

Critical Infrastructure Professional Services

at the **core** of your business



Consultancy | Design | Engineering | 3D/BIM | CFD | Audit | Commissioning

Critical Infrastructure Professional Services





Table of Contents

- 01** About us
- 02** Service Wheel
- 03** Data Centre Strategy
- 05** Infrastructure Audit & Operations
- 06** Data Centre Design & Consultancy
- 07** 3D Modelling/BIM/CFD
- 09** Design Peer Review
- 10** Site Quality Assurance
- 11** Testing & Commissioning Management
- 12** Technical Documentation & Facility Operation

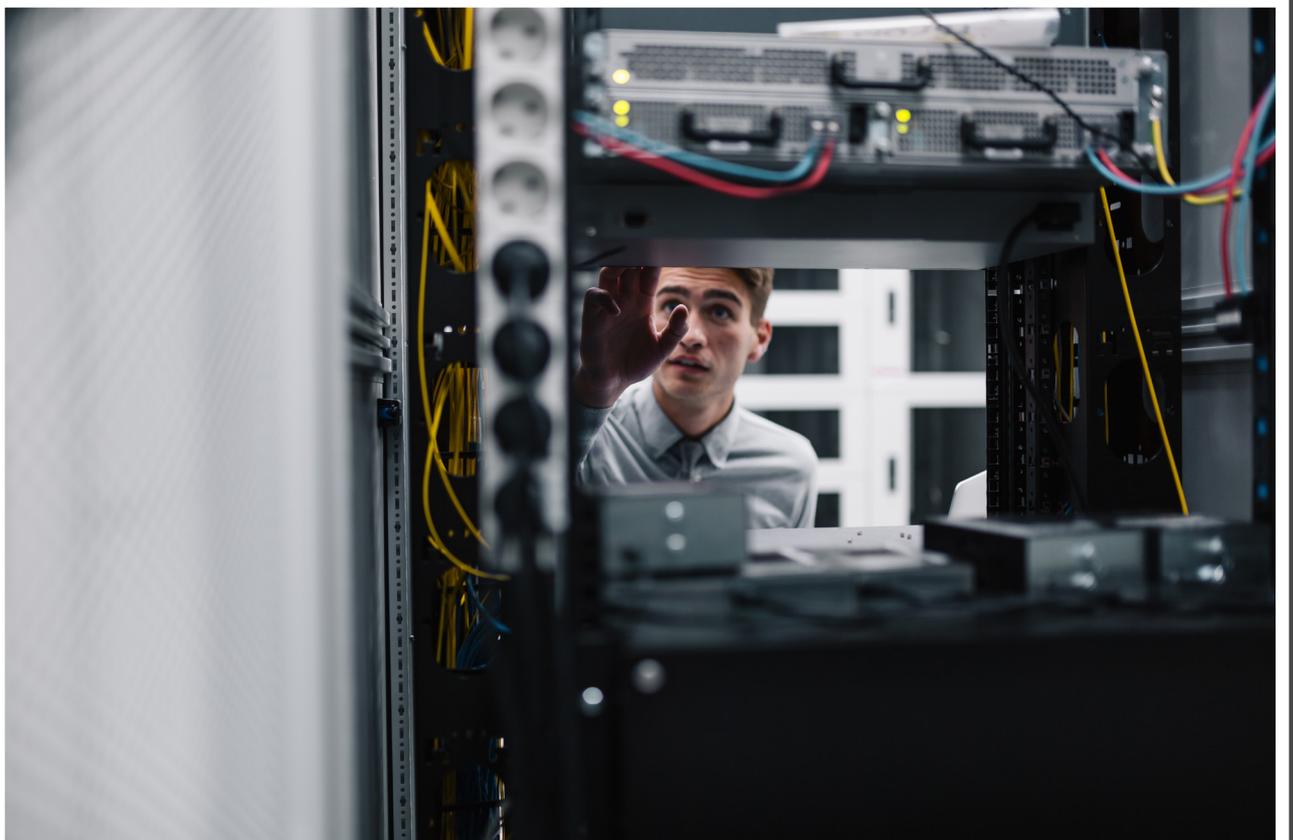
About us

Sudlows DMCC's Professional Services are structured to provide support, expertise and management to navigate through the entire life-cycle of your critical facility.

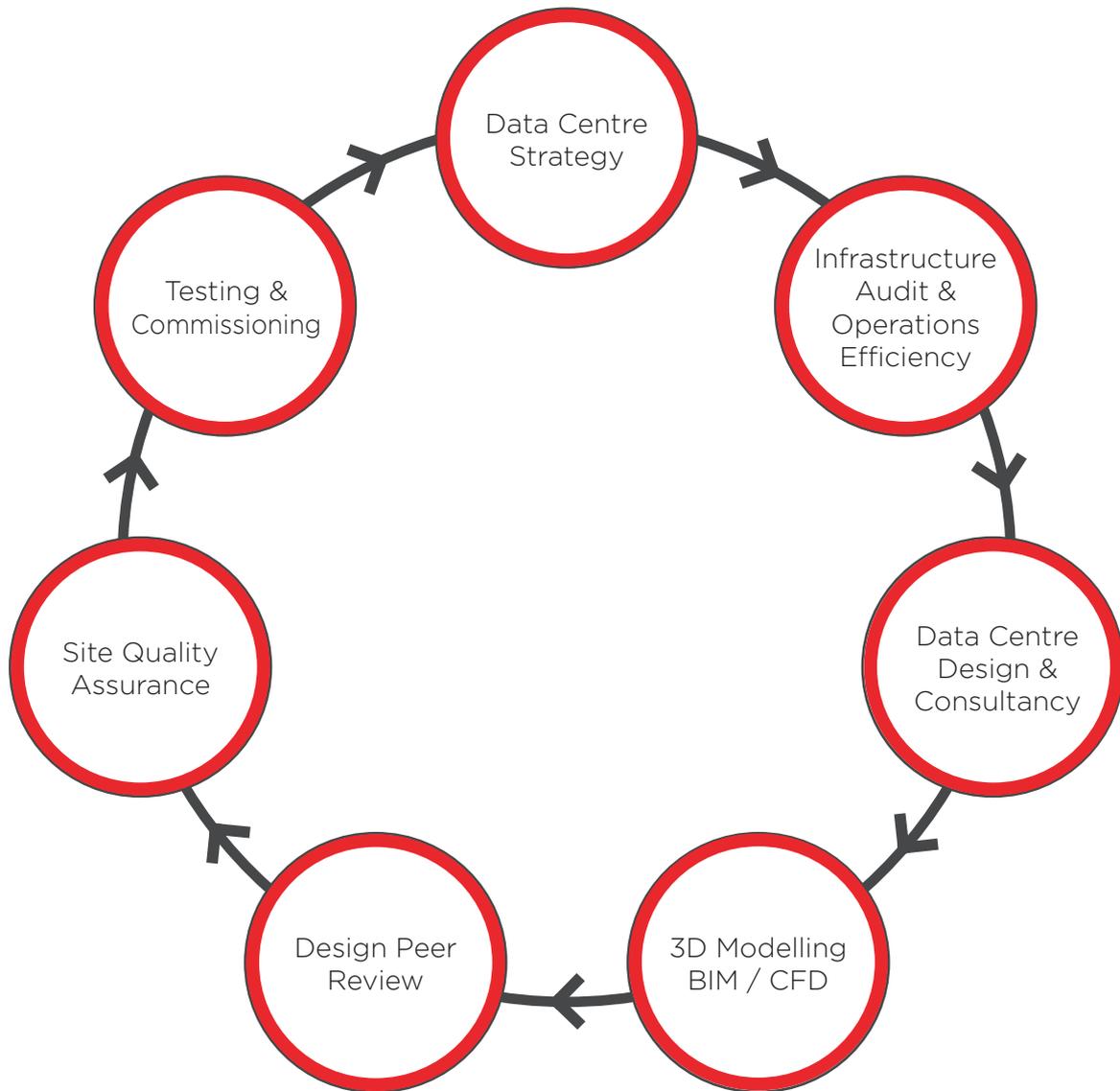
Sudlows is an award-winning critical infrastructure specialist formed around Design & Consultancy, Auditing, and Professional Services.

Launching in Dubai in 2014, the company quickly established itself as the consultancy of choice for Critical M&E and Data Centre projects across the MEA region. Since then we have also opened offices in India and Singapore.

Our highly qualified staff of engineers and consultants provide bespoke technology road maps that enhance, improve and ensure every critical facility operates to the highest levels of international standards of resilience, sustainability and energy efficiency.



Service Wheel



Sudlows' Professional Services are structured to provide support, expertise and management to navigate through the entire life-cycle of your critical facility.

Our Data Centre Consultants will guide you through every critical stage, from preliminary feasibility assessment through to final testing and commissioning. Every aspect of our technical services are designed and carried out by our team of award-winning experts.

As critical infrastructure specialists, we have both the knowledge and experience of the latest technologies and a thorough understanding of all aspects of a critical facility, Data Centre or server room.

Building on these strengths enables Sudlows to maximise the benefits at the early Audit, Feasibility and Design stages and to understand the weaknesses during the final Testing and Commissioning stage. We are able to deliver significant Return on Investment (ROI) and ensure your project is in safe hands at every stage.



Data Centre Strategy

- Regional Market Demands & Trends
- Business Case Package
- 3D Facility Master Planning
- Cost Modelling & ROI
- Feasibility Review
- Data Centre Road Map
- Site Selection & Planning

Our award-winning design and build heritage gives us a unique insight in to the full life-cycle of the Data Centre, providing experience to help define your build strategy.

At the start of your Data Centre journey there are many key factors, such as the immediate local and regional factors, which should be undertaken and analysed before you make a commitment to build or upgrade your Data Centre facility.

Feasibility Review

Our Feasibility Review services use our experience and industry knowledge to provide a detailed and thorough assessment of the possible risks and benefits for a potential project. These can be commercial elements, such as a Return on Investment (ROI), or technological factors which affect the ability of the facility to perform and meet Service Level Agreements (SLA).

Increasingly, environmental factors are a key part of the decision-making process, requiring projects to be aligned with the organisations' ethics and commitments. To assist with this, we can provide Environmental Impact Assessments (EIA), such as CO2 footprint and water usage, or more thorough life-cycle sustainability reports to enable the right solution to be delivered.

3D Facility Master Planning

At the early stages our in-house team of Data Centre Designers will create and bring to life your new facility master plan in 3D images, high definition video renders and first person virtual reality tours. This will provide project stakeholders with a visualisation of how the facility and supporting MEP plant spaces will look and feel.



Cost Modelling & Return on Investment (ROI)

Cost analysis goes further than just Capital Expenditure (CAPEX). Based on different technologies and efficiency, we will provide a full 10-year Total Cost of Ownership (TCO) adding in all expected Operational Expenditure (OPEX) costs.

Business Case Package

Sudlows' Data Centre Consultants are able to develop the necessary documents, on your behalf, required to support business cases for new build facilities or existing facility upgrades and renovations. These are all based on technical data, commercial information and 3D animated walkthroughs which all provide a detailed visualisation of how your future facility will look.

Data Centre Road Map

Sudlows will generate your 'Data Centre Road Map', which is tailor-made for enterprise, resale or wholesale clients. During this process we consider key questions such as, how many racks? How many metres sq.? How much kW? What is the potential for future growth? Will the facility be modular or traditional? Hybrid? To install DCIM or not? Rack population and densities? White space areas (m²)? Power requirements?



Infrastructure Audit & Operations

- Facility Overview
- FM / Operational Audits
- Uptime Institute Gap Analysis
- Operating Standards
- Single Points of Failure (SPoF) Report
- Best Practice & Energy Efficiency

For existing facilities, we will undertake a site audit and produce a comprehensive report detailing the condition of the installation and its current operation. This will be assessed against best practices, a target level of resiliency or a specific standard e.g. Uptime Institute Tier Topology Standards.

The infrastructure audit comments on all elements of the facility, from the physical location to the specifics of the plant and equipment. As Data Centre specialists, a review of the configuration, type and condition of critical plant items will be undertaken including Cooling Systems, UPS, Standby Generation, and LV/HV Distribution. Additionally, specialist ancillary systems are also assessed, such as BMS/DCIM Systems, Security, Access Control and Fire Suppression. Finally, an assessment of the building fabric, security arrangements, and the approach to maintenance ensures that the audit process is comprehensive and complete.

During the audit, passive measurements of the environment are taken and recorded to assess the thermal characteristics of the space and identify opportunities for improvement. Where a more detailed assessment is required or where specific modifications are proposed, this can be enhanced with a full in-house CFD analysis and report. The report can not only model the running condition, but also, simulate operational failures, design changes or load additions to the space.

The audit process will identify any underlying issues with the design or operation of the facility and can include a comprehensive single point of failure analysis, along with recommendations and potential options for mitigation. During the audit, a detailed assessment of the load within the space and current energy consumption will be completed and recommendations made where there are opportunities to improve the operational efficiency and reliability.

As your complete Data Centre specialist, our project teams are on hand to support the implementation of any recommendations made.

Data Centre Design & Consultancy - The Sudlows Difference

- Practical
- Manageable
- Buildable
- Maintainable

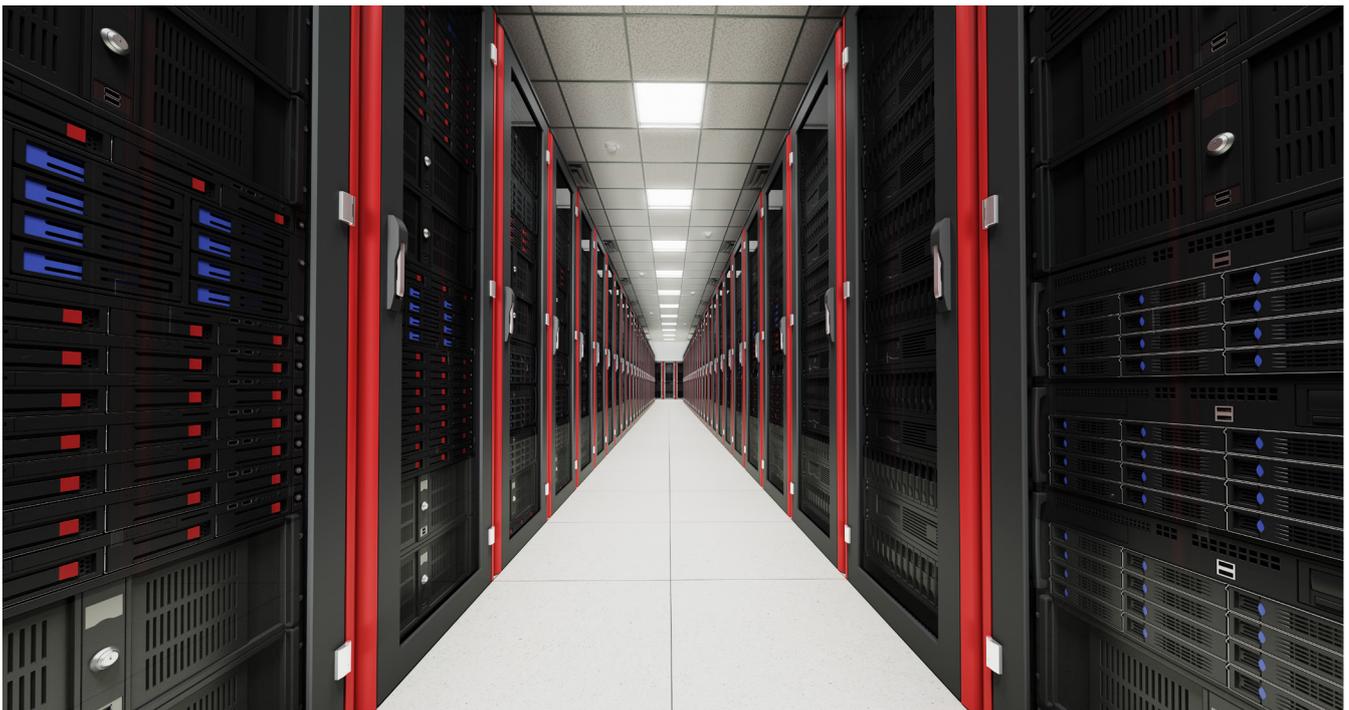
At Sudlows, we have taken innovation to the next level. Our award-winning standard design and consultancy methodology is enhanced by drawing upon decades of practical implementation experience as a vendor neutral Data Centre specialist.

Our project experience ranges from, basic 5 rack rooms to complex large 350MW co-location campuses, deploying technologies such as high density racks (>20kW), innovative cooling and IP BUS rotary UPS systems – Sudlows has designed, installed and tested it all.

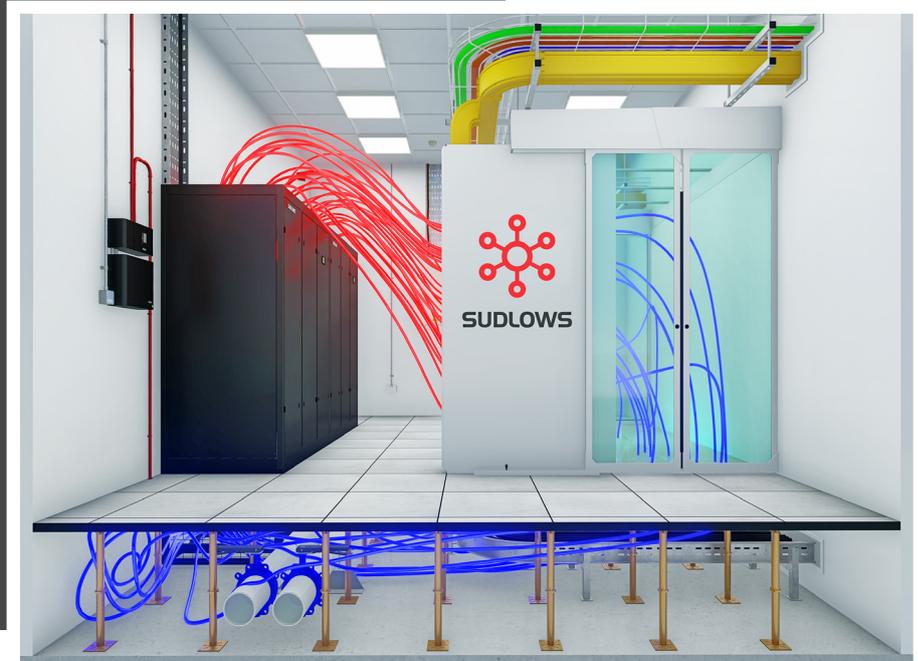
By drawing upon a wealth of practical knowledge in delivering turnkey Data Centres within the UK, Sudlows are able to offer a unique design and consultancy service throughout the European, MENA and APAC regions.

All of Sudlows' design and consultancy appointments benefit from our real-world Data Centre experience, calling on our in-house expertise and understanding of the practical implementation of Data Centre projects.

We are able to ensure that your critical facility will be practical in design, offering a buildable solution which is easy to manage and maintain, for the full life of the facility.



3D Modelling/ BIM/CFD



3D Modelling

Sudlows draft and prepare innovative and complex Mechanical & Electrical (M&E) designs on a regular basis using our extensive in-house design capabilities. This is backed up by our Computer Aided Design (CAD) Department who produce detailed 3D co-ordinated models, drawings and images to fully illustrate the design.

We integrate a design approach into all projects. This does not see physical engineering as being separate from the programme and budgetary constraints that are required on any project to fully satisfy customer aspirations and requirements in the early stages. Using the latest dynamic 3D modelling software, consultants and customers can fully analyse and understand Data Centre performance and the potential impact of our design options and solutions.

Building Information Modelling

Data Centres are among the most complicated and intelligent buildings on the planet, comprising of multiple systems and technologies to form one integrated facility. The design of such a facility requires collaboration between multiple teams and Building Information Management (BIM) provides the central framework necessary to achieve this.

It is Sudlows' belief that the effective and efficient exchange of information lies at the heart of collaborative relationships. As a company, Sudlows are committed to continuously improving to ensure a leaner and smarter delivery of projects to our customers.

Recognising the importance of BIM, Sudlows are Level 3 compliant.

Level 0	2D CAD Drafting	No Collaboration
Level 1	3D Concept CAD work & 2D construction drawings	No Collaboration
Level 2	3D CAD used throughout project by entire team	Collaboration through combinable separate models
Level 3	3D CAD used throughout project by entire team	Full collaboration on a single model

BIM is a collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of designing, constructing and maintaining building and infrastructure assets. One key competitive advantage of BIM is the ability to promote greater transparency and collaboration between our designers and our suppliers and thereby reducing waste (procurement, process and material).

Sudlows are continually committed to the development and implementation of BIM capability which forms an integral part of the way we and our supply chain deliver projects.

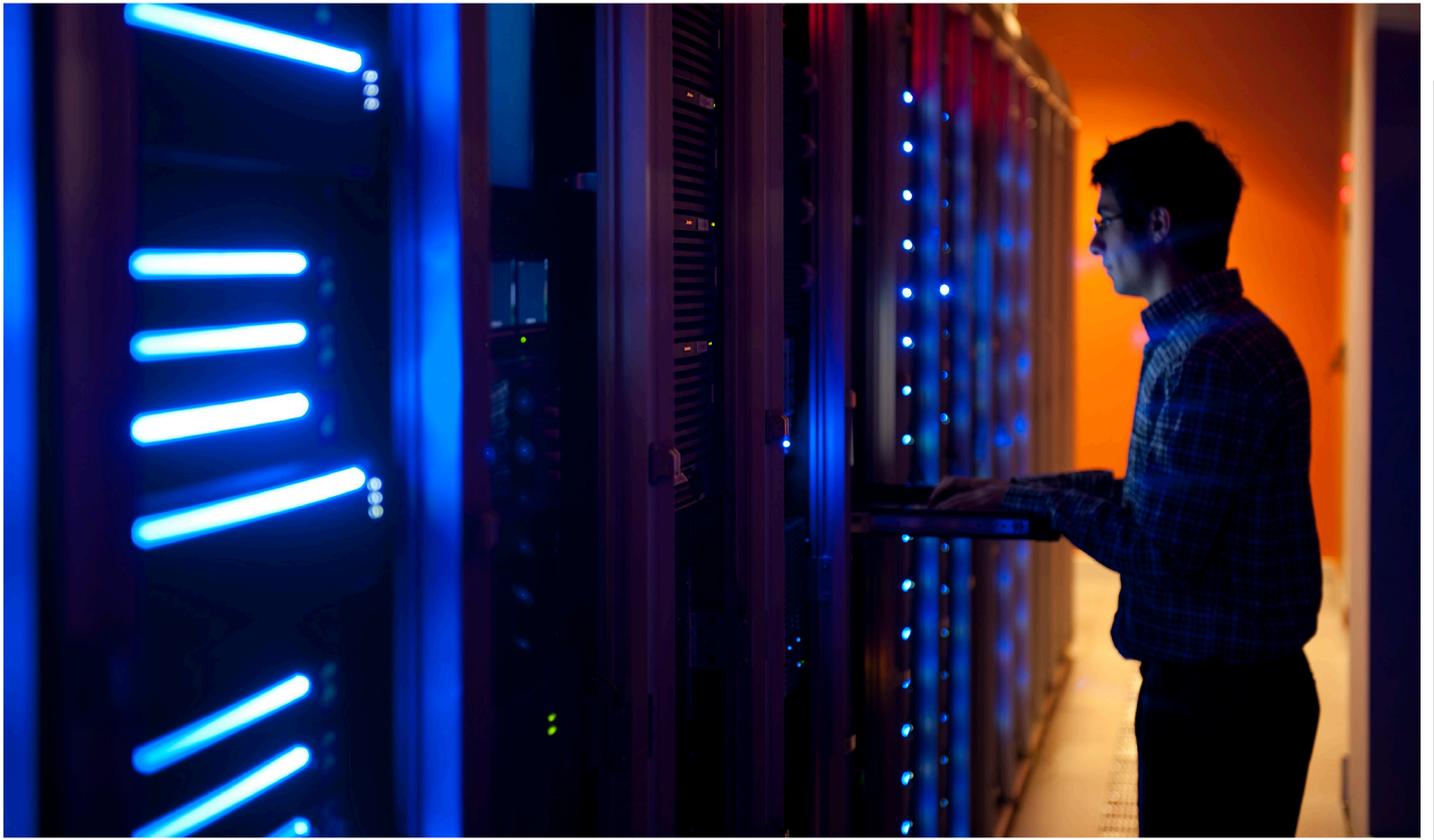
Computational Fluid Dynamics

Our Design Verification teams make full use of a range of advanced analytical methods, including our own in-house Computational Fluid Dynamics (CFD), which enables us to simulate, develop and optimise the configuration of a Data Centre to a high level of accuracy.

Using industry leading simulation technologies, we ensure that before a facility has been constructed, the performance of its cooling architecture has been rigorously tested and modelled at millions of location points, and verified to be within specification.

By modelling the underlying physics of the Data Centre, CFD provides a thermal description of a facility at any running condition, providing the necessary depth of technical understanding upon which to base mission critical decisions.





Design Peer Review

- Specification Adherence
- Uptime Standards and Validation
- Enhanced CFD Modelling
- Operational & Maintenance Review
- Evaluation of Buildability

Sudlows will provide a full assessment of the proposed Data Centre facility to ensure all elements of the design are fit for purpose, meet the intended specification and project objectives, and are compliant to current standards and best practice.

Our expertise, and understanding of the underlying Data Centre technology, enables us to provide independent engineering advice at all stages of a project. This valuable insight has led us to work with numerous national and international organisations across all industry verticals.

Our Design Verification teams make full use of a range of advanced analytical methods, including our own in-house CFD, which enables us to simulate, develop and optimise the configuration of a Data Centre to a high level of accuracy.

Site Quality Assurance

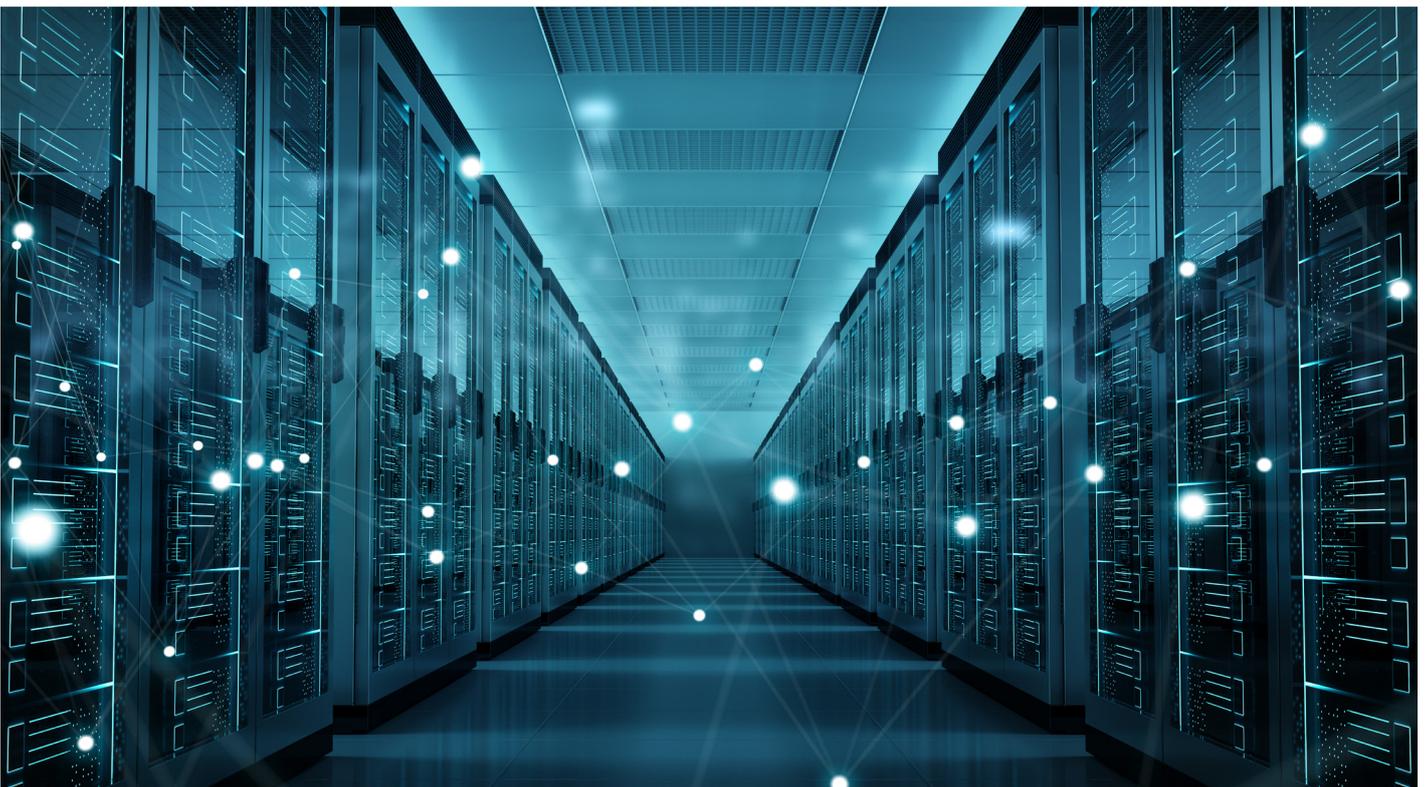
- Design Drawing Review
- Programme Management
- Professional Snagging Reports
- Technical Submittal Evaluation
- Installation Quality Inspections

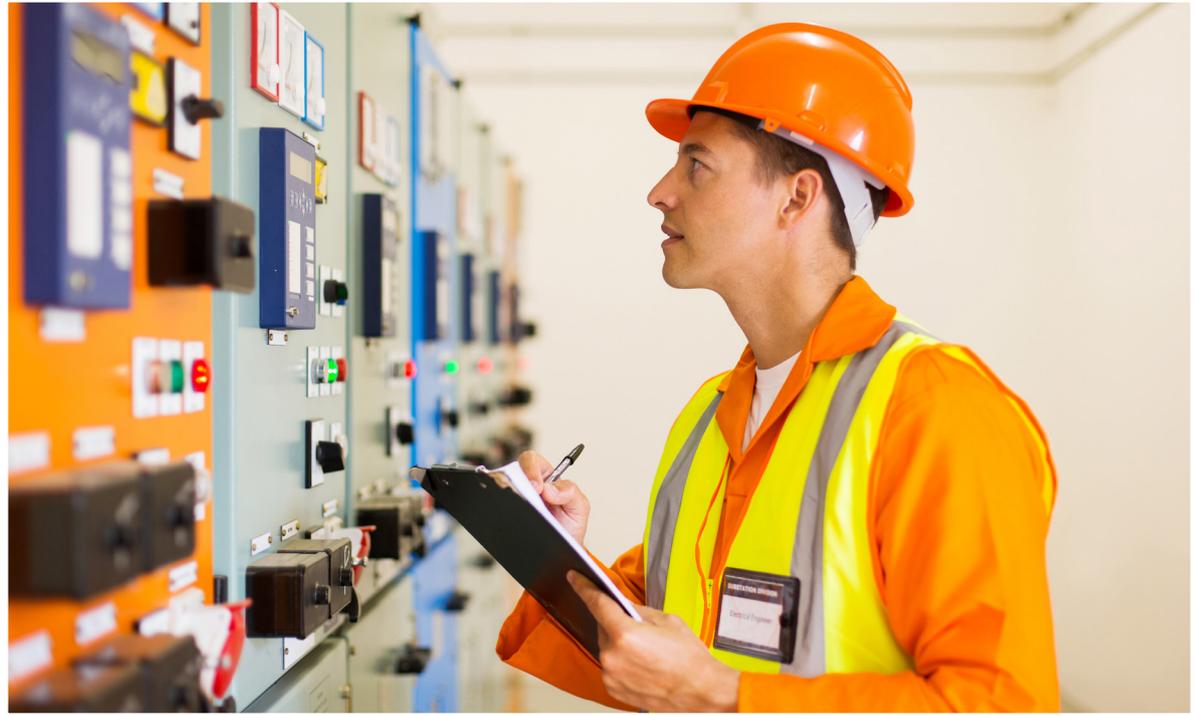
Working as part of the client team, we can ensure that a facility is constructed and delivered to the highest standards, and does not deviate from the approved design or installation methods.

We can act as your appointed critical infrastructure specialist and throughout the project will monitor, verify, critique and approve a contractor's technical submittals and drawings, identifying deviations or performance limiting factors where they exist, in order to mitigate risk.

Our highly qualified team of Uptime Institute Accredited Tier Designers and experienced Project Managers work closely with your project stakeholders to create a structured and detailed programme that will deliver the commercial and technical objectives of the project.

With exacting planning and co-ordination, we will see projects run as expected against the delivery programme and which are aligned with project budgets. This supports the envisaged business case and in turn, delivers the anticipated commercial benefits.





Testing & Commissioning Management

- Switching and Simulation
- Integrated Systems Testing (IST)
- Systems Acceptance Test (SAT)
- Test Script Development
- Monitor, Record and Report
- ASHRAE Levels L1, L2, L3, L4, L5

Following on from the systems commissioning stage, our independent testing and commissioning teams can provide extensive and industry leading Systems Acceptance Testing (SAT) and Integrated Systems Testing (IST) including a clear and detailed sequence and programme.

The SATs first verify that the equipment has been installed correctly, as designed and in-line with the manufacturer's recommendations. They then test performance and capacity within both the design load and, if applicable, any acceptable overload condition.

The IST then tests the Data Centre as a full and complete system and is the ideal opportunity to ensure that everything is operating correctly before being handed over to the client. The IST will push the Data Centre to its design limits in terms of capacity, maintainability, and fault tolerance. If the facility should tolerate a generator failing to start, we will simulate it, likewise, if the chillers are designed to be maintained live, we will demonstrate it.

Ultimately, the IST is the foundation for future confidence, ensuring the facility will operate as intended even when pushed to the limit.

We will plan, undertake, and record testing independently from the project delivery teams. Alternatively, we can act as a client's representative, or independent witness, where testing is being co-ordinated and demonstrated by others.

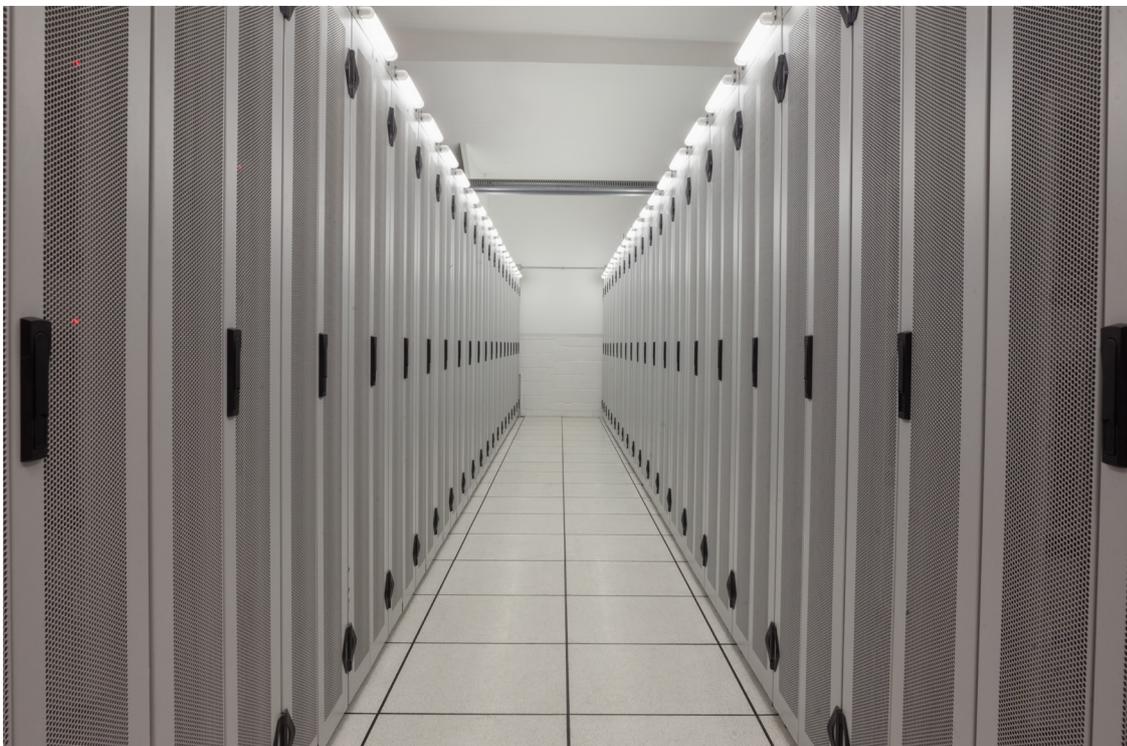
Technical Documentation and Data Centre Operation

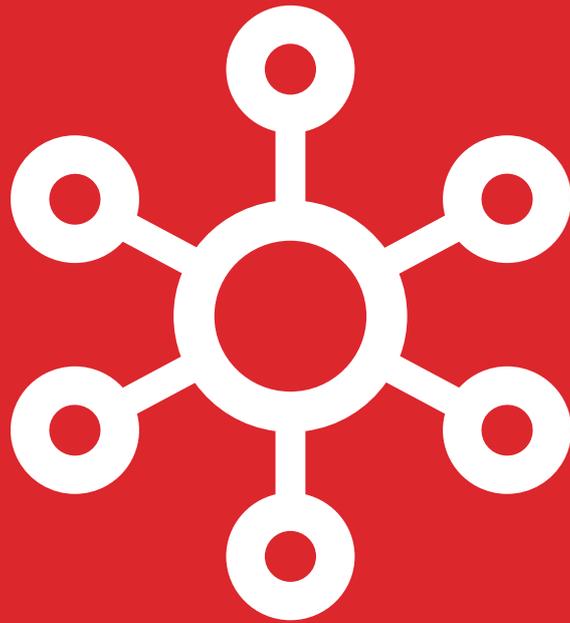
- Operating & Maintenance Manuals (OMM)
- Standard Operating Procedure (SOP) Manuals
- Emergency Operating Procedures (EOP)
- Maintenance Operating Procedures (MOP)
- Training
- Global Operations
- Site Operational Procedures

Having successfully delivered over 100 Data Centres, Sudlows is in a prime position to provide a bespoke 'Soft Landings' programme, complete with a quality handover. Sudlows always implement and deliver a thorough aftercare plan to ensure that our customers are satisfied with the future demands of their procured service.

Even the most resilient Data Centre design is at risk of failure, simply from the day-to-day operations. That is why it is of upmost importance that your Data Centre has specific operating and maintenance manuals which relate to your infrastructure, facilitating the operations team to run the Data Centre successfully with high availability of your critical systems.

Training is tailored to our client's specific needs. Early in the programme we begin the arrangements for ensuring adequate training is given to staff and any third parties involved in the ongoing function of the facility. Our 'Soft Landings' approach means our client receives all necessary documentation, training, programme benefit realisation and future managed services options.





uptime@sudlows.com

UK:	0800 783 5697
MENA:	+971 (0) 4 554 9744
APAC:	+65 (0) 9715 9460

sudlowsconsulting.com

sudlows.com