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Designing the Digital Backbone: How Data Centers Are Reshaping A/E Practice

Across the country, data centers are emerging as one of the defining building types of the digital economy. The expansion of AI platforms, cloud computing, and hyperscale infrastructure is accelerating demand for large, highly technical facilities that are reshaping land use, utility planning, and project delivery in many U.S. markets. For architects and engineers, the significance lies not only in the volume of work but in the unique project risks and delivery pressures these facilities create.

The Digital Economy Is Now Physical Infrastructure

The digital economy increasingly depends on physical infrastructure constrained by utility access, entitlement timing, and construction capacity rather than real estate alone. Markets such as Ohio and the broader Midwest are benefiting from available land, relative power advantages, tax incentives, and proximity to major population centers. At the same time, public resistance to data center growth is increasing as communities scrutinize electricity demand, water use, land intensity, and long-term infrastructure impacts.

Growth Is Outpacing Infrastructure Capacity

Industry reporting throughout 2025 and 2026 has consistently identified power availability and interconnection timing as the defining constraints on data center development. Utility capacity, permitting schedules, and long-lead equipment procurement now influence project feasibility and delivery schedules as much as the building design itself.

Central Ohio illustrates the trend clearly. Rapid expansion in the region has intensified pressure on electrical infrastructure, utility planning, and long-range development strategies. Similar conditions are emerging in Texas, Arizona, Virginia, and portions of the Midwest, where AI-oriented campuses require larger power feeds, sophisticated cooling systems, and accelerated utility upgrades.

Why Data Centers Are Different

Data centers differ materially from conventional commercial projects because they function as mission-critical facilities. Even brief outages can expose owners to operational disruption, contractual liability, reputational damage, and major financial loss. That reality changes both owner expectations and the severity of potential disputes.

These projects typically involve:

- Fast-track schedules and compressed procurement timelines
- Dense interdisciplinary coordination among electrical, mechanical, structural, controls, fire protection,

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and telecommunications systems

- Extensive commissioning and integrated systems testing before occupancy
- Evolving owner criteria and vendor-driven performance requirements
- Significant reliance on delegated design and proprietary equipment

In this environment, relatively ordinary design or coordination issues can escalate quickly when they affect energization, sequencing, or uptime assumptions.

Contractual and Professional Liability Risks

Many of the largest exposures on data center projects arise from contract language rather than technical complexity alone. Mission-critical operations and aggressive delivery schedules often push agreements toward obligations that exceed traditional professional liability standards or available insurance coverage.

Architects and engineers should carefully review:

- Performance obligations or uptime representations that resemble guarantees
- Broad indemnity provisions and exposure to consequential damages
- Schedule commitments dependent on utility approvals, permitting, procurement, or contractor sequencing
- Certification language implying promised outcomes rather than professional judgment
- Liability provisions inconsistent with available insurance coverage

The safest approach is to keep obligations tied to a traditional negligence-based standard of care, clearly document assumptions and owner responsibilities, and define external dependencies such as utility availability, owner-furnished information, and vendor criteria.

Practical Risk-Management Strategies

Because data center projects combine technical complexity with heightened sensitivity to delay, disciplined documentation and coordination are essential. A/E firms should:

- Define scope, system interfaces, and design assumptions with precision
- Maintain rigorous change-management and decision-tracking procedures
- Clearly allocate responsibility for delegated design, commissioning, and systems testing
- Treat utility access, interconnection timing, permitting, and long-lead equipment as primary project risks
- Use enhanced QA/QC procedures for dense interdisciplinary coordination
- Align liability limitations and indemnity language with insurable risk

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Conclusion

The data center boom presents a significant opportunity for architects and engineers, but these projects are not simply larger versions of conventional industrial or commercial work. They combine infrastructure dependency, technical complexity, and heightened exposure to delay-related claims in ways that demand disciplined project delivery and carefully negotiated contracts.

Firms best positioned for this sector will pair technical capability with strong scope definition, realistic assumptions, rigorous coordination, and contracts aligned with insurable risk. In the data center market, risk management is not peripheral to professional service — it is part of the service itself.