



Document Control

Rev	Date	By	Comments
A	Jun'16	L. Davies	Technical review update
B	Oct'17	L. Davies	Technical review update
C	Dec 17	UoL	Sign off for release
D	Apr 19	L. Davies	Technical review update

Design Guidance

- This document shall be read in conjunction with the University structured network cabling specification.
- The structured cabling system shall be from a single manufacturer component matched throughout.
- The contractor shall provide a warranty for the complete installed structured cabling system from the date of handover for a minimum period of 25 years. This warranty shall provide for the client to contact the installer in the first instance and if the contractor is no longer in existence for the manufacturer to fulfil the contractor's obligations.
- All outlets are to be labelled to an agreed scheme. Notionally this will be:
 - A/001 – A/** (for the first communications cabinet)
 - B/001 – B/** (for the second communications cabinet)
 All labelling shall be machine/electronically produced. Hand written labels are not acceptable.
- The maximum permitted cable length from the communications room(s) to any given wall outlet served from that room is 90 metres. Ideally one comms room per floor will be provided within the building.
- If more than one communications room is required to serve the building network infrastructure then these rooms are to have link cabling installed between them in a star topology. This will comprise single mode fibre optic cabling fitted to dedicated panels. There may be a requirement to provide air conditioning to the room, particularly if the room houses a large number of cabinets/equipment. There may also be a requirement to provide a building Uninterruptable Power Supply (UPS) to the room as well. Detailed discussions regarding the IT topology will be held with UoL IT department during the design stage.
- Test results are required for each cable run in PDF format.
- As installed drawings for the cable system must be provided showing outlet location, outlet numbering, cable routes and comms room location.
- Cable outer claddings must be of the appropriate type and cater for the worst-case conditions to be expected on the various routes.
- Installed cables must maintain the cable/system manufacturer minimum bending radii.
- Telephones shall make use of the UTP cabling system. Generally, this will utilise IP Telephony technology and will be part of the data network. As such no additional dedicated cabling is required for desktop phones etc. Analogue telephony would be minimal and likely only required for services that have a need for externally provided BT PSTN lines. Unless these are classed as essential services, they will also use the UTP cabling system, otherwise they will be hard-wired end-to-end.
- Depending on the way telephony is to be provided (IP Telephony or analogue telephony) it may be necessary to terminate & CW1308 copper pair cable between the patch cabinet and the telephone frame/DP in the building. The quantity of the copper pair cable will be dependent on the number of telephones supported by the comms cabinet.
- The University operates an Attendance Management System (AMS). The purpose of the system is to enable undergraduate students to register electronically their attendance at all taught sessions. The system will be based on data collected using card reader technology from Salto Systems, similar to, but distinct from, the readers and controllers used for access control. The AMS system components are detailed in the following section.
- The design of Wireless access points (WAP) shall be co-ordinated and discussed with the UoL ITS project manager at concept design stage. Each WAP shall be provided with a double data port and shall operate 'Power over Ethernet'. When locating WAP outlets considerations shall be given to the following:

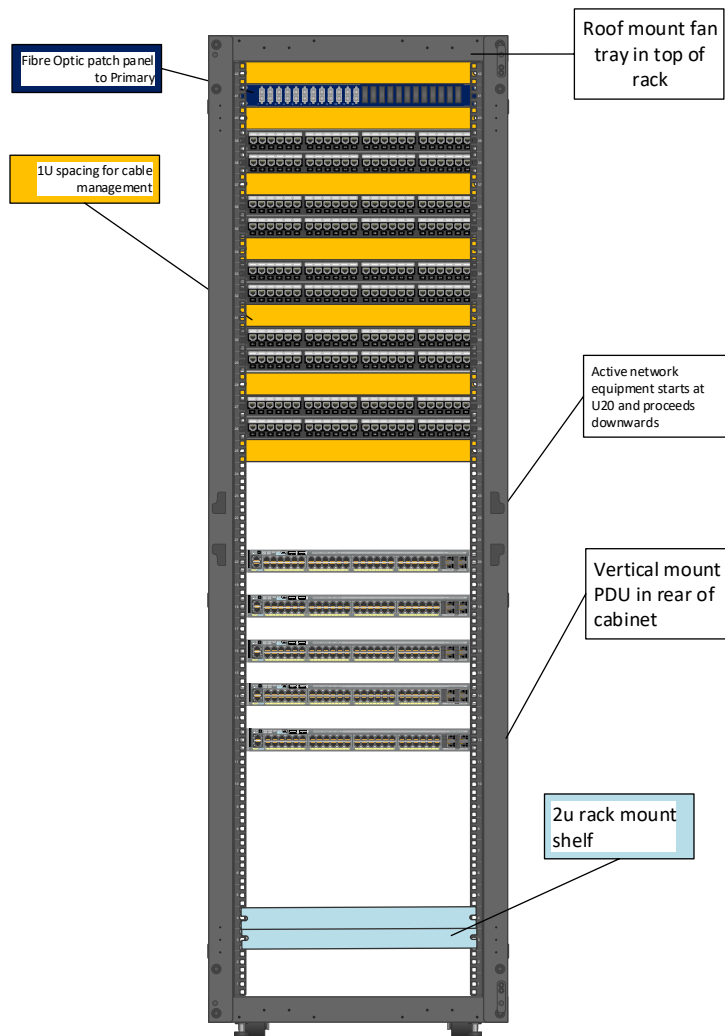


Design Guidance

- WAP's to be located at least 1m from any corner and 2 m away from each other
- Data outlets may only be located within ceiling or wall voids where accessible. WAP's shall not be installed within voids
- WAP's shall be free issued for contractor installation

University of Leicester Centre Cabinet layout using
42U 800mmx800mm Racks

Maximum 240 outlets per cabinet: 10x24 port panels from U39 to U25 per cabinet with cable management as shown. Maximum panel and active equipment configuration is shown below for illustration.





Design Components

	Manufacturer	Comments
Cable	Hellermann Tyton (Gigaband) Brand Rex (Leviton) Cat6Plus	Cabling shall be used throughout unless augmented Category 6 is specified by the UoL IT manager Unshielded twisted pair (UTP) cable shall be used. Cable sheath composition shall be LSZH (Low smoke Zero Halogen) and must consider current legislation for suitability of intended application. Each cable shall be continuous throughout its entire route length with no joints/ splicing.
Outlets	Hellermann Tyton (Gigaband) Brand Rex (Leviton) Cat6Plus	All outlets shall be provided in twin or quad formation. If single outlet modules are fitted then these are to be 'centred' by fitting matching quarter blanking plates to the single gang faceplate. Data faceplates shall be selected to match the surrounding general wiring accessories in all cases ensuring the same manufacturer and range is specified. Where contrasting faceplates are provided for DDA purposes for the general wiring accessories the data faceplates shall be selected to match also.
Cabinets	Prism	Cabinets shall generally be 42U high (800mm x 800mm). Cabinets shall be steel construction with lockable hinged doors to side and rear with a hinged lockable glass front. All cable entries to cabinets shall be via the bottom providing a 100mm cable plinth where no raised access floor is provided. Cabinets to be provided with roof mounted 4-way quiet running fan tray, 12way PDU with angled 13A fused socket outlets, levelling feet, vertical cable management and 1No cantilever shelf (400 deep). Where cabinets are installed in banks, dividing panels shall be removed and appropriate manufacturer baying kits must be provided to link the cabinets together. RJ45 patch panel density shall be 24-way occupies 1U of rack space or 48-way occupies 2U. Matching 1U horizontal patch cable guides shall be fitted between each 48-ways of patch panel, plus one top and bottom of the patching array. Patch panels are to be located at the top of the cabinet working down. The maximum number of outlets connected to one cabinet will not exceed 240.



Design Components

	Manufacturer	Comments
Fibre Optic Cabling		<p>Fibre connectivity shall be single mode grade to specification ITU-T G.652.D. The number of fibre optic cores in a given fibre optic link will vary depending upon the application.</p> <p>External cable runs shall utilise a loose tube steel tape armoured construction for enhanced protection. The cable outer sheath shall be LSOH and be suitable for internal and external applications. Internal cable runs can use the tight buffered type if preferred, however these must be of robust construction.</p> <p>Termination shall be on 1 RU panels utilising LC connectors.</p>
Patch cables	<p>Hellermann Tyton (Gigaband)</p> <p>Brand Rex (Cat6Plus)</p>	<p>Four pair link cables that are fully compliant with the proposed cabling system are to be supplied only (fitting will be by the client). Colour and sizes would need to be agreed.</p>
Attendance Monitoring (AMS) Controller	<p>Salto CU42EO (Main Controller)</p> <p>Salto CU4200 (Slave Controller)</p>	<p>Dimensions Approx. 180 x 240 x 56mm and weight is 700g</p> <p>Controller typically installed into a ceiling void or behind a wall panel where possible. Where this is not possible, the controller should be installed at a height which would allow access for maintenance using a step ladder, but which would prevent casual interference by users of the room.</p> <p>A power supply and single data outlet should be provided in close proximity.</p> <p>This controller will be connected (using standard cat5e/cat6) to either card reader(s), slave controller(s) or both. Maximum cable length to a card reader or slave controller is 400m</p>
Attendance Monitoring (AMS) Card Reader	Salto WRx	<p>Dimensions Approx. 95.5 x 95.5 x 22mm</p> <p>The card reader will be installed in a location suitable for students to register easily their attendance, based on the flow of people into the room. Larger rooms will require two or more readers. The exact location of the reader(s) within a room will be advised by the specialist Salto installer and agreed with the AMS project manager and/or service owner.</p> <p>The card reader is connected via a 4-wire twisted pair (typically using standard cat5e/cat6) to either a master or slave controller. Maximum cable length for this is 400m.</p>

ES12

IT/ Telephony

UNIVERSITY OF
LEICESTER**Minor Works Framework Contractors**

Service	Specialist	Address & Contact Details
IT cabling network	Yello	Yello Communications 23 Meadvale Road West Knighton Leicester LE2 3WN Contact – Tony Mee enquiries@yello.co.uk