CASE STUDY:

Laboratory Clean Room Air & Mechanical

SERVICE: 3d Revit Design co-ordination & installation of HVAC for process engineering

PROJECT: Laboratory & Process Engineering

CLIENT: Northampton

DURATION: 24 Month

VALUE: £4Million

Assets at-a-glance:

3 x Carrier Chillers
7 x Grundfos Pumps
Spirotech degasser
5000 Ltr Buffer Vessels
Isothermal steam cylinders
3 x VES AHU's with HEPA grade filtration
15 x Mitsubishi ASHP
3 x Solvent extract fans
3 x Acid extract system utilising Halar coating
12 x Sensible heat cooling coils
Vacuum lines
Ultra pure process cooling water loop

ACCENT SERVICES

Accent's involvement in this project began when a leading process engineering specialist handed over a RIBA Stage 4 design. The task was to transform a large portal frame warehouse into a series of state-of-the-art laboratories to undertake lithography, each requiring 100% clean air.

To achieve this, Accent coordinated with the consulting engineers on the 2D mechanical design, to develop a 3D BIM model using Revit software and create a workable solution across two levels. On the lower level, dedicated semi-clean and 100% clean air zones were created for the sensitive and intricate processes. The upper level housed the mechanical services, including pumps, air handling units, and ducting, on a custom-built mezzanine.

A unique challenge arose in safely venting a mildly acidic extract, as it posed a risk of corrosion to ducting over time. Special measures were implemented to prevent long term damage and ensure system longevity.

Chilled Water Loop:
Serving cooling coils in the air handling plant to ensure optimal performance and energy efficiency.

Isothermal resistive Steam Cylinders:
Integrated with the chilled water loop, these cylinders are supplied by reverse osmosis demineralised water, contributing to laboratory moisture content.

High-Grade HEPA Filtration:
To maintain cleanroom standards, our system includes HEPA filtration, ensuring clean air distribution to the plenum cap of the clean room.

Sensible Heat Coils:
These generate a recirculation cooling effect within the plenum caps, distributed by fan tiles to maintain clean, pressurised air in the laboratory.

High-Pressure Extraction:
We utilised specialist internal Halar coating within the ducts made from rolled stainless steel, which had been orbital welded and quality checked. This process ensured insurance levels for the clients fire rating.

Resilient Design:
Our employer's requirement focuses on resilience, ensuring 100% standby capacity, available 24/7. We stripped the warehouse building to its shell and core, with our Accent design team running point cloud measurement data within the client's proposed laboratory space. This data was imported into Revit, allowing us to 3D model mechanical, and process services within the clean room spaces.

Fresh Air Supply:
The design includes a 100% fresh air supply to the laboratory, provided by an air handling plant and heated by an air source heat pump circuit. A high-capacity chiller ensures efficient cooling through the chilled water system.

This project showcases our commitment to innovation, precision, and quality in delivering cutting-edge solutions. A big thank you to the entire team for their hard work and dedication!