All images in this article courtesy of JCA Engineering

Kao London One 2018

KAO DATA LONDON ONE

By JCA Engineering

When Kao Data appointed leading building engineering specialist, JCA Engineering, as the preferred design and build contractor for its first data centre, the two companies agreed to take a truly open and collaborative approach.

Paul Finch, COO at Kao Data said: "It's my view that when designing and constructing technical real estate, it makes absolute sense for any project to be engineering led. I'd say that our recent experience working with JCA to bring Kao Data's first data centre to market more than bears this out."

Working collaboratively enabled a free flow of ideas together with high levels of project dynamism and problem solving. This approach was to be unique to the data centre industry for such a major development.

JCA is primarily an engineering services and data centre specialist that would not traditionally undertake the construction of a new build shell and core data centre, as this would generally be undertaken by a recognised large scale construction company. By allowing the project to be engineering led, however, Kao Data benefitted from a shell and core design and construction that was in harmony with the overall purpose of the facility and complementary to the mechanical, electrical and ancillary infrastructure services. It was also delivered on time and on budget, two elements that are often targeted but very rarely achieved.

The objective for Kao Data was to become the first entrant into the London UK wholesale data centre market for many years. The driving force for the project was to create a product that was market leading in terms of quality, efficiency and innovation. To be able to offer state-of-the-art carrier neutral data centre space at a strategic location just outside London and in doing so form one of the largest data centre campuses in the UK.

Kao London One was completed in December 2017. It is the first of four planned data centres that will comprise the Kao Data Campus, on the 36 acre Kao Park development located in the Harlow Enterprise Zone on the London-Stansted-Cambridge technology corridor.

Each data centre in the £200 million Kao Data Campus is split into four halls, totalling around 150,000 square feet of net technical space. In addition, each technology suite will be capable of supporting a 2200kW IT load, representing a total technical load of 8.8MW per data centre. JCA designed Kao London One to deliver market leading efficiency with the innovative use of technical infrastructure and building engineering expertise to provide resilience, operational sustainability and connectivity. JCA's focus on delivering the highest levels of sustainability has also resulted in the data centre achieving BREEAM Excellent Design Certification. Importantly, the design and construction of the data centre follows the innovative principles of the Open Compute Project and as such is one of the first carrier neutral wholesale data centres to do so.

The Kao Data Campus is powered by a specifically installed UK Power Networks 33kV/11kV 43.5MVA substation within the campus security demise. The 33kV utility power supplies are diverse with N+1 33/11kV transformers in the UKPN adopted substation located within the security demise of the campus. The objective of the concurrently maintainable design is to offer 100% availability with N+1 11kV power generation specific to each data centre and each generator comes complete with 48 hours of fuel storage.

Rack densities up to 20kW and beyond can be accommodated within the data hall which is designed around hot aisle / rack exhaust air stream segregation with flooded style supply air distribution.

Kao London One offers the latest incarnation of Indirect Evaporative Cooling systems that are so efficient, there is no requirement for any form of mechanical cooling. This assists towards total facility PUE of 1.20 even at part load.

The campus is compliant with the ASHRAE Technical Committee 9.9 (TC9.9) Thermal Guidelines (2011 and 2015) including the commonly overlooked International Society for Automation Environmental Conditions for Process Measurement & Control Systems: Airborne Contaminants (ISA 71.04 (2013)). Kao Data views the monitoring of airborne gaseous contaminants within the technology suite as a pre-requisite for data centre operations. All major volume server OEMs stipulate the minimum environmental operating

conditions required to comply with their warranties. By strictly adhering to these requirements Kao Data is able to evidence to its customers that neither the reliability of the technology assets nor the warranties will ever be put at risk and the environment is optimised for compute performance. Having consulted with subject matter experts, Kao Data believes this approach is a first for a wholesale data centre operator.

Whilst there were multiple challenges that had to be overcome throughout the design and construction phases of the project, the overarching principle of collaborative engagement and an engineering led approach to the design and construction has enabled Kao Data to achieve its objective of operating one of the most advanced data centres in the world.

Paul Finch, COO at Kao Data, commented: “I'm delighted that the first phase of the Kao Data Campus has been brought to market according to schedule with all objectives met and importantly, on budget. From the outset, we went back to basics with an acute focus on reliability and availability. We have shown these attributes can be complementary to lower capital and operations expenditure, energy efficiency and sustainability.

“From a procurement perspective, we adopted a collaborative and shared risk approach to delivery, which in light of recent high profile failures in the construction sector, has strongly positioned both us and our partners well for the future phases of the development. This is due in no small part to the experience of the management team and the decision to partner with an engineering main contractor, JCA and key equipment suppliers."

Aerial rendering of completed Kao Data Campus

Tom Absalom, Managing Director, JCA, said: “This industry leading data centre is a showcase for our full design and construction capability, as well as demonstrating our innovative and collaborative approach to critical infrastructure projects, working closely with both client and supply chain partners to achieve the highest levels of operational and sustainable delivery.”

Fittingly, the new campus is constructed on the former Nortel Networks/STC site synonymous with pioneering discoveries in telecommunications. In the 1940s it was the birthplace of the wartime navigation system OBOE, invented by Alec Reeves and in 1966, Nobel prize winning engineer Sir Charles Kao and his colleague George Hockham made one of the most significant technological breakthroughs in the post war era. They pioneered the use of optical fibres as a transmission medium for long range communications and thus paved the way for the digital age and the associated data centre industry that is thriving today.

*Source: JCA Engineering, for more information visit: **www.jca.co.uk**.*