

# DATA CENTRE SERVICES

Our Data Centre service offerings cover full design, lead consultancy and project management services for our clients including site-selection & feasibilities, detail design & documentation, operation & life-cycle cost assessment for greenfield projects, refurbishments and fit-outs for all types of data centres and related mission critical applications.

# OUR OFFICES AROUND THE WORLD

Meinhardt is one of the largest independent engineering consultancies in Asia. For over 69 years, our innovative, highly buildable & sustainable solutions have helped clients to realize expectations and achieve their goals.

A global company with 61 offices, we assist and contribute for addressing major infrastructure and urban challenges while always serving the needs of our clients. As a result, more than half of our clients are repeat customers who have been with us for at least 10 years.



61

Offices Worldwide

6,000

Professionals

- HEAD OFFICE
- REGIONAL OFFICES
- OFFICES

- Techno-Commercial Feasibility Studies
- Masterplanning
- Urban Infrastructure Planning
- Commercial & Investment Advisory

- Lead Consultancy
- EPCM
- Contracts & Cost Management
- Facility Management
- Asset Management Services
- Value Management Services (VMS)
- Design Quality Audit

## DESIGN



### CORE DISCIPLINES

- Architectural Design
- Civil & Structural Engineering
- Geotechnical Engineering
- Mechanical, Electrical, Plumbing
- Infrastructure Engineering
- Smart Cities
- Digital Modelling

### SPECIALIST SERVICES

- Environmental Sustainable Design (ESD)
- Certification Advisory
- Specialist Lighting Design
- Façade & Façade Access
- Threat and Vulnerability Risks Analysis



# STRIKING A BALANCE



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Meinhardt strikes a balance between the localised delivery requirements and global best practices without compromising on worldwide practices and standards.

As an integrated design consultancy that offers a full suite of engineering, planning, design supervision and project / construction management services. We can offer end-to-end services to our clients.

Our experience working with data centre operators, financial institutions, telecommunication companies, real estate owners and investors has given us invaluable insight into how data centres are conceptualized, planned, designed and executed.

We are strong proponents of Building Information Modelling (BIM) and it allows for the integration of all disciplines and for full clash control. We offer a virtual models before construction stage whilst providing real time insights into design changes across the various disciplines.





## **100+ PROJECTS & COUNTING**

As a global firm we have been able to pool together invaluable design and execution lessons learnt over more than 100 data centre / mission critical projects worldwide.

## **ACCREDITED PROFESSIONALS**

We have project managers, civil and structural and MEP engineers and architects who possess various Accredited Tier Designer (ATD) certifications and Sustainability qualifications.





OUR GLOBAL PROJECT

# DELIVERY APPROACH

## DIGITAL TECHNOLOGY

We use our digital delivery as a critical tool for space planning, Prefabrication, Project Phasing, design coordination & management and overall delivery integration.

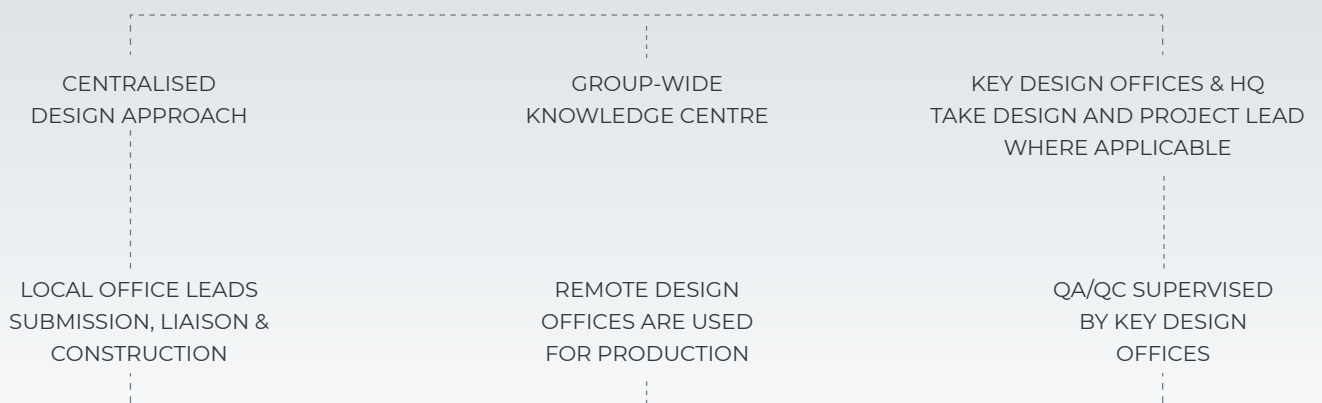
## INNOVATIVE TECHNOLOGIES

Our professional teams together with our partners are continuously monitoring worldwide R&D trends and technology enhancements to be on the forefront of the latest design solutions.

## SUSTAINABILITY & GREEN DATA CENTRES

Sustainable designs lie at the heart of our engineering solutions, we seek to address challenges and barriers at the design stage so that owners and operators can lower operational costs whilst decreasing the overall impact to the environment.





HELPING CLIENTS AROUND

# THE WORLD

1

“

As the demand for data centres continues to see a significant growth, we continue to focus on the need of sustainable, modular and robust facilities.

2

“


Operational reliabilities are the backbone of all data centres. We have a well-rounded approach to ensure the requirements of mission criticalities across all engineering systems designed by us.

3

“

Our ATD Certified Engineers, LEED & BREEAM Professionals, ensure the proper certification processes and procedures on every single project.





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Our services as an engineering consultant are broken down into four key pillars

#### **ESSENTIAL TASKS**

- Project Objectives
- Feasibilities
- Define Parameters
- Risk Mitigation
- Constraints
- Logistics
- Schedules
- Planning

#### **KEY PROJECT CONSIDERATIONS**

- Reliability Expectations
- Anticipated Load Growth Profile
- TCO (CapEx & OpEx)
- Cost-efficient Scaling

#### **DESIGN WORK**

- Concept Design
- Schematic Design
- Detailed Design
- Construction Documentation
- Construction Phase Supervision
- Testing & Commissioning
- Defect Liability Inspections

#### **VALUE-ADDED SERVICES**

- Total Cost (Ownership & Energy Modelling)
- Reliability Modelling
- Technology Advisory
- 3D Computational Fluid Dynamics
- DCIM Analysis
- Threat and Vulnerability
- Risk Assessment



# TELIN DATA CENTRE

SINGAPORE

A new build single tenant data centre with a gross floor area of 20,000 sqm. The 5-storey data centre was designed and built to meet Uptime Institute's Tier 3 and Tier 4 standards incorporating a multi-tier design with the flexibility to meet the desired operational requirements.







## World's first Tier-III & IV co-certified data centre

### KEY ATTRIBUTES

- PUE: 1.5
- IT Power: 15.75 MW
- Sustainability Rating: Green Mark Platinum
- UTI Rating: Tier III & Tier IV Co-Certified

### KEY SYSTEMS DESIGN

- Concurrently maintainable at Tier III and Tier IV (fault tolerant)
- Cooling systems: N+1 and 2N cooling towers with dual make-up water supply, Extensive chilled water and fuel leakage detection systems
- Electrical Systems: N+1 and 2N active supply paths to critical load, 2N active supply paths to all IT racks

Client: Telekomunikasi Indonesia International Pte Ltd (Telin Singapore)

Completion Date: 2016

Construction Cost: S\$ 200 Million

Services Provided: Lead Consultancy, C&S, MEP Engineering, ESD, Security & TVRA, Blast Effect, Standard OPS and Emergency Procedure, Tier III and IV Design Consultant

**Awards: BCA Green Mark – Platinum 2017**



# JEBEL ALI DATA CENTRE

DUBAI



**UTI RATING**  
TIER III

**COMPLETION DATE**  
2020

**SERVICES PROVIDED**  
Lead Consultancy

## KEY ATTRIBUTES

Annualized PUE:	1.55
No. of Racks:	1920
IT Power:	12.48 MW
Rack Power Density :	6.5 KW/Rack
IT/Support Area Ratio:	15% – 85%
Sustainability Rating:	Green Mark As per DM
UTI Rating:	Tier III

## KEY SYSTEMS DESIGN

Cooling Systems:  
Air Cooled Chillers with CRAHs

Electrical Systems:  
Diesel Generators and DRUPS

- Thermal Storage tanks for continuous operation
- High Efficiency chillers for elevated ambient temperature
- CRAH Units with high efficiency EC Fans
- Flexibility to upgrade to higher rack power density





# KIZAD DATA CENTRE

DUBAI

**UTI RATING**  
TIER III

**COMPLETION DATE**  
2020

**SERVICES PROVIDED**  
Lead Consultancy

## KEY ATTRIBUTES

Annualized PUE:	1.55
No. of Racks:	1892
IT Power:	24 MW
Rack Power Density:	8 to 20 KW/Rack
IT/Support Area Ratio:	70%: 30%
Sustainability Rating:	Estidama Pearl 1
UTI Rating:	Tier III

## KEY SYSTEMS DESIGN

### Cooling Systems:

Air Cooled Chillers with Fan walls

### Electrical Systems:

Diesel Generators and UPS

- Solution without raised floor
- Elevated Chilled water temperatures
- Elevated Supply Air temperatures
- Hot Aisle Containment
- Thermal Storage tanks for continuous operation
- High Efficiency chillers for elevated ambient temperature
- Fan wall Units with high efficiency EC Fans
- High Efficiency UPS with Li Ion batteries
- DCIM with AI for better operational efficiency



# TELEHOUSE CCC DATA CENTRE

HONG KONG

**UTI RATING**  
TIER IV

**CLIENT**  
HKCOLO NET Ltd

**COMPLETION DATE**  
2015

**SERVICES PROVIDED**  
MEP Engineering

## KEY ATTRIBUTES

Annualized PUE:	1.6 – 1.8
No. of Racks:	1920
IT Power:	40MW
Rack Power Density:	6.5 KW/Rack
IT/Support Area Ratio:	15% - 18%
Sustainability Rating:	Green Mark As Per DM
UTI Rating:	Tier IV

## KEY SYSTEMS DESIGN

- Concurrently maintainable at Tier III and Tier IV (fault tolerant)
- Cooling systems: VFD for chiller and oversized cooling towers, condensate water for cooling tower make-up tank
- Electrical Systems: Optimised plant design and operation for part load, high efficiency UPS and other equipment
- The existing 3-storey industrial building was converted to a colocation data centre. The GFA is about 36,000m<sup>2</sup>. The building was augmented by renewing the facade. It also encompassed the relocation of the existing technical facilities and the renewal of the base building systems to provide all necessary plants and infrastructure to support the new data centre.





# HSBC DATA CENTRE

HONG KONG

**UTI RATING**  
TIER IV

**CLIENT**  
The Hong Kong and  
Shanghai  
Banking Corporation Ltd

**COMPLETION DATE**  
2008

**SERVICES PROVIDED**  
MEP, C&S, Geotechnical  
Engineering

## KEY ATTRIBUTES

Annualized PUE:	1.65 – 1.75
IT Power:	40 MW
UTI Rating:	Tier IV
GFA of approx.	46,000 m <sup>2</sup>

## KEY SYSTEMS DESIGN

- Uptime Availability requirements with 340km of Copper Cable and 2,400 optic fibre cable
- IAQ Excellent Class
- Rainwater Harvesting System
- Plug and Play System for Phase II expansion
- Inergen Gas Fire Suppression System with Zero Global Warming Potential



# GLOBAL SWITCH DATA CENTRE

SINGAPORE

**UTI RATING**  
TIER III

**COMPLETION DATE**  
2018

**SERVICES PROVIDED**  
C&S Engineering

Global Switch's proposed new Tier III data centre facility has been designed to accommodate latest IT technologies in terms of power and cooling, together with sufficient flexibility to allow adaptation as those demands change over time.

The data centre is targeted to meet the highest environmental rating for a data centre, being LEED Gold/Platinum as well as local Green Mark Platinum.

Total GFA: 24,800 sqm, with the possibility of future expansion.





# CREDIT SUISSE DATA CENTRE

SINGAPORE

**UTI RATING**  
TIER IV

**COMPLETION DATE**  
2012

**SERVICES PROVIDED**  
MEP Engineering & PM

Meinhardt Singapore was the Project Manager and Owner's Representative and MEP Engineer for Credit Suisse's New Data Centre Facility. The project consists of a 5-storey new build with approx. GFA of 14,500 sqm. The building is capable of housing 4 nos of data halls.

- Estimated energy savings: 839,542 kWh/yr and water savings: 1,311 m<sup>3</sup>/yr.
- Multi-layered insulation system resulting in ETTV of only 33.64 W/m<sup>2</sup>.
- Chiller Façade System providing extensive sun shading. Building in white as most reflective color. Same applies inside building where majority of equipment and all internal surfaces are also in white.
- Overall air-conditioning plant system efficiency is 0.688 kW/ton.
- Rainwater harvesting and NEWater connection to reduce the mains water consumption for cooling tower make-up, irrigation and WC flushing.
- Independent Testing and Commissioning Company to verify the commissioning of the building and ensure that set up is done in most energy efficient way.





# GLOBAL SWITCH DATA CENTRE

HONG KONG

**UTI RATING**  
TIER IV

**COMPLETION DATE**  
2019

**SERVICES PROVIDED**  
C&S and Geotech  
Engineering

Meinhardt is provided civil, structural and geotechnical consultancy services for a design and build Tier 4 data centre in Hong Kong.

The centre has a GFA approx. 55,000m<sup>2</sup> on 5-levels plus a roof. The building will be built in three phases.

RSE services for superstructure works and also substructure and associated ELS works for provision of 7 nos. 60000L underground fuel storage tanks in form of RC structures underneath the EVA.





# GOVERNMENT DATA CENTRE COMPLEX

HONG KONG

## COMPLETION DATE

2018

## SERVICES PROVIDED

MEP and Independent  
Checker

The Government Data Centre Complex at Cheung Sha Wan is owned by the Office of the Government Chief Information Officer (OGCIO) who provides a colocation data center and associated facilities for 10 government departments/ Bureaus.

Total GFA is about 12,400m<sup>2</sup>, there are data center halls in 7 storeys occupying total white space of 4,100m<sup>2</sup>. The Building Services facilities in the Complex will be designed to Tier III service availability of Uptime Institute and compliant to Level L2 Security Standard of HKSAR Government.

Meinhardt provided appraisal services for the major building services systems design for Stage 1 (Programme No. 120KA) and act as the independent checker employed by OGCIO for Stage 2 to Stage 4.



# PACNET NEW DATA CENTRE

HONG KONG

## UTI RATING

TIER III

## COMPLETION DATE

2012

## SERVICES PROVIDED

Lead Consultancy & PM

The existing EAC1 cable station was converted to a new Tier III Data Centre over 4,000 sqm to provide capacity for 800 equipment cabinets operating at 3.8kW per rack.

The building was augmented by renewing the facade and an additional new concrete roof.

It encompasses the relocation of the existing technical facilities and the renewal of the base building systems to provide all necessary plant and infrastructure to support the new data centre.





# BARCLAYS DATA CENTRE

INDIA

**SHARED SERVICES  
DATA CENTRE**

**COMPLETION DATE**  
2010

**SERVICES PROVIDED**  
Due Diligence & MEP

The data centre was fitted out with resilient IT infrastructure capable of integrating information across locations and provided centralized repository in a secure environment.



# TELSTRA DATA CENTRES

AUSTRALIA

## MODULAR SOLUTION

PLUG & PLAY  
TECHNIQUE

## COMPLETION DATE

2015

## SERVICES PROVIDED

MEP Engineering

The project includes major services upgrade of two existing exchange buildings and their data centres & telecommunication floors, including an emergency power plant, new substation work, DA submission to Sydney City Council and compliance with Telstra end-to-end standards.

## PROJECTS & LOCATIONS

Telstra: Kent Street	Sydney, NSW
Telstra: Hypermarket	Sydney, NSW
Telstra: Pitt Street	Sydney, NSW
Telstra: Broadway	Sydney, NSW
Telstra: North Sydney	Sydney, NSW
Telstra: Strategic Masterplans	NSW & ACT

Central to the success of the project was the provision of a one-stop shop service. This allowed total control of the project from a cost and scheduling perspective but also gave us the ability to integrate innovative ideas to ensure full flexibility and reliability.

We have created a modular solution, which adopts a 'Plug and Play' technique to all services for easy future expansion. By simply providing the necessary infrastructure for immediate load increase significant cost savings have been made. This modular approach also allowed easy dissection of the project into seven, fully integrated stages to minimise any impact on the existing building's operation.

Computational Fluid Dynamics (CFD) techniques were employed, and studies performed during design development to optimise the plant room layout and air flow cooling and combustion air flow.





# MELBOURNE UNIVERSITY DATAHALL 1 & 2

AUSTRALIA

**UTI RATING**  
TIER II

**COMPLETION DATE**  
2017

**SERVICES PROVIDED**  
MEP Engineering

The data centre was designed for 800w/m<sup>2</sup> density and incorporated 100% generator back-up, full redundancy UPS, N+1 air conditioning option. Full FM200 suppression system and pre-action sprinkler system.

The building services have been designed to solve a complex challenge and provide the University with a sufficiently redundant high density, IT Equipment facility which:

- Supports Research High Performance and Super Computing Requirements
- Rationalises IT equipment
- Reduces running costs to operate IT equipment by reducing power consumption
- Is scalable in a modular design to meet future UoM Data Centre capacity requirements

Our design has enabled the client to save money and energy by virtue of lower power consumption.

Close collaboration with partners/suppliers enabled a very tight 4-month construction programme to be met.



# SILA DATA CENTRE

THAILAND

**UTI RATING**  
TIER III

**COMPLETION DATE**  
2015

**SERVICES PROVIDED**  
Design Review  
and Construction  
Management

This is the new AIS data centre which has 15,000 sqm whitespace to accommodate 800 IT racks. The Data Centre infrastructure has been designed to meet Tier III standard with new innovation for energy saving to minimize the PUE (Power Usage Effectiveness).

## KEY ATTRIBUTES

No. of Racks:	800
IT Power:	4.8 MW
UTI Rating:	Tier III

## KEY SYSTEMS DESIGN

### Cooling Systems:

- Magnetic Water-Cooled Chiller
- Thermal Storage Tanks for Continuous Cooling
- CRAH Units with high efficiency EC Fans

### Electrical Systems:

2N Redundancy for all Power Distribution including Transformers, Generators, UPS and Switchboards



A photograph of the SCB New Data Centre building, a modern, multi-story structure with a glass facade, situated in an urban environment. The building is the central focus of the image, with other skyscrapers visible in the background under a clear sky.

# SCB NEW DATA CENTRE

THAILAND

**UTI RATING**  
TIER IV

**COMPLETION DATE**  
2012

**SERVICES PROVIDED**  
Design Review, Project  
Management and  
Construction Supervision

The data centre meets the highest level of resilience requirements to TIA-942 Standard (Tier 4) – the first in Thailand. It is designed to be the primary support for a major commercial bank's IT infrastructure for the next 20 years.

## KEY ATTRIBUTES

No. of Racks:	310
IT Power:	1.0 MW
UTI Rating:	Tier IV


## KEY SYSTEMS DESIGN

### Cooling Systems:

- Magnetic Water-Cooled Chiller
- Thermal Storage Tanks for Continuous Cooling
- CRAH Units with high efficiency EC Fans

### Electrical Systems:

2N Redundancy for all Power Distribution including Transformers, Generators, UPS and Switchboards



# TELLUS 2 MODULAR DATA CENTRE

THAILAND

**UTI RATING**  
TIER III

**COMPLETION DATE**  
2012

**SERVICES PROVIDED**  
Project Management and  
Design Review

## KEY ATTRIBUTES

No. of Racks: 800  
IT Power: 4.0 MW  
UTI Rating: Tier III

## KEY SYSTEMS DESIGN

Data Centre Modules:  
2@10 Stack-up Scalable Modular Data Centre Modules

### Cooling Systems:

Variable Speed Air-Cooled VRF

### Electrical Systems:

2N Redundancy for all Power Distribution including  
Transformers, Generators, UPS and Switchboards





# GH BANK DATA CENTRE

THAILAND

**UTI RATING**  
TIER III

**COMPLETION DATE**  
2017

**SERVICES PROVIDED**  
Project Management  
& Construction  
Management

The project is the Government Housing Bank's new data centre with located at Rama 9, Bangkok. This data centre has total GFA of 4,700 sqm with 500 sqm white space area, consisting of 5 storeys and 1 basement level. This GH Bank main data centre is designed up to Tier III level standards.

## KEY ATTRIBUTES

No. of Racks:	150
IT Power:	0.6 MW
UTI Rating:	Tier III

## KEY SYSTEMS DESIGN

### Cooling Systems:

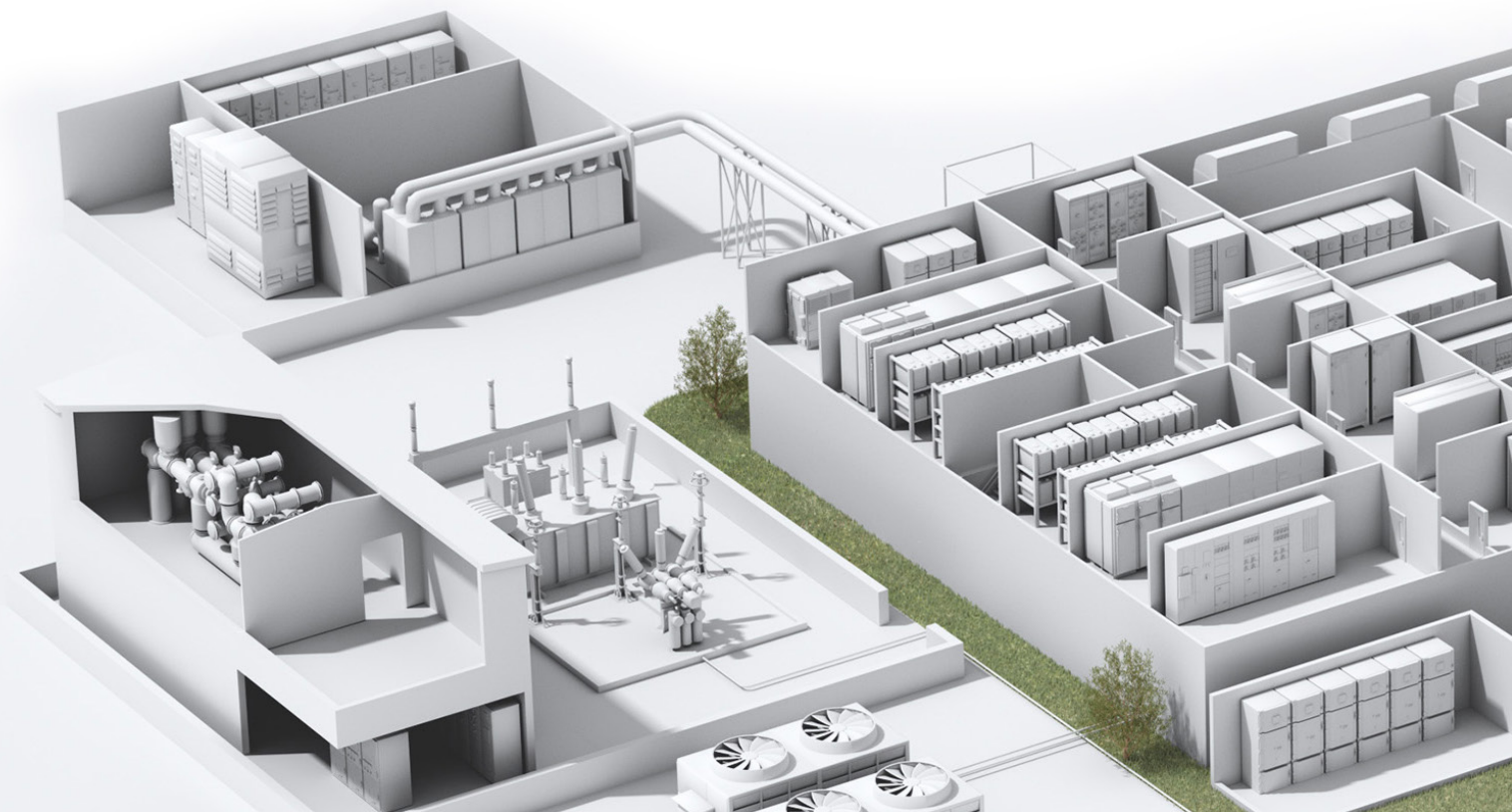
Variable Speed Air-Cooled VRF

### Electrical Systems:

2N Redundancy for all Power Distribution including Transformers, Generators, UPS and Switchboards.

# WE BELIEVE IN A 3-PRONG APPROACH

Governments, Technology Companies and various other end-users continue to drive innovation in the data centre industry. They demand more **efficient, sustainable, environmentally considerate** data centres, whilst reducing carbon emissions.





## BIM & VIRTUALISATION

Apart from the benefits of using BIM for coordination and clash detection, it is a critical tool for navigating the lines of conduit and other elements through very tight spaces – the margin for error needs to be at the absolute minimum.

- Space Planning
- Prefabrication Coordination
- Managing Project Phasing
- Integrating Raised-Floor Layouts
- Conflict-free Routing
- Commissioning and O&M Tasks
- Airflow Analysis through CFD Simulations

## INNOVATIVE COOLING TECHNOLOGIES

Our engineers are well versed with current cooling systems and methods and are continually keeping abreast of the design of future cooling systems and technologies.

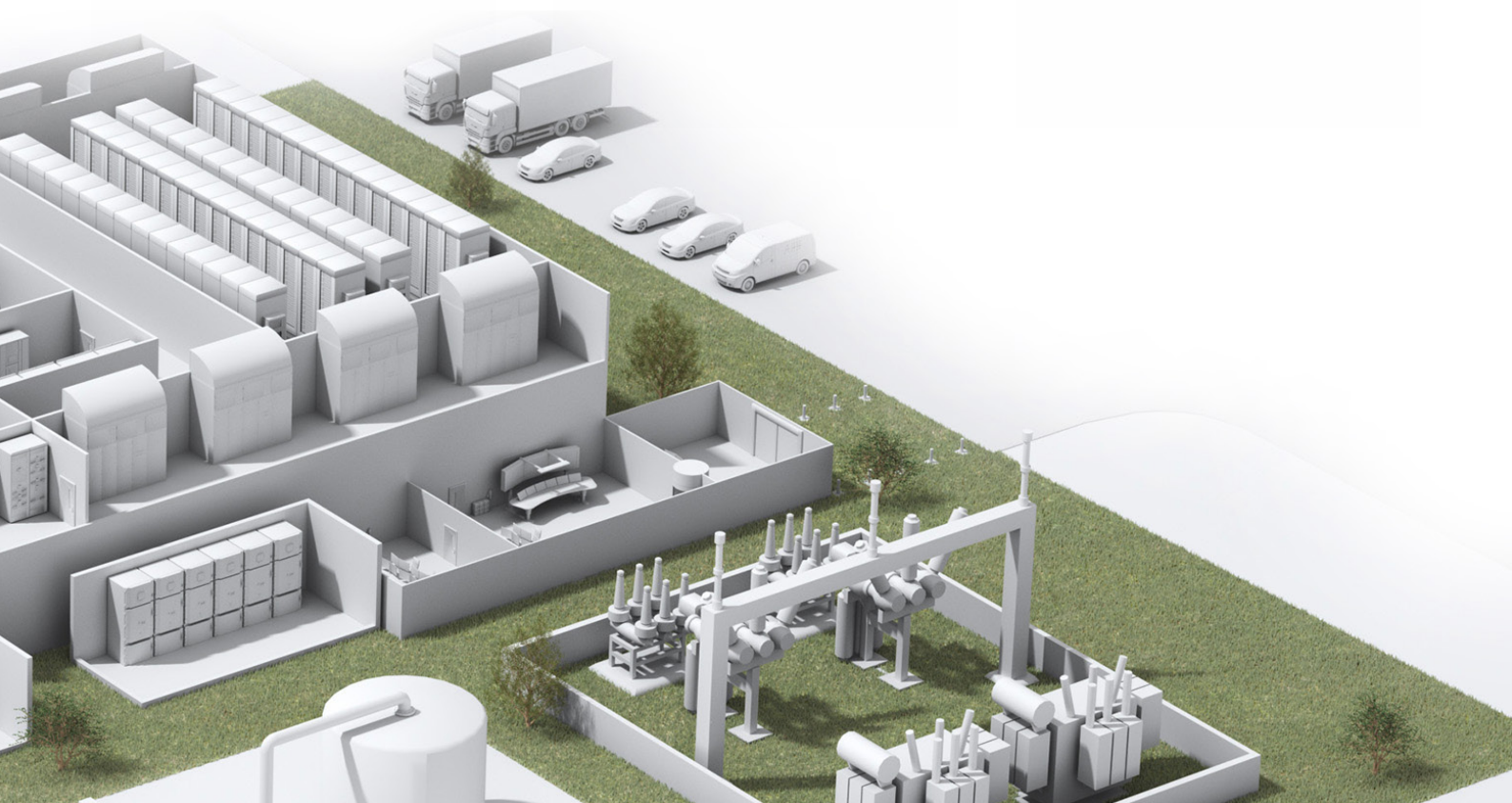
Colocation centres are now investing in liquid cooling and other new methods to solve their cooling challenges.

- Liquid Cooling Technologies
- Immersion Cooling
- Direct to Chip Cooling

## SUSTAINABILITY & GREEN DATA CENTRES

Sustainable designs lie at the heart of our engineering solutions, we seek to address challenges and barriers at the design stage so that owners and operators can lower operational costs whilst decreasing the overall impact to the environment.

- We leverage the latest technologies and monitoring systems
- Engineers, operators and owners can analyse power transparently to optimize cooling and infrastructure
- Inefficiencies can be identified and addressed at the design stage



## CONTACT

Get in touch today and let us help you navigate the intricate energy and environmental challenges in your next data centre.

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Sustainable Designs with  
Global Accreditation



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