



Health and Medical Research



**2bm provides a modern, energy efficient data centre that is simple to operate and requires minimal maintenance**



*Whilst cost was clearly one of the key drivers in the choice of partner, other key factors played a part in the decision to award 2bm the contract. We were aware of 2bm's growing reputation and that was reflected in their professional approach. They weren't afraid to challenge and as such we had complete confidence in Gordon (Smith), Rob (Sewell) and the project team. They understood the challenges the building presented and put forward an innovative design that ticked all the boxes.*



**Phil Ashworth**  
MRC



# INNOVATIVE AND SPACE EFFICIENT DATA CENTRE DELIVERS REAL BENEFITS FOR THE MRC

## The Client

For over a century the Medical Research Council (MRC) has made a real difference to people's lives, not only in the United Kingdom but throughout the world, promoting improved human health via a programme of leading edge research.

Such high-impact research has provided the financial support and scientific expertise behind a number of medical breakthroughs. Central to their role has been their ability to advance and disseminate knowledge, with technology playing a key part, never more so than in recent years with the need for access to more resilient computing resource.

enabled, efficient, ready.



From this...

## MRC Harwell – The Challenge

With growing demands to back up data in addition to increased support required for a research programme in Gambia, MRC's Harwell site was chosen as the location for a new Data Centre facility. As there was limited space onsite, an existing redundant building was identified.

With funding secured, a tender was drawn up that challenged respondents to come up with a space and energy efficient design.

## The Design

2bm's challenge was to make the most efficient use of the space available through the use of innovative design using tried and tested components.

The solution required an efficient and sustainable solution with redundancy to meet TIA942, and this was achieved by the deployment of 10 IT equipment enclosures, designed to accommodate a mixture of low and medium density power configurations up to 10kW per rack. With built in future proofing the design allowed for 50% future expansion without disruption to the currently deployed equipment, allowing the facility to grow as the IT requirement increases.

With the number of limitations in place, a hybrid in-row cooling solution was employed to provide a resilient and efficient cooling solution that required no ceiling or floor void, thus fitting in with the building constraints. The hybrid cooling solution further improved the site energy efficiency credentials with free cooling being provided for the majority of the year, given the local (UK) temperatures.

A modular UPS solution was also used to allow for future growth to be accommodated without downtime, all whilst providing N+1 resilience and a small physical footprint.

Dual power distribution and low energy lighting was also

used along with a suite of environmental monitoring tools to provide the MRC with ongoing management information.

## The Works Programme

- › Health and Safety, CDM compliance, separate site setup
- › Full existing site strip out complete with major renovations and new room build
- › Modular DC build and associated ancillary areas
- › New mains power provision and distribution within the IT facility
- › Modular expandable N+1 UPS system
- › Emergency standby generator
- › Low energy lighting, associated controls and small power
- › Individual rack earthing and bonding
- › N+1 cooling solution with free cooling
- › Zero Ozone/GWP depleting inert fire detection and suppression system
- › Environmental monitoring with remote alerting
- › IT infrastructure and aisle containment
- › IST testing and commissioning
- › Network cabling
- › Full level 5 IST testing and commissioning utilising IT load simulators to carry out full black out and failure scenarios

## Modular Design Key to Meeting Deadlines

With a tight 12 week build programme the 'room within a room' approach made best use of modular wall panels, which were part assembled off site. This reduced the time required to install the shell of the data centre to ensure handover deadlines were met, in addition to providing an insulated hermetically sealed area to provide the required environmental stability.

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## Project Management

Key to the successful completion of the project on time was the close relationship between 2bm and the team at MRC.

*“Communication is key to any project especially one with such tight timescales, with the additional challenge of restricted access to site for both personnel and ‘just-in-time’ deliveries it was important we had clear plans and outcomes on a day by day basis.”*

Stuart Robinson  
2bm Project Manager

## Executive Summary

2bm delivers state of the art new data centre facility for the Medical Research Council inside three months to radically improve efficiency and the resilience of operation at Harwell.

The project’s modular design ensured the data centre was handed over on time and to budget, with controlled access at all times to the secure site. The facility is supported by a full environmental monitoring solution that is linked to the site’s Building Management System (BMS) and provides alerts to key members of staff. Due to the innovative design, free cooling is achieved for 80% of the year, resulting in a projected PUE of less than 1.3.

## Technical specification

<b>IT Services Racks</b>	1200mm deep network and server racks with industry standard 19 inch profiles, enabling a future proof solution to accommodate even the largest IT hardware
<b>Total Technical Load</b>	Day one - 50 kW, day two potential - 75kW
<b>UPS Protection</b>	Modular UPS with N+1 modules
<b>Mains Power Protection</b>	New LV mains supply with an emergency standby generator sized for the day two load, complete with a 2 hour integral bundled generator fuel tank
<b>Cooling</b>	Hybrid DX/CW free-cooling in-row units with fully separate stand-alone controls, providing a true N+1 resilience with no single points of failure
<b>EMS</b>	Temperature and humidity sensors within the IT and plant areas, leak detection cables, fault signalling for all major items of plant and equipment, SNMP based monitoring with GSM connection providing email and text alerts to nominated staff along with BMS integration to provide site wide alerting
<b>Access Controls</b>	All internal and external doors integrated to the existing site wide access control systems to maintain security and monitoring
<b>CCTV</b>	Extension of the existing site wide CCTV system to provide HD coverage of the IT suite
<b>Fire Suppression</b>	IG55 fire suppression

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The logo for 2bm, featuring the letters '2bm' in a white, sans-serif font inside a white circle, which is set against a green, trapezoidal background.The logo for MRC Harwell Institute, with 'MRC' in a larger font and 'Harwell Institute' in a smaller font, separated by a vertical line, all within a dark grey rounded rectangle.A large, stylized green double quote icon.

*The world is now a much smaller place and with the uncertainty attached to facilities located in certain parts, the UK was chosen for the new data centre.*

*We purposely didn't make the tender too prescriptive.*

*As a Government department efficiency of operation however was always going to be key, along with the innovative use of space given the building chosen presented a lot of challenges not least ceiling height and its general state of disrepair.*

A large, stylized green double quote icon.

**Phil Ashworth**  
**Engineering & Estates**

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