

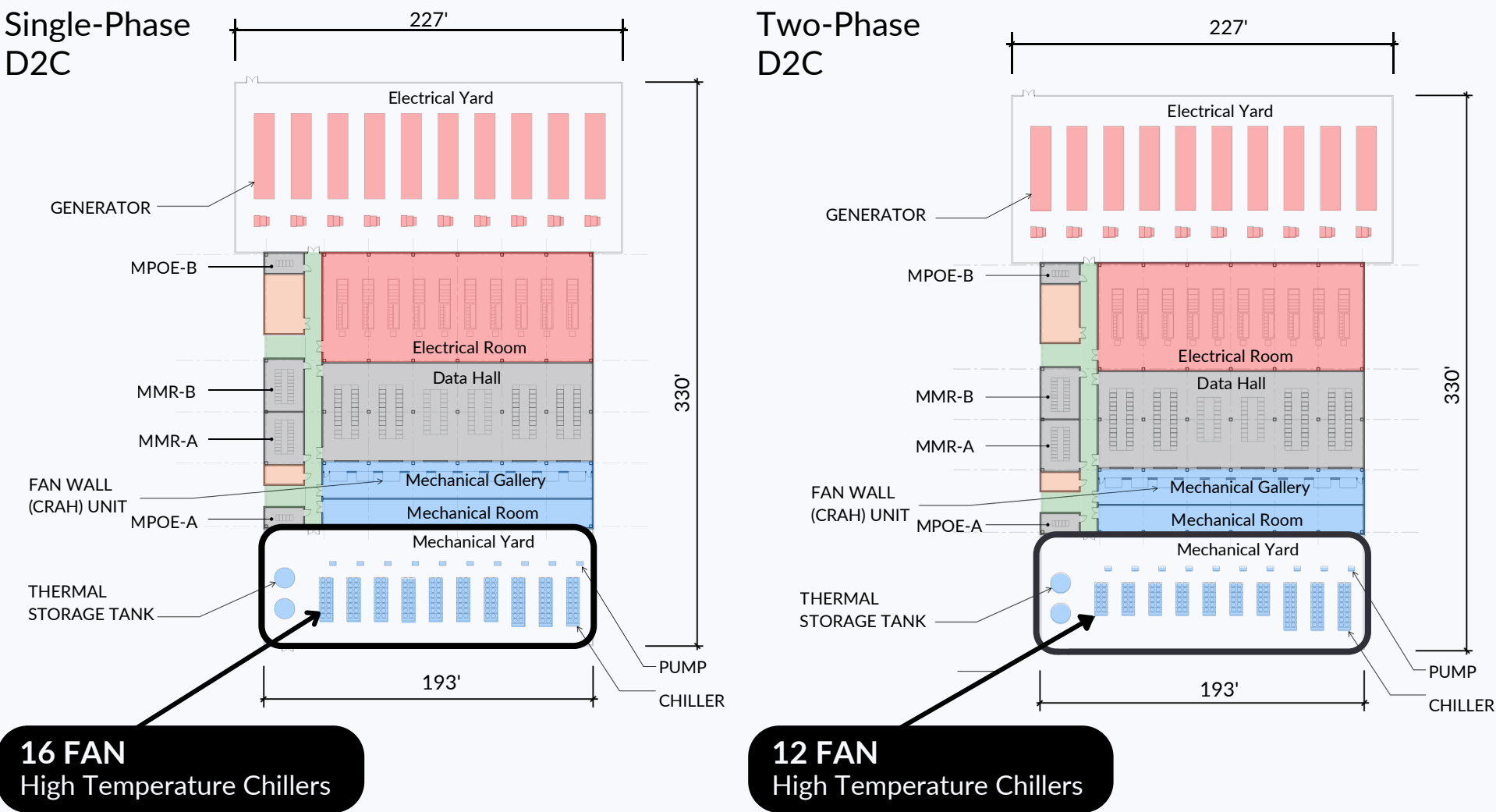
Jacobs 10MW Data Center Reference Designs

Introduction

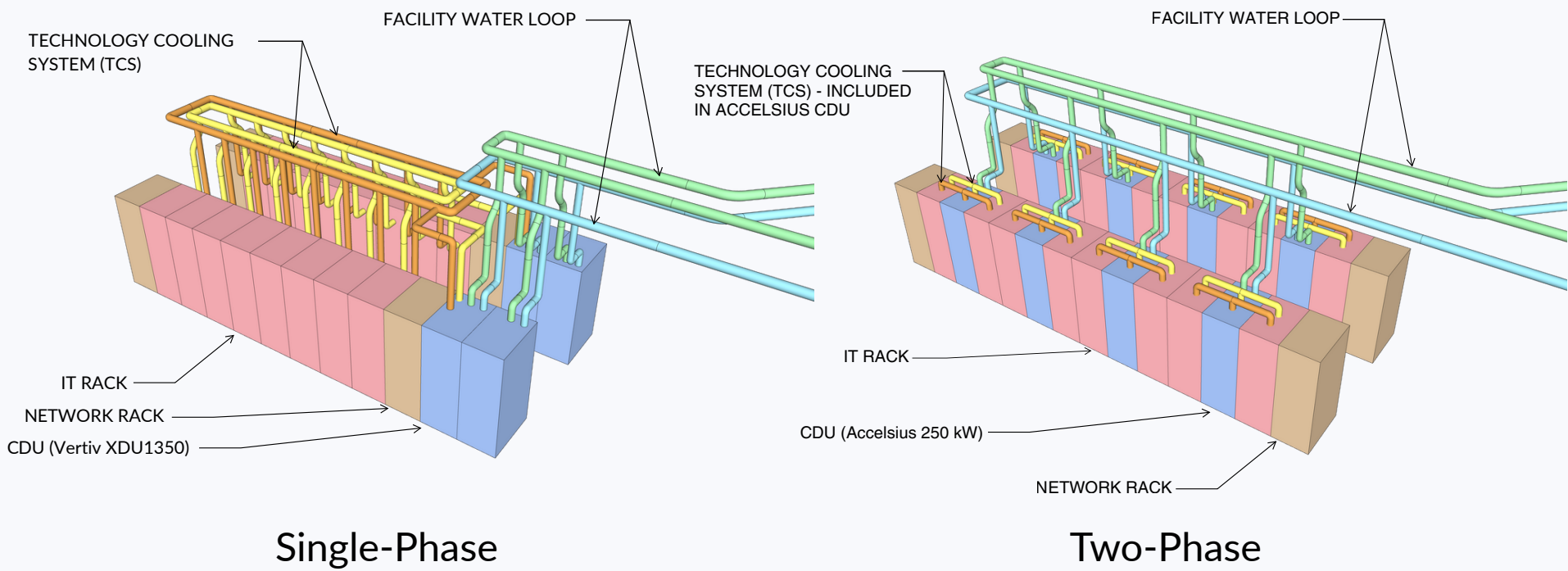
Jacobs Engineering created a 10MW data center reference design using two-phase direct-to-chip liquid cooling. They also provided a comparable reference design with single-phase direct-to-chip liquid cooling to help evaluate performance and cost between the two technologies in multiple climate zones. Check out the top takeaways.

Top Takeaways

1 Two-phase D2C’s better thermal performance reduces chiller load requirements, lowering up-front chiller cost and energy consumption



2 Integrated manifolds on the MR250 eliminates the need for a TCS, reducing cost and complexity



3 Chip-to-chiller infrastructure has comparable CapEx and lower OpEx, leading to a 5-year TCO savings of more than 10% for 2P D2C

	Single-Phase D2C	Two-Phase D2C	Savings (%)
CapEx*	\$10,385,576	\$10,381,534	0%
Annual OpEx	\$1,043,799	\$678,640	-35%
5-Year TCO**	\$15,604,571	\$13,774,735	-12%

*CapEx figures include chillers for the liquid cooling FWS, CDUs, TCS Loop, fluid, FWS extension, cold plates, manifolds, and QDs. It does not include FWS piping from chiller to white space, FWS pumps, and other minor supporting mechanical infrastructure.
**TCO analysis is based on a data center in Austin, TX. Detailed energy consumption for Austin, TX and other regions is available on request. Additionally, the TCO analysis includes maintenance and piping material costs from other third-party sources.