

# Case Study: University of Bristol Modular Prefabricated Data Centre Project



University of  
**BRISTOL**



## The Challenge

Bristol University required a new modular, prefabricated datacentre and two comms rooms to host The University's immersive reality facility known as the Reality Emulator (RE). The RE will connect a diverse range of current and evolving physical infrastructures (smart city pilots, 5G testbeds, health-sensing houses, connected transport, autonomous vehicles etc.) to its new, purposebuilt facility for scaling-up physical samples and creating realistic representations of socio-technical systems. These will be used for academic and commercial research, for public engagement, and for innovation.

The core functions connected with the RE are:

- Data collection, transfer/integration, processing, and storage.
- Model development/training and execution.
- Interactive and immersive representation of model outputs and other data.

The Reality Emulator will be a world-class facility for digital research and innovation in the socio-technical arena.

## Bespoke Offering

### DataCube™ Prefabricated Data Centre



Workspace Technology developed a bespoke design based around a 180m<sup>2</sup> double storey, modular, prefabricated, pre-engineered building.

Due to the size of the of the data centre and comms rooms, and to ensure the data centre could be transported to site and craned into position the structure consisted of four pods and a plant deck, that when 'assembled' on site formed a single lower ground data centre pod, with an upper storey consisting of comms room pods and a plant deck.

### Off-Site Construction

The University required that the Data Centre, Comms Rooms, and Plant deck be entirely constructed offsite, and delivered to pre-prepared foundations, fully populated, with physical data centre equipment, Power, Cooling, Electrical Distribution, Rack Infrastructure, Fire Suppression, Lighting Systems, Access Control and CCTV.

The Universities data centre and comms room facility was entirely built off-site at Workspace Technology's modern UK production facility.

### Realty Emulator Data Centre (REDC)

The Realty Emulator Data Centre (REDC) is used to house 4 of the RE's immersive sub systems, Data, HPC, Network and Management and Monitoring.

The REDC has 16 x 20kW Equipment Racks and is designed with Tier-III "Concurrently Maintainable Site Infrastructure" with redundant capacity components and multiple independent distribution paths serving the critical load, incorporating static transfer switches and resilient chilled water circuit.

- 2N Incoming supply.
- 2N Switchgear.
- UPS; N+1, Redundant Power Modules paired with a Static Switch.
- Rack Power 2N A&B PDU's.
- Cooling N+1 Air Handling Units & 2N External Chiller Units.



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The design provides a concurrently maintainable installation for the REDC pod allowing components to be removed from service on a planned basis with no impact on critical power.

The design allows for sufficient permanently installed capacity to meet site demands when redundant components are removed from site.

### Reality Emulator Main Comms Room (REMCR)

Reality Emulator Main Comms room (REMCR): provides mechanical, electrical, and physical hosting services for the Reality Emulator Network Sub Systems Components that are hosted outside of the REDC, including cross connectivity to other campus comms rooms and REDC.

- 2N Incoming supply.
- 2N Switchgear.
- UPS; N+1, Redundant Power Modules.

- Rack Power 2N A&B PDU's.
- Cooling N+1 Air Handling Units & 2N External Condenser Units.

### Plant Deck

The plant deck adjacent to the REMCR on the second level houses external cooling infrastructure including pipework, pump's, chillers, and condensers.

## Project Success Overview

The University of Bristol Reality Emulator data centre was a challenging project from both technical and practical deployment aspects.

### Key challenges faced during the project included:

- Delivering the high cooling capacity required of + 20kW per rack, within a constrained footprint.

- The complex structural designs required to support the double stacked data centre buildings with a combined weight of 80 Tonnes.
- Efficient space organization of equipment within the high-density environment.

A critical requirement of the University was a short delivery timeframe. Workspace Technology's modern UK based production facility meant that the prefabricated data centre was completely fitted out off-site, factory production efficiencies shortening the fit-out period whilst allowing the preparation of the foundations on site to run in parallel, resulting in a compressed delivery and commissioning program that met with the Universities exacting requirements.



Interested in finding out more?

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