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*UNSW Design & Construction Requirements (Rev 4.1)*
E.4 COMMUNICATIONS – SCHEDULE OF CHANGES – REVISION 4.1

As a guide only, attention is drawn to changes that have been made in the following clauses since the last revision

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E.4. COMMUNICATIONS

E.4.1. General

The Communications Unit has overall responsibility for the installation and management of the University’s telecommunications and data network facilities. This includes voice and data links within the campus and to all remote locations. These facilities are vital to the University’s academic, teaching and administrative efforts.

This section outlines the basic requirements and standards for the installation of plant and equipment for the communications network within UNSW. The requirements below are general in nature and should be read in the context of the detailed project brief and Communications Unit detailed standards (Specification for the UNSW Backbone Cabling System; Specification for the UNSW UTP Cabling System and associated documents). The Communications Unit must be consulted in the early stages of all proposed building works.

The University Network is hierarchical. The hierarchy consists of four major nodes located in four different buildings on Kensington Campus and separate equipment in remote locations. Each building is connected via fibre optic cable to one of the nodes. Each building (or group of huts) has a main building cabinet and may have floor cabinets on every floor, every second floor or multiple locations per floor. The size and location of cabinet rooms will vary according to the building design and outlet density. Copper cables then run from floor cabinets to the final outlet position.

Lead in Cables

• Building design should include provision for suitable access and support of the building Lead-In cabling from the point of building entry to the nominated Building Communications Room locations. The Communications Room should be located as close as practicable to the vertical backbone pathway. The route must be easily accessible and provide sufficient capacity for future expansion.

Backbone Cables Reticulation

• Designs for new buildings or major refurbishments should include the provision of a communications riser. Backbone cabling connects the main building communications room (cabinet) to each of the floor cabinets. The vertical riser should extend from the building communications room to each communications room and provide access and capacity to enable installation of additional cables as required.

Risers should be adequately protected against damage which might reasonably be expected from mechanical injury, exposure to weather, water or excessive dampness, corrosive fumes, accumulation of dust, steam, oil or high temperature or any other circumstance which may damage cables.

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E.4.2. Communication Rooms

Communications Rooms (excepting major PABX installations) house one or more communications cabinets. The cabinet is the transition point between the backbone and horizontal distribution pathways. It houses activation equipment, cable termination and associated cross connection cabling.

Communication (cabinet) room locations and characteristics are subject to a number of constraints:

E.4.3. Location

There must be a cabinet location within 90 metres wiring distance of all current and potential network outlets. This corresponds to around 65 metres in a straight line.

The cabinet must be convenient for connection to the building backbone cabling i.e. adjacent or very near to a vertical duct.

It must be accessible by trolley and provide reasonable space within or outside the area to unload and manoeuvre equipment.

It must be accessible by Communications staff 24 hours per day, 7 days per week and is best positioned directly off a common area e.g. corridor.

The cabinet generates fan noise and should not be positioned next to a desk.

The cabinet once installed cannot be moved without re-cabling the entire area (floor or even building). The location must be in an area not subject to rebuilding.

Prohibited Locations
In ablution or toilet facilities, boiler, plant, machine rooms, or in areas subject to corrosive fumes or fluids.

In fire escape stairways
Near automatic sprinklers, unless cabinet is protected from water
In any area that is subject to flooding
Within a cupboard containing a fire hose reel

E.4.4. Size and Inclusions

A single cabinet location requires 3-5 metres of floor space, which includes around 1 metre of clear space on three sides of the cabinet.

The space should not be shared with electrical installations (other than those to provide power to the cabinet) or with any other unrelated service (e.g. plumbing). Adequate separation between power and data cabling should be maintained at all times.
Adequate provision should be made for related services e.g. security, fire alarm systems, energy management systems as required. The Communications Unit is not responsible for these services and makes no provision for them.

A dedicated 15 Amp screw covered power point to be provided in each cabinet location to power each cabinet.

Floor walls and ceilings should be finished to eliminate dust.

The floor must be level.

All installations should include a provision for 100% future expansion. Future installation of cables must be possible with minimum disruption to existing services and disturbance of cabling.

All floor penetrations should be bonded using a formed concrete upstand or similar. This prevents flooding on lower floors. All penetrations are to be sealed as per fire regulations. Fire pillows or similar removable material must be used. Pouring concrete around cables is not suitable as the water content may damage the cables and will void the cabling warranty. Additionally, provision must be made for reasonable access when new cabling is installed.

The door should be a minimum of 900mm wide and 200mm high. The door width requirements may vary depending on the size of the room. Technical personnel must have clear access to at least three sides of the cabinet. Dual doors should not include a centre post. The door should open outward and must be able to secured from the outside. Egress from the room should not require a key.

Lighting should be adequate to enable detailed work within the cabinet.

Some cable tray to support backbone and horizontal cables will be required. The size and location of the tray may vary with each installation.

The area is to be adequately ventilated. The ventilation system should be designed to cater for the proposed heat load of existing and future equipment.

E.4.5. Horizontal Cabling

Horizontal cabling is the UTP cable running from each floor cabinet to the final outlet position. Using the star topology, all wall outlets wire back to the most appropriate communications cabinet.

The design shall provide a suitable means and method of supporting cables from the communications room to the workstations to be served. The cabling reticulation method is largely dependant on the type of building, the number and density of outlets, pre-existing cabling plant or other installed services. Cable paths may utilise cable trays, catenaries, conduits, and skirting or surface ducts.
Cable pathways must be considered in the early stages of design. The electrical consultant normally provides for communications cabling reticulation when designing the power reticulation. The following are guidelines to assist with planning:

Cable pathways must be accessible and provide for 100% capacity expansion over the entire length from cabinet to outlet location.

Ceiling pathways along major corridors is preferred.

Inaccessible ceiling pathways such as behind lock-in type tiles or plaster is not recommended. Removable ceiling tiles are preferred. If a set plasterboard ceiling is installed sufficient panels must be provided.

A minimum cabling zone of 75mm vertical clearance should be provided within the ceiling cavity.

Power up to 240v and telecommunications cable may be run in a dual compartment duct so long as there is a continuous rigid barrier between them.

Electrical interference needs to be considered in modular furniture where parallel runs are longer than 5 metres.

The following requirements are applicable to cable tray systems.

Trays will have minimum clearance of 25mm standoff from walls to allow suitable cable fasteners to be used.

Trays shall provide a minimum vertical open working space of 150mm.

Changes in direction shall be made using standard formed bends compatible with the main trays.

Tray must provide a smooth surface for the cables.

Use separate trays for power and telecommunication. (This assists in maintenance of mandatory separations, increases the safety of the installation and minimises the effects of electromagnetic interference.

Catenaries

A catenary is a length of wire attached between (2) two points.

Catenary wires must be taut as sagging may result in performance loss in the cables.

Separation from other services must be maintained.

Maximum bundle sizes must be maintained. (The weight of the cable attached by cable ties on the catenary may result in performance loss over time.)

Conduits and Ducts

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Conduits may either be of light duty UPVC or galvanised steel construction.

There are two skirting types currently approved by the University. One of these must be installed in all installations. Ducts may be either of light duty rigid UPVC or metal.

Mechanical continuity shall be maintained through joints in metallic ducts and conduits. (Metal construction will give superior protection from EMI, provided continuity is maintained.)

Conduits shall have all sharp edges removed from their internal surface.

The minimum-bending radius for the type and quantity of cables must be maintained.

Telecommunications cables shall not be accommodated in the same conduit, duct or skirting as those containing a hazardous electrical service.

Conduit of a colour specified for hazardous services.