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What Every Construction Manager Needs To Know Before Building An AI Data Center

A Four-Phase Field Guide For The Full Delivery Cycle

Written by: Lawyer Darfour, Lead Consultant, Quality Manager, WSP

U.S. data center spending now totals roughly $40 billion annually. By 2028, data center projects are projected to represent 40% of all U.S. office construction expenditures, up from 5% a decade ago. Amazon has pledged to spend $100 billion in an effort towards global expansion. The Meta Campus in Lebanon, Ind., has a $10 billion price tag and the Stargate Project is targeting 10 gigawatts of new capacity nationwide.

Most construction managers (CMs) stepping into this volume of work lack a delivery framework built for it. This is not a conventional data center construction project of the past that just involves larger equipment. This is a fundamentally different discipline in scope, schedule pressures, technical coordination demands, and the ever-present owner's expectations. What follows is a four-phase operational framework covering delivery across the full project cycle.

PHASE 1: PRE-CONSTRUCTION, RISK PLANNING, AND COMMUNITY ALIGNMENT

Pre-construction has more long-term risks on AI data center projects than on other project types, this phase consistently compressed under schedule pressure. AI data centers consume 20 - 100 MW of power per building; they draw millions of gallons of water daily and depend on fiber infrastructure that can take years and a significant amount of capital to extend. A site that looks clean from a real estate standpoint can be disqualified on engineering or operational grounds if the utility capacities are insufficient.



CM engagement before site acquisition, not after, is one effective risk management step on these projects. Zoning and entitlement timelines, which can range from six to 24 months, need to be confirmed before the project schedule is set. The CM should get written IT load targets, rack density assumptions, and hardware refresh cycle commitments before design begins. AI infrastructure changes faster than a construction cycle. A facility designed for one GPU generation may be under construction as the next generation is announced, meaning different thermal profiles and power requirements.

Community opposition to data center development has halted several U.S. markets, therefore risk should be extended to public relations as well. The two cases below highlight some community opposition risks:

- **Naperville, Ill. (January, 2026):** Developer Karis Critical proposed a data center campus on the former Alcatel-Lucent site along the I-88 corridor. The project was scaled back three different times over five months, from 72MW to 24MW before the Naperville city council voted 6-1 to deny the conditional-use permit, despite the Planning and Zoning Commission had recommended 8-1 approval.
- **Hobart, Ind. (2025-2026):** Amazon Web Services received unanimous approval by the city council for a $15 billion, 700-acre campus, after nearly 90 minutes of public testimony in which all but one speaker sought rejection. By early 2026, multiple lawsuits had halted site work, including a challenge alleging a fill permit was approved without a complete site plan.

The CM's obligation is to verify before mobilization that the owner has done the work: documented adjacent property outreach, required public information meetings held, generator specifications are disclosed before the first public hearings take place, and a signed permit condition compliance matrix.

PHASE 2: DESIGN REALITIES, COST TRACKING, AND SMART PROCUREMENT

The CM's role in the design and engineering process on an AI data center isn't review and approval. It's constant conflict resolution between what the design team develops and what can be built within the project's cost and schedule. Total construction costs for a ground-up AI data center typically range from $600 - $1,100 per gross square foot for a conventional facility. AI-ready, liquid-cooled facilities are coming in at $20 million per MW or more, roughly double, driven by direct liquid cooling infrastructure and high-density power distribution.

This increase in cost can change the entire MEP scope of a project:

- **Conventional Data Center:** Electrical systems account for approximately 54% of construction cost and mechanical systems approximately 22%.
- **Liquid-cooled AI Facility:** Mechanical systems rise to 33% based on direct liquid cooling loops, CDUs, and associated chilled water systems, while electrical systems drop to 48%.

Electrical systems generally make up 40 - 45% of the total construction costs on an AI data center. A 100MW campus at mid-range pricing, a 3% variance on the electrical scope is $8 - $14 million. Cost tracking needs more frequent update cycles than standard commercial construction: weekly updates, not monthly, on MEP. Owner Furnished, Contractor Installed (OFCI) scope requires a parallel tracking system updated on the same cycle as the construction cost report.

Treat procurement as a post-construction document activity and you will miss the schedule. Lead times for specialized equipment exceed what most schedules can absorb.

Switchgear is currently running 46 - 48 weeks in most markets, and up 50% from the Q3 2021 baseline. UPS, generators, and transformers have moved to 44 - 48% over the same period. A purchase order placed at 50% construction documents is not early procurement; it's late procurement with pricing reflected. Any item with a lead time of over 30 weeks, qualify a backup vendor before the primary award, not after a delivery failure. Dual-source qualification is trivial compared to the cost of a six-weeks schedule recovery.

PHASE 3: CONSTRUCTION EXECUTION, COORDINATION, AND LABOR

The MEP density, equipment sensitivity, and scheduling stakes on AI data center projects demand a higher level of execution discipline than most CMs have ever encountered on commercial or industrial work. BIM-based clash detection at LOD 400 is considered the floor, not the ceiling, to prevent rework a weekly coordination meeting where the MEP trade foremen, structural superintendent, and IT infrastructure lead resolve conflicts before they reach the field.

Phased delivery is now standard on large campuses, and once a hall goes live while the next is under construction, the CM is managing an operating critical facility and active construction site at the same time, so utility access, vibration, dust, and worker routing boundaries that must be established before energization and enforced without exception.

Jobsite safety on data center projects includes arc flash hazards at levels that are considered uncommon in commercial construction. Stop-work authority should be defined in writing at project kickoff. A site-specific electrical safety program defining arc flash boundaries, mandatory PPE requirements,

and energized work permit procedures must be in place before work begins in any switchgear area. Electrostatic discharge control deserves the same discipline: modern GPU accelerators are sensitive to ESD in the same ways conventional IT equipment is not, and damaged components can degrade for weeks before they fail.

Labor is the most volatile cost input on a data center project currently. The U.S. construction industry was short roughly 439,000 workers industry-wide in late 2025, data center contractors carry an average project backlog of almost 11 months versus about eight months for other contractors. A licensed commercial electrician is not qualified to terminate 15kV switchgear, and a commercial plumber is not qualified to install a deaerated ultra-pure water loop. Data center roles can also pay 25 - 30% above the standard construction rates, not a union scale adjustment but a market premium for verifiable experience. Staffing shortages accounted for 52% of disruptions on data center projects in 2025, up from 43% the previous year. Prequalification criteria that distinguish data center experience from commercial experience are the CM's only way to catch these gaps before they become a schedule nightmare.

These execution risks do not occur in isolation: a switchgear delay compresses the commissioning window; the compressed window now pressures the CxA accept undertested systems, and those systems produce year one failures that create warranty exposure. A risk register created at the start of the project and reviewed weekly between the CM, the owner's PM, and the lead EoR is the one tool that keeps the interaction visible before it becomes a schedule event.

PHASE 4: COMMISSIONING IST, DOCUMENTATION, AND WARRANTY

Most project teams underestimate commissioning until they understand what it fully entails: a multi-level validation process that must prove power, cooling, controls, monitoring can all work together before a single rack goes live. The Commissioning Authority (CxA) needs to be engaged during design development even before Guaranteed Maximum Price (GMP) is set, and not at substantial completion. The BAS/DCIM/EPMS system integrator should be on-boarded at least 12 months before occupancy. This is the minimum required to complete integration programming without compressing the testing window.

The Integrated Systems Test (IST) or "pull the plug" test is a minimum of 72 - 96 hours of continuous operation with load banks simulating full IT load. All possible failure scenarios should be assessed during this period. Every automatic control sequence must perform as it was designed before IST is accepted. IST is not just some formality; it serves as proof that the facility works and functions as intended.

Zone-by-zone commissioning running in parallel with construction is both a schedule advantage and a cost control measure, since defects found while the trade is still mobilized can cost a fraction of what the same defects cost during a compressed end of project commissioning push. Digital twin data is generated throughout construction and commissioning rather than assembled at closeout.

CONCLUSION

AI data center construction is not a market segment that a construction management firm can enter by applying existing commercial or industrial methodologies. The exposure points are real, and the mistakes that produce the biggest losses are all avoidable with a delivery framework built specifically for this work. The CMs who build the right delivery framework now will be the ones executing the next cycle of projects.

For industry professionals looking to dive deeper into the technical specifications and data behind this framework, this four-phase article maps directly to the 12 considerations detailed in the full white paper, "Special Considerations for Construction Management on Building AI Data Centers," available here: Special Considerations for Construction Management on Building AI Data Centers.



About the Author

Lawyer Darfour, lead consultant, quality manager at WSP, is a construction professional with 22+ years of complex project experiences spanning oil sands refineries, LNG facilities, pulp and paper mills, lithium process plants, potash process plants, and rail/transit infrastructure across North America, South America, and international markets. He is a member of the CMAA Chicago Chapter.

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