

02 · DESIGN

Detailed data centre design from LOD 200 to LOD 450

A detailed design engagement that ends at the drawing stage is only half a service. Technavious keeps the same engineering team involved through construction.

WHAT THIS SERVICE COVERS

A detailed design engagement that ends at the drawing stage is only half a service.

The Detailed Design and Execution Pack covers the full design development lifecycle across HVAC, Electrical (LV/MV), ELV, Fire Protection, Network, and Plumbing, all in-house, with no sub-consultant dependency. Every design is validated through CFD thermal simulation and ETAP electrical analysis before construction begins, so design gaps that would otherwise be discovered on site are identified and resolved at the drawing stage. A cloud-delivered, simulation-ready digital twin is produced as part of the engagement, giving the operations team a validated model for future capacity planning from day one. The service is available for Greenfield, Brownfield, Powered Shell, and AI-ready data centre variants.

LOD 200 to LOD 450

CFD and ETAP simulation validated

Cloud digital twin delivered

WHAT WE DELIVER

Deliverables from this engagement

01

Design calculations, all disciplines

Full engineering calculations across HVAC, Electrical, ELV, Fire Protection, Network, and Plumbing, forming the technical basis for all design decisions.

02

CFD and ETAP simulation reports

CFD thermal simulation validating airflow and cooling performance. ETAP electrical analysis confirming power system stability and fault current.

03

Co-ordinated design package (LOD 200–450)

Phased design development from schematic LOD 200 through construction-ready LOD 450, with clash detection at each stage.

04

Cloud digital twin

Simulation-ready digital model delivered via cloud platform, enabling ongoing capacity planning and upgrade scenario modelling.

05

Vendor document & shop drawing review

Technical review of all equipment vendor submissions and shop drawings against design specifications.

06

HOTO documentation package

As-built drawings, equipment schedules, O&M manuals, warranties, and test certificates compiled for handover.

WHY TECHNAVIOUS

What makes our detailed design approach different

Simulation before construction. One team across all disciplines. No interface gaps.

1

All six disciplines in-house

HVAC, electrical, ELV, fire, network, and plumbing are all in one co-ordinated team, with no interface gaps between consultants for contractors to exploit.

2

Simulation as standard, not a premium add-on

CFD and ETAP simulation are included in every Detailed Design engagement. Design decisions are backed by simulation rather than assumption.

3

Digital twin from day one of operations

Most facilities commission a digital twin retrospectively, months or years after handover. Technavious delivers it as part of the design engagement.

HOW WE WORK

Five phases from design brief to construction support

01

Design brief

Client requirements, site constraints, and any Decision Accelerator outputs confirmed.

02

Schematic (LOD 200)

System selection, layout concepts, preliminary calculations. Review gate before LOD 300.

03

Development (LOD 300)

Detailed system design, equipment selection, CFD/ETAP simulation. Gate before LOD 400.

04

Construction docs

LOD 400–450 drawings, specifications, and BOQ. Vendor document review initiated.

05

Construction support

RFI resolution, design change management, on-site support through build and T&C.

CASE STUDIES

Detailed design work we have delivered

COLOCATION OPERATOR

MEP design for a 4 MW facility with a dual-mode cooling system supporting 6–20 kW rack loads. ETAP and CFD modelling mitigated hotspots and voltage risks before construction.

HYPERSCALE DC OPERATOR

Power density upgrade across 100 live racks, from 6 kVA to 15 kVA. A 150% density increase, CFD-validated with zero hot spots, delivered without disrupting tenant operations.

LEADING INDIAN STOCK EXCHANGE

Infrastructure expansion and modernisation within an existing live premises. 120 additional racks delivered with full multi-standard sign-off across Rated 3, IEEE and ASHRAE.

FREQUENTLY ASKED QUESTIONS

Questions we are regularly asked about Detailed Design

What is LOD 450 and why does it matter for data centre construction?

Level of Development 450 is a construction-ready design with enough detail to let contractors install equipment without interpretation. A design delivered at LOD 400 or below leaves gaps that contractors fill with on-site decisions, which is how design erosion begins.

How does CFD simulation reduce construction cost?

CFD simulation identifies cooling configuration problems, hot spots, and airflow issues at the design stage, where they cost engineer time to resolve. The same issues discovered on site require equipment repositioning, additional cooling units, or structural modifications.

Can you design for AI workloads and high-density rack configurations?

Yes. Technavious offers an AI-ready design variant within the Detailed Design pack, covering high-density rack configurations above 10kW per rack, direct liquid cooling and rear-door heat exchanger integration, and power distribution design for GPU-intensive workloads.

What is the cloud digital twin and how do operators use it?

A simulation-ready virtual model of the facility that lets the operations team model future capacity scenarios and test cooling configuration changes before implementing them physically. It remains accessible as a cloud-based tool for the life of the facility.

Ready to scope a Detailed Design engagement?

Tell us your project stage, capacity, and use case, and whether you have a Decision Accelerator Pack or conceptual design to build from.

[Talk to us today](#)