

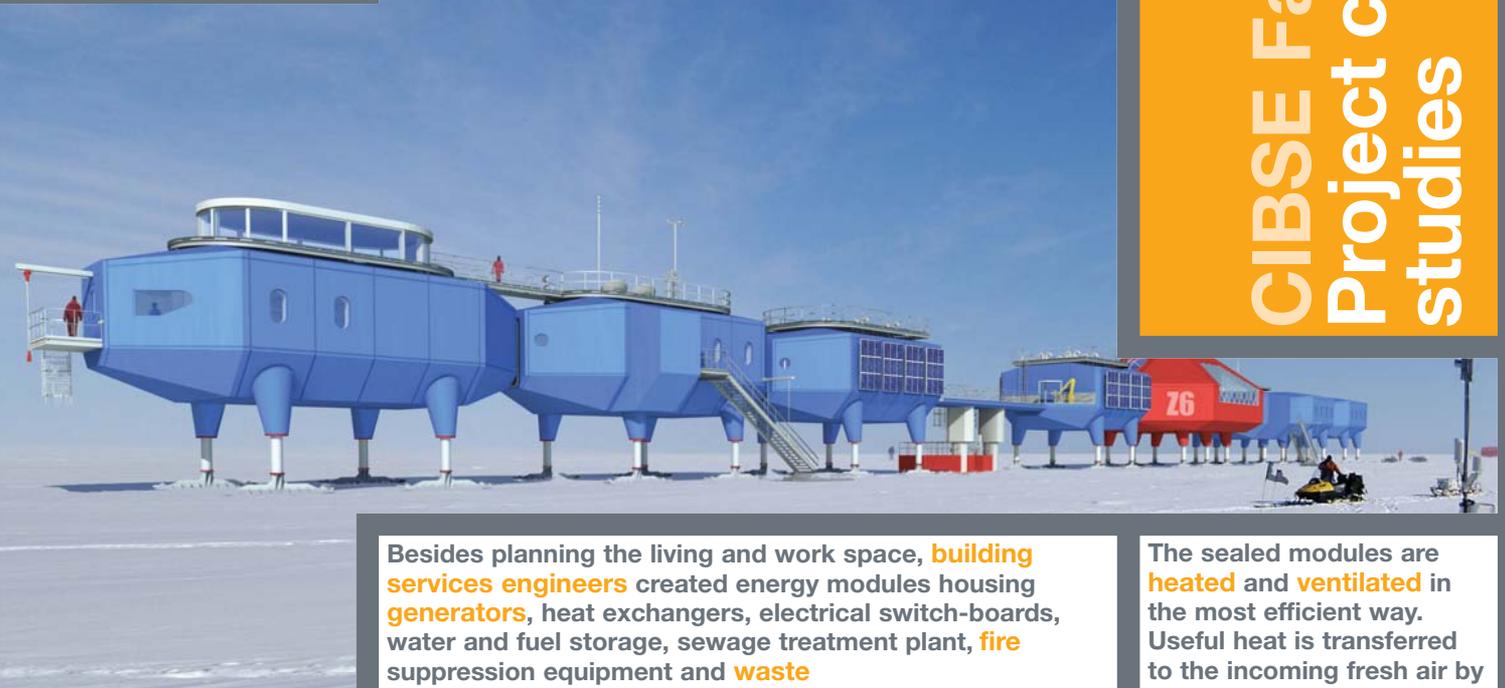
Case Study 1: The UK's Halley VI research centre

The UK's **Halley VI** research centre is located in **Antarctica** where temperatures drop to **-55°C** in the winter, snow accumulates to **1.5m** each year, and gales blow at **100mph**. After the relief ship leaves in late February the scientists are in total isolation until December.

Faber Maunsell had to design an elevated building of **2,000m²** to accommodate **52 scientists** at Halley during the summer months and **16** during the long winter.



CIBSE Factsheet Project case studies

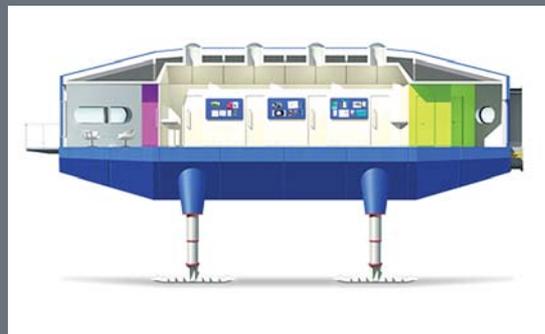
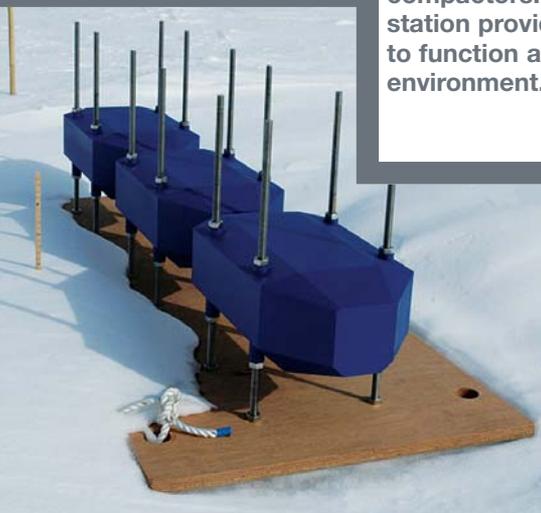


Besides planning the living and work space, **building services engineers** created energy modules housing **generators**, heat exchangers, electrical switch-boards, water and fuel storage, sewage treatment plant, **fire** suppression equipment and **waste** compactors. They are the **heart** of the station providing the services that enable it to function as a self-contained environment.

The sealed modules are **heated** and **ventilated** in the most efficient way. Useful heat is transferred to the incoming fresh air by high efficiency heat exchangers. **Lighting** utilises state-of-the-art lamps and the automatic climate control reduces **energy** use to a minimum. The services for the laboratory modules can **adapt** to future changing needs.

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The most important thing about designing building services for **extreme** and remote locations is to ensure that the systems are totally **reliable**, simple to **maintain** and easy to **fix** if they break.





Case Study 2: Emirates Stadium

Buro Happold created the building services systems for the new Emirates Stadium, home of Arsenal FC.

- It cost £390m to construct and building services systems accounted for £40m of that.
- The stadium has 60,100 seats, 7 restaurants, 150 hospitality suites and 16 bars.
- Night games use 196 floodlights giving 1500lux of lighting – 5 times the brightness of the average classroom.
- Building services engineers played a pivotal role in teams that included security engineers, club representatives, groundsmen, caterers, media people and the Met Police, as well as interfacing with over 1,000 workmen on site.
- 41 TV cameras can be accommodated and there is space for 215 reporters.
- Premier league football stadiums are “high energy” venues, so there are state-of-the-art control systems enabling sections not in use to be switched down whilst allowing other parts to function normally.
- Around 1,500 building services design drawings were produced to communicate with the contractors.
- The stadium needs 9 megawatts of heating, 4 megawatts of cooling and 7 megawatts of electricity. Peak demand on electric systems comes at the half-time interval, for cooling the beer pumps!

Emirates Stadium pics: Simon Warren and HOK

Case Study 3: City of London Academy

The new City of London Academy provides a progressive teaching environment for 1,200 pupils. The five-storey building features a low energy design with natural ventilation and daylighting.

Services in the classrooms run predominantly exposed and have been carefully integrated to compliment the architectural vision. The design includes use of acoustically absorbent material, which reduces sound reverberation to improve speech intelligibility.

Simple controls including movement sensors ensure the building is easy to manage, making it highly energy efficient and a great place to work and learn.



One young Building Services Engineer at Max Fordham LLP who worked on the project said:

“Contributing to the design process that takes an idea and turns it into a building that people enjoy is a fantastic experience. The fact that this work was rewarded with the Prime Minister's Better Public Buildings Award in 2006 is just the icing on the cake!”