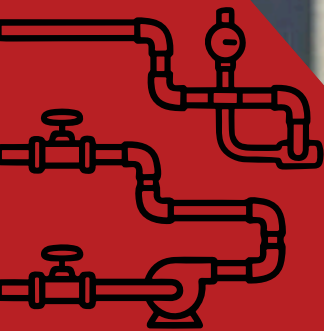




Case Study: Mechanical Installation for a Low Carbon District Heating Energy Centre

Project Overview

Project Name: Low Carbon Energy Centre - Mechanical Installation

Location: UK

Sector: Low Carbon Technology / Decarbonisation

Project Duration: 8 months core scope

Project Value: Confidential

Project Completion Date: August 2026

Client: Confidential



PEM Engineering and Construction Ltd

+44 (0) 1482 259258 info@pemec.co.uk www.pemec.co.uk

PEMEC House, Thomas Street, Hull, HU9 1EH

Introduction

District heating networks are a core part of the UK's route to decarbonisation.

Large-scale low carbon energy centres use industrial heat pumps and associated plant to deliver low carbon heat to homes, offices and public buildings across dense urban areas.

Plant of this scale is safety-critical and must be built to protect the long-term integrity of the network. The mechanical installation requires precise fabrication, high-integrity welds, coordinated interfaces with existing services and a fully auditable QA record at handover.

This case study covers PEMEC's turnkey mechanical installation package inside a new low carbon energy centre in the UK, including scope, challenges, solutions and outcomes.



Scope of Work

The mechanical installation scope included:

- Preconstruction and buildability input
- Prefabrication of steelwork and pipework, leaving green ends for final site measure
- Installation of heat pumps and associated equipment
- Pipework and inline equipment installation
- Fire-rated ductwork installation
- Pipework support solutions coordinated around existing services
- Controlled hydraulic testing with calibrated test equipment
- Calibrated torque-wrench verification of flanged joints, to manufacturer-approved torque data
- ITP, test certification and O&M handover



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Engineering & Design

Design and fabrication approach:

- Prefabrication used a green-end approach, with final connections site-measured to avoid rework
- All running lengths were site-welded in line with client Employer's Requirements, avoiding long-term flange maintenance requirements.
- A revised PRV design during construction required a controlled change from prefabricated to site-run pipework



Execution Strategy

- Prefabrication of spools and steelwork, with green ends left for final site measure
- Staged site installation phased around upstream steelwork, power availability and material readiness
- Formal recording of programme dependencies and instructed changes throughout



Site Team

The team included site management, welders, pipefitters, riggers and mates.



Health, Safety & Environment

- No safety incidents recorded across the programme.



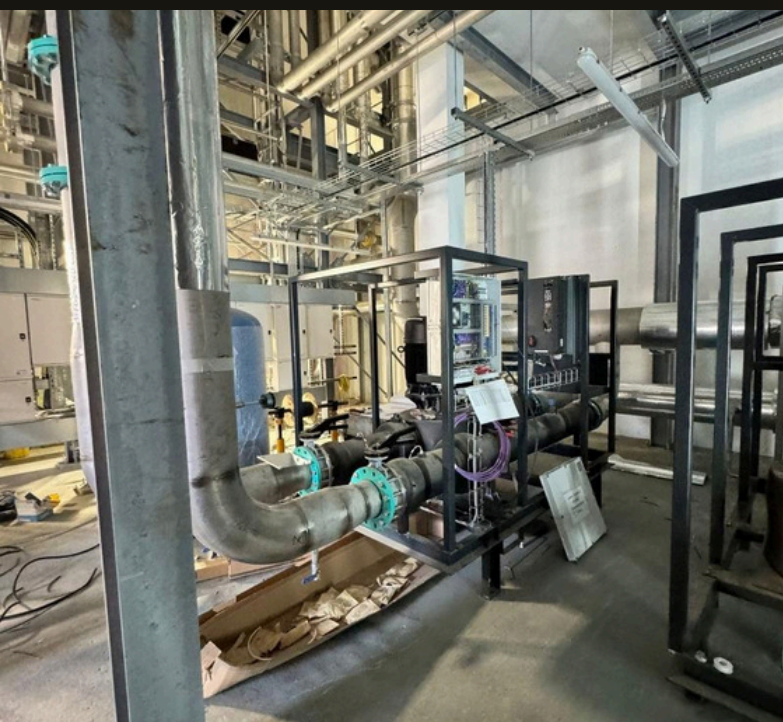
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Challenges & Solutions

Challenge	Solution
Upstream steel riser delay of approx. 40 days	Programme updated; dependencies formally recorded; site return re-planned once ready
Late revised design for PRV pipework	PRV prefabrication paused to prevent abortive work; switched to site-run fabrication after design review
Heat-meter design issues preventing immediate installation	Affected sections held and documented pending design resolution.
Site readiness and power dependencies	Staged return planned once site power and readiness were confirmed.
Long-lead specialist supports around existing services	Support solutions designed and coordinated around existing services
Historic snags and open quality records	Joint inspections completed; rectification carried out; QA re-certification issued



Testing & Handover

- Controlled hydraulic testing on in-scope systems, using calibrated equipment with certificates
- Calibrated torque-wrench verification of flanged joints
- Joint inspections and QA re-certification of affected sections
- Test certificates, ITP records and O&M documentation submitted as part of the handover package



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Key Outcomes

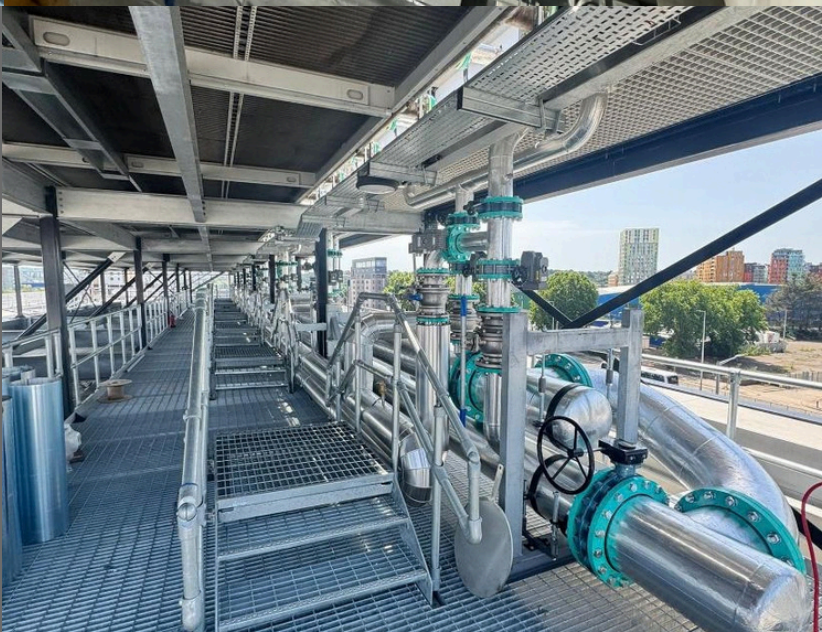
- Delivered on budget, including variations agreed throughout the project
- All running lengths site-welded in line with client Employer's Requirements, avoiding long-term flange maintenance



Conclusion

This project demonstrated that a complex low carbon energy centre installation can be delivered safely and to a fully auditable quality standard, even when subject to upstream programme delays and mid-contract design change.

Turnkey mechanical delivery covered fabrication, installation, testing and QA close-out through to handover.



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