

02 · DESIGN

Simulation-validated design engineering

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INTRODUCTION

The most common and expensive failure in data centre construction is discovering on site what should have been resolved on paper. Technavious eliminates that failure mode through a design process validated by simulation before construction begins, aligned to TIA 942C from day one.

100+ TIA 942C reference designs	30–45 days Conceptual design delivery	6 disciplines All in-house	CFD + ETAP Simulation validated
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WHAT IS INCLUDED

Five design services for every stage of project maturity

From early conceptual validation through to full construction documentation and independent peer review.

01 · Decision Accelerator Credible concept design in 30–45 days Using our library of 100+ TIA 942C-certified reference designs, we deliver use-case optimised feasibility concepts and LOD 200 schematics. - LOD 200 schematics × 6 disciplines - Budgetary estimates - Compliance adjacency assessment - Vendor document review	02 · Detailed Design LOD 200 to LOD 450, simulation-validated Our flagship design service, from conceptual approval to a fully co-ordinated, construction-ready design package, CFD and ETAP validated. - CFD + ETAP simulation - Cloud digital twin - Architectural walkthrough - As-built & HOTO package	03 · Testing & Commissioning T&C within Design, not Build A three-stage programme: component, system, and operational readiness. The same team that designed the facility validates its realisation. - Component & system test reports - Failover test reports - Punch list management - HOTO sign-off
04 · Prefabricated DC Site to handover in 24 weeks Pre-designed, pre-fabricated, pre-installed and pre-tested to TIA 942C before it arrives on site, for edge, enterprise satellite, and temporary capacity needs. - Pre-fabrication co-ordination - Factory testing - SITC on site - TIA 942C-ready cert package	05 · Design Peer Review Independent validation against TIA 942C Review against ASHRAE, NFPA, IEEE, IS, NBC, TIA 942C and IEC, with optional CFD and ETAP validation. - Design review report - Compliance gap analysis - Certification readiness - Optional CFD/ETAP	

WHY TECHNAVIOUS

What makes our design outputs different

Every design is validated by simulation before construction begins. Standards-aligned from day one. No sub-consultant dependency.

1 Multi-discipline in-house team

HVAC, electrical (LV/MV), ELV, fire, network and plumbing, all in-house. No interface gaps between disciplines for contractors to exploit, and clash-free designs in a single co-ordinated model.

2 Simulation as standard, not optional

CFD validates airflow and cooling. ETAP validates power system stability and fault current. Every design decision is backed by calculation or a certified reference precedent, not assumption.

3 TIA 942C alignment from design stage

Our design team works in active collaboration with our TIA 942C auditors throughout design, not at the end. Designs meet certification requirements at pre-construction phase, eliminating CAPA cycles.

HOW WE WORK

A structured six-phase design engagement

Design gate reviews happen at each phase. The client approves each level of detail before the next is developed.

01	02	03	04	05	06
Design brief	Scope alignment	Conceptual design	Detailed design	Construction support	T&C & handover
Client provides planning outputs, design requirements, and constraints. Technavious confirms scope.	Design product proposed with deliverable schedule and pricing, approved before work commences.	Decision Accelerator Pack delivered in 30–45 days, reviewed and approved before Detailed Design.	LOD 200 through LOD 450. Intermediate client reviews at each LOD gate. Simulation models submitted.	Vendor document review, design change management, RFI resolution on site by the engineering team.	T&C programme executed against design specifications. Operational readiness sign-off and HOTO.

CASE STUDIES

Design and engineering work we have delivered

HYPERSCALE DC OPERATOR, TWO SITES

Independent design peer review across two upcoming facilities identified cooling and power distribution gaps. Design corrections were completed before any rack was powered on, and both facilities launched thermally stable and production-ready.

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.

COLOCATION SERVICE PROVIDER, JORDAN

HVAC and cooling stabilisation for a 0.75MW facility. Recurring chiller shutdowns and alarm cycles eliminated, with a documented, prevention-first framework established to protect customer SLAs.

FREQUENTLY ASKED QUESTIONS

Questions we are regularly asked about data centre design

What is CFD simulation and why does it matter?

CFD (Computational Fluid Dynamics) models airflow and thermal performance before construction begins. It validates cooling placement, identifies hot spots, and confirms the CRAC/CRAH configuration meets ASHRAE requirements.

How does the Decision Accelerator deliver in 30–45 days?

The speed comes from our library of 100+ TIA 942C-certified reference designs. We start from a validated, certified precedent and adapt it to the specific use case, eliminating the validation step that makes bespoke conceptual design so time-consuming.

Why does Technavious put testing and commissioning in Design, not Build?

T&C validates that design intent was met, not merely that construction was completed. When the same team that designed the facility validates its realisation, accountability is clear and the TIA Facility Cert audit trail is unbroken.

What is a data centre digital twin and what does Technavious deliver?

A digital twin is a simulation-ready virtual model delivered via a cloud platform, letting operators model future capacity scenarios before committing to physical works. Technavious delivers it as part of the Detailed Design pack.

Ready to scope a Decision Accelerator for your project?

Tell us your use case, capacity, and target tier, and we will confirm whether a reference design exists in our library.

[Talk to us today](#)