

OCP Ready Colo Facility Site Assessment		KLONDC1		
Self Assessment Status:		COMPLETE-MEETS REQUIREMENTS		
Data Center Location Name		Kao Data London DC1 (KLONDC1)		
Data Center Location Address		Kao Data Campus, London Road, Harlow,Essex, CM19 9NA [Latitude -51.769291 (N) and Longitude - 0.129859 (E)]		
Site Description: IT Technical Space (White Space) Area		KLONDC1 has 4 IT Suites providing 850m sq. (9,100 Sq. ft.) of plain slab floor, with ASHRAE Recommended TC9.9 compliant temperature and humidity control, Gaseous Contamination monitoring and overhead bus bar fed UPS critical power rated at 2.2MW per Technology Suite		
Site Description: Critical IT Power		Total of 8.8MW planned IT power, across 4 Information Technology Suites of 2.2MW Critical Power, from distributed redundant centralised UPS per IT Suite. 8.8MW now fully commissioned and 2.4MW available as at 3/1/23		
Site Description: Network Provider Availability		Installed; BT (British Telecom) via Openreach Dark Fibre; Vorbos (formerly AiNetworks via Openreach dark fibre); Linx (London Internet Exchange via Openreach dark fibre; euNetworks – Dark fibre and lit network; Vodafone via their own dedicated and owned network fibre; Zayo, Colt, Lumen, Virgin Media and Megaport		
Site Description: Facility Features		Campus site, with potential for 4 buildings of equal capacity to KLONDC1, with the second building due for completion 9/23/23. Ultra low PUE (<1.2 PUE at greater than 25%, annualised), indirect adiabatic & evaporative cooling with some suites having Dx 'top up' cooling, with 44MVA campus substation with dual feeds to each building. Main Data Centre power distribution at 11kV, backed by N+1 11kV Hydo-treated Vegetable Oil (HVO) generators, serving distributed redundant Critical Power systems for each Technology Suite.		
Site Description: Other Services		A 15 Acre site, with 3.1m (approx. 10 ft.) perimeter fence and dual barrier & bi-fold gate access controlled points. Fence 'trembler' (PIDs) detection system applied and full CCTV system with fixed and PTZ colour & low light cameras.		
Date Original Assessment is Completed		3/5/2019		
Re-Assessment Date:		3/1/2023		
REQUIREMENTS - Attribute (Must have an Optimum or Acceptable result)	Parameter	Result	Notes	
ACCESS				
Building Access	1. Loading dock with lift or leveler	Optimum	External Loading bay is provided with a scissor lift device to offload equipment and racks from truck level to unloading area, when it can then be rolled threshold free in to the Goods Receiving area.	
Delivery pathway, Loading dock to Goods in	1. ≥2.7m (108in) H x ≥2.4m (96in) W x ≥2.4m (96in) D unobstructed access and threshold free	Optimum	Access throughout the facility is design for a 58U cabinet to be transported on a pallet truck, through doorways sized at 3m clearance and ceilings with a minimum of 3.15m clearance.	
Delivery pathway, Goods in to White space	1. ≥2.4m (96in) H x ≥1.8m (72in) W unobstructed access and threshold free	Optimum	3.1mm clear ceiling height (min) in lift lobby, with 3.0m high clear opening doors. Door width 1.8m (clear opening) with 1.6m minimum corridor width, but main corridors at 2.7m for turning.	
Corridor floor rolling load	2. ≥459kg (1012lb) (4.5kN) (notes required)	Acceptable	The floor system is tested in accordance with PSA MOB PS/SPU specification for Kingspan FDEB 38 c/w stringers. Performs to a safety factor of 3 x static load, with 4.5kN load	
Unboxing/pre-staging/storage area floor uniform load	1. ≥1221kg/m2 (250lb/ft2) (11.97kN/m2)	Optimum	12kN/msq (1224 kg/m2 or 250 lb/ft2)	
Unboxing/pre-staging/storage area floor concentrated load	2. ≥459kg (1012lb) (4.5kN) (Notes Required)	Acceptable	Floor will stand smooth movement of 900kg cabinet on a pallet truck with 3 point loads , each of two wheels. 4.5kN/msq (over 25mm x 25mm area), as determined by access floor supplier.	
RAMPS				
Gradient	1. ≤1:12	Optimum	Only one ramp on each delivery route from the goods lift to each Information Technology Suite (ITS) access corridor, serving two ITS. Threshold drop is 150mm, and ramp length is 1,800mm long (1/12)	
Width	1. ≥1.5m (60in)	Optimum	Ramps only provided in to ITS service corridors from Goods Lift lobby - at 1/12 fall, 2.7m width	
Landing area	1. ≥1.5m x 1.5m (60in x 60in)	Optimum	Goods landing area is flat with minor threshold transition height for weathering - full width of roller shutter door (approx. 3.6m)	
Railings	1. ≥900mm (36in) and <1000mm (40in)	Optimum	Internal ramps are bounded by solid walls with wall guard protection.	
LIFTS / ELEVATORS				
Weight loading	1. ≥1500kg (3300lbs)	Optimum	2500kg certified carry weight is provided.	
Door height	1. ≥2.4m (96in) Lift /Elevator door opening height (not internal cabin)	Optimum	Industrial type lift with 3.0m door opening and 3.0m internal clear height to underside of cabin roof.	
Width	1. ≥1.5m (60in) Unobstructed door opening width	Optimum	1.9m wide, unobstructed opening	
Depth	1. ≥1.5m (60in) Unobstructed cabin depth	Optimum	2.4m unobstructed cabin depth	
IT TECHNICAL SPACE (WHITE SPACE)				
Floor rolling load	1. ≥680kg (1500lb) (6.67kN)	Optimum	Concrete slab and this is compliant. If a raised floor was to be used in the IT Space, it depends on system utilised, but can be provided to suit Customer requirements.	
Floor uniform load	1. ≥1221kg/m2 (250lb/ft2) (11.97kN/m2)	Optimum	The concrete slab in the White Spacer is rated at 1,530kg/m2 (15kN/msq or 315lbs/sq.ft) provided on all ITS floor areas as standard. Raised floor can be installed to suit Customer requirements, but typically 12kN/msq is a heavy grade raised access floor.	
Floor concentrated load	1. ≥680kg (1500lb) (6.67kN)	Optimum	Standard concrete slab is compliant - for raised floors, it depends on raised floor manufacturer, but typically greater than 4.5kN/msq.	
Finished floor to ceiling height	2. ≥3.1m (124in)	Acceptable	With standard sealed concrete slab, ceiling height (return air plenum) is 3.65m	
Access floor clearance	1. Not Applicable - No Access Floor	Optimum	Basis of Design is no raised floor. If a raised floor is required by the Customer, it can be accomodated, but a ramp may be needed in the Customer White space if the void is greater than 150mm.	

ELECTRICAL				
Number of independent circuits to the rack	1. 2N (A+B)		Optimum	Basis of design is 2N at rack location derived from a distributed redundant central UPS, but N and non-UPS feeds can be provided.
Maximum circuit capacity	1. 3 ϕ 32A/230V		Optimum	Tap off boxes, on a pitch-free system, can be provided with 1, 2 or 3 x 16A, 32A or 63A x single or 3 Phase outlets, complete with power monitoring if required.
Circuit voltage	1. 400/230 VAC nominal		Optimum	Nominal 230v a.c. Single phase,, 400 V a.c. 3 phase.
Circuit frequency	1. 47-63 Hz		Optimum	Nominal 50Hz, +/- 0.1 Hz
Power receptacle / WIP Type	1. IEC60309 532R6W		Optimum	Both connector formats can be provided (equivalent to BS 4343), single phase/3 wire (blue) or 3 Phase/5 wire (red).
Circuit receptacle location	1. Overhead		Optimum	Power is delivered overhead, via a busway system - various manufacturers available.
Upstream UPS options	1. UPS and non UPS feeds available		Optimum	Basis of design is for central UPS (3 to make 2 or 2+1 redundancy), but for OCP racks V2 with BBU, then ITS supply can be arranged as generator backed only.
Rack-based batteries permitted	1. Allowed		Optimum	Kao Data are able to provide compliant racks is requested by the Customer.
Generator load acceptance time	1. <60 seconds		Optimum	Generator load acceptance time < 35 seconds.
COOLING				
Rack airflow direction	1. Front to Back		Optimum	From room void (front of rack) to back of Rack in Hot aisle.
Air containment methods	1. Hot aisle containment or rack chimney		Optimum	Basis of design is HAC, for cabinet orientation in Information Technology Cells (ITC) or POD's of 34 rack (2 rows x 17 racks).
Maximum rack density	1. ≥ 12 kw		Optimum	Based on maximum rack count, average density would be 5kW per cab. Rack density of 10 to 20kW is achievable.
Minimum cold aisle width	1. ≥ 1500 mm (60in)		Optimum	1200mm is standard pitch to achieve maximum rack count, but there are no constraints on a width, subject to reducing the overall cab/rack count.
Minimum free width cold aisle (Inside cage)	1. ≥ 1200 mm (48in)		Optimum	900mm is minimum code compliant width of an access corridor (may be bigger to suit server extraction), but should be OCP compliant. Where two cages adjoin, the total cold aisle is 1.8m. 1200mm is the standard pitch.
Minimum hot aisle width	1. ≥ 1200 mm (48in)		Optimum	1200mm is standard pitch to achieve maximum rack count.
Inlet air conditions	1. ASHRAE Class A1 Allowable		Optimum	The basis of design is ASHRAE Recommended (Class A1) 2015 to be achievable 100% of time based on N=20. In agreement with the Customer, set points can be adjusted to allow controlled excursions to the ASHRAE Allowable (Class A1), meaning that the more energy efficient operating range and SLA of 80% Recommended and 100% Allowable can be delivered to provide TCO savings. The humidity SLA is arranged to meet the ASHRAE 2015 Allowable limits or better.
Air quality	1. EN 779 G4 and F7 filtering & Gas particulate monitoring to the ANSI/ISA 74.04-1985 G severity levels		Optimum	Fresh air make-up unit is provided on an N+1 redundancy basis with trimming humidity control. Basis of design is for EN 779 G4 and F7 filtering as standard. Gas particulate monitoring is provided by 4 stations within each ITS, assessing both copper and silver corrosion (for contaminants such as chlorine and sulphur) to the ANSI/ISA 74.04-1985 G severity levels. Where corrosion above Level G1 is detected, additional gaseous and particulate filtering can be provided.
Temperature rise	1. ≥ 12 Deg C DeltaT		Optimum	The design at Kao Data is for a 12 degree delta T across the rack. Delta T of greater magnitude can be accommodated. If the delta T across the rack is less than 12 degrees, a potential cooling shortfall will exist.
Cabinet blanking of open space	1. Mandatory		Optimum	Kao Data works with Customers to achieve 100% redundant slot blanking.
CABLING				
Cabling infrastructure pathways	1. Top and Front of rack fed		Optimum	Basis of design is top entry and front presentation for all power and network connectivity. Bottom access can be provided with raised access floor if required by the Customer.
Overhead Network Infrastructure containment levels	1. 3 Levels (Intra-Pod cabling; Inter-Pod cabling; OOB cabling)		Optimum	At 58U, it is feasible to install 3 levels of inter-rack and IT Technology Cell (pod) cabling, in addition to the power busbar.
Fibre Type (if installed)	1. OS2 & OM4		Optimum	OS2 and OM4 fibre cabling installed as standard to Customer locations from Carrier MMR's via ODF and pre-installed carrier fibre and fibre cross connects
Fibre connection presentation (if installed)	1. Interchangeable LC Duplex and MPO		Optimum	LC Duplex and MPO terminations provided at ODF in each of 2 MMR's)2 additional expansion rooms to follow)
CONSIDERATIONS (For information only)	Parameter		Result	Notes
SERVICE				

Replacement PSU Modules	2. Secure storage available	Acceptable	Customer agreements can be arranged to cover the scope of replacement parts, but this is not in force as of March 2023. Secure storage is available for pre-ordered spares.
Replacement BBU Modules	2. Secure storage available	Acceptable	Customer agreements can be arranged to cover the scope of replacement parts, but this is not in force as of March 2023. Secure storage is available for pre-ordered spares.
Option to monitor PSUs and BBUs	1. Yes	Optimum	Currently, the PMS/BMS and Customer portal has an option to add monitoring points for a range of products. Customer specification is required.
Remote hands for PSU and BBU replacement or expansion	2. No	Acceptable	Currently, a service provide for remote hands is available for general IT, but specific OCP equipment is not currently offered As OCP adopters are assigned, Kao Data will increase the scope of remote hands coverage.
Remote hands for OCP IT hardware replacement or expansion	2. No	Acceptable	Currently, a service provide for remote hands is available for general IT, but specific OCP equipment is not currently offered As OCP adopters are assigned, Kao Data will increase the scope of remote hands coverage.
EFFICIENCY			
Site Operations Standards	2. Bicsi 009-2019 Data Center Operations and Maintenance Best Practices	Acceptable	Kao Data is certified to the UTI M&O standards compliance until July 2023. The OCP Operational Guideline will be reviewed in this 2023 operating period.
Site PUE Monitoring	1. Continuously monitored	Optimum	The Power Monitoring System continually monitors the IT power consumed (via UPS output or final delivery busway) and the total facility power. Reports are generated, daily, weekly or monthly
Site Design PUE	1. <1.2	Optimum	The average dPUE across the load range is 1.2, with 1.24 at 25%, 1.15 at 50%, 1.16 at 75% and 1.23 at 100% IT load.
Site Annualized PUE Current Achievement	2. <1.5	Acceptable	The predicted annualised PUE was proved during the ASHRAE Level 1 to 5 IST testing (based on 0 to 100% load in a single suite - iPUE). However, the facility has only been operating at or fractionally above the 35% mark in one of the ITS. The actual annualised PUE as defined by IEC 30132-2:2016 is 1.37 (including energy used for testing), based on 1.65MW IT load in a 8.8MW facility, with typically a total DC load of 1.95MW. The pPUE to each suite (TS01 is 1.21@35% load & TS02 is 1.22@19% load) which excludes the building general loads and administration block. Energy metering and efficiency performance is measured and monitored to ISO 50001.
Site WUE Monitoring	1. Continuously monitored	Optimum	WUE is monitored via water meters on site and the calculated based on the IT kWhr consumptions. The actual usage of process water shows that 0.41 l/kWh has been achieved annually, but with loads of around 35%.
Site CUE Monitoring	1. Continuously monitored	Optimum	CUE is monitored via energy meters on site and the calculated based on the IT kWhr consumptions. The target value in the design is 0.49 kg CO2e at 100% IT load. Partial load CUE is available - 25% - 0.71; 50% - 0.53; 75% - 0.50 - actual output shows 0.36 is achieved. However, under current rules, since Kao Data operates on a REGO 100% renewable guarantee of origin energy supply (fed from Little Cheyne windfarm through Shell UK), reportable CUE is zero. As IEC 30134-8 is published, Kao Data intend to demonstrate calculation to this standard.
OPENNESS			
PUE Published	1. Real-time available online	Optimum	Via the Customer Portal, PUE will be available 24/7. Kao Data are happy to publish the PUE if required. pPUE has been as low as 1.16 as an ipPUE for TS01.
Facility Design Drawings & Files	2. Available to view upon request	Acceptable	PDF drawings 'As Built' are available for Customers and prospective customers to view. Kao Data will consider permanent access to drawings for Customers resident in the facility for systems that relate to their own installations.