Charles Sturt University

Revision 1.0

Infrastructure Design Standards

Module S13: Information Technology

Division of Finance (Facilities Management)
Charles Sturt University

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1. Introduction

1.1. Overview

The Charles Sturt University Infrastructure Design Standards (the Standards) outline the University's expectations for its built forms to achieve consistency in the quality of the design and construction of those built forms.

The Standards have been developed to provide guidance to the design team and to assist Facilities Management to drive a consistent approach to the design, construction, commissioning, handover, and operation of new capital projects to ensure the new asset is fully integrated into campus life and conforms to the University's standards and policies.

The successful integration of any new project into the day-to-day operation of campus life cannot be underestimated and is vital to ensuring the new asset provides a fully functional platform for Facilities Management clients and the University. The Standards will ensure Facilities Management is successful in supporting the University's strategic objectives now and into the future. The pitfall of viewing any new project as a standalone entity must be avoided as any new project is an extension of the existing campus.

The Standards are aligned with Charles Sturt's requisites for aesthetic appeal, life cycle maintenance and environmental sustainability, while ensuring that there is sufficient scope for innovation and technological advancements to be explored within each project.

1.2. The University

The history of Charles Sturt University dates to 1895, with the establishment of the Bathurst Experiment Farm. Formed progressively through the merge of regional institutions in south-western and western NSW, Charles Sturt was formally incorporated on 19 July 1989 under the Charles Sturt University Act 1989. As one of Australia's newer universities, Charles Sturt has been built on a tradition of excellence in teaching and research spanning more than 100 years.

With over 40,000 current students studying both on-campus and online, Charles Sturt University is the largest tertiary education institution in regional Australia. The University operates six main campuses across New South Wales in Albury-Wodonga, Bathurst, Dubbo, Orange, Port Macquarie, and Wagga Wagga, alongside specialist campuses in Canberra, Parramatta, and Goulburn. Charles Sturt University is structured around three Faculties: Arts and Education; Business, Justice and Behavioural Sciences; and Science and Health.

1.3. University Vision and Values

Charles Sturt University is committed to building skills and knowledge in its regions by offering choice and flexibility to students, while collaborating closely with industries and communities in teaching, research, and engagement. As a significant regional export industry, the University brings both strength and learning back to

its regions, positioning itself as a market-oriented institution. Its goals are to remain the dominant provider of higher education in its regions and a sector leader in flexible learning.

Charles Sturt University believes that wisdom has the power to transform communities. With perseverance and dedication, the University contributes to shaping resilient and sustainable regions for the future. Acknowledging the deep culture and insight of First Nations Australians, the University's ethos is encapsulated by the Wiradjuri phrase *yindyamarra winhanganha,* which translates to "the wisdom of respectfully knowing how to live well in a world worth living in." Through its values, Charles Sturt University fosters a welcoming community and learning environment that supports innovation, drives societal advancement, and gives back to the regions it serves.

1.4. Using the Infrastructure Design Standards

The Infrastructure Design Standards are written to advise Charles Sturt University performance requirements and expectations that exist above and beyond existing industry codes and standards.

The Infrastructure Design Standards do not repeat codes and standards.

Performance to Codes and Standards are a non-negotiable regulatory minimum of any design solution, to be determined for each project by the design team.

The Standards are to be used by all parties who are engaged in the planning, design, and construction of Charles Sturt's facilities. This includes external consultants and contractors, Charles Sturt's planners, designers, and project managers as well as faculty and office staff who may be involved in the planning, design, maintenance, or refurbishment of facilities. All projects must comply with all relevant Australian Standards, NCC, EEO as well as Local Government and Crown Land Legislation.

1.5. Modules

The Standards are divided into the following modules for ease of use, but must be considered in its entirety, regardless of specific discipline or responsibilities:

- **S01 Overview and Universal Requirements**
- S02 Active Transport
- S03 Acoustics
- S04 Building Management System
- S05 Electrical and Lighting
- S06 Energy Management
- S07 Ergonomics
- S08 Fire and Safety Systems
- S09 Floor and Window Coverings
- S10 Furniture
- S11 Heritage and Culture
- S12 Hydraulic

- S13 Information Technology
- S14 Irrigation
- S15 Mechanical Services
- S16 Roof Access
- S17 Termite Protection, Vermin Proofing and Pest Management
- S18 Security Systems
- S19 Signage
- S20 Sustainable Building Guidelines
- S21 Waste Management
- S22 Project Digital Asset and Data Requirements
- S23 Commissioning, Handover and Training

1.6. Related Documents

1.6.1. University Documents

The Standards are to be read in conjunction with the following relevant University documents, including but not limited to:

- Facilities and Premises Policy along with supporting procedures and guidelines
- Charles Sturt University Accessibility Action Plan 2020 - 2023
- Relevant operational and maintenance manuals
- Charles Sturt University Asbestos Management Plan
- Charles Sturt University Signage Guidelines
- Charles Sturt University Modern Slavery Statement
- Charles Sturt University Sustainability Statement
- Charles Sturt University Work Health and Safety Policy
- Charles Sturt University Risk Management Policy
- Charles Sturt University Resilience Policy
- Charles Sturt University Health, Safety and Wellbeing Policy

1.6.2. Federal Legislation

The planning, design and construction of each Charles Sturt University facility must fully comply with current relevant Federal legislation, including but not limited to:

- National Construction Code (NCC)
- Disability Discrimination Act 1992 (DDA)
- Environment Protection and Biodiversity Conservation Act 1999 (EPBC)
- Work Health and Safety Act 2011

1.6.3. NSW State Legislation

The planning, design and construction of each Charles Sturt University facility must fully comply with current relevant Federal legislation, including but not limited to:

- Work Health and Safety Act 2011
- Environmental Planning and Assessment Act 1979 (EP&A Act)
- Building and Development Certifiers Act 2018
- Heritage Act 1977
- Protection of the Environment Operations Act 1997 (POEO Act)
- Design and Building Practitioners Act 2020
- State Environmental Planning Policies (SEPPs)
- Local Government Act 1993

1.6.4. Federal Regulations and Standards

- Relevant Australian or Australian/New Zealand Standards (AS/NZS)
- Safe Work Australia Model Codes of Practice
- Work Health and Safety Regulations 2011
- Disability (Access to Premises – Buildings) Standards 2010
- National Environment Protection Measures (NEPMs)

1.6.5. NSW State Regulations and Standards

- SafeWork NSW Codes of Practice
- Disability (Access to Premises – Buildings) Standards 2010
- Building and Development Certifiers Regulation 2020
- NSW Work Health and Safety Regulation 2017
- Protection of the Environment Operations (General) Regulation 2022
- NSW State Environmental Planning Policies (SEPPs)
- Fire and Rescue NSW Fire Safety Guidelines
- NSW Local Council Development Control Plans (DCPs)

1.6.6. Manufacturer Specifications and Data Sheets

All installation must be carried out in accordance with manufacturer specifications and data sheets to ensure product performance over its intended life and so as not to invalidate any warranties.

1.6.7. Project-Specific Documents

Requirements specific to a particular project, campus, or other variable, will be covered by project specific documentation, such as client briefs, specifications, and drawings. These Standards will supplement any such

project specific documentation. The Standards do not take precedence over any contract document, although they will typically be cross-referenced in such documentation.

Extracts from the Standards may be incorporated in specifications; however, it must remain the consultant's and contractor's responsibility to fully investigate the needs of the University and produce designs and documents that are entirely 'fit for purpose' and which meet the 'intent' of the project brief.

1.7. Discrepancies

The Standards outline the University's generic requirements above and beyond the above-mentioned legislation. Where the Standards outline a higher standard than within the relevant legislation, the Standards will take precedence. If any discrepancies are found between any relevant legislation, the Standards and project specific documentation, these discrepancies should be highlighted in writing to the Manager, Capital Works.

1.8. Departures

The intent of the Standards is to achieve consistency in the quality of the design and construction of the University's built forms. However, consultants and contractors are expected to propose 'best practice / state of the art' construction techniques, and introduce technological changes that support pragmatic, innovative design. In recognition of this, any departures from relevant legislation, or the Standards, if allowed, must be confirmed in writing by the Manager, Capital Works. Any departures made without such written confirmation shall be rectified at no cost to the University.

1.9. Professional Services

All projects at Charles Sturt University require the involvement of adequately skilled and experienced professionals to interpret and implement the Standards. Consultants or contractors lacking proper qualifications and licenses are not permitted to conduct any work.

1.10. Structure of Document

This document is structured into 4 sections:

Section 1 Introduction (this Section).

Section 2 General Requirements – outlines the general requirements or design philosophies adopted at Charles Sturt University.

Section 3 Supporting Documentation – Legislation, Standards, Codes of Practice, University Policies, and other applicable technical references.

Section 4 Specifications (if applicable) – materials specifications and/or preferred lists for materials, processes or equipment used by Charles Sturt University.

2. General Requirements

2.1. Overview

This standard outlines the technical and functional parameters for integrating information technology (IT) and network communications infrastructure in Charles Sturt University construction projects. It is essential for all building projects, refurbishments, or expansions where information technology systems are implemented. Compliance ensures consistency and adherence to both University standards and relevant regulations.

2.1.1. Scope and Application

This standard applies to building project managers, external contractors, consultants, and IT specialists involved in the design, construction, and commissioning of information technology assets including audio visual, network communications systems in all university projects. The standard is designed to ensure that the university's IT infrastructure remains resilient, scalable, and adaptable to future technological advancements, while maintaining high performance in current operations. The standard governs:

- Data network cabling
- Network control systems
- Audio-visual systems (AV)
- Video conferencing systems (VC)
- Security and monitoring systems cabling and network connectivity
- Communication rooms and associated equipment
- Procurement of information technology assets

2.2. University Documents

The Division of Information Technology has two documents key standards documents that are referred to within this module:

- Communications Standard
- AV and VC Standards

For the latest versions of these documents, it is advised to contact the Manager, Networks, and the Technical Officer, Audio Visual.

2.3. Consultation with the Division of Information Technology

As part of the Gate 2 Briefing process for new construction or refurbishment projects, it is critical to engage with the Division of Information Technology to ensure all IT and network-related requirements are properly integrated into the project design. This consultation ensures that the project will meet Charles Sturt University's

IT infrastructure standards, avoid disruptions to existing systems, and accommodate future technological needs. The following DIT requirements must be reviewed and confirmed before proceeding to Gate 3:

- **Standards Documents:** The current Networks and AV standards are to be accessed through DIT.
- **New Building Requiring Network Connectivity:** When planning a new building, DIT must be engaged to ensure proper network connectivity. This includes determining the number of network ports, the layout of communications rooms, and fibre optic connectivity to existing university networks.
- **Addition, Relocation, or Removal of Network Cabling:** Any modifications to existing network cabling, including the addition, relocation, or removal of outlets, require consultation with the DIT Networks team. Proper labelling and documentation must follow university standards.
- **Ground Works Impacting Network Pits and Conduits:** Any groundworks or excavation activities that may affect interbuilding network pits, conduits, or fibre optic cabling must be communicated to DIT in advance. This ensures that critical university network connections are not accidentally disrupted during construction.
- **Modification or Addition of Communications Rooms or Racks:** When changes to the layout, number, or configuration of communications rooms or racks are proposed, the Networks team must be consulted to ensure adequate space, cooling, and power are available.
- **Connection of Devices to the Network:** The connection of specialised devices such as CCTV, building management systems, Internet of Things (IoT) devices, or other specialized equipment must be reviewed by DIT. Network security, power over Ethernet (PoE) requirements, and device management need to be aligned with university standards.
- **Inclusion of Wireless Network Points (WAPs):** Engagement of DIT to plan and design wireless coverage and WAP deployment. This will impact network point locations for WAPs.
- **Audio Visual (AV) Facilities Required:** Any room or space where audio-visual equipment will be installed or upgraded must be reviewed by the DIT AV team. This includes classrooms, lecture theatres, meeting rooms, and any other spaces requiring projectors, interactive whiteboards, or presentation systems.
- **Video Conferencing (VC) Facilities Required**: For rooms that will support video conferencing, such as conference rooms, meeting rooms, or classrooms, consultation with DIT is necessary to determine the appropriate equipment, camera placement, and network requirements.
- **Software Requirements**: If the project has a requirement for software that is new to the university, this must be raised with DIT who will allocate resources to investigate requirements and options.
- **Procurement of IT Equipment:** Allowing time for DIT to provide cost estimates, quotations, and procurement timeframes to ensure Project Officers consider budgets and equipment lead-times as part of project program development.

2.3.1. Documentation and Approvals

All consultations with DIT must be documented and included in the project file. Any agreed changes or modifications must be confirmed in writing, and the project team must ensure that the necessary approvals are secured before moving forward with construction or refurbishment activities.

Failure to consult with DIT when required can result in delays in project delivery, unexpected costs, and disruptions to the university's IT and communication networks. Project Officers are responsible for ensuring timely and thorough engagement with DIT to safeguard the university's infrastructure. Ideally, a DIT representative should be included within the project governance structure to ensure adequate consultation and approvals.

2.4. IT Infrastructure Design Principles

The design of IT systems must incorporate future-proofing elements such as scalability, adaptability to emerging technologies, and sustainability. This includes the provision of adequate power, data connectivity, and cooling infrastructure in communications rooms.

Networks:

- **Communications Rooms:** All new buildings must have dedicated communications rooms that meet university specifications. These rooms must be adequately sized, ventilated, and secured to house IT and AV equipment. Room layouts and rack installations should comply with Charles Sturt's rack configuration standards. Refurbishment of existing buildings shall consider the best solution for communications infrastructure on a case-by-case basis.
- **Data and Power Distribution:** All power and data connections must follow the university specifications for outlet placement, labelling, and equipment mounting. Floor boxes should be utilised where necessary, providing power, data, and AV connections to tables in conference and meeting rooms.

Audio-Visual (AV) and Video Conferencing (VC) Systems:

- **Screen positioning** is critical, with the distance from the first row of seats to the screen required to be twice the screen height, while the distance to the last row should be 5.3 times the screen height. Additionally, the screen's minimum height from the floor must be 1200mm to ensure clear visibility for all participants.
- **Air conditioning systems** must be designed to avoid obstructing the teaching wall or blowing air directly onto screens, ensuring maximum usability of the screen and whiteboard areas. Similarly, room lighting should be dimmable and controlled via the AV system (AMX), with lighting zones allowing selective dimming, particularly above the teaching position.
- For **spaces with windows**, it's important that they are positioned towards the sides or rear of the room to avoid light interference, especially during video conferencing or presentations. These windows should be fitted with blackout options like blinds or louvers to control external lighting.
- **Ceiling space is** another key consideration, with adequate room provided for projectors, microphones, speakers, and other AV equipment. Care should be taken to avoid obstruction or vibration caused by air conditioning systems. Lecterns should be positioned to the side of screens to ensure maximum visibility for the audience, and they must have appropriate controls for AV equipment and room lighting.
- **Power and network outlets** must be appropriately placed for AV equipment, ensuring they share a common earth circuit to minimize any interference. In videoconference-enabled rooms, care should

be taken to position far-end view screens at suitable distances for optimal interaction between the presenter and remote participants. These design elements are essential for ensuring that teaching and meeting environments are fully functional and user-friendly.

2.5. Procurement of IT Assets

All IT assets must be procured through the University's established procedures, ensuring they are necessary for the University's business purposes and compliant with the relevant regulations and standards. The Finance Procedure requires using preferred suppliers unless specific exemptions are granted, which are overseen by the Associate Director, Procure to Pay. IT assets, including computers, mobile devices, and peripherals, must generally be purchased through the Computer Shop, the University's central procurement point for IT equipment. DIT will facilitate the specification and quotation of networking and audio-visual technology solutions. Project Officers are to consider the following principles when preparing budgets for information technology procurement:

- **If the equipment is used for facility-based functions**, it shall be fully purchased from project funds. This applies to, but is not limited to, access control, BMS, CCTV, and equipment control. Facilities Management will be responsible for the ongoing replacement of this equipment when it reaches the end of its operational life.
- **Where equipment is provided for general academic or administrative use**, the project shall facilitate the provision of the equipment from the project's budget. Provisioning will be under the Computer Shop's leasing arrangement and the project shall pay for the first full year of leasing. The user will then be responsible for the annual ongoing lease costs on the first anniversary of the lease agreement.
- **Where equipment is provided for public access computers**, the project shall facilitate the provision of the equipment from the project's budget and be fully purchased from project funds. DIT will be responsible for the ongoing replacement of this equipment when it reaches the end of its operational life.
- **Where equipment is provided for course specific computers**, the project shall facilitate the provision of the equipment from the project's budget. Provisioning will be under the Computer Shop's leasing arrangement and the project shall pay for the first full year of leasing. The user will then be responsible for the annual ongoing lease costs on the first anniversary of the lease agreement.
- **Software licenses** will be funded by the project's budget if the required software is either related to a facility-based function, public access computer or critical to the success of the project. Note the non-capital nature of software and comments regarding software in section 2.3. Ongoing software upgrades and maintenance costs will be borne by the responsible user.
- **Telephony services** required for facilities-based functions (i.e. emergency phones will be funded by the project's budget with all ongoing charges funded by Facilities Management.

2.6. Disposal of IT Assets

IT assets that have been identified as no longer required or are at the end of their lifecycle must be redeployed or disposed of in accordance with the University's disposal procedures. This includes completing the necessary asset disposal forms and ensuring that all items are processed through the approved channels to avoid improper disposal.

2.7. Installation and Materials

Networks:

- **Quality of Materials and Workmanship:** All materials must be new and of high quality, with minimum warranty periods of 25 years for structured cabling installations. Cabling contractors must provide proof of ACMA registration and must be certified Panduit installers.
- **Cabling Systems:** All cabling must meet Charles Sturt's structured cabling specifications, including the use of Panduit UTP Category 6 (for non-wireless access points) or Category 6A (for wireless access points) and fibre optic installations. Testing and certification of all cabling must be conducted to ensure compliance with university standards and industry regulations.
- **Patching:** the contractor is tasked with patching the outlets in the communications rack to the active switches based on a list provided by the Division of Information Technology. The contractor must ensure that the patch cables used match the specifications of the outlets and are certified for the required speeds. Proper cable management practices must be followed to keep the setup tidy, and port blockers must be installed in any outlets that are not patched to active equipment to maintain the security and integrity of the system.
- **Network Switches:** The contractor is responsible for installing all network switches into the communications rack as part of the building's network setup. This process must occur only after the communications rack is fully prepared, with all cable tests completed, the environment made dust-free, and all fit-out tasks finalised. This ensures that the switches are installed in optimal conditions to prevent potential damage or issues.
- **Documentation and Testing:** Contractors are required to provide detailed documentation of all installations, including cable routes, terminations, and testing results. The Charles Sturt University Fibre Installation Record and the ACMA TCA1 form must be completed and submitted at the conclusion of each project.

Audio-Visual (AV) and Video Conferencing (VC) Systems:

- All AV materials, such as projectors, screens, and microphones, are of high quality and suited to the space. For example, projectors must be mounted using universal hardware, and screens should either be electric or designed for effective wall projection.
- In terms of room lighting and power, the document specifies that all rooms must have dimmable lighting controlled through the AV system. Additionally, power outlets must be placed adjacent to key equipment locations, with separate circuits dedicated to AV systems and electric screens.

- Proper cabling and ducting are essential to the installation process. The guidelines require a minimum of two 100mm ducts or conduits for cable management, connecting the lectern and teaching walls to projector mounts and other equipment locations. This ensures neat and organized wiring that is easy to maintain.
- Networking and connectivity are important considerations in these installations. Each room must have sufficient network points to support AV controls, VoIP phones, and future expansion needs. This includes ensuring that GPOs are available near the equipment racks and lecterns to power devices without overloading circuits or causing interference.

2.8. As Constructed Drawings

As constructed drawings for Information Technology (IT) systems are essential to accurately reflect the final configuration of network, audio-visual (AV), and related infrastructure at Charles Sturt University. These drawings ensure that all IT installations are correctly documented for future maintenance, upgrades, and troubleshooting. Requirements:

- **Submission:** The contractor must provide detailed as-constructed drawings that reflect the actual installation of IT infrastructure, including networks, AV systems, and communications rooms. Any deviations from the original design must be clearly documented.
- **Format**: As-constructed IT drawings should be submitted in digital format (AutoCAD or University-approved software). These drawings must adhere to Charles Sturt University's drafting standards for IT infrastructure.
- **Content**: The as-constructed IT drawings should include:
    - Network infrastructure, including data cabling, fibre optics, and wireless access points (WAPs).
    - AV system installations, including projector/screen placements, audio systems, and video conferencing (VC) setups.
    - Detailed layout of communications rooms, showing the final arrangement of network racks, switches, patch panels, and power outlets.
    - Equipment locations for security systems (e.g., CCTV) and any Internet of Things (IoT) devices connected to the network.
    - Cabling pathways, including conduits, ducts, and cable trays.
    - Labelling for all network outlets, ports, and communications equipment following the University's IT labelling standards.
- **Approval Process**: The Division of Information Technology (DIT) will review and approve the as-constructed IT drawings to ensure they meet University standards and align with the original project scope. All changes from the initial design must be explained and justified.

3. Supporting Documentation

These below lists are not all-inclusive and those associated with the project are responsible for identifying and complying with all standards relevant to the scope of works.

3.1. Supporting Legislation

Work Health and Safety Act 2011 (NSW)

Work Health and Safety Regulation 2017 (NSW)

Work Health and Safety Act 2011(ACT)

Work Health and Safety Regulation 2011(ACT)

NSW Local Government Local Environmental Plans (LEP)

3.2. Supporting Standards

Standard Number	Standard Title
AS/NZS 3000:2018	Electrical installations (known as the Australian/New Zealand Wiring Rules)
AS/NZS 3084:2017	Telecommunications installations — Telecommunications pathways and spaces for commercial buildings
AS 3085.1:2022	Telecommunications installations — Administration of communications cabling systems, Part 1: Basic requirements
AS/NZS 14763.2:2020	Information technology — Implementation and operation of customer premises cabling, Part 2: Planning and installation
ISO/IEC 14763.3:2024	Information technology - Implementation and operation of customer premises cabling - Part 3: Testing of optical fibre cabling
IEC 61935 Series	Specification for the testing of balanced and coaxial information technology cabling
IEC TR 61200-52:2013	Electrical installation guide - Part 52: Selection and erection of electrical equipment - Wiring systems

3.3. Industry Codes of Practice

Safe Work Australia Construction Work Code of Practice

https://www.safeworkaustralia.gov.au/sites/default/files/2022-10/Model%20Code%20of%20Practice%20-%20Construction%20Work%20-%2021102022%20.pdf

3.4. University Documents

Information Technology Policy

https://policy.csu.edu.au/document/view-current.php?id=448

3.5. Other Resources

AETM AV Design Guidelines

https://delivery-cqucontenthub.stylelabs.cloud/api/public/content/AETM-AV-Design-Guidelines-Excerpt.pdf

Panduit Safety Data Sheets

https://www.panduit.com/en/support/design-and-installation-resources/msds-sheets.html

Panduit Supplier's Declaration of Conformity

https://www.panduit.com/content/dam/panduit/en/website/support/download-center/documents/suppliers-declaration-of-conformity.pdf