPLE AIR SOURCE & GROUND SOURCE HEAT PUMPS

With a sharp focus on reaching low carbon emission goals, Mid Devon District Council awarded Space Engineering Services / Orwell Design Associates the contract to design the gas boilers replacement, at Exe Valley Leisure Centre, with a new heating system which combined Ground Source and Air Source Heat Pumps.

Heat pumps are highly energy efficient and can reduce CO2 emissions by up to 70% compared to gas boilers. They also play a major role in improving air quality as gas combustion accounts for up to 40% of nitrogen oxide (NOx) emissions.

The facility needed to remain up and running during the project period so, working closely with the principal design team and the client, a sensible and achievable programme of works was formulated.

The two existing gas fired boilers were replaced with 5no Air Source Heat Pumps and 4no Ground Source Heat Pumps. Boiler No1. was temporarily retained for the changeover, to ensure services were maintained for the site for the duration of the works.

All associated items were carefully and logically removed, including Air Handling Units, pipework (that couldn't be retained and adapted), flues, wiring, control circuits, main pool heat exchangers and radiators.



The Ground Source Heat Pump scheme was designed as the primary source for heating and hot water on site. Utilising a new borehole and ground loop array, from the manifold, a pair of flow and return pipes were installed into the plant room. These were fitted with reducer pieces, and purge points (for quick fill, flushing and deaerating). The new 'free cooling' circuit system was served by a glycol tank, Microfill pressurisation unit and the associated expansion vessel.

Space Engineering installed 4 off Mitsubishi Ecodan Monobloc CRHV-P600YA-HPB 60kW ground source heat pumps, which were connected to the ground loop, heating circuit and cooling circuit. Each heat pump can be individually controlled and modulated, with the individual controls interfacing with the BMS system – allowing all of the units to be cascaded.

5 off Mitsubishi Ecodan CAHV-P500YB-HPB 43kW Air Source Heat Pumps were also installed, to support the GSHP configuration. These were located in a new ASHP compound, also installed by Space Engineering.



Other key features within the scope of works were:

- 1no 4000L Buffer Vessel
- 2no 800L Hot Water Cylinders
- New Stainless-Steel Pipework
- 7no Grundfoss Pumps (variable speed)
- New Dantherm 'Wet Change' AHU
- New Fan Coil Units (serving the main pool hall)
- New Free Cooling Fan Coil Units
- New Biomass Thermal Store
- BMS Modifications & Upgrades

There were a number of challenges to consider, during the installation process, with multiple variations but, working with all the stake holders, the project was handed over within the allotted time frame.

This was completed with minimal impact on the 'live' site.

