

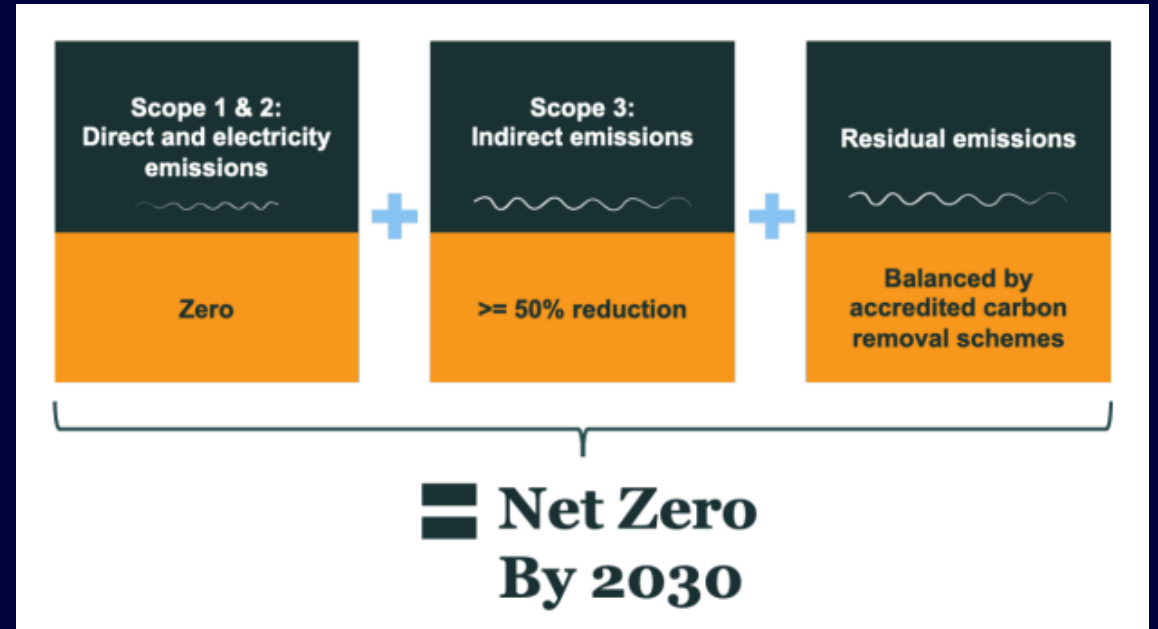
University of Greenwich

**Avery Hill Campus
Salix Decarbonisation Project**

**Presented by:
Noel Mc Sweeney – Building Services Manager**

Strategic Net 2030 Ambitions

- University of Greenwich Commitment to Net Zero Carbon by 2030
- Maintaining the estate.
- Early feasibility work in 2017 allowed for us to develop the journey further with Salix
- in 2020 we used a simulation modelling system to understand the ASHP solution for the Salix Bid
- University made an application for funding to Salix for the PSDS 3a scheme in Nov 2021 and were successful in being awarded £1.1M and works commenced April 2022.



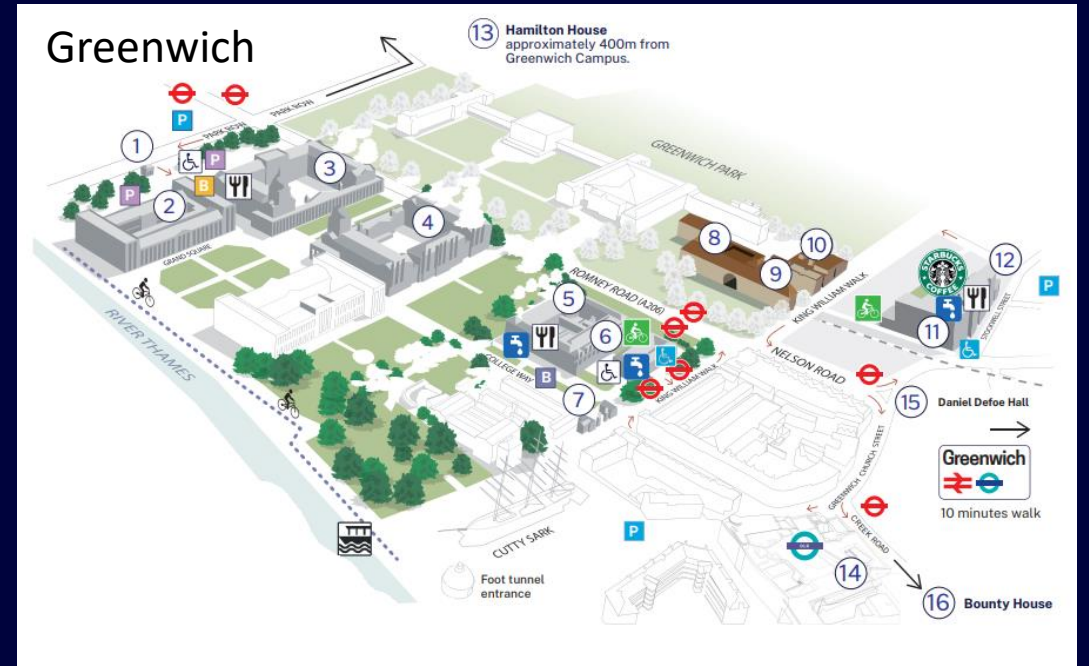
UoG Estate

University of Greenwich have 3 Campuses in London & Kent:

- Greenwich – UNESCO World Heritage Site, Grade 1 listed
- Avery Hill – Metropolitan Open Land – locally listed
- Medway – Chatham Historic Dockyard – Grade 2 listed

- 40 buildings to decarbonise across the 3 campuses.

- Future opportunities to join district heating networks in Greenwich and Chatham.





UoG Estate

Existing Heating Network to Decarbonise at Avery Hill

Existing Heat Network

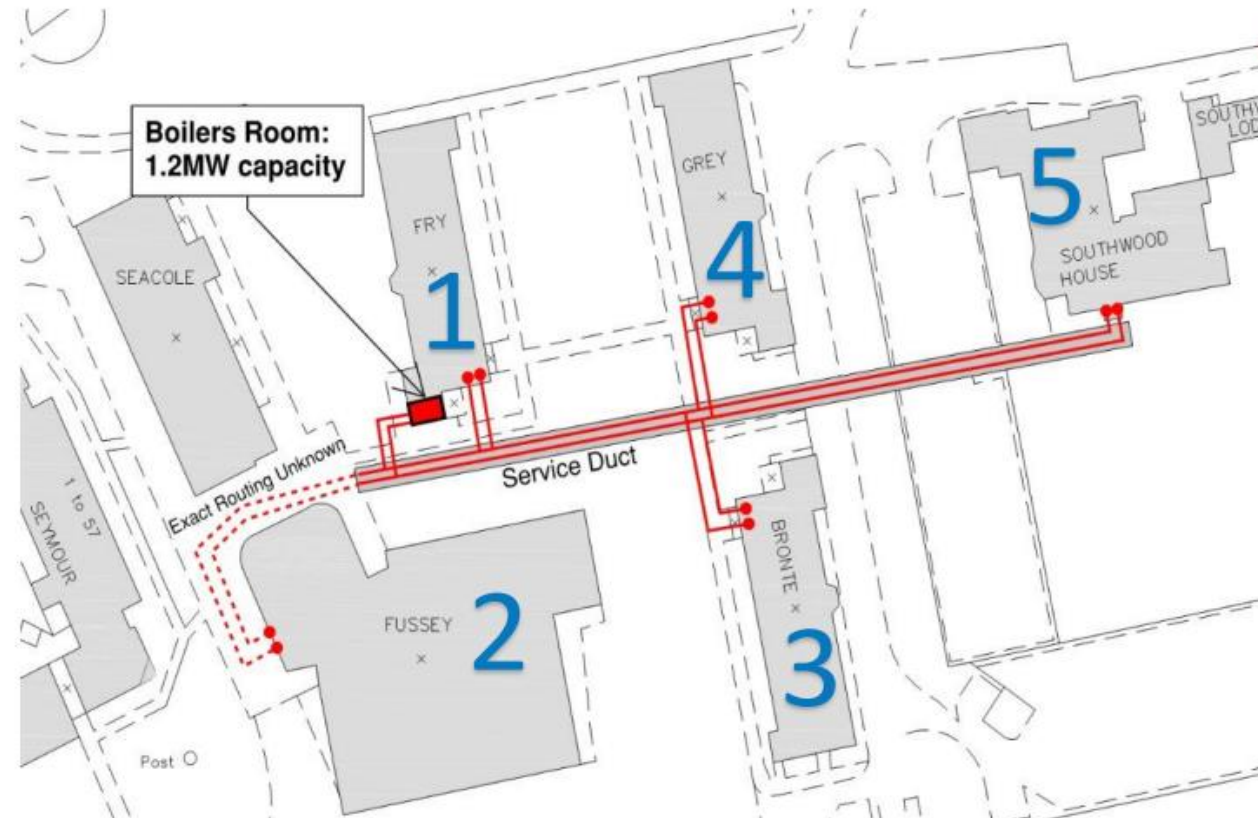
Energy Centre

1. Boiler room: 1.2 MW Capacity

Heating to the five buildings is provided from two identical Stelrad Ideal Module Boilers. The boilers are of Concord Super Series 4, Model 600V with nominal heating output of 600kW each. The boilers appear to have been manufactured in 1986.

Buildings (Substations)

1. Fry Building
2. David Fussey Building
3. Grey Building
4. Bronte Building
5. Southwood House



Existing Modular Gas Fired Boilers and Network

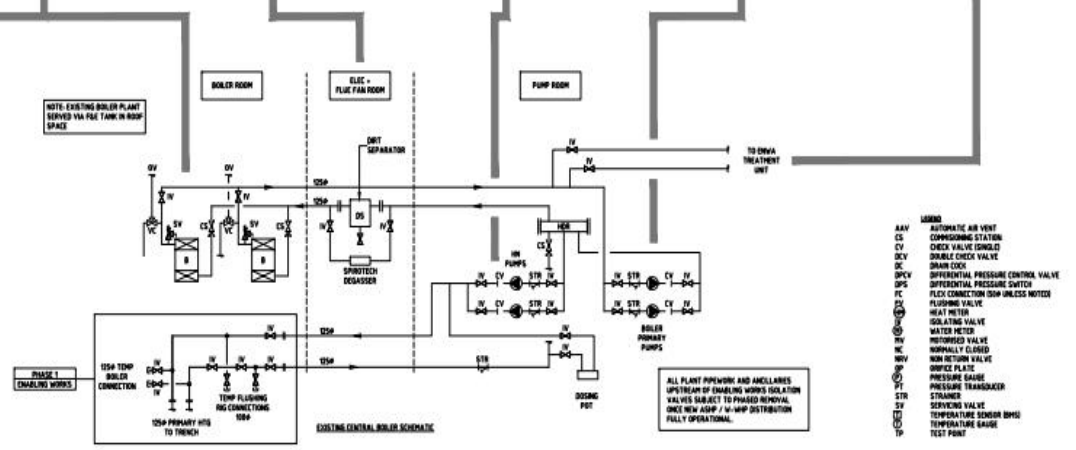
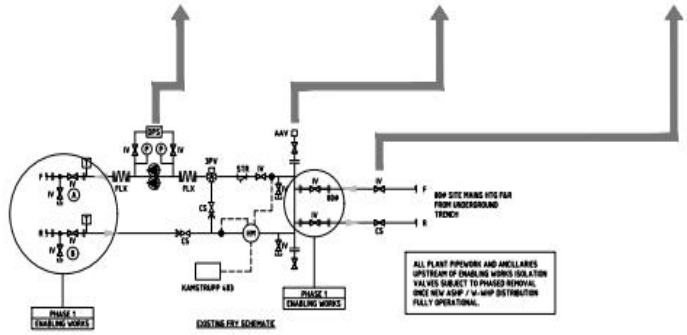
Enabling Works & Existing System Interfaces



BMS CONTROL PANEL



1. DO NOT SCALE THIS DRAWING.
2. FINAL LOCATIONS OF ALL PLANT EQUIPMENT ETC. TO BE CHECKED ON SITE.
3. WHERE APPLICABLE ALL WORKS ON DIFFERENT SERVICES SHALL BE COORDINATED AT SITE.

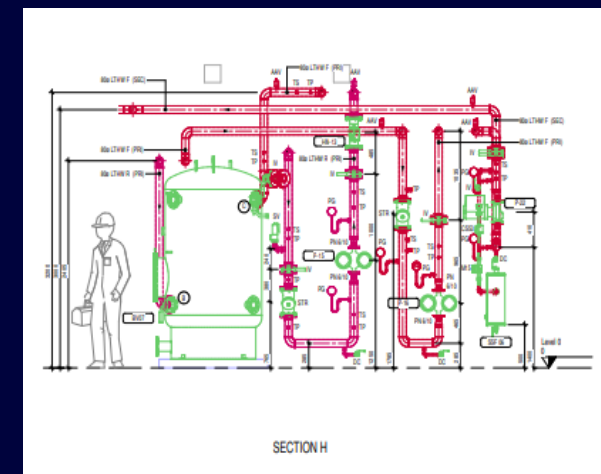
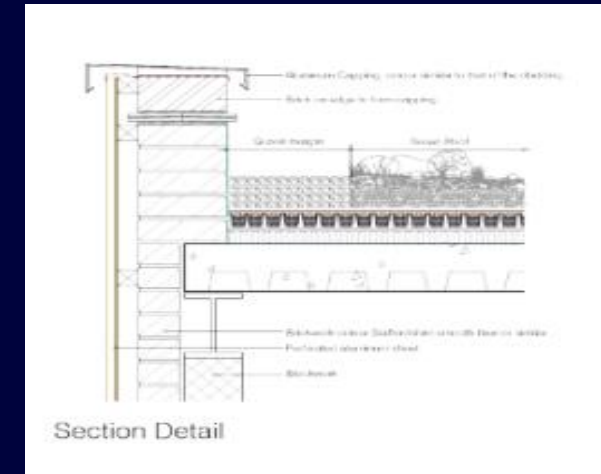
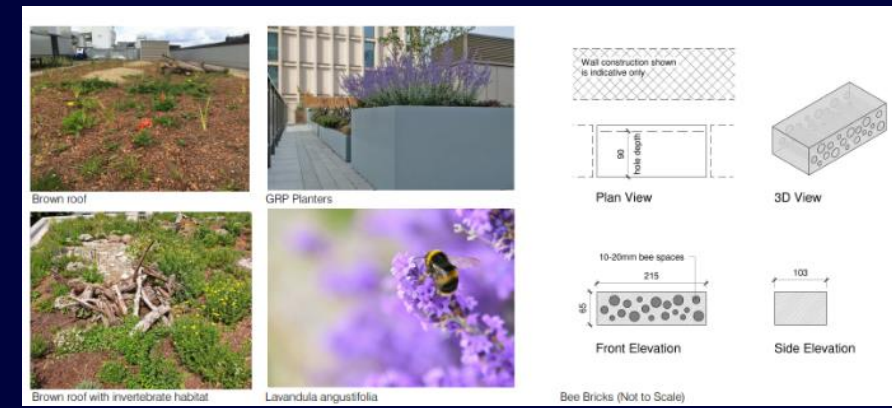


- LEGEND
- AAV AUTOMATIC AIR VENT
 - CS COMPENSATING SYSTEM
 - CY CHECK VALVE (SHOULD)
 - DCV DRIBBLE CHECK VALVE
 - DC DRAIN COCK
 - DPVC DIFFERENTIAL PRESSURE CONTROL VALVE
 - DPS DIFFERENTIAL PRESSURE SWITCH
 - FLV FLOWING VALVE
 - FC FLEX CONNECTION (SHOWN UNLESS NOTED)
 - HM HEAT METER
 - HT HEAT METER
 - ISV ISOLATING VALVE
 - IPW ISOLATING VALVE
 - MC MANUALLY CLOSED
 - NRV NON RETURN VALVE
 - NP PRESSURE GAUGE
 - PF PRESSURE TRANSDUCER
 - PF PRESSURE GAUGE
 - STR STRAINER
 - SV SERVING VALVE
 - TEMP TEMPORATURE GAUGE (SHOWN)
 - TG TEMPERATURE GAUGE
 - TP TEST POINT

1/15	m/s	PIPEWORK SIZING GRID
1000	Pa/m	MEDIUM GRADE STEEL
10	mm	UNLESS NOTED OTHERWISE
10	mm	UNLESS NOTED OTHERWISE

The Project Journey

- Project moved from Strategic to Delivery and a Fees and Survey Business Case Submitted
- Options Appraisal Approach - Ground Source – open / closed loop and reviewing the University future position.
- Programme Pressure Point and how we could plan to deliver to programme
- Multiple surveys undertaken so that we ensure base data was accurate and deliverable into contract.
 - Topographical and Soil Surveys / CCTV Drainage Surveys
 - Aboricultural (Tree) Surveys / Asbestos Surveys (R&D) as appropriate / Background Noise Assessments/ Surveys / Building Fabric Desktop Studies
- Originally only Heating and with Salix allowing flexibility we could make a modified change through this project.
- We have a centralised system and designed a clear Heating scheme for delivery. We took the approach that as a university we could fund and include, and we chose to take this path alongside the Salix journey to ensure we have future proofed out campus.
- We kept to the Heating Bid and Plan and included our future proofing element of cooling.



Site Location Plan – Avery Hill Campus



Fry Building (Old Boiler Room)
Converted to Satellite Plantroom

Grey Building - Satellite Plantroom

Bronte Building Satellite Plantroom

Main Energy Centre (ASHP location)



Buildings Connected to ASHP system :
Fry, Grey, Bronte,
Southwood house,
David Fussey

Planning and Planning Process

Planning permission granted 31/1/23 with four key conditions:-

Condition 1 - Time Limitation on Development

Condition 2 – Working to Approved Plans

Condition 3 - Facing Materials

Condition 4 - Acoustic Plant Noise

- Pre-Application Planning Meetings
- Continual Dialogue with Royal Borough of Greenwich
- University owned Planning Risk
- Collaboration in full with Project Team / Contractors



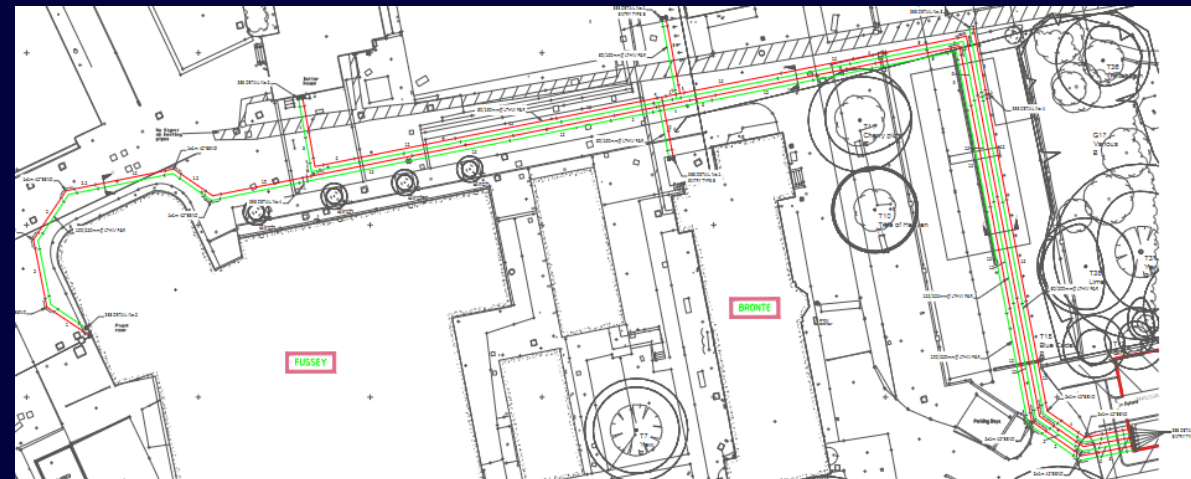
Project Deliverables

Salix Reporting and Revised Programme Position

- SALIX / UOG confirmed our commitment to the obligations set out in contract
- Committed to Salix spend but the University would fund the project programme extension

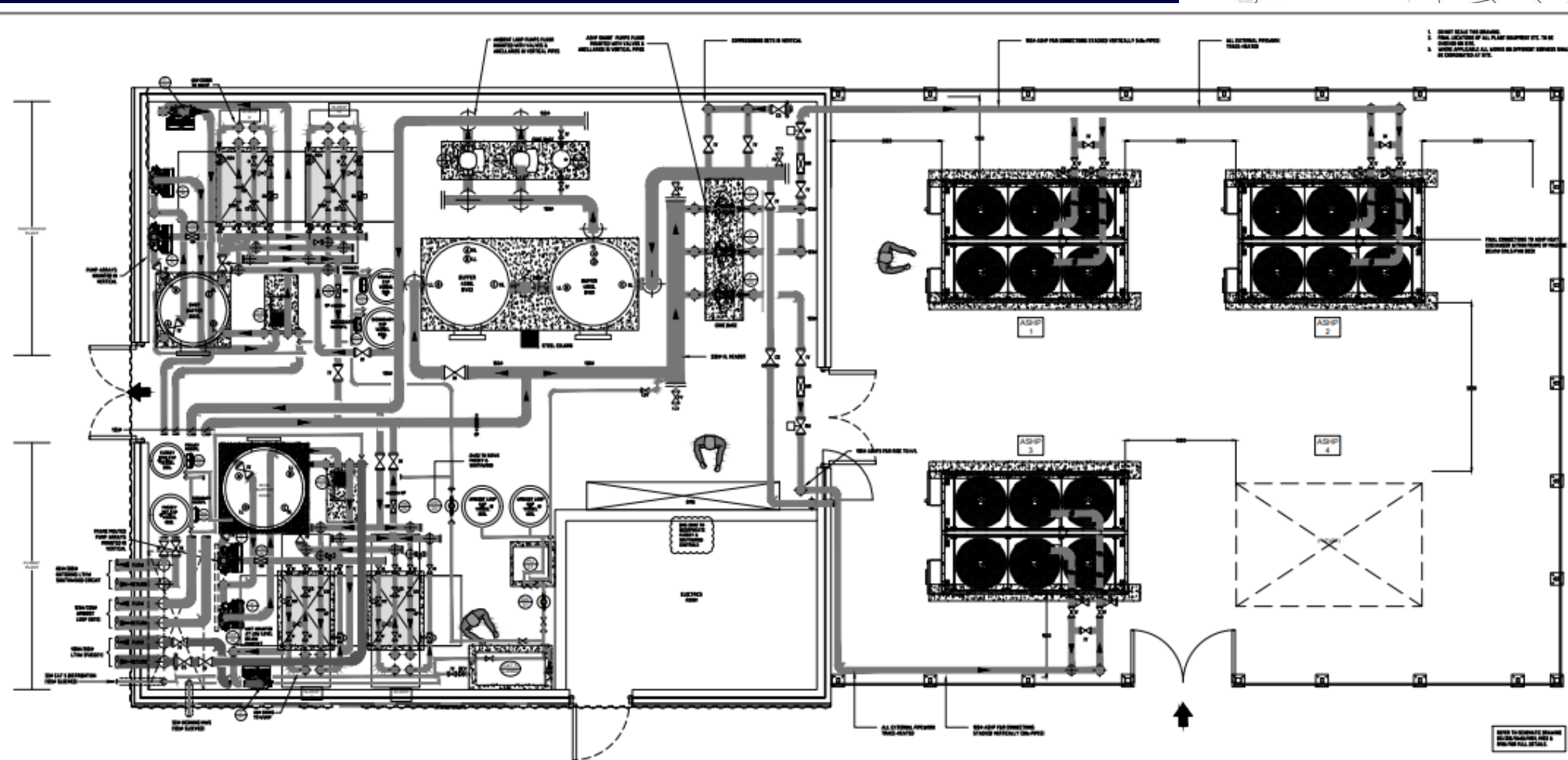
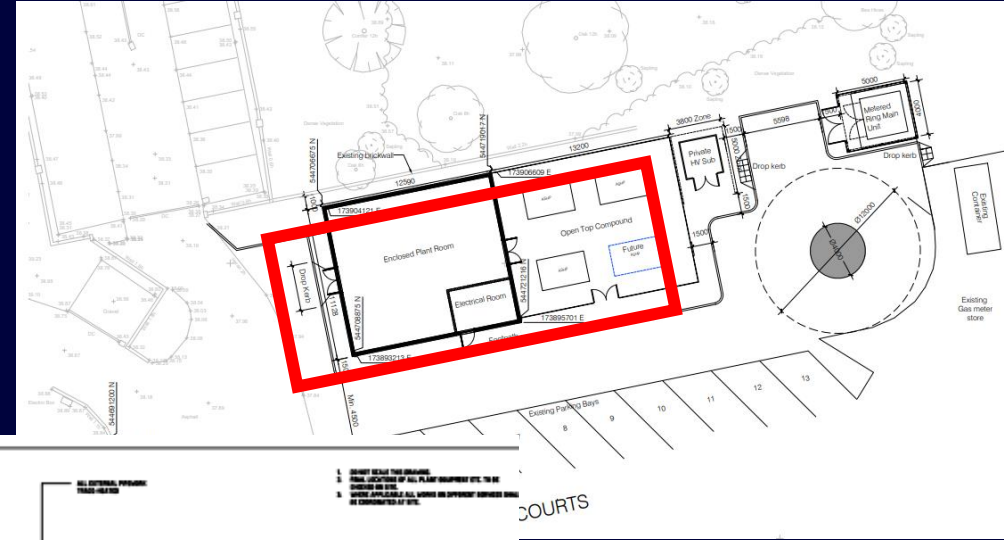
Works on Site

- Enabling Works – Including modifying existing pipework in buildings
- Decommissioning of a Boiler System – Installation of a temporary Boiler in place to ensure continued heating through winter.
- Electrical infrastructure work – New Substation and new Incoming mains to increase the electrical load
- Constructed the Plant and Satellite rooms
- Trenching New pipework
- Installing plant and equipment



Main Energy Centre

Provides LTHW directly to David Fussey and Southwood House
Provides "Ambient Loop" temperature hot water to Satellite
Plant Rooms at Fry, Bronte & Grey



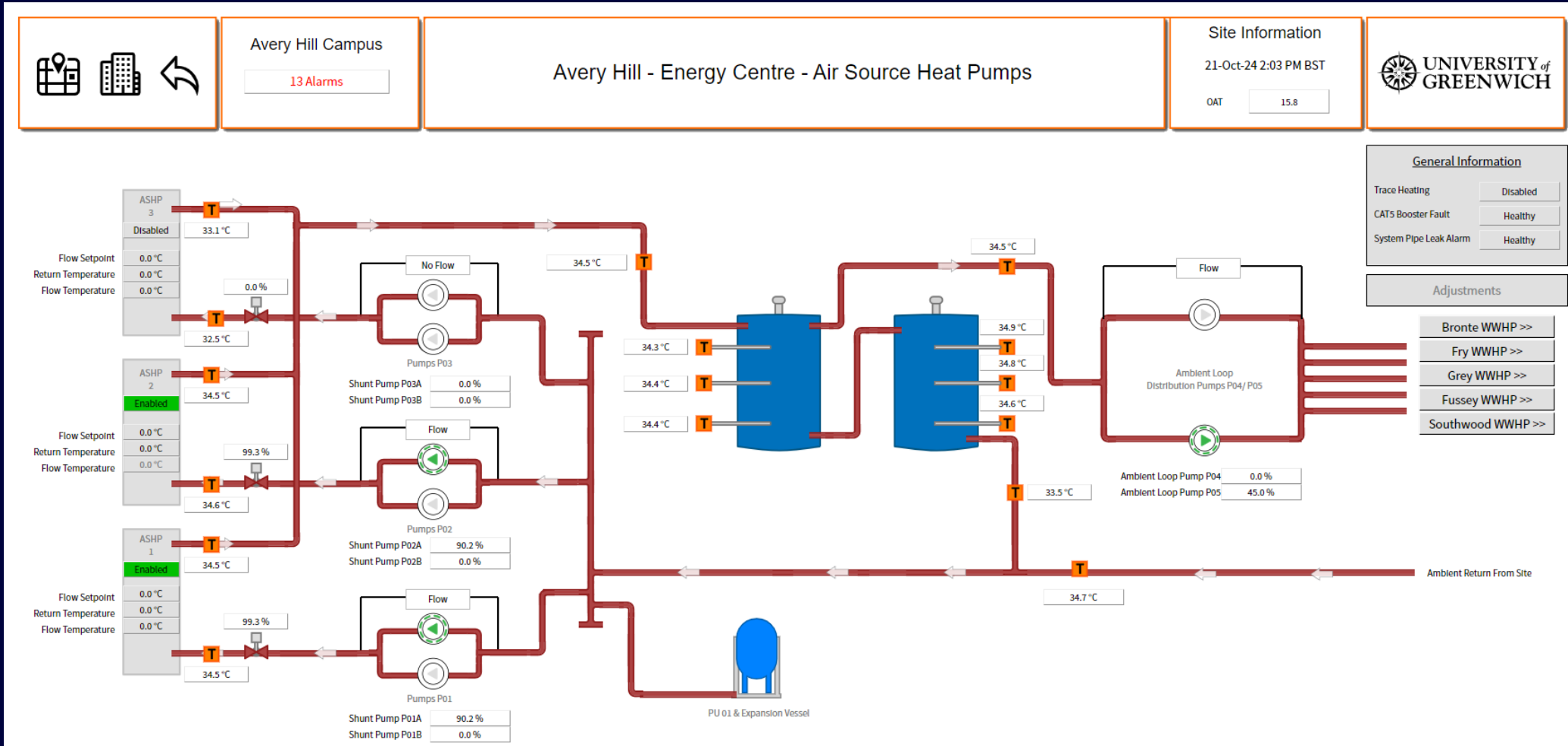
COURTS

ASHP TO BE INSTALLED IN VERTICAL POSE

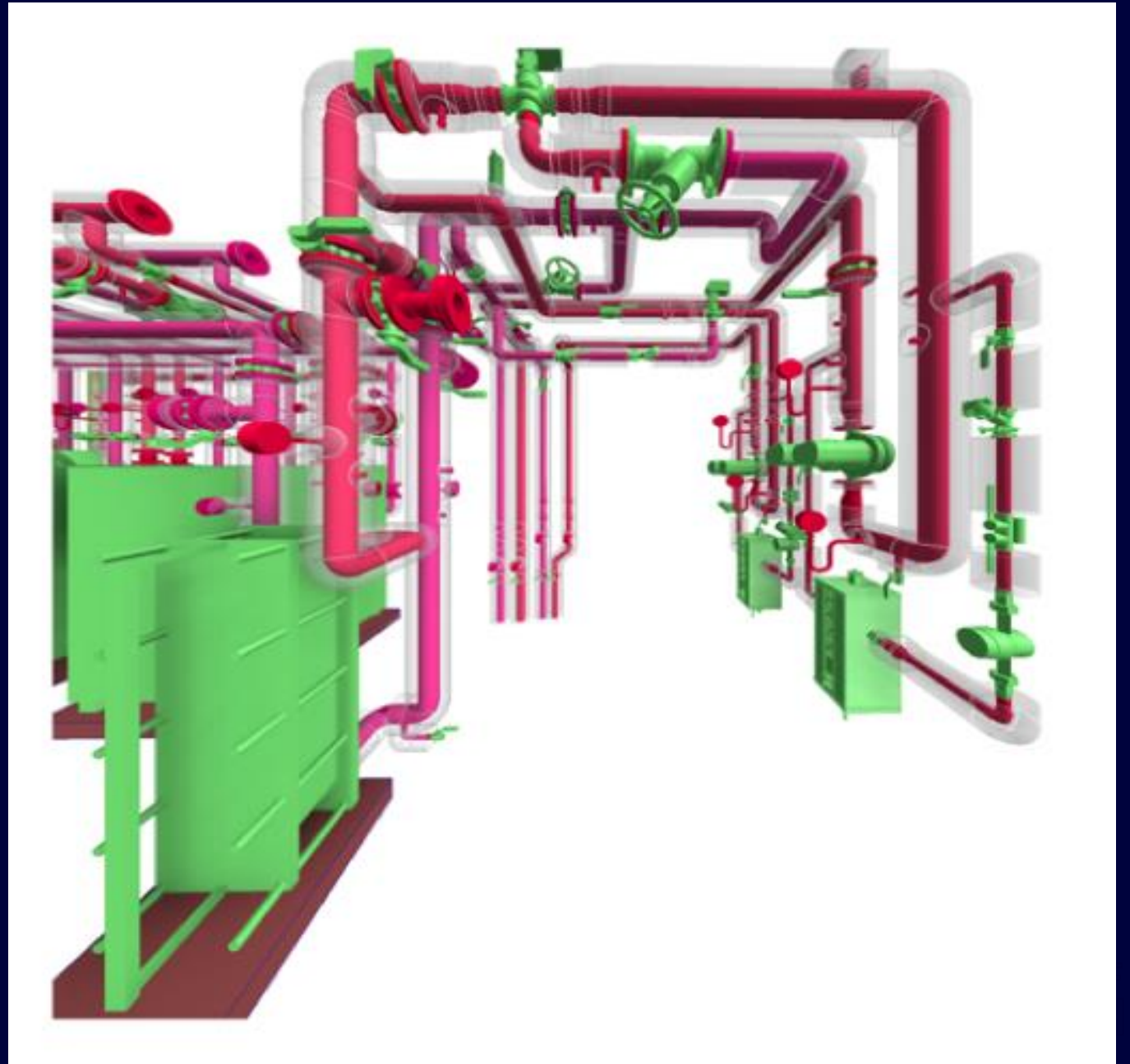
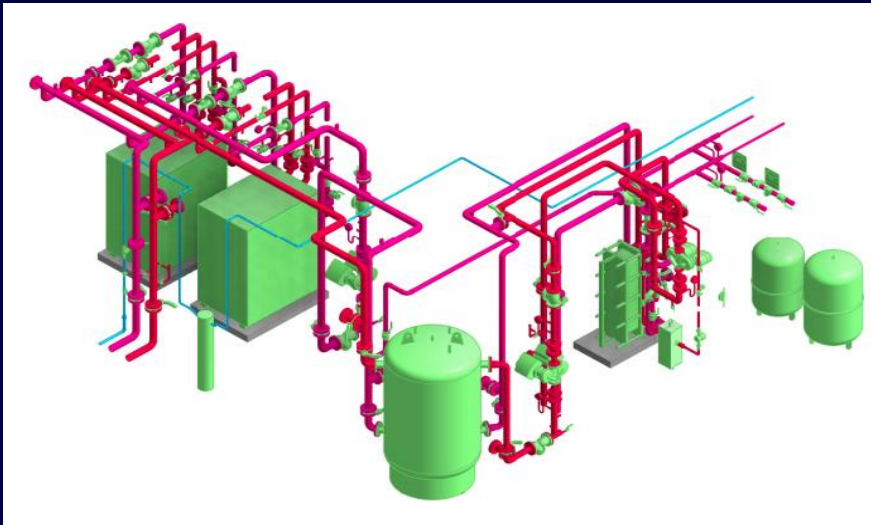
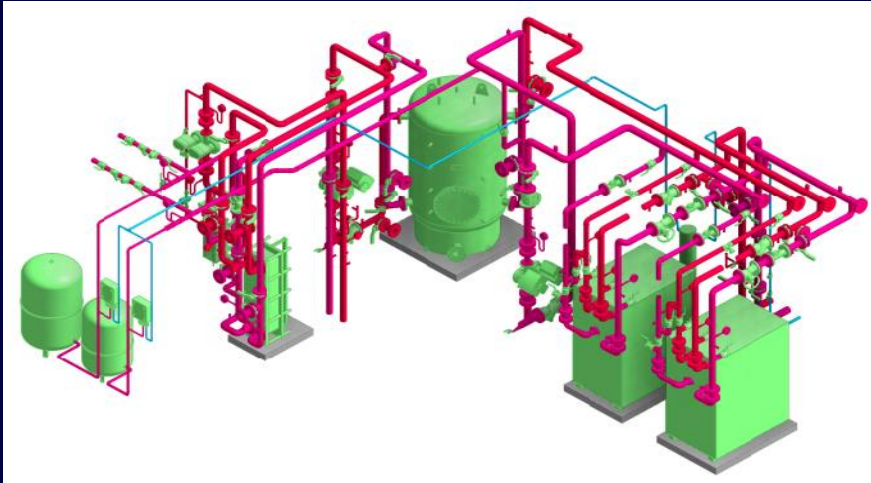
Main Energy Centre



Energy Centre - ASHP – Ambient Loop



3D Modeling



Satellite Plantroom – Bronte Building

Serves Bronte Building (only)

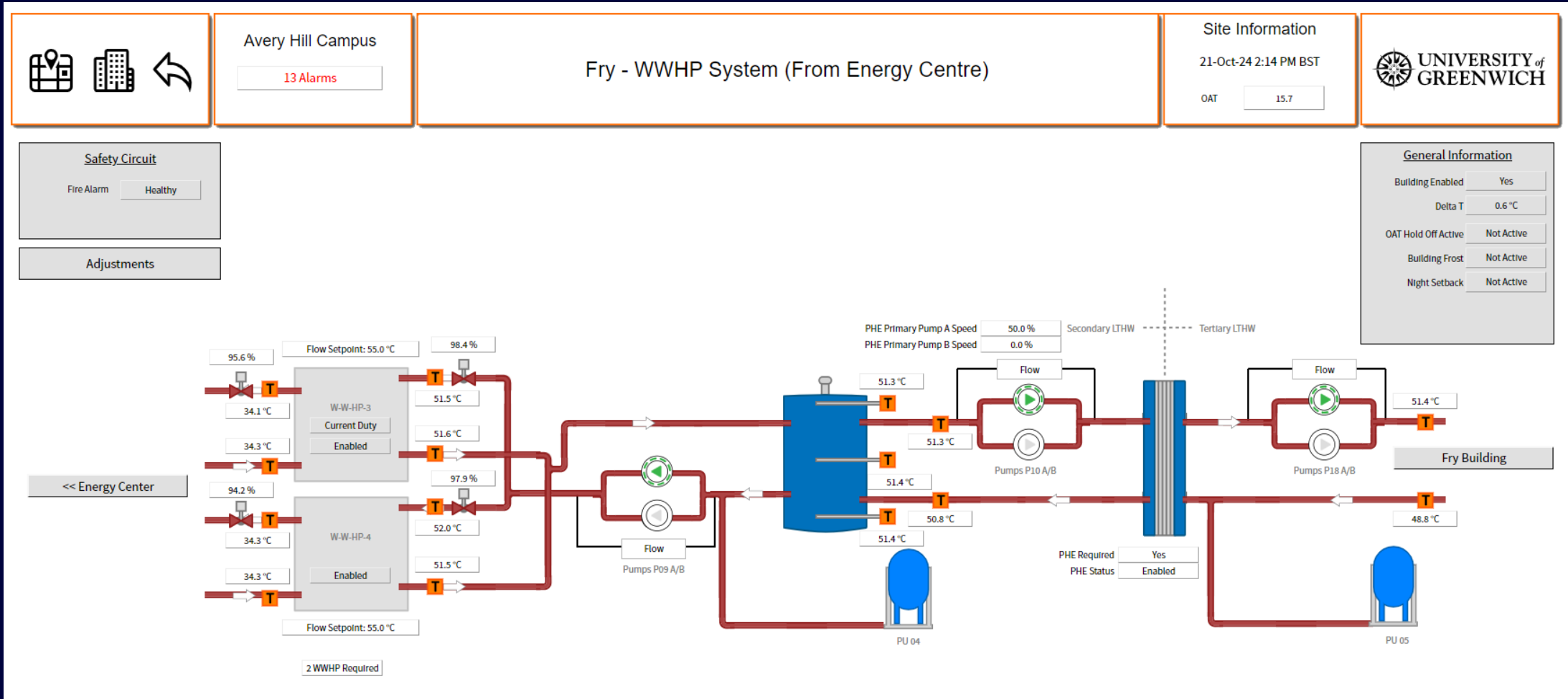


Satellite Plantroom – Bronte Building

Serves Bronte Building (only)



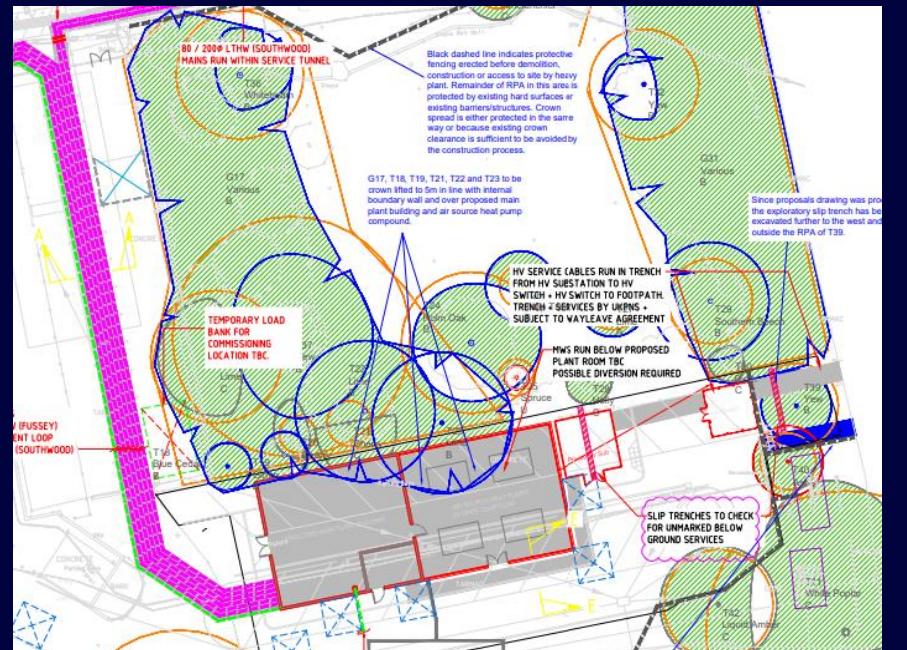
Satellite Plant Rooms - WWHP – Primary, Secondary & Tertiary Circuits



Construction Challenges / Risks

The University approach Programme and Risk Management collaboratively:

- Allowing programme time and duration for Planning and long lead order on equipment and items
- Lease and Legals with the District Network Power Operator DNO (engage early to allow a generous programme allocation)
- Site Risks and Asbestos and Underground unknowns
- Trees / Tree roots and pipework routing
- Sequencing and Multiple Critical Paths converging
- Procurement and Compliance and Project Controls remaining on track
- 'LIVE' site delivery Model – Operating University and remaining as one throughout



Communication and Stakeholder Management

Communications with our external stakeholders – neighbours and wider community

- Open Days, Community Days and site visits
- Work collaboratively with our communications team on communication plan and wider PR piece
- Internal user group/stakeholder meetings
- Regular internal communications are sent out to update of any disruptions/building closures



Lessons Learned

- Never Undertake a Project after a Pandemic
- Test Early Assumptions and Manage Changes
- Engage Early with Planners & DNO
- Allow a Generous programme/ Legal Agreements
- Design to a Budget and continue to manage this task
- Consider Procurement Route to Market Carefully
- Adopt an open-minded approach to emerging Technology
- Ensure Procurement Price / Quality / Programme / Social Value / EDI are all inclusive of procurement
- Embed assurance (technical/ commercial) at every gateway signoff
- Be realistic AND ambitious



What Next for UoG.

- Heat Decarbonisation Plan completed to RIBA stage 1.
- Salix Funding secured for a further 3 buildings.
- Talks underway with both Medway Council and the Royal Borough of Greenwich with joining a district heating network.
- Rolling program of works will pick up building fabric improvements and internal heating and controls upgrades.
- Business case being developed to increase renewable (Solar PV) at Avery Hill , producing an additional 330MWh of electricity annually.
- Exploring further opportunities in reducing energy and increase renewables.