

PCR Communications Room Standards



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Design Performance
Standard

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1.3	April 2010	3 rd Revision – PCR Communications Room

Introduction –

This standard sets out BAA's design and installation requirements for a PCR Communications Rooms

It covers:

- Facility
- Elements
- Fittings / Special
- Mechanical Services
- Public Health and Domestic Services
- Lighting
- Power
- Communications
- Services General
- Fire Requirements
- Health and Safety

It excludes:

- Communications Room Access Process/Policy
- Specific details supporting CI Compliance

The objective of this standard is to create a set of minimum requirements for the construction of a PCR Communications Room

This standard may be referenced in specifications, design guidelines and briefs but should not be used in place of specific, procurement, user, or system requirement specifications for purchasing purposes.

Requirement statements in this standard shall define, but not be limited to, the following performance attributes:

- 1. Safety**
- 2. Functional requirements**
- 3. External interfaces**
- 4. Environmental conditions**
- 5. Reliability**
- 6. Maintainability**
- 7. Verification & Validation**

The design philosophy shall try and reflect that of the European Code of Conduct for Data Centres/Server Rooms/Communications Rooms which include the following principles:

1. Communications Rooms are designed so as to minimise the energy consumption whilst not impacting the business performance.
2. Communication Room equipment is designed to allow the optimisation of energy efficiency while meeting the operational or service targets anticipated.
3. Facilities are designed to allow regular and periodic energy monitoring.
4. Energy consumption of Communications Rooms are monitored; where PCR's, SCR's and DSCR's are part of larger facilities or buildings, the monitoring of the specific room consumption may entail the use of additional energy and power metering equipment.
5. Communications Rooms and their equipment are designed, specified and procured on the basis of optimising the TCO within the requirements for reliability, availability and serviceability.
6. Communications Rooms should be designed to minimise the energy used, if any, to remove heat from the facility.
7. Supports CI Policy

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Section 1a – Statutory Compliance

The following compliance documents, but not limited to, have been identified as statutory prerequisites to this standard. The latest edition and relevant amendments shall be complied with:

Legislation

Health and Safety at Work Act
Construction (Design and Management) Regulations 2007 - SI 320
Lifting Operations & Lifting Equipment Regulations 1998 – LOLER
Provision & Use of Work Equipment Regulations 1998 – PUWER
The Machinery Directive - 91/368/EEC
Supply of Machinery (safety) Regulations 1992 – SI 3073
Supply of Machinery (safety) Regulations 2008 – SI 1597 [*comes into force on 29th December 2009*]
Air Navigation Order 2005 - SI 1970
Civil Aviation Authority Regulations 1991 - SI 1672
Electromagnetic Compatibility (EMC) Directive - 89/336/EEC

Building Regulations

These rooms are not expected to comply with DDA compliance, but will attempt to comply where applicable.

Sustainability and environmental protection (See BAA Corporate Responsibility Policies)

Environmentally Sensitive Materials Strategy
Noise
Waste reduction
Energy Efficiency and Energy Metering

Section 1b –BAA Policy & Procedures Compliance

The following, but not limited to, have been identified as meeting BAA policy and are prerequisites to this standard.
The latest edition shall be complied with:

1b. 1 BAA Policy

BAA Corporate Responsibility Policies	
	<p>These documents explain BAA’s interpretation of the statutory regulations and explore the issues most important to us as a business. They help us to monitor, measure and report performance. They are also useful to inform projects of latest policy statements and requirements. They can be found on our website:</p> <p>(www.baa.com/corporateresponsibility).</p>
BAA Health and Safety Standards	
	<p>BAA’s Health and Safety team are responsible for ensuring BAA operate and grow our business responsibly, safely and securely.</p>
BAA Supply Chain Policies	
	<p>BAA’s Supply Chain is responsible for ensuring BAA deliver a positive impact upon the money the company spends. Information on latest agreements and objectives can be found on the Supply Chain intranet site.</p>

BAA Design and Implementation Standards

- BAA Electronic Communications Approvals Process (ECAP)
- BAA Design Performance Standards / Specifications
 - Airside Engineering
 - Building Management Systems
 - Common language for asset coding
 - Electrical Distribution
 - Energy efficiency buildings
 - Fire alarm and public address systems
 - Lighting
 - Airport Sign System
 - Structural Design Criteria

These documents discuss in more detail, aspects of systems relevant to the specific area covered. They can be found on BAA's Intranet site.




Section 2a – Requirement Section

This section describes the critical performance criteria required by BAA to meet identified business needs. The designer shall demonstrate full compliance with the following criteria.

2a. 1 Key Requirements

	Requirement	Reason / Consequence/ Comment
2a. 1	QUICK REFERENCE	
2a. 2	<p>PCR - Hosted Facility - Network Devices/IT Servers over 12U</p> <p>Network Type Core Services</p> <p>Cooling (Dry Bulb Temp) Between 18 to 26 °C</p> <p>Humidity 30 - 60% non-condensing</p> <p>Maximum Rate of Change per hour 5°C and 10%RH</p> <p>Power 2x PDU in Rack, Cabinets fed from 2x32amp Commando Socket</p> <p>UPS UPS - Conditioning and autonomy 30Mins</p> <p>Security Single stage door, MAID swipe entry</p> <p>Racks Prism/APC</p> <p>Monitoring Heat, Humidity and Access (Room/Server) Leak Detection (where applicable)</p>	IF a distributed UPS system is to be used it should provide multiple SNMP connectivity to attached servers for controlled shut down services

	Requirement	Reason / Consequence/ Comment
2a. 3	FACILITY	
2a. 4	Primary Communications Room is to house Core Network switches and server applications. To act as a main distribution, switching and processing point for IT systems and services.	Shared/Hosted/BAA facility
2a. 5	A PCR could incorporate additional/sub rooms for specific services or third parties such as: <ul style="list-style-type: none"> • FTNS – Fixed Telephony Network Services • Radio • Cellular • Airline & Partners 	
2a. 6	Minimum of 3.5m headroom shall be required	
2a. 7	Occupancy is frequent (intermittent)	BAA Rating 4 (Where 1 is low and 5 is high)
2a. 8	Security is High	Authorisation to work obtained from BAA IT
2a. 9	ELEMENTS	
2a. 10	Floor Type shall be Raised with maximum 800mm plenum zone and a minimum of 450mm	Floor depths above 800mm will impair cold air distribution back to the top of the cabinets
2a. 11	Floor Loading is High/Heavy – Uniformly distributed >12.0kn\m²	
2a. 12	Walls shall be Sealed with a Dust proof finish	
2a. 13	A false ceiling is NOT required	
2a. 14	Windows and Glazing shall be NONE	

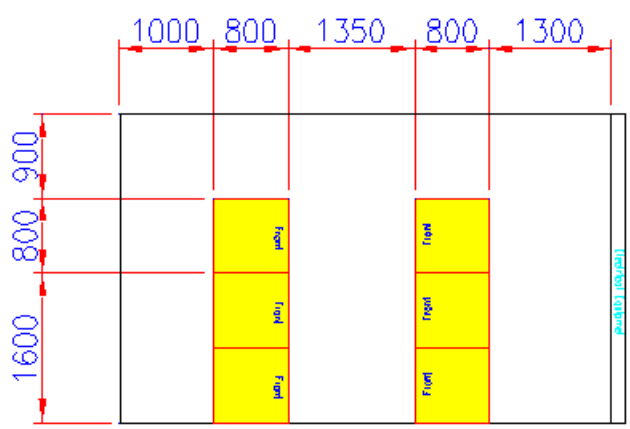
	Requirement	Reason / Consequence/ Comment
2a. 15	Doors shall be a minimum of 2, No. 2 leaf, High Security and self-closing	
2a. 16	Emergency signage must be in the format of the European Signs Directive - BS 5499-10:2006	
2a. 17	FITTING /SPECIAL	
2a. 18	Furniture – To be advised by BAA IT	
2a. 19	IT Server Racks shall be BAA specification APC Netshelter SX racks	Please refer to Racking Solutions Standards- BAA Server V1.0 for a complete IT Server rack standard
2a. 20	Network Cabinets shall be BAA Specification 1, 2, 4 or 5 dependent on application	Please refer to Physical Infrastructure Standards 17-11-08 V1.0 for complete Network Cabinet standards
2a. 21	Each cabinet shall be individually earthed with a 16 mm (Sq) earth from the earth point in the cabinet back to the nearest building earth bar, which will be connected to the main earth system in accordance with BS 7671	
2a. 22	All cabinet electrical supplies shall be properly protected and segregated so that they comply with the current IEE wiring regulations.	
2a. 23	Daisy chaining of earth connections from one cabinet to another is NOT permitted.	
2a. 24	The electrical supply needed to each cabinet shall be 2 x 32 amp Commando presentations for all cabinets to provide power diversity and the supply shall be from the same phase. The distribution panel shall be fitted with a dedicated circuit breaker and properly labelled.	The PDU must be properly labelled to show which distribution panel or circuit breaker is feeding the cabinet.

	Requirement	Reason / Consequence/ Comment
2a. 25	MECHANICAL SERVICES	
2a. 26	Air Conditioning shall be able to support the entire load of the facility. A recommended load of 500 W/m² shall be achieved as a minimum	
2a. 27	Dry Bulb temperature shall be between 18-26°C	
2a. 28	Relative Humidity shall be between 30-60% Non-condensing	
2a. 29	The maximum rate of change per hour shall be 5°C and 10%RH	
2a. 30	The minimum Fresh Air rate shall meet statutory and pressurisation requirements	
2a. 31	Positive pressurisation IS required in the facility	
2a. 32	Noise levels shall not exceed NR.65	
2a. 33	Emergency Actuation Devices are not required except for large plant and unless for statutory requirement	
2a. 34	PUBLIC HEALTH AND DOMESTIC SERVICES	
2a. 35	Cold Water is NOT required	
2a. 36	Hot Water is NOT required	
2a. 37	Drinking Water is NOT required	
2a. 38	Gas is NOT required	
2a. 39	Soil is NOT required	

	Requirement	Reason / Consequence/ Comment
2a. 40	LIGHTING	
2a. 41	Levels shall be 500 lux at 1m from the finished floor and should be above the aisle rather than the cabinets	
2a. 42	Fittings shall be batten fluorescent with trough reflectors	
2a. 43	Switching shall be Manual	
2a. 44	Emergency lighting shall be required in accordance with IS 3217:2008	
2a. 45	POWER	
2a. 46	Single Phase 13 amp wall mounted outlets shall be required	Cleaning purposes
2a. 47	Single Phase 32 amp shall be required	Cabinet supplies via 2 No. Dedicated PDU's each fed from a different distribution panel
2a. 48	Three Phase may be required – TBC confirmed by IT, dependent on application	IT Servers will require Three Phase for certain applications
2a. 49	Emergency generator power is NOT required	
2a. 50	A UPS System is required and shall support the critical equipment only	
2a. 51	Power requirement shall be based on 500 W/m² unless IT Servers are present where the total load should be calculated based on the equipment to be housed in the facility	
2a. 52	Power shall be distributed at high level to equipment cabinets and shall allow sufficient room (300 - 600mm) between the top of the cabinet and the fittings for working	

	Requirement	Reason / Consequence/ Comment
2a. 53	Power bars shall ideally be situated centrally above the racks and commando sockets shall be offset to indicate the orientation of the supply	This will easily identify which Commando is fed from which supply – see 2a. 46
2a. 54	COMMUNICATIONS	
2a. 55	Fixed Voice Services (e.g. Telephone or intercom) IS required	Phone type shall be Cisco 7911, located on wall by entrance
2a. 56	Fixed Data Services (e.g. Printer, PC, Modem) IS required	
2a. 57	Public Address / Voice Alarm IS required	
2a. 58	CCTV is NOT required	
2a. 59	Television is NOT required	
2a. 60	Alarm System / Intruder Detection / Panic Alarm IS required	This shall be linked to the Building Control Centre. The alarm must be audible in the room and the use of a flashing beacon is recommended
2a. 61	Master Clock System is NOT required	
2a. 62	Security System / Access Control shall be via MAID	Specifically for entrance to the facility. Rack access is treated separately
2a. 63	Radio Systems and Mobile Telephony coverage IS required	
2a. 64	Airport Information Systems (Inc. FIDS) is NOT required	
2a. 65	SERVICES GENERAL	
2a. 66	No water pipes should enter or pass through the PCR facility	To avoid flooding of the facility

	Requirement	Reason / Consequence/ Comment
2a. 67	FIRE REQUIREMENTS	
2a. 68	A VESDA system WILL be required	
2a. 69	VESDA systems will conform to BS 5839-1:2002, Fire detection and fire alarm systems for buildings. Code of practice for design, installation, commissioning and maintenance.	
2a. 70	A Fire Alarm shall be fitted in accordance with BAA guidelines	
2a. 71	Fire Alarm break glass panels shall be fitted both inside and outside the facility	
2a. 72	If required by Fire Authorities a Smoke Extraction system shall be fitted	
2a. 73	Sprinklers and Hose Reels are NOT required unless it is to satisfy Insurance or Property Protection	
2a. 74	Compartmentation shall be for 60 Minutes	
2a. 75	There shall be at least 2 Entrance and Exit points in the facility for Fire Safety purposes	
2a. 76	Health & Safety	

	Requirement	Reason / Consequence/ Comment
2a. 77	<p>Cabinet clearances shall adhere to the following for Health & Safety (Top Down View)</p> 	

2b

PCR Communications Room Standards



Recommendation
Section

Section 2b – Recommendation Section

In support of Section 2a - Requirements, the designer should take note of the following performance and best practice recommendations. Any departure from these recommendations should be highlighted and the reason for the deviation explained.

2b.1 General Design

	Recommendation	Reason / Consequence
2b. 1	If IT loads over 25kW per rack are expected then Hot Aisle Containment cooling solutions are recommended over the traditional HVAC and CRAC units	Close coupled, dynamic modular cooling gives greater efficiency over traditional cooling and can support IT loads in excess of 25kW per rack. As the server architecture dictates that we use Blade Chassis and virtualisation traditional cooling cannot support more than 1 Blade Chassis per rack
2b. 2	APC HACS is the preferred solution for close coupled dynamic cooling	As our standard racking solution for servers is APC the cooling solution can be easily incorporated into existing racks as well as new racks, it provides a modular solution that can be expanded or collapsed dependant on the application
2b. 3	HACS will be sized accordingly for the application at the time of installation, however all pipe work and infrastructure to support future requirements should be installed during initial installation	Reduces disruption in the facility once it is operational
2b. 4	Where possible a Zero Footprint HACS will be used to maximise rack space in the facility	Maximises rack space
2b. 5	Containment for Network and Power should all be fed from above the rack	Easier access for network and removes the need for a raised floor if used with in-line cooling architectures
2b. 6	Recommended minimum room size is 190m ² with a 3.5m high ceiling	

3 Supporting information

3.1 Glossary of terms