SECTION 19: COMMUNICATIONS INFRASTRUCTURE

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19.1 INTRODUCTION

The University's Infrastructure Services (IS) group within University Services (US) is responsible for the design and management of all University telecommunications infrastructure (including wired and wireless data, voice and video communications).

All projects that include new Communications Infrastructure installations (including telecommunication cabling, wired and wireless networking infrastructure) must have a IS Network Engineer assigned to them. The Network Engineer must approve any cabling designs and active network equipment model selections to ensure it is consistent with the University's overall Network Architecture and standards specifications.

The University presently maintains two key specification documents used in the specification, design and deployment of Communications Infrastructure, which consultants shall comply with:

- Standards for the Installation of Communications Infrastructure (SICI) – the current version is available on the University's Design Standards web page.
- Computer and Network Accommodation Strategy (CANAS) - the current version is available on the University's Design Standards web page.

This section provides a brief introduction to these documents and some concepts within to assist in compliance with the specifications. The assigned IS Network Engineer for works will also utilize the above specifications and inspect new installations for compliance and defects prior to hand-over.

A copy of the tender specification, schematic and/or floor plan shall be submitted to the assigned IS Network Engineer for approval prior to the issuing of documents for tender.

A complete wired data, wireless data and voice communications network integrated into the University's infrastructure is to be documented for by the Consultants. The Consultant shall be responsible for:

- Incorporating a network that meets the University's requirements and is endorsed by the IS assigned Network Engineer as being operable and compatible with the University's general Communications Infrastructure, Standards and Architecture;

- Documenting the design to the comply with the above Communications Infrastructure standards (SICI and CANAS). Any installation that does not comply with these Standards shall not be connected to the University network infrastructure;
- Including in the project budget all costs necessary to have the designed Communications Infrastructure and associated services fully operational on occupation by the Users (e.g. racks/cabinets, data network switches for wired communications, wireless network access points, telephony services, programming of numbers and appropriate maintenance/support in place, etc.);
- Ensure that any Trade Contractor(s) complies with the University Communications Infrastructure Standards (SICI and CANAS as listed above);
- Ensure that the US assigned Network Engineer inspects and approves the network(s) for operational use at the completion of the pre-commissioning tests.

19.2 Wired & Wireless Data Networks

19.2.1 User Requirements Gathering

The Communications Consultant in conjunction with the Architect is to ascertain the initial communications requirements of the Users to cover:

- Description of the number and type of users (e.g. indicating numbers of staff and students that different spaces are to support);
- Expected usage profiles of the space (e.g. types of rooms, theatres, open spaces, meeting rooms etc.) and any advanced user requirements (e.g. high density wireless, research computing, real-time location services requirements);
- Any advanced usage requirements of a space that would be considered above and beyond standard University space and usage (e.g. Commercial usages, high requirement collaborative spaces, support of advanced technologies, etc.)
- Initial estimation of the number and location of data outlets (see the SICI specification in regards to UoM standards for number of outlets per working area);
- Any required fibre optic cabling (to meet requirements in the SICI specification);
- Any non-communications technology components (e.g. Desktop computing, Server computing, Printers, etc.) are not covered by the Communications Infrastructure design, however information on potential usages is required to ensure the Communications Infrastructure supports the intended usage/devices.

Note: In addition to the above information, it is important to note that as of 2018, the University has a desire to explore opportunities for a "wireless first" approaches to building network design for users and devices. This may include additional wireless design and infrastructure to support a reduced deployment of physical network cabling. Any new product deemed suitable should be authorised by the Assigned UoM Network Engineer.

19.2.2 Network Design and Documents.

Cost Estimates (based on user requirements):

- Network Equipment cost estimates and deployment time estimates will be provided to the UoM Project Manager by the IS assigned Network Engineer. The Network Engineer will require the above User Requirements Gathering information to generate these cost estimates. More accurate information will result in more accurate estimates.

Physical Network Design (Data Outlet Floor Plans/as-built showing data outlets):

- The Consultant will need to ensure data outlet location design balances user requirements with adherence to UoM standards and the IS Network Engineer will need to approve the final data outlet location plan.
- The consultant will need to facilitate the final data outlet location plan by bringing together building tenant representatives, Project Staff and the IS Network Engineer to agree on the outlet numbers and locations.
- Test results will need to be provided to the University by the Contractor (facilitated by the Consultant or University Project Manager)

Logical Network Design:

- An initial Detailed Building Network Deployment Design document will be completed by the IS assigned Network Engineer subsequent to receiving the agreed floorplan/outlet location information.

- This will be updated prior to handover to Operational support with any updates made during deployment.

Wireless Design:

- Wireless Design shall be undertaken by a UoM IS assigned Wireless Network Engineer only, at the relevant project phase (working with the primary assigned IS Network Engineer) – Construction/Building consultants are NOT to provide any wireless design or estimates.
- Preliminary Wireless Design work will be undertaken to facilitate cost estimation, based on available User Requirements gathering information as captured above).
- Further design refinements will be undertaken on receipt of floor plans (predictive survey) and final design will be provided by the Wireless Engineer during initial deployment (based on actual site surveys and any remediation work undertaken at that stage to fine tune coverage due to any obstructions).

Device Commissioning requests:

- The University has a template for requesting addressing/commissioning of core building networked services (e.g. BMS, A/V, Security) required to commission the building. This will be provided to any external party commissioning devices during construction and must be completed and sent to the IS Network Engineer in order to activate (patch/program) new devices.

The design of the wired and wireless data networks is to be done on separate drawings to the electrical installation. All documentation is to be submitted to the IS assigned Network Engineer for approval at the preliminary budget stage and prior to tendering the works.

19.3 Telephone Systems

The University currently deploys a Cisco IP Telephony system as its main telephony delivery mechanism. There are cases in which certain telephony services will not able to be connected to the IP Telephony system or will require connection through an Analog to digital medium (such as NBN provided gateways, University Voice Gateways or 3G/4G services). Examples of this include any existing direct exchange line, lift phones and fax services. For these cases the project budget will need to account for provision of required additional services to support these usages.

19.3.1 User Requirements and Design

As per section 19.2.1 above, the Communications Consultant, in conjunction with the Architect, is to audit the existing telephone installation and determine from the Users their new requirements:

- Types of Telephony handsets and locations;
- Quantities of new and re-used handsets;
- Number of new extensions;
- Fax machine points;
- Whether telephony cabling in the building has to be upgraded.
- Where any of the above requires non-IP telephony based services (e.g. NBN services, Voice Gateway Analog services, 3G/4G services, mobile augmentation)

The Consultants are to prepare marked-up drawings in consultation with the Users. The design of the telephone installation is to be done on a separate drawing to the electrical installation and all documentation is to be submitted to the assigned IS Network Engineer for approval at the preliminary budget stage and prior to tendering the works.

19.3.2 Budgets

The consultant shall allow in the budget for:

- The current cost of each Telephony handset;
- The cost of providing fax machine extensions;
- Programming of extensions;
- All analogue cable requirements between the installation and the Campus MDF.

19.3.3 Telephone Handsets

The Consultant shall approach IS, through the project Co-ordinator, for the current cost of each item and make allowance for the purchase of handsets and the programming of new extensions in the project contract documentation as a Prime Cost item.

19.4 University Approved Cabling Contractors

All Network Data Cabling for all wired & wireless applications must be installed by a University of Melbourne approved cabling contractor.

A current list of approved Cabling contractors are available from the University Network & Telephony Team or University Project Manager.