LA TROBE UNIVERSITY

Information Services
Technology Enablement

INFORMATION SERVICES - EQUIPMENT ROOM STANDARDS

July 2024

V1.0

ENQUIRIES
Steven Osbrough
Infrastructure Project Manager
La Trobe University
Victoria 3086

T (03) 9479 6090
E s.osbrough@latrobe.edu.au
latrobe.edu.au

Table of contents

Document Control

VERSION CONTROL

Printed and electronically issued versions of this document are to be considered as uncontrolled. This document will be subject to continual review and updates. The latest version can be downloaded from:

https://www.latrobe.edu.au/information-services-design-standards

Document Title	Information Services Equipment Room Standards
File Name	LTU-Equipment-Rooms-Standards_V1.0
Prepared by	Steven Osbrough
Document Author	Steven Osbrough
Contact	Steven Osbrough
Approved By	Fraser Sheilds - Director – Cloud, Infrastructure and Service Delivery Mark Brincat – Director – Technology Enablement

Version	Date	Comment	Author
1.0	July 2024	Initial Publication	Steven Osbrough

COPYRIGHT AND INTELLECTUAL PROPERTY

Administration

EXECUTIVE SUMMARY

La Trobe University (LTU) is a multi-campus institution with campuses and sites through Melbourne and regional Victoria. LTU is a place of social and personal interaction, where learning and creative thinking is encouraged.

This document describes the details and requirements for Equipment Rooms that contains structured cabling and hardware for the buildings data network systems. These rooms underpin the technology and connectivity of the University.

By adhering to these standards La Trobe's data network systems can achieve a high level of reliability, optimized performance, robust security, and effective operational support, ensuring that the network meets the needs of the university community effectively.

ABOUT THIS DOCUMENT

This document provides for the University:

- A consistent experience for end users, designers, and support personnel for all equipment room deployments housing La Trobe network data systems.
- Alignment with I&O design standards and requirements.
- Deployment of Network Communications systems that can be supported in a timely and cost-effective manner.
- Define a minimum level of functionality and installation quality.
- Provide guidance to consultants, integrators, architects and other stakeholders regarding the selection, design and installation of Equipment Rooms.
- Preferred network infrastructure manufacturers and part list.
- The procedure and considerations for installations that are unable to abide by these standards.

This document is to be used in conjunction with the La Trobe Data Cabling Infrastructure standards and Information Services brief documentation.

WHO IS THIS DOCUMENT FOR?

This document is for all members of design and construction teams working on LTU Equipment Rooms and network communications systems. It outlines mandatory requirements to ensure compliance and quality.

Relevant Sections

Party	Relevant Information
Architect / Principle	Equipment Room Requirements Equipment Room Types Appendix
Services Engineer / Contractor / Builder	Whole Document La Trobe Data Cabling and Infrastructure Standards

REFERENCE DOCUMENTS

Relevant La Trobe University Documents

As well as complying with this document, implementation of Equipment Room systems shall also comply with the following:

- La Trobe University Design Standards
- La Trobe University Data Cabling Infrastructure Standards
- La Trobe University Information Services Brief
- La Trobe Audio Visual Design Standards

Where any conflicts exist between any of the above documents and this document, a Request For Information (RFI) shall be raised to request clarification. The RFI will be brought to the attention of the Information Services Technology Enablement and the Principal for a clarification.

Other Relevant Documents

Several standards will be relevant to any network communications project. They will apply according to the following order of precedence (higher on the list will take precedence).

- Any Victorian or Commonwealth Legislation that may apply (including reference regulations) including the National Construction Code (NCC).
- Other Relevant Australian Standards
- LTU Standards (including this document).

Reference Documents

The following list of documents may be relevant to the communications room design for this project. Where LTU standards do not specifically address an issue, the below should be consulted for relevant design information.

Standard	Name / Description
AS 1428.1:2021	Design for access and mobility, Part 1: General requirements for access New building work.
AS 1428.2:1992	Design for Access and Mobility – Enhanced and Additional Requirements Buildings and Facilities
AS 3080:2013	Information Technology – Generic Cabling for Customer Premises
AS 3084:2017	Telecommunications Installation, Pathways and Spaces for Commercial Buildings.
AS 3760:2022	In-service Safety Inspection and Testing of Electrical Equipment
AS/NZS 61000	Electromagnetic Compatibility (EMC) Limits
NCC (BCA)	Building Code of Australia 2021 (BCA)
C-tick:	Complying with Australia and New Zealand EMC Framework requirements.
DDA	Commonwelath Disability Discrimination Act 1992 (DDA)
La Trobe University Design Standards	https://www.latrobe.edu.au/io/working-with-us/design-standards

La Trobe University Cabling Infrastructure Standards	https://www.latrobe.edu.au/information-services-design-standards
La Trobe University Information Services Brief	La Trobe University Information Services Brief

STAKEHOLDERS

The following La Trobe University stakeholders have been identified as having a role in the use, design, development, maintenance and support of network communications systems at the University

.

Stakeholder	Role
Principal	La Trobe University's representative who has full authority to act on behalf of the University for all technical and design related matters.
LTU Project Managers	Project Managers oversee the effective delivery of tasks to a defined timeline and budget. Deployments may have an I&O Project Manager, IS Project Manager or both.
LTU I&O Services	I&O manage requirements for building specifications, maintenance and contractors attending campus.
LTU Technology Enablement	• Responsible for defining the standards. • Designing the network system solution and/or coordinating with relevant consultants. • Working with the electrical/data contractor overseeing the installation works. • Conduct acceptance testing. • Manage defects remediation and project deliverables. • Storing LTU documentation related to network communication systems. • Project handover, at completion, to Information Services support team(s).
LTU Network and Facilities	• Complete witness testing and accept the deployment into service. • Ongoing maintenance and technical support. • Provide advice on design and desired outcomes. • Deployment of active network hardware.
Architect / Services Engineer	Varies dependent on agreed engagement, commonly responsible for the gathering of functional requirements, technical design of the network communications system in consultation with LTU Technology Enablement and Networks and Facilities team.
Data Contractor	The company and its sub-contractors, agents and representatives engaged to deliver the network communications system as detailed in supporting documents. The Data Contractor may be directly engaged or subcontracted under a builder or other services integrator.

DEFINITIONS

The following definitions are used throughout this document.

Name	Description
Active Network Hardware	Electronic hardware that transmits data between devices; ie network switches and routers.
Architect	The person (group) who plans, designs and oversees the construction of buildings.
LTU	La Trobe University
Approval	Formal acceptance of the submitted works. Approval does not relinquish the contractor's responsibility under the applicable contract or engagement.
Contract	An enforceable agreement between La Trobe University and engaged contractor.
Contractor	The company, its staff, agents, or sub-contractors that have entered into an agreement to complete the works as detailed in the contract and/or "Scope of Works".
Defects Liability Period	A period from the day that practical completion was obtained where the contractor is to provide warranty for all supplied goods and services.
Delivery Director – Technology Enablement	La Trobe University's representative who identifies technological business opportunities and facilitates applications for project funding. Assists with high-level stakeholder management.
Instruction	A formal direction issued by the principal or their representative.
Passive Network Hardware	Structured cable (fibre/copper), equipment racks, connectors, patch panels.
Practical Completion	The data that all works have been completed and there are no outstanding defects. Practical Completion may be conditionally granted if defect rectification is delayed by issues outside the contractor's control. DLP for outstanding items will commence from the day of rectification.
Principal	La Trobe University's representative who has full authority to act on behalf of the University for all technical and design related matters.
Builder	Typically engaged to manage requirements for a particular project to perform building works according to specifications, maintenance and manage contractors attending campus.
Project Manager	La Trobe University's representative responsible for scheduling and liaising with all concerned parties to ensure the delivery of the project is completed in a professional, timely and cost-efficient manner.
Superintendent	La Trobe University's representative who has full authority to act on behalf of the University for all project related matters.

ACRONYMS

The following acronyms are used throughout this document.

Name	Description
AFFL	Above Fixed Floor Level
DDA	Disability Discrimination Act

DER	Distribution Equipment Room
DGPO	Double General Power Outlet
HVAC	Heating, Ventilation and Air Conditioning
I&O	LTU Infrastructure and Operations
IEEE	Institute of Electrical and Electronics Engineers
IoT	Internet of Things
IP	Internet Protocol
IS	LTU Information Services
ISDN	Integrated Services Digital Network
IT	Information Technology
LAN	Local Area Network
MER	Main Equipment Room
LTU	La Trobe University
NCC	National Construction Code
O&M	Operations and Maintenance Manual
OS2 SM OF	Optical Singlemode Fiber
PDU	Power Distribution Unit
PoE	Power over Ethernet
PSTN	Public Switched Telephone Network
RF	Radio Frequency
SER	Satellite Distribution Room
UPS	Uninterruptable Power Supply
WAN	Wide Area Network
WHS	Workplace Health & Safety

EQUIPMENT ROOM PROJECT PROCESS

The design and installation of Equipment Rooms and data network systems requires a coordinated project team and collaboration at the earliest stages. Equipment Rooms and Network systems underpin all other technologies utilised with the building spaces. The LTU project process follows these steps:

1. **Preliminary architectural concept**, this is the initial step where it has been identified that the University will build or refurbish a physical space. At this stage, it will be determined if existing Equipment Rooms are suitable for the intended concept or if new Equipment Rooms are required (ie. New build).

2. **Requirements workshops** are conducted by the Architect or LTU Technology Enablement with representatives of the LTU stakeholders to gather a comprehensive understanding of the expected uses of the space(s) and all requirements are identified. This process may take several workshops.

3. **Preliminary Equipment Room identification**, this is completed by LTU Technology Enablement in consultation with LTU Networks and Facilities. The type of Equipment Room identified will be defined by the IT/AV technology requirements of the building / spaces.

4. **LTU Information Services brief,** prepared by LTU Technology Enablement will outline Equipment Room requirements. The requirements will be captured and reflected in the architects and electrical/data services design documentation.

5. **LTU Information Services brief approval**, required prior to processing to the next step. LTU Technology Enablement and the Principle will confer to ensure the process undertaken to document the functional requirements has included all relevant stakeholders. This step is evidenced by the endorsement of the brief document at project meetings. Any modifications of the brief document must repeat this step.

6. **Detailed Design** documents are prepared by the Architect/Services Engineer and will comply with the details provided by this document, LTU Data Cabling Infrastructure Standards and LTU Information Services brief. Where there is a discrepancy between these documents, the LTU Information Services Brief will take precedence.

7. **Detailed Design Approval,** is required to ensure the principle, LTU Technology Enablement and LTU Networks and Facilities have completed a review of all requirements and identified potential conflict between the Equipment Rooms and other services including, mechanical, electrical, HVAC, structural, and project budget. This step is evidenced by the endorsement of the detailed design document at project meetings. Any modifications of the detailed design must repeat this step.

8. **Tender evaluation and award**, is completed by the Architect / Services Engineer in consultation with LTU procurement and strategic sourcing teams. Tender submissions are evaluated for their technical and commercial merit and a recommendation is provided to the LTU Technology Enablement and the principal. Once awarded the successful builder/contractor will be engaged by the principle.

9. **Build,** of the Equipment Room is completed by the builder/contractor as specified by the Architect, Services Engineer and LTU Technology Enablement. Works by the builders electrical/data contractor shall include all electrical, structured cabling, racks and passive network hardware.

10. **Commissioning of active network hardware,** takes place prior to commissioning of all other systems that require LAN connectivity. This can only proceed once the build of the space is complete and test reports, as-builts are submitted. LTU Technology Enablement and LTU Networks and Facilities are responsible for installation and commissioning of active network equipment.

11. **Defect Inspection,** is conducted by the Services Engineer and LTU Technology Enablement during rough-in stage and at completion of the build. Any remediation works are then identified and completed prior to notification being sent to LTU Technology Enablement that the space is ready for practical completion. LTU Technology Enablement will verify the space has been built according to the functional brief and detailed design.

12. **Defect Remediation** is conducted by the builder/contractor as soon as practical. Defects that have been identified as critical to a practical completion are to be prioritised.

13. **Handover / Practical completion**, is submitted by the builder/data contractor to the principle. The documentation submitted includes structured cabling test results, electrical/data as-builts and data sheets. These may be accepted separately or contained with the Operations & Maintenance Manual (O&M). All documents are issued to LTU Technology Enablement for archiving, the principle concludes the project.

RACI Matrix

Responsible - Executes task and ensures its completion
Accountable - Person with authority to sign-off and ensure thorough completion of the task or deliverable.
Consulted - The person who has the ability or knowledge needed to complete the work.
Informed - People who must be kept informed of the work.

Task / Stakeholder	**Project Architect**	**LTU I&O Services**	**LTU Project Management**	**LTU Technology Enablement**	**Project Services Engineer**	**Builder / Contractor**	**LTU Networks and Facilities**
Preliminary Architectural Concept	R	C	A	C	I	-	C
Requirements Workshop	R	I	A	I	I	-	I
Preliminary Equipment Room Identification	I	I	A	R	I	-	C
LTU Information Services Brief	I	I	A	R	I	-	I
Detailed Design	R	I	A	I	R	-	I
Detailed Design Approval	I	R	A	R	I	-	I
Tender and Evaluation Award	R	C	A	C	I	I	I
Build	I	I	A	I	I	R	I
Commissioning of Active Network Hardware	I	I	A	R	I	I	R
Defect Inspection	I	C	A	C	R	I	C
Defect Remediation	I	I	A	I	I	R	I
Handover / Practical Completion	R	I	A	I	R	R	I

Equipment Room requirements

Information Services Equipment Rooms are defined as a *Main Equipment Room (MER)* or *Satellite Equipment Room (SER)*.

Main Equipment Room (MER)

The MER (also known as Building Distributor) is provided on ground floor of the building. The room houses active network equipment and is the entry point for all campus fibre lead-in. The MER distributes vertical backbone fibre to each Satellite Equipment Room (SER) located on each of the building's floors.

Horizontal cabling for the same level will originate from the MER.

Satellite Equipment Room (SER)

The SER (also known as Floor Distributor) houses active network hardware and is the origin of horizontal cabling for the floor. The vertical fibre backbone connects the SER to the buildings MER.

General Requirements

- Each floor of a multi-story building will contain at least one Equipment Room.
- Equipment Rooms are preferred to be place central of the building floor plan.
- All Equipment Rooms are to be vertically aligned within the building to minimise deviations in vertical cable paths between levels.
- Horizontal cable runs will not exceed 85m. Where horizontal cable runs exceed 85m, an additional Equipment Rooms will be provided to maintain a cable length of <85m.
- Rooms are to be sealed slab-to-slab to prevent dust ingress and concrete dust within the room.
- The room construction will be acoustically treated to minimise the noise transmitted to the adjacent works areas.
- No services (inclusive of stormwater, water, sewer pipe runs) other than those serving the space are permitted to traverse through or over the Equipment Room.
- Access to the Equipment Room will be clear and unobstructed through to the level entrance.
- There will be no passthrough to other rooms.
- At least 1m clearance is required around the sides and rear of equipment racks, and 1200mm to the front. Rooms containing multiple racks will have the racks side-by-side.
- Dedicated overhead cabling support systems (cable tray/basket) will be provided for all optical fibre and copper cabling.
- Furniture & fixtures for storage are not permitted in the communications room.
- Walls and ceilings will be finished in Antique White USA , semi-gloss paint.

Ceilings

- The Equipment Room ceiling will be of minimum 2.7m and open to the above floor slab. Suspended ceiling types of not permitted.
- Where an upper floor slab is not available (such as top floor of building), the ceiling will be of solid plaster and fitted with an access hatch.

Floors

- Floors are to be the same level to the adjacent corridor/room. Raised or lowered floors will not be accepted.
- The floor finish will be of sealed concrete or anti-static vinyl.

Doors

- Doors will be minimum of 920mm width and be of solid construction.
- The door will open inwards of the room and positioned so that the door swing does not impede the working area in front of the equipment racks.
- The door will be fitted with a hold door closer with the hold open position set to minimum of 100^0.

Fire Rating

- Water sprinkler systems for fire systems are not permitted. The Equipment Room will be a minimum 2-hour fire rated construction.
- A CO_2 portable fire extinguisher typically 4.5KG rated for Class E type fires (electrical equipment) will be provided in the room near the exit door.
- The Equipment Room will have a smoke detector system that interfaces the building Fire Indicator Panel fitted.
- Fire rating of the room must comply with fire regulations and requirements.

Electrical Services

- The Equipment Room will have a minimum of two (2) DGPO's rated at 10A installed at 300mm AFFL for general use.
- Each equipment rack will require two (2) 15 Amp captive outlets. The outlet will be suspended of overhead mounted to remove tripping hazard. Each outlet will have an independent circuit.
- The Equipment Room will contain other power services for HVAC and other room related systems. Services will have an isolator switch to allow removal of power to circuit for maintenance. Power requirements for these services are to be specified by the Service Engineer.

Lighting

- LED lighting will be fitted to illuminate front and rear of equipment racks. Colour of light will be a minimum of 4000k (Cool White) and brightness of at least 500 lumens per square meter.
- Lighting will be operated by switch, sensor and automatically turn off during no occupancy after 30 minutes.
- Each light fitting will be individually switched.
- Operating specifications of lighting systems will comply with La Trobe Design Standards.
- The light switch will be located on the wall at the entry door.
- The room will be fitted with an emergency light that is activated during the event of power outage/emergency and will luminate pathway to the exit door.

Heating Ventilation Air Conditioning (HVAC)

Air Conditioning

- The Equipment will have a split air conditioner unit with the head mounted on the wall.
- The air conditioning system will be independent of other air conditioning systems within the building and comply with the requirements with the main Mechanical Services.
- The air conditioning system will have a minimum rated cooling capacity of 7kw.
- The power supply to the air conditioning system will be on an independent circuit.
- A drain will be fitted to expel condensation generated by the air conditioner away from the room.
- Operational requirements:
    - **Run time:** 24 x 7
    - **Room temperature:** 22 ± 2 deg celsius
    - **Room humidity:** 20 to 80% humidity
    - **Restart:** The air conditioning unit shall auto restart after a power outage.

- An environmental monitoring system (compatible with existing LTU systems) is to be provided for temperature and humidity control.

Ventillation

Heat extraction is to be provided within the communications room in case of failure of the air conditioning unit.

- Where a UPS is present, the extraction fan will be connected to the UPS to allow continuous operation in event of power outage.
- The extraction fan will be on an independent power circuit.
- A passive vent will be fitted to the door and contain filter to prevent dust ingress.
- The extraction fan will be activated where the ambient room temperature exceeds 30 degrees celsius.

Security and Access

- All access doors will be monitored for both entrance and exit.
- Access into the communications rooms is to be via swipe access in accordance with the LTU standard Gallagher access controller.
- Access to the room will be via a public area (rather than a teaching area).
- Access to the communications rooms will be restricted to selected personal from the La Trobe University Information Services and I&O maintenance teams.
- A dome style security camera will be fitted to the room that has the equipment rack and door entry within its field of view. The camera will be defined by the LTU Security Standards and connect to the LTU Security System.

Room Numbering

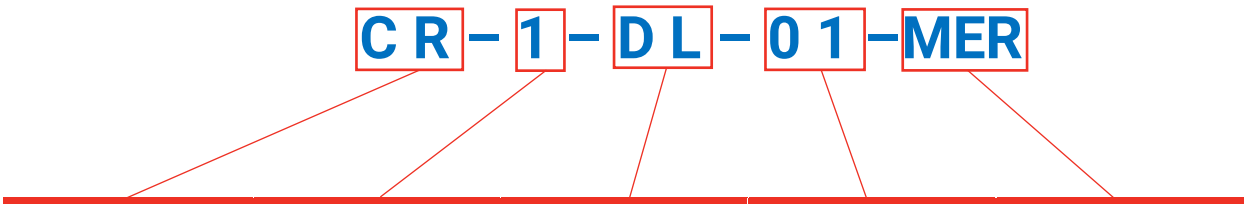
- Room numbering for communications rooms will comply with LTU Design Standards.
- Room numbering for ***existing*** communications rooms will not be changed.

Equipment Room Type

The below room types are defined by the number of equipment racks required and the function of the space (MER or SER). The room type and function will be determined during concept phase of the project by La Trobe Technology Enablement.

Floorplans and elevations drawings are available in the Appendix C.

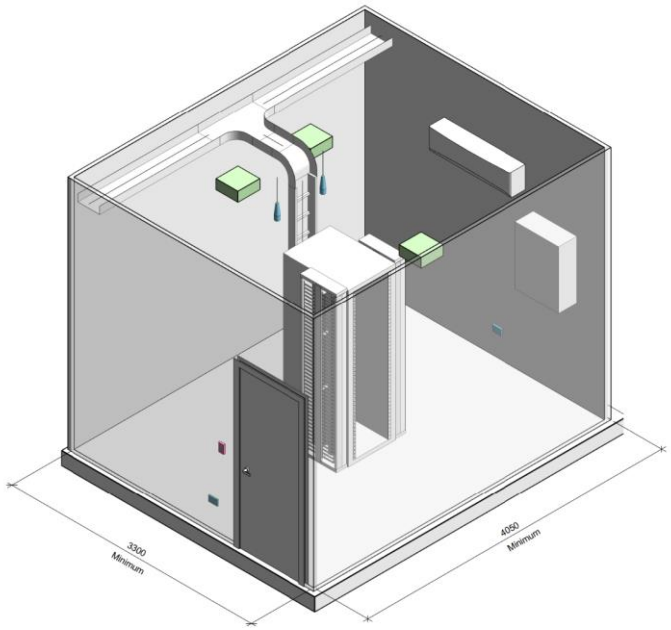
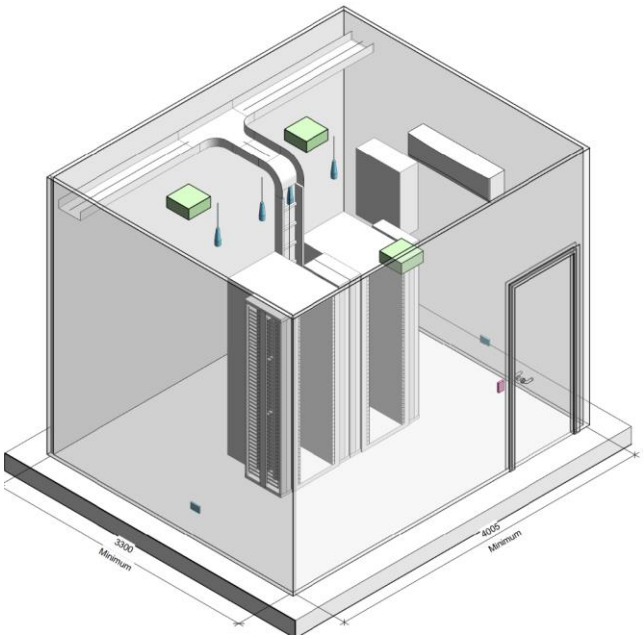
Drawing Name Nomenclature

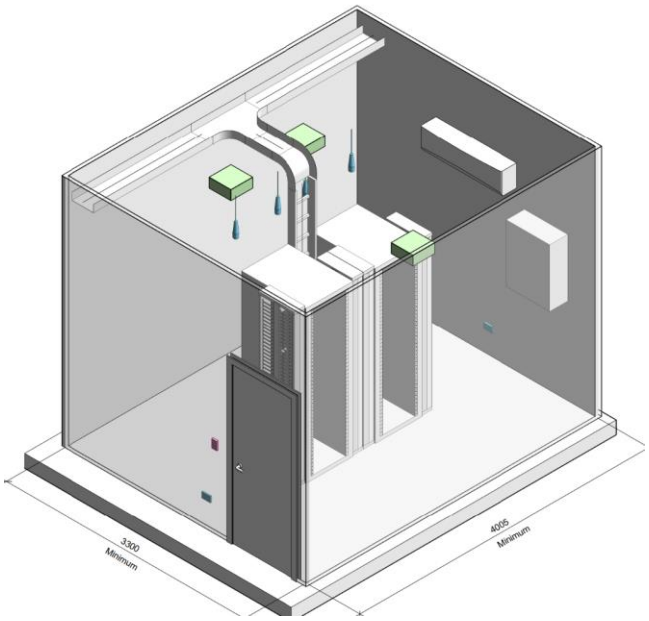
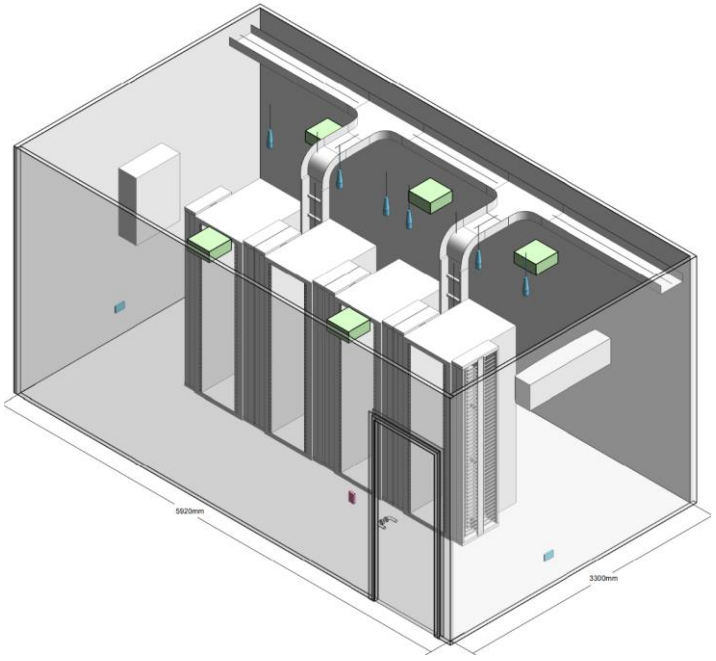


CR	1	DL	01	FD
"Communications Room"	Number or racks (ie: **1, 2, 3, 4**)	**DL** – Door is located on long wall **DS** – Door is located on short wall	Variant (ie. **01, 02, 03**…)	Defines the function of the room **MER** – Main Equipment Room **SER** – Satellite Equipment Room

Room Types

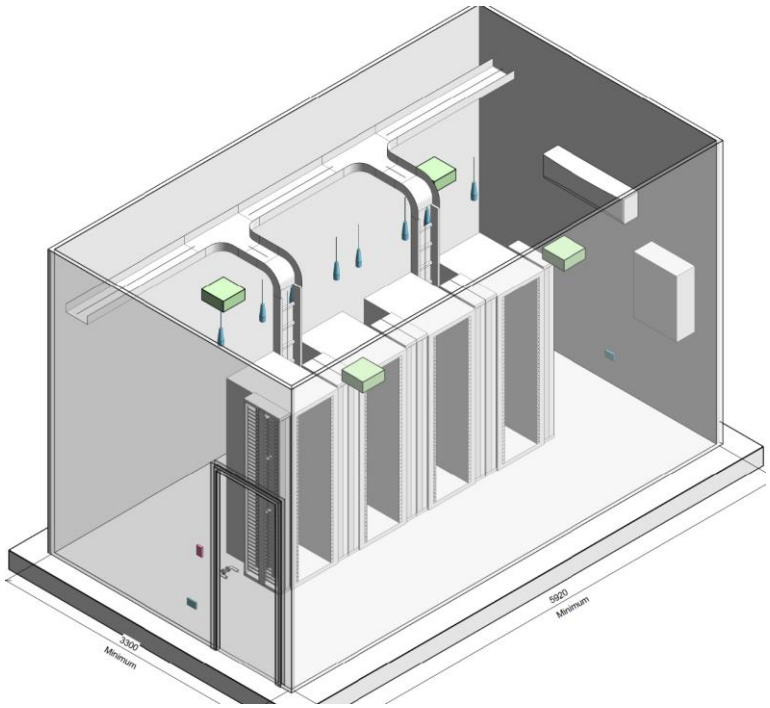
Drawing	Illustration
CR-1-DL-01-SER (or MER) Equipment Racks: 1 Door: Long Wall	*(No Image)*

CR-1-DS-01- MER (or SER) Equipment Racks: 1 Door: Short Wall	
CR-2-DL-0-MER (or SER) Equipment Racks: 2 Door: Long Wall	

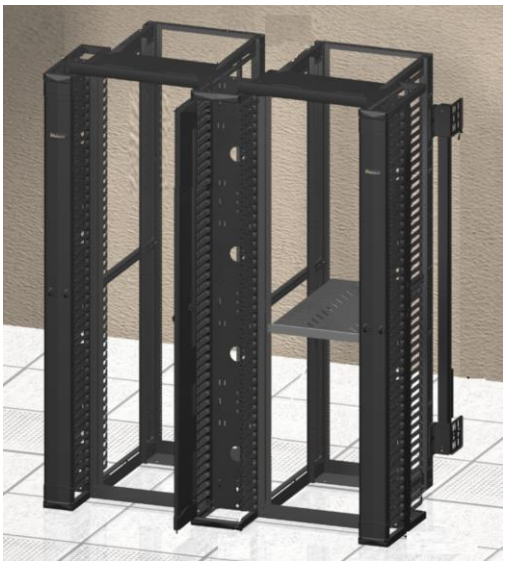
CR-2-DS-0- MER (or SER) Equipment Racks: 2 Door: Long Wall	
CR-4-DL-01- MER (or SER) Equipment Racks: 4 Door: Long Wall	

CR-4-DS-01- MER (or SER)

Equipment Racks: 4
Door: Short Wall



EQUIPMENT RACKS



- La Trobe University specifies Panduit R4P equipment racks as the approved type. Specifications, rack accessories, and layouts are defined in the La Trobe Data Cabling Infrastructure Standards. Other types of racks are not permitted unless approved by La Trobe Technology Enablement.
- All rack mounted components and accessories must be selected from the approved parts list contained within the La Trobe Data Cabling Standards *(see Appendix B).* Where the part is unavailable, or an alternative is required the Builder/ Contractor will submit a variation and obtain approval by LTU Technology Enablement and the Principal.

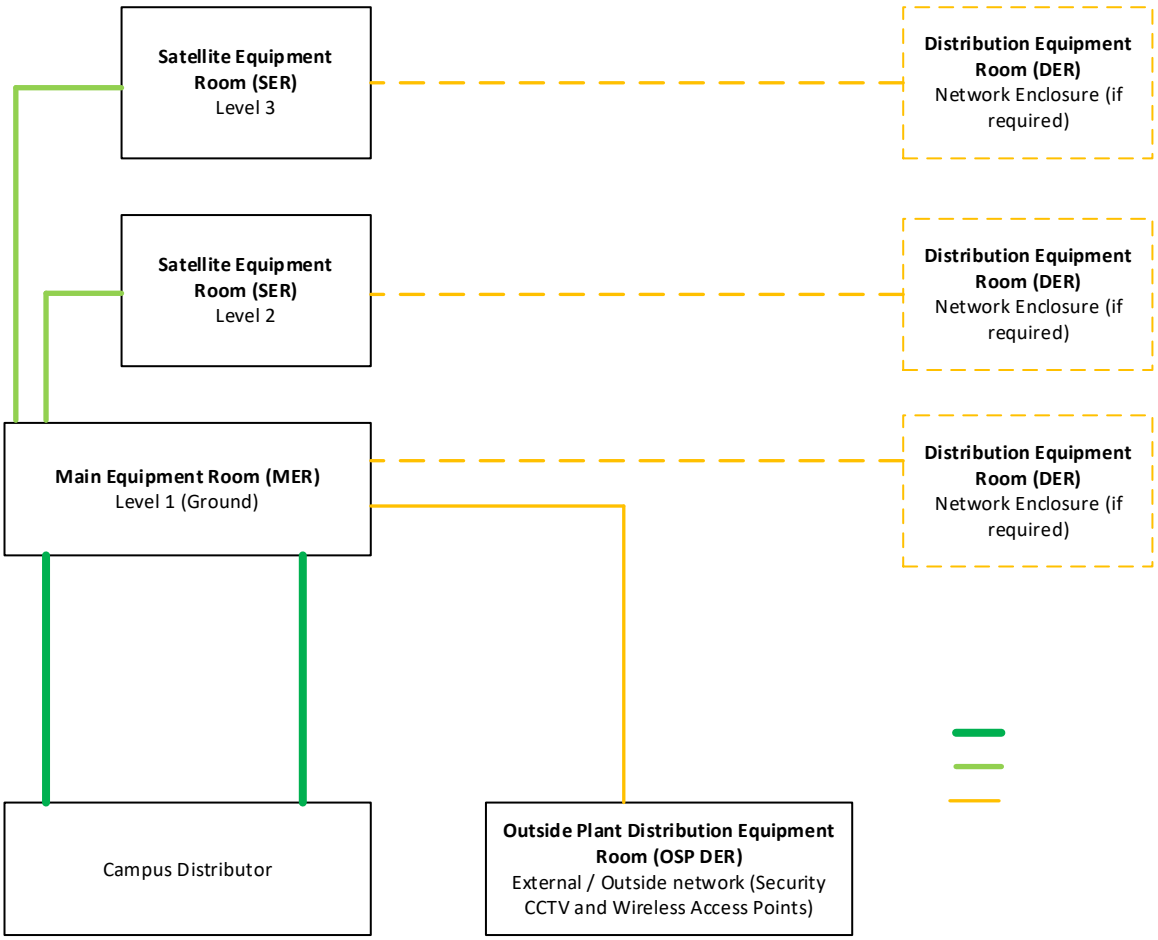
  Parts installed that are not on the approved parts list or approved variation will be defected.

- All metallic components, cabinets, racks, cable trays, cable basket and catenary wires shall be connected to the building protective earth as specified for each case in the latest revisions of AS/NZS 3000, AS/CA S009 and AS 30129.
- Sizing of Earthing conductors shall be as per latest revisions of AS/NZS 3000 and AS/CA S009.
- All equipment racks will be secured to the floor
- Racks will be fitted with vertical cable managers on both sides
- Where more than one rack is installed, they will be installed side-by-side.
- Rack 1 will house active network hardware exclusively. Where rack mount equipment for Audio Visual or 3rd party equipment is required, additional racks will be provided.
- For purposes of design, 1000mm wide and 1000mm deep is to be used to accommodate the foot print of a Panduit R4P rack with accessories.

BUILDING FIBRE AND COPPER TOPOLOGY

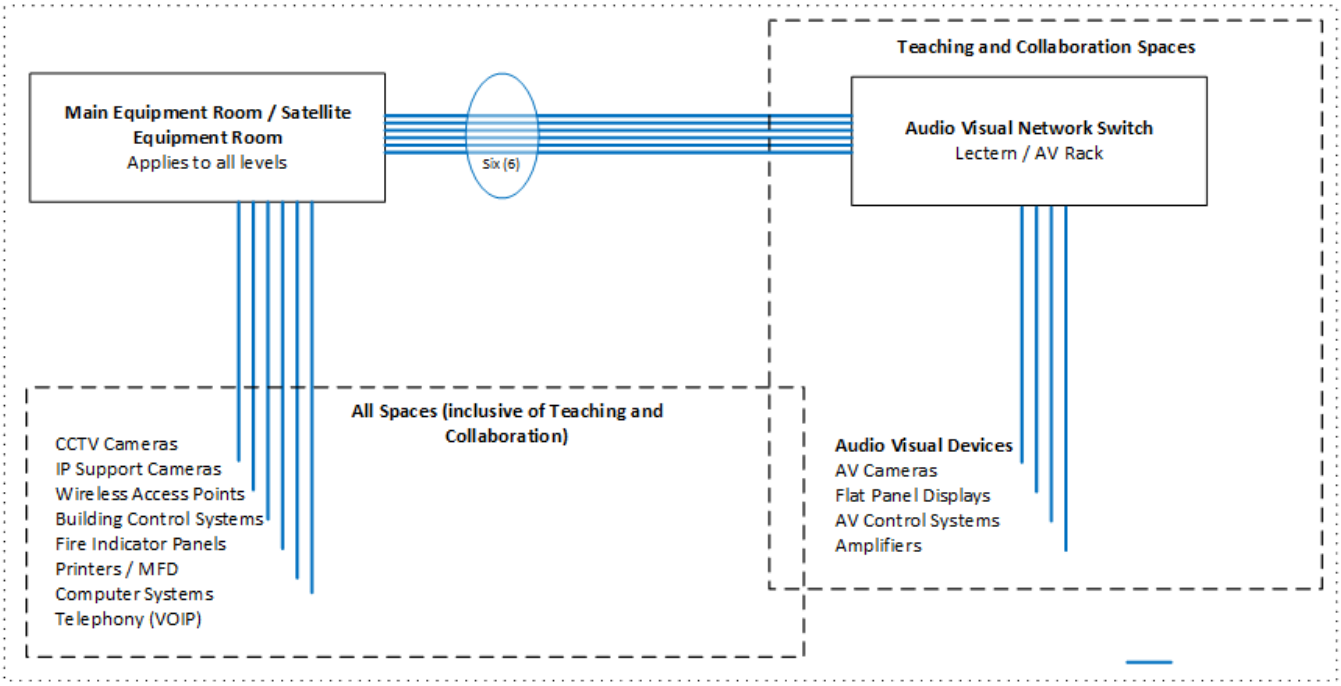
Building Fibre Topology

- The Building Distributor will be connected to the Campus Distributor via a primary and secondary fibre.
- The primary and secondary fibre cable will run through diverse pathways to provide resiliency.
- Each SER will have backbone riser cabling originating from the MER.
- Location of connectivity to Campus Distributor will be provided by LTU Technology Enablement.



Building Copper Topology (Horizontal)

- All horizontal cabling will terminate to the same level MER or SER.
- Where an Audio Visual Network Switch is present in a Teaching / Collaboration space, Audio Visual equipment specified by the AV designer will connect via CAT6a to the in-room AV Network Switch. Other LAN connected devices (non-AV) will have a CAT6a cable terminate to the MER or SER.



SIGNAGE AND LABELLING

- All communications rooms will have signage at the entry showing room number and title of “Communications Room”. The signage style will be as defined by the Signage Style Guide in the La Trobe Design Standards.
- Equipment Racks will be labelled with the rack identification number. The label will be placed on the front of the rack frame in the top, left hand corner.
- Patch Panels and Fibre panels will be labelled in accordance with AS/NZS 3085.1 and LTU Data Cabling Standards.
- All electrical switches and outlets are to be labelled and identify circuit origin.

Working at La Trobe University Sites

All contractors and consultants working on La Trobe University sites or projects must conform with all documented policies, guidelines, and procedures. Further to this they must ensure compliance with all statutory and regulatory requirements.

Specific policies to Equipment Rooms, guidelines and procedures are referenced in the relevant sections of this document. All others are managed by La Trobe University Infrastructure and Operations (I&O) Group and can be reviewed on the following website https://www.latrobe.edu.au/io/working-with-us . All works conducted at La Trobe University must comply with all relevant Workplace Health & Safety legislation. La Trobe University specific policies can be found in the I&O Design Standards, at the following website, **https://www.latrobe.edu.au/io/working-with-us/design-standards**.

All Consultants and Integrators must ensure that their designs or installations do not breach any WHS requirements during its use or maintenance. Potential risks must be identified during the requirements gathering phase and mitigated. Any outstanding risks must be brought to the attention of the principal and LTU Technology Enablement. All contractors or engaged subcontractor must:

- Complete the La Trobe University induction prior to working on any project.
- Ensure the safety of their staff, La Trobe University Staff, students, and the public at all times.
- All external staff need to sign-in at La Trobe I&O Office prior to commencing work and sign out at the end of their shift.
- Familiarise themselves with the content of the Safety in Design website prior to commencing any works.
- Have a current 'Working with Children Check' (WWCC)

NON-COMPLIANCE

Where a design or deployment cannot meet the requirements as defined by this document and referenced supporting documents then a variation / non-conformance form is to be submitted to LTU Technology Enablement and the principal with approval required prior to proceeding.

A variation / non-conformance template is available in **Appendix C** and must answer the following questions.

- The section within this document relating to the nonconformance.
- The reason for the nonconformance.
- The impact to La Trobe University with consideration to the delivery of a functional system that meets the requirements as detailed in the functional brief.
- The impact of lifecycle support and maintainability of the systems including impact related to accessibility of equipment and OH&S related matters.
- Any mitigation actions.

INSURANCE

All Consultants and Integrators working at La Trobe University must hold the following insurances:

- Public Liability - $20M.
- Professional Indemnity - $5M.
- Work Cover as required by state or territory laws.

- Any additional coverage as required by the principle.

INSTALLATION AND WORKMANSHIP

General Requirements

Integrators must complete all work in a professional manner. All works must be undertaken by well supervised and qualified staff. All works must:

- Comply with all applicable Standards with the listed order of precedence:
    - Australian and International Standards.
    - All applicable I&O, IS Data Cabling Infrastructure Standards.
    - All applicable Facilities and Services Standards.
    - Where there are no applicable Standards, follow industry best practice.
- Be undertaken by qualified staff.
- Follow the intent and requirements as detailed in the scope of works

Mandatory quality assurance inspections will occur during rough-in and commissioning stages of the project. LTU Technology Enablement, LTU Networks & Facilities (and others at LTU's discretion) will perform quality assurance checks to ensure compliance with all LTU standards and functional requirements. Where items are found non-conforming to the standards and result in a variation, the builder/contractor will submit a variation / non-conformance form and submit to the Principal to seek approval from LTU Technology Enablement and LTU Networks & Facilities.

In addition, LTU reserves the right to perform quality assurance inspections at any time by request.

The following sections provide additional information to ensure the Consultant and Integrators are informed of the minimum expectations of La Trobe University. Any areas that are not included in this section that will impact on the quality, functionality, or timely delivery of the project, must be brought to the principal's attention at the earliest possible opportunity.

Qualifications

All contractors, sub-contractors and their representatives must hold appropriate trade, manufacturer, or industry qualifications.

Contractors and Installers must be currently registered as ***Panduit Certified Installer*** *prior to working on La Trobe Universities Data Cabling and Communications Infrastructure.*

APPENDIX

APPENDIX A – APPROVED PARTS LIST

MANUFACTURER	PRODUCT DESCRIPTION	PART NUMBER
PANDUIT	45RU 4-POST RACK, THREADED RAIL, 760mm DEEP, NUMBERED UP	R4P
PANDUIT	45RU 150mm WIDE PATCH RUNNER VERTICAL CABLE MAAGER, DUAL SIDED With Doors	PR2VSD06
PANDUIT	1RU HORIZONTAL D-RING CABLE MANAGER, D-RINGS ON FRONT ONLY	CMPHF1
PANDUIT	48 PORT HIGH DENSITY PATCH PANEL WITH VERTICAL NUMBER SEQUENCE	CPP48HDVNSWBL
PANDUIT	CATEGORY 6A, RJ45 10Gb/S MINI-COM JACK MODULE, OFF WHITE	CJ6X88TGIW
PANDUIT	CATEGORY 6A, RJ45 10Gb/S MINI-COM SHUTTERED JACK MODULE, OFF WHITE	CJH6X88TGIW
PANDUIT	SINGLE GANG, 4 OUTLET, VERTICAL, WATER RESISTANT FACEPLATE	CFPWR4CIG
PANDUIT	CATEGORY 6, 24AWG, RJ45-RJ45 PATCH CORD, BLUE 1m	UTPSP1MBU
PANDUIT	CATEGORY 6, 28AWG, RJ45-RJ45 PATCH CORD, BLUE 2m	UTP28SP2MBU
PANDUIT	CAT 6, 28AWG, UTP PATCH CORD, BLUE, 1m	UTP28SP1MBU
PANDUIT	CAT 6, 28AWG, UTP PATCH CORD, WHITE, 0.5m (for Wireless Access Points)	UTP28SP0.5MY

PANDUIT	24 PORT, CATEGORY 5e, PUNCH DOWN PATCH PANEL	DP245E88TGY
PANDUIT	FIBRE TRAY	FMT1
PANDUIT	OS2 | 12 Core | Tight Buffered | INTERNAL OPTICAL FIBRE	FLKL912
PANDUIT	OS2 | 6 Core | LT | INDOOR/OUTDOOR FIBRE	FLCR906Y
PANDUIT	OS2 | 12 Core | LT | INDOOR/OUTDOORL FIBRE	FLCR912Y
PANDUIT	OS2 | 24 Core | Stranded LT | INDOOR / OUTDOOR FIBRE	FLNR924Y
PANDUIT	OS2 | 48 Core | Stranded LT | INDOOR / OUTDOOR FIBRE	FLNR948Y
PANDUIT	FLAT FIBRE PANEL PATCH PANEL	CFAPPBL1
PANDUIT	FIBRE ADAPTOR PANEL WITH 6 LC DUPLEX ADAPTORS SINGLEMODE OS1 (BLUE) ZIRCONIA	FAP6WBUDLCZ
PANDUIT	LC-PIGTAIL FIBRE PATCH CORD, SINGLEMODE 9um SIMPLEX BUFFERED-1m	NKFP91BN1NNM001
PANDUIT	FIBRE OPTIC SPLICE MODULE FOR UP TO 24 FUSION SPLICES FOR RACK MOUNT ENCLOSURES	FOSMF
PANDUIT	BLANK FIBRE ADAPTOR PANEL	FAPB
PANDUIT	CATEGORY 6A Vari MatRiX 4-PAIR 23 AWG 6.6mm COPPER CABLE, U/UTP, WHITE, 305m	PUL6AV04WH-CEG

APPENDIX B – VARIATION / NON-CONFIRMANCE FORM

Request for Variation	
Distribution	Principal, LTU Technology Enablement, LTU Network and Facilities
Project Name	
Requested Date	
Name / Position	
Contact information	

Description of Variation	
Current scope / Reason for variation	
Proposed Change	
Reason for Variation	

Justification	
Provide example of why variation is necessary	
Supporting documents (please attach and submit)	

Impact Assessment	
Scope impact	
Time impact	
Cost impact	
Any potential risks or issues	

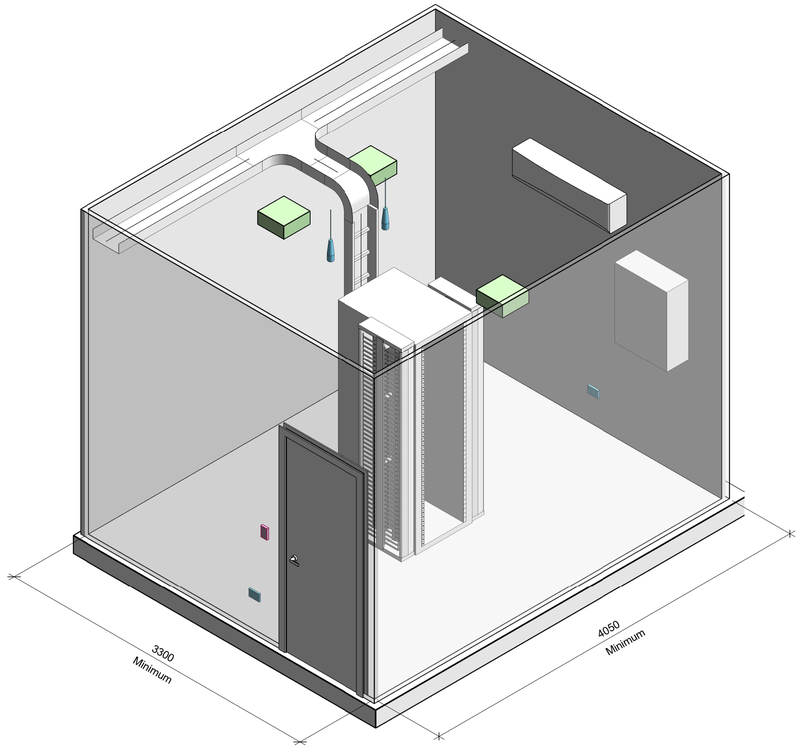
Approval (For Internal Only)			
LTU Technology Enablement		Date	
LTU Network and Facilities (Manager)		Date	
Decision (Approved/Rejected)			

Action	
Description of action	
Planned implementation date	
Action by	

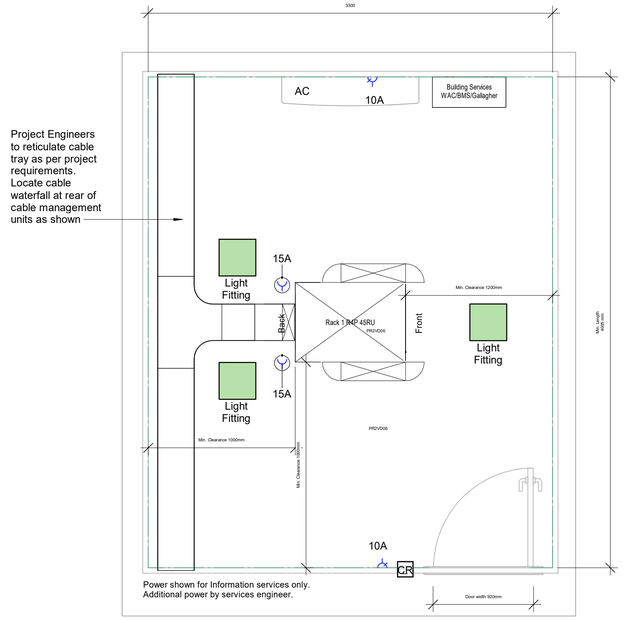
APPENDIX C – ARCTHITECTURAL / SERVICES SCHEMATIC DRAWINGS

The following pages contain architectural layouts for each of the Equipment Room types. The drawings are include:

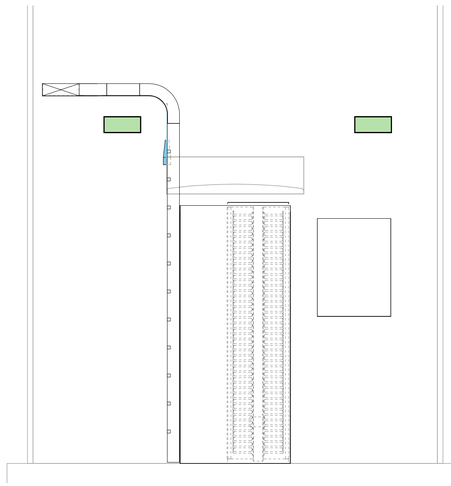
- 3D Isometric
- Floor Plan
- Elevations
- FFE Layout
- Reflected Ceiling Plan
- Services layout



1 FD/BD Type 5

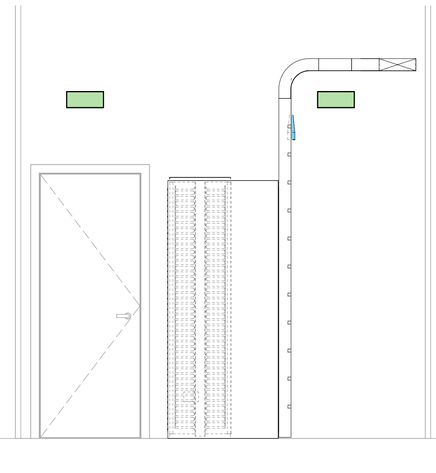


2 Type 5 Layout
1 : 25

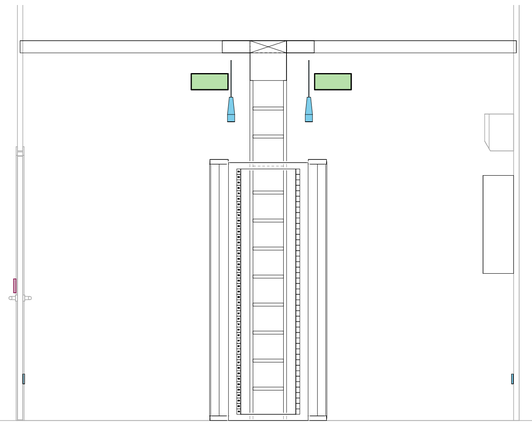


3 BD Type 5 Elevation North
1 : 25

4 BD Type 5 Elevation East
1 : 25



5 BD Type 5 Elevation South
1 : 25



6 BD Type 5 Elevation West
1 : 25

CR-DS-R1-01

REV	DESCRIPTION	DATE	INITIALS

ARCHITECT

AV CONSULTANT

AV INTEGRATOR

LA TROBE UNIVERSITY
PLENTY RD & KINGSBURY DR
BUNDOORA
VIC 3086

LA TROBE UNIVERSITY

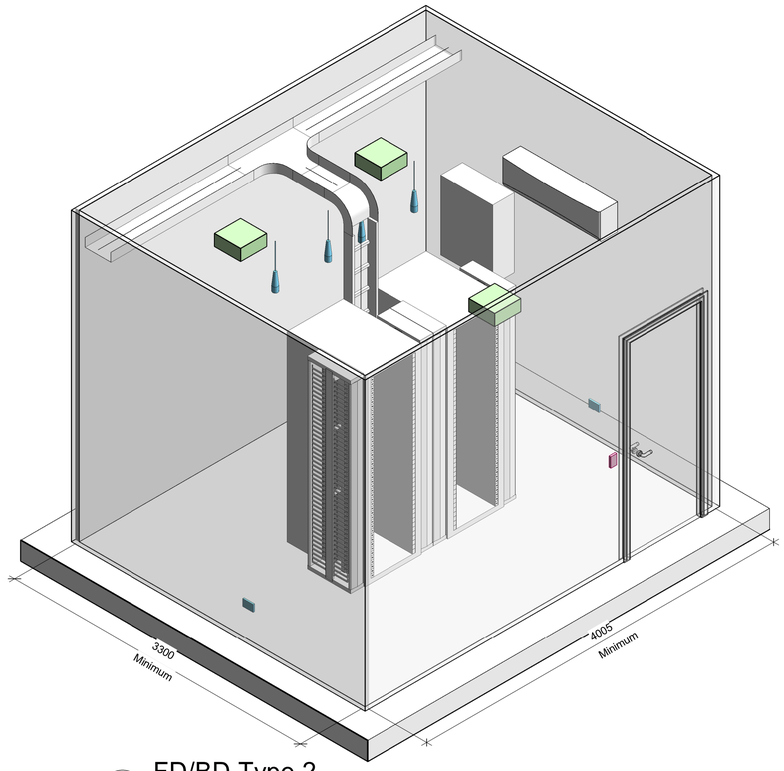
S.Osbrough@latrobe.edu.au

PROJECT
LTU Communications Room Guidelines

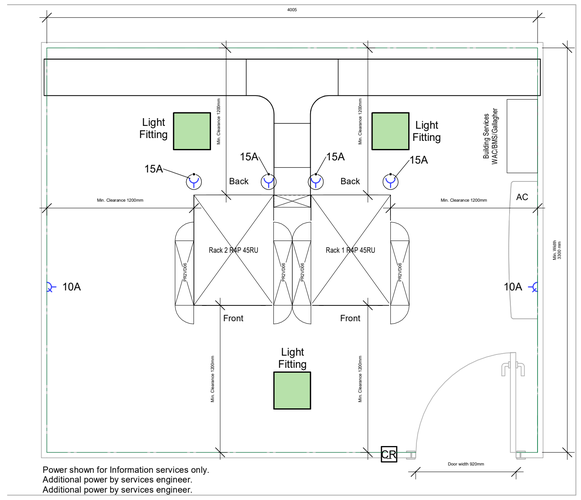
ICT Comms Rooms
Type 4
Standard Dimensions

SIZE	REF	DWG NO	REV
A1		ICT-005	

SCALE 1 : 25 SHEET

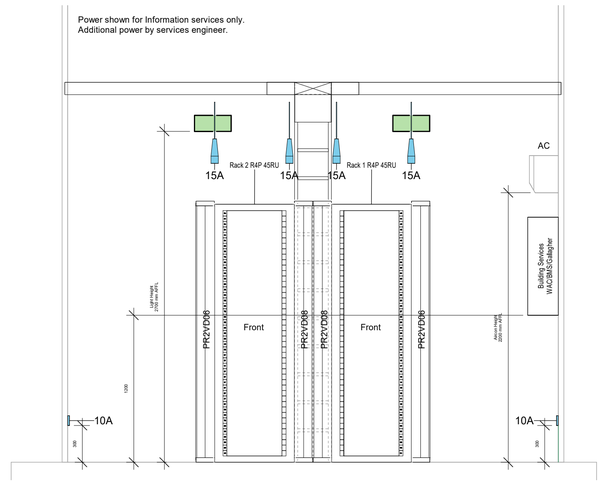


1 FD/BD Type 2



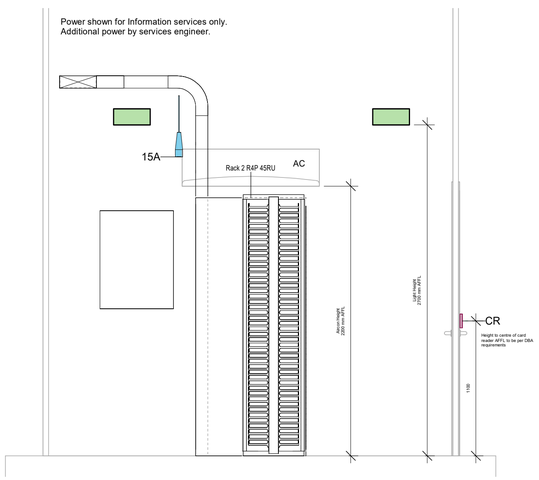
2 Type 2 Layout

1 : 25



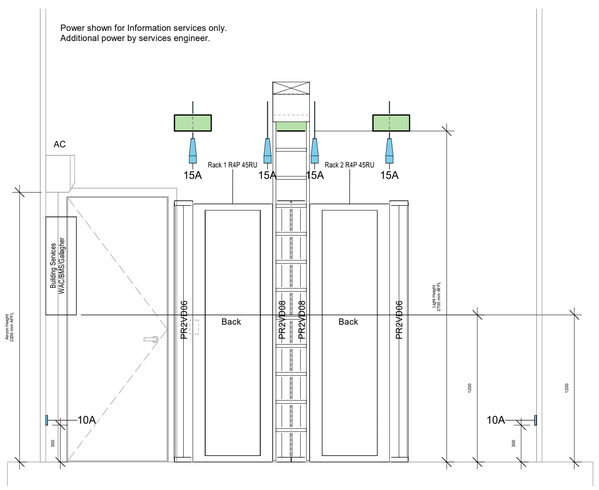
3 BD Type 2 Elevation North

1 : 25



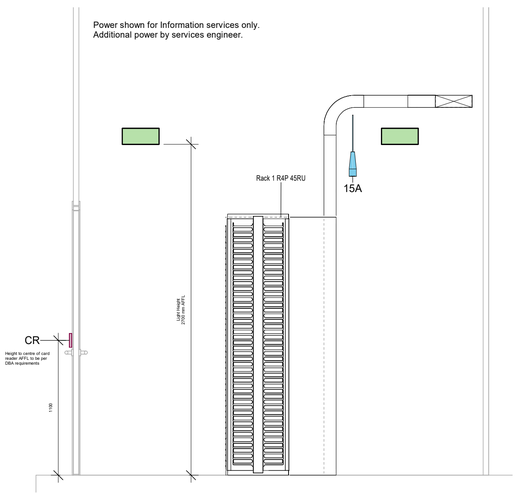
4 BD Type 2 Elevation East

1 : 25



5 BD Type 2 Elevation South

1 : 25



6 BD Type 2 Elevation West

1 : 25

CR-DL-R2-01

REV	DESCRIPTION	DATE	INITIALS

ARCHITECT

AV CONSULTANT

AV INTEGRATOR

LA TROBE UNIVERSITY
PLENTY RD & KINGSBURY DR
BUNDOORA
VIC 3086

LA TROBE UNIVERSITY

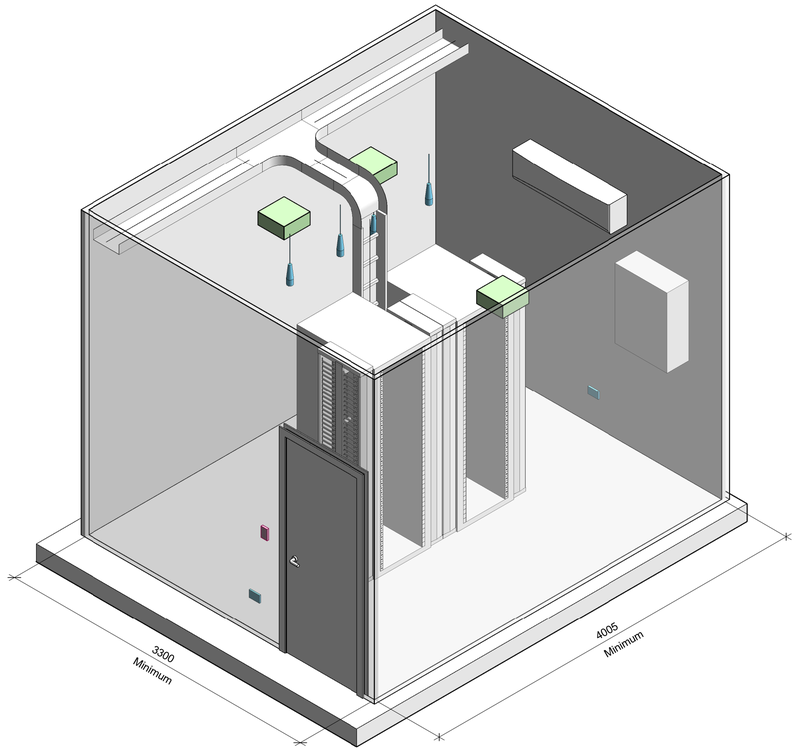
PROJECT

LTU Communications Room Guidelines

ICT Standard Comms Rooms
Type 2
Standard Dimensions

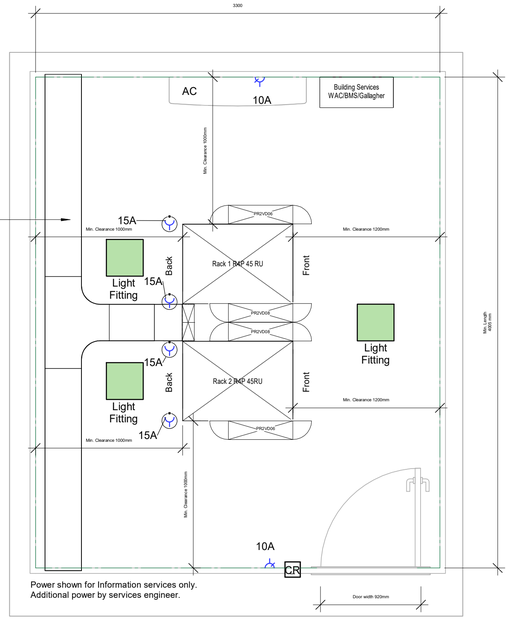
SIZE	REF	DWG NO	REV
A1		ICT-002	

SCALE 1 : 25 SHEET



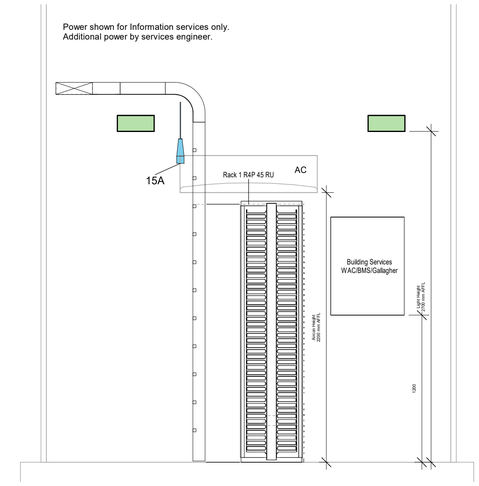
1 FD/BD Type 1 ISO View

Project Engineers to reticulate cable tray as per project requirements. Locate cable waterfall at rear of cable management units as shown



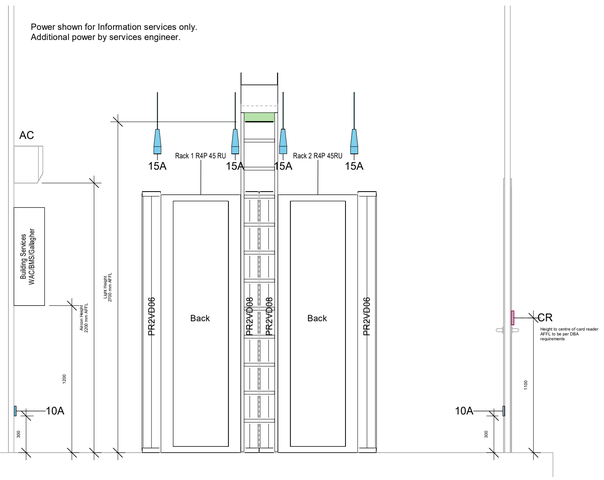
2 Type 1 Layout

1 : 25



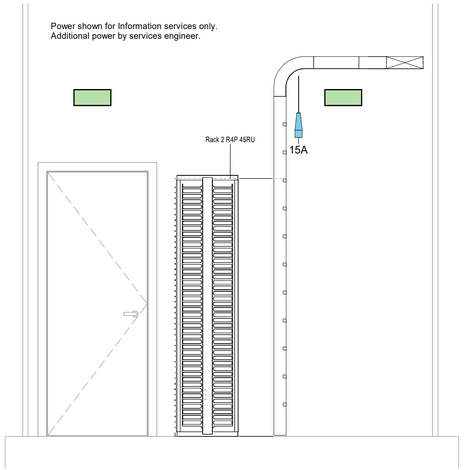
3 BD Type 1 Elevation North

1 : 25



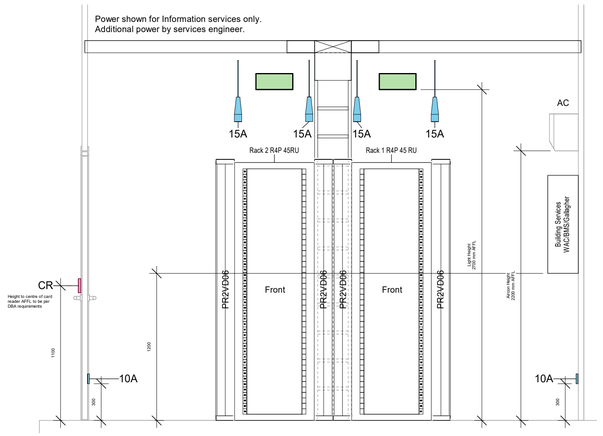
4 BD Type 1 Elevation East

1 : 25



5 BD Type 1 Elevation South

1 : 25



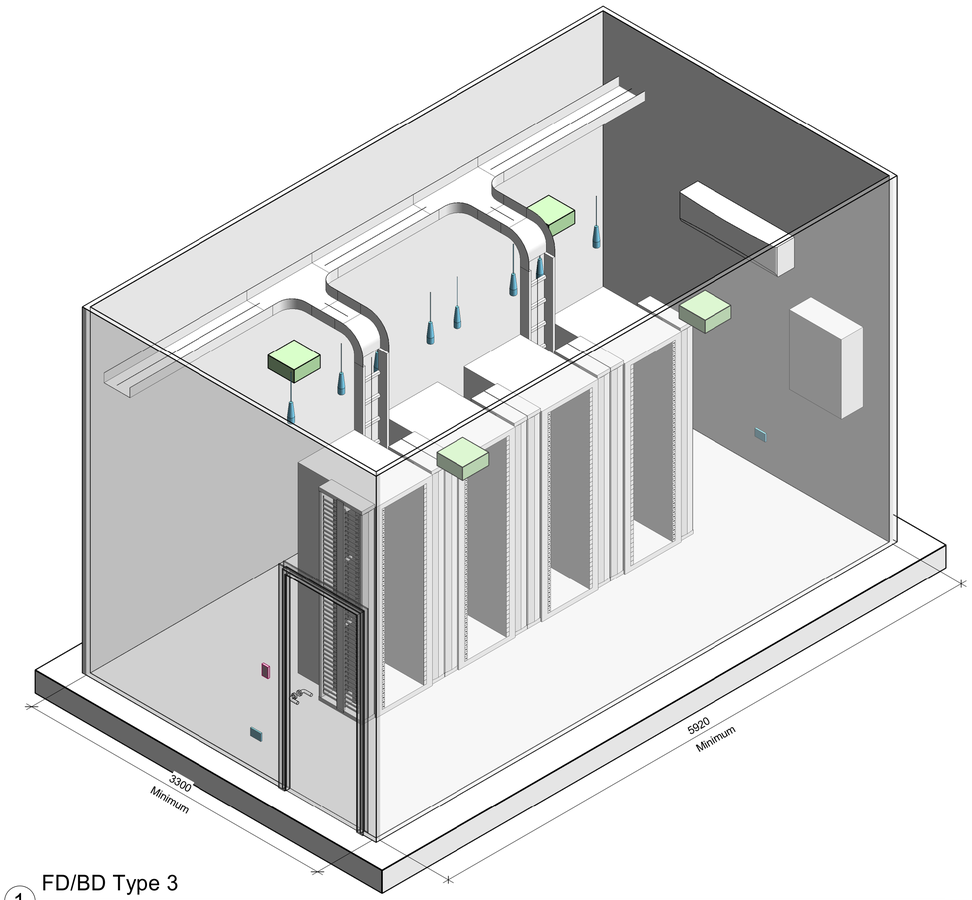
6 BD Type 1 Elevation West

1 : 25

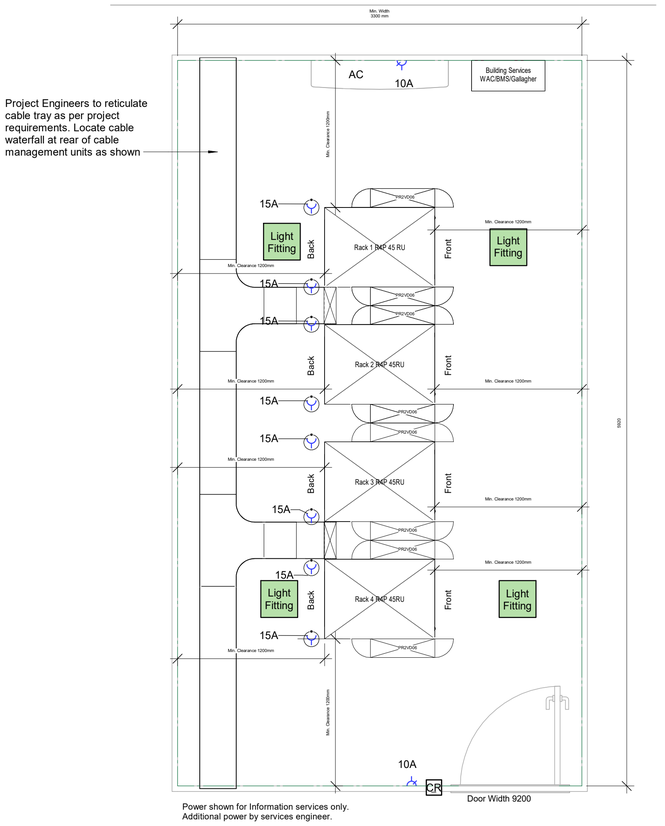
CR-DS-R2-01

ARCHITECT		PROJECT: LTU Communications Room Guidelines
AV CONSULTANT	LA TROBE UNIVERSITY LA TROBE UNIVERSITY PLENTY RD & KINGSBURY DR BUNDOORA VIC 3086	ICT Standard Comms Rooms Type 1 Standard Dimensions
AV INTEGRATOR	LA TROBE UNIVERSITY	SIZE: A1 · REF · DWG NO: ICT-001 · REV
		SCALE: 1 : 25 · SHEET

REV	DESCRIPTION	DATE	INITIALS

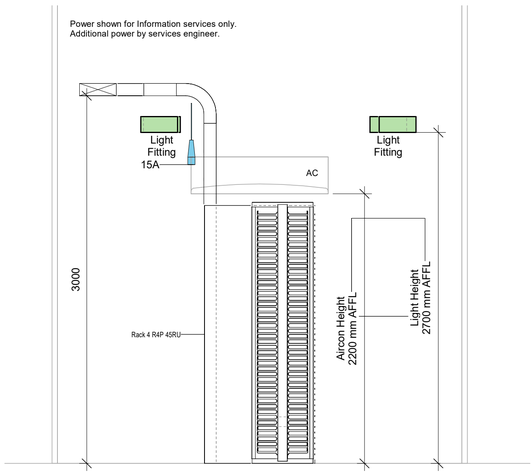


1 FD/BD Type 3



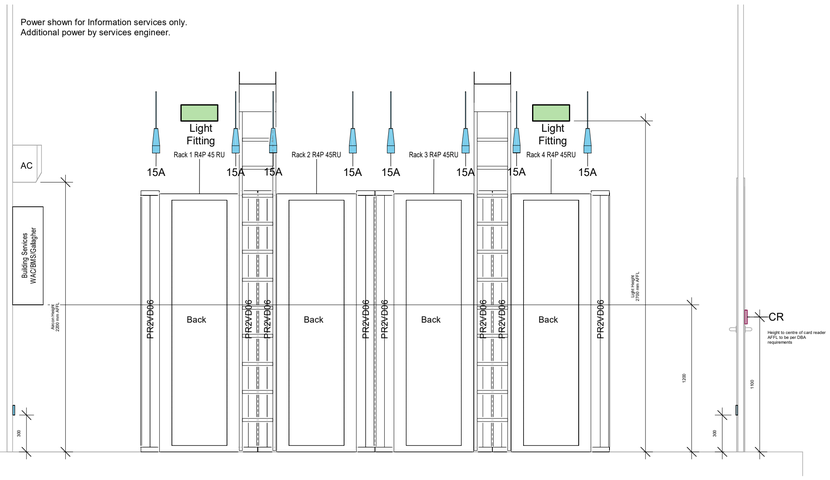
2 BD Type 3 Layout

1 : 25



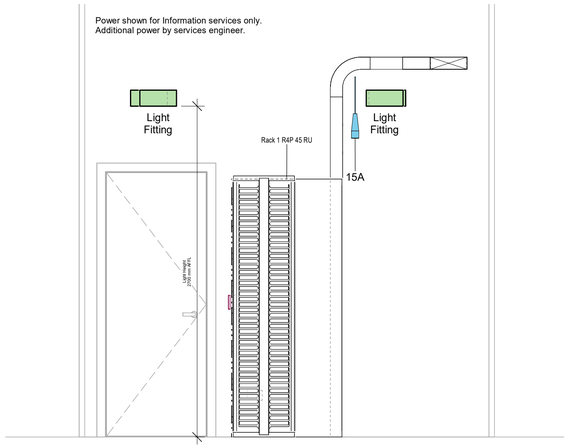
3 BD Type 3 Elevation North

1 : 25



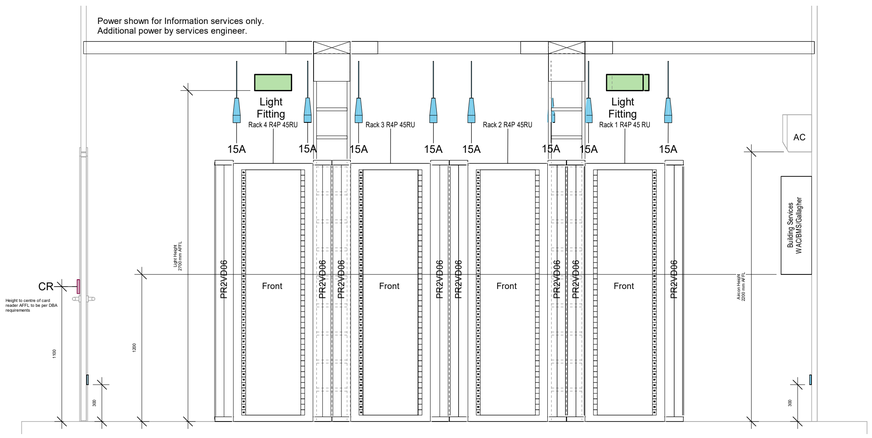
4 BD Type 3 Elevation East

1 : 25



5 BD Type 3 Elevation South

1 : 25



6 BD Type 3 Elevation West

1 : 25

CR-DS-R4_01

REV	DESCRIPTION	DATE	INITIALS

ARCHITECT

AV CONSULTANT

AV INTEGRATOR

LA TROBE UNIVERSITY

LA TROBE UNIVERSITY
PLENTY RD & KINGSBURY DR
BUNDOORA
VIC 3086

LA TROBE UNIVERSITY

PROJECT

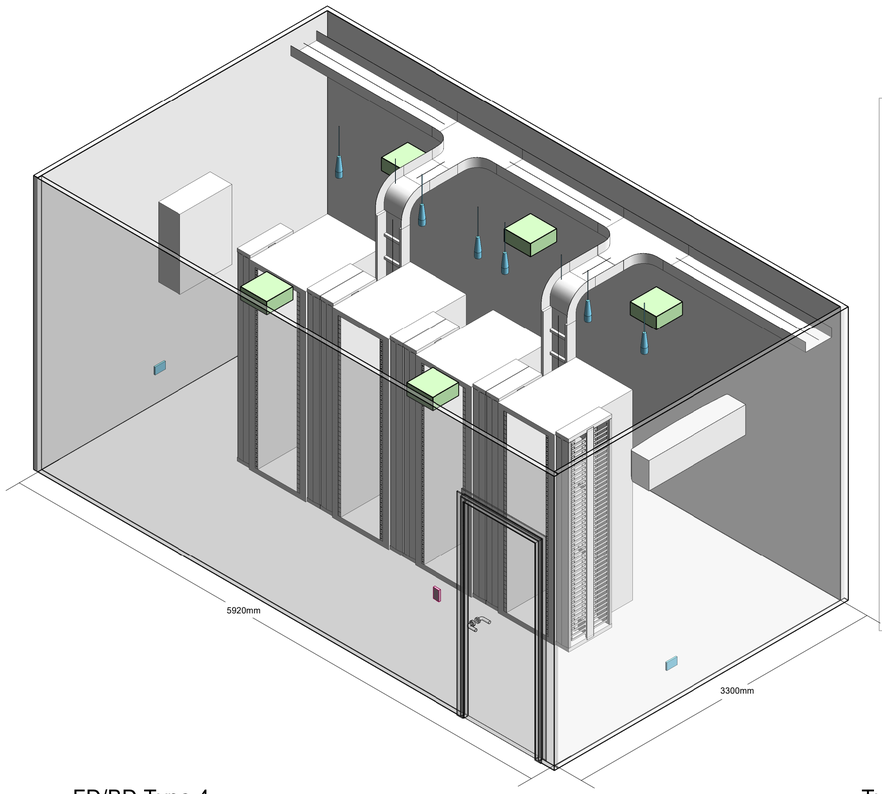
LTU Communications Room Guidelines

ICT Standard Comms Rooms
Type 3
Standard Dimensions

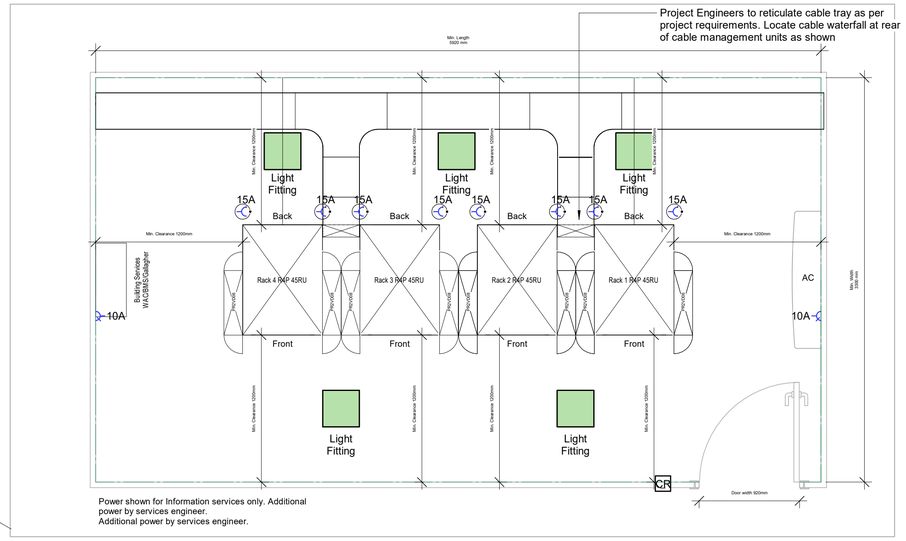
SIZE	REF	DWG NO	REV
A1		ICT-003	

SCALE 1 : 25

SHEET

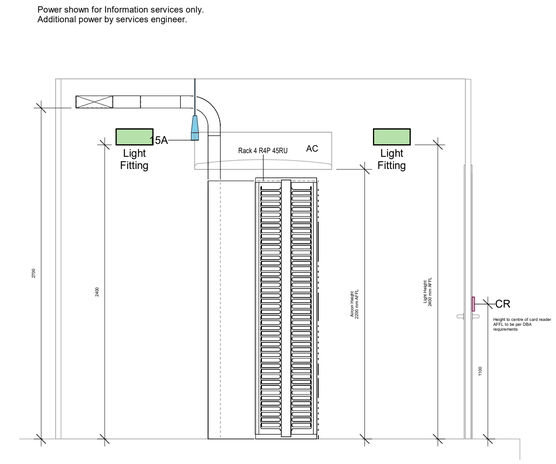


1 FD/BD Type 4



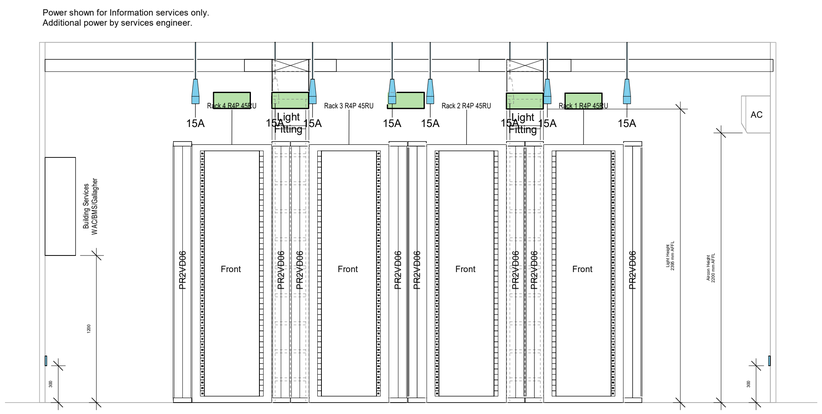
2 Type 4 Layout

1 : 25



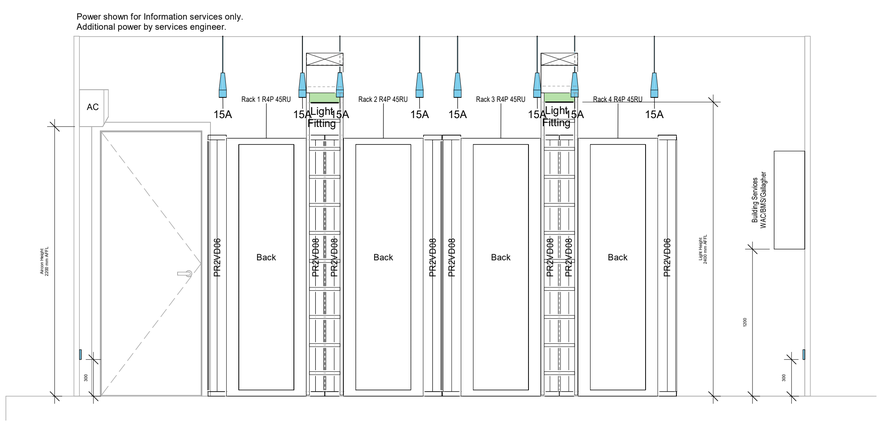
4 BD Type 4 Elevation East

1 : 25



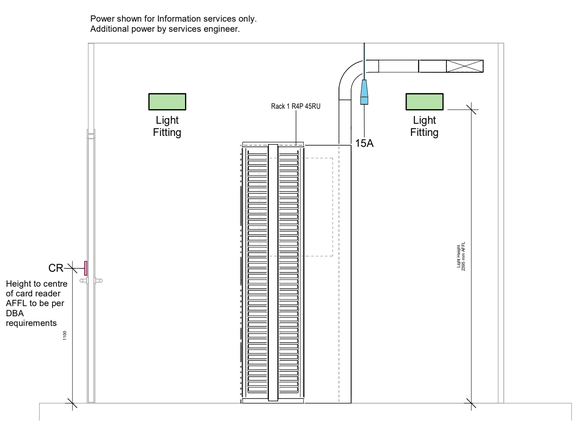
3 BD Type 4 Elevation North

1 : 25



5 BD Type 4 Elevation South

1 : 25



6 BD Type 4 Elevation West

1 : 25

CR-DL-R4-01

REV	DESCRIPTION	DATE	INITIALS

ARCHITECT

AV CONSULTANT

AV INTEGRATOR

LA TROBE UNIVERSITY

LA TROBE UNIVERSITY
PLENTY RD & KINGSBURY DR
BUNDOORA
VIC 3086

LA TROBE UNIVERSITY

S.Osbrough@latrobe.edu.au

PROJECT

LTU Communications Room Guidelines

ICT Comms Rooms
Type 4
Standard Dimensions

SIZE	REF	DWG NO.	REV
A1		ICT-004	

SCALE 1 : 25 SHEET