

kelvin grove urban village.



QUEENSLAND DEPARTMENT OF HOUSING

KELVIN GROVE URBAN VILLAGE

PHASE 3: ICT IMPLEMENTATION

REQUIREMENTS FOR POP ROOM

Prepared by



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1. INTRODUCTION

Gibson Quai, in conjunction with GDI, has been engaged by the Kelvin Grove Urban Village (KGUV) stakeholders to develop a set of requirements for developers to describe their responsibilities in provisioning ICT infrastructure in their buildings.

This document is a design guide for the KGUV Point of Presence (POP) Room to house the common electronics and optic fibre interconnect point for the KGUV development.

The KGUV central POP room is a key element of the required infrastructure to ensure that there this Urban Village is provided with flexible, future-proof and competitive ICT services delivered to each unit and business within the KGUV development.

2. REQUIREMENTS FOR POP ROOM

The Requirements for the Point of Presence (PoP) Room include:

1. Reference to relevant sections of the Australian Standards.
2. Overall Design Requirements for PoP Room, including:
 - Location
 - Size
 - Layout
 - Equipment interface requirements
 - Building lead in requirements
 - Cable and equipment termination location/room requirements
 - Cable and equipment records
 - Space and access requirements for maintenance and retrofitting
 - Environmental
 - Air conditioning
 - Power requirements
 - Fire and flood protection
 - Security
 - Access control for service providers

The target audience is at two levels:

- Builders/developers who will understand the business and functional requirements of the KGUV IT Strategy.
- IT experts who may be employed by builders/developers to design, cost and oversee installation of the infrastructure in compliance with the relevant requirements. (Refer to the appropriate Australian and International Standards and Practices).

2.1 Cabling Responsibility

The PoP room will house the equipment necessary to connect the carrier services with the inter-building distribution cabling and electronics necessary to distribute telephone, data and television signals through the KGUV development.

The PoP room is located within Lot 14 of the KGUV development. The service provider selected as the 'Preferred Supplier' for the KGUV will be responsible for the cabling and electronics necessary to distribute services throughout the KGUV development and to connect to the carrier services.

The inter-building cabling will be the responsibility of the 'Preferred Supplier' to maintain although the building developers will provide a financial contribution to the cost of electronics in the main PoP room and for the cabling to interconnect buildings.

The intra-building cabling provides the distribution of telephone, data and television signals through a building. The 'Set of Requirements for Developers' provides the developer with the necessary information to meet cabling standards, and also includes equipment rooms and floor cupboards for the intra-building cabling. The intra-building cabling will be the responsibility of the building developer to provide and for the building body corporate to operate.

The cabling responsibilities are shown in Figure 1 - KGUV Cabling Responsibility.

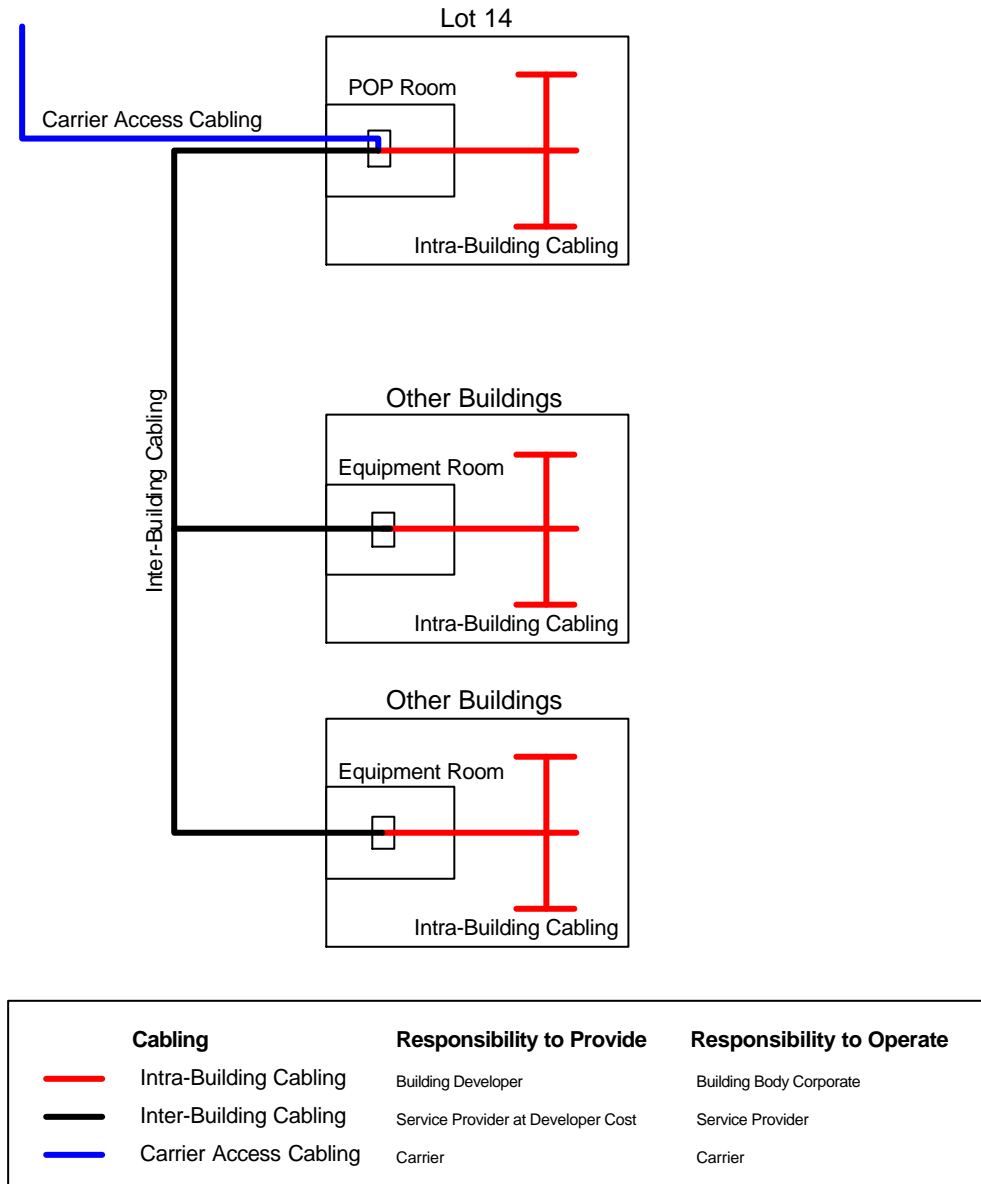


Figure 1 - KGUV Cabling Responsibility

3. SUMMARY OF SERVICE DELIVERY AND MANAGEMENT CONCEPT

To provide a context for these requirements, and in keeping with the overall ICT vision for this urban village, this section provides a brief summary of the overall concepts (noting that the POP room not only provides services to potentially the whole village but also needs to interface with the ICT infrastructure in the building in which it is located.)

A major goal for the entire development is to future proof the buildings such that they are easily fitted and retrofitted with the latest ICT service at low cost through the life of these buildings. ICT infrastructure should be able to be provided from a number of service providers to promote competition as well as the introduction of new and innovative technologies.

This contrasts with many buildings for which any major ICT installation is difficult, thereby lowering the potential value of the building to tenants and the owner.

This desirable feature of the building is achieved by taking two steps:

- a) The design of the building to facilitate the installation initially and subsequently of modern equipment and cabling systems.
- b) The initial installation of equipment and cabling systems to cost effectively provide tenants with access to the latest ICT services.

Services to be provided to tenants within the buildings will include:-

- Fixed telephone lines
- Internet Access
- Commercial TV
- Pay TV.

The ICT service provider(s) will deploy the optic fibre cable and electronics infrastructure required to deliver services to the buildings across KGUV.

The scope of this Set of Requirements is to provide at least one central equipment room ('POP room') to enable various service providers to install, operate and maintain necessary equipment that will potentially service multiple buildings in the village.

The typical infrastructure to be deployed to deliver services to the buildings within KGUV is shown in Figure 2 - KGUV Network Diagram.

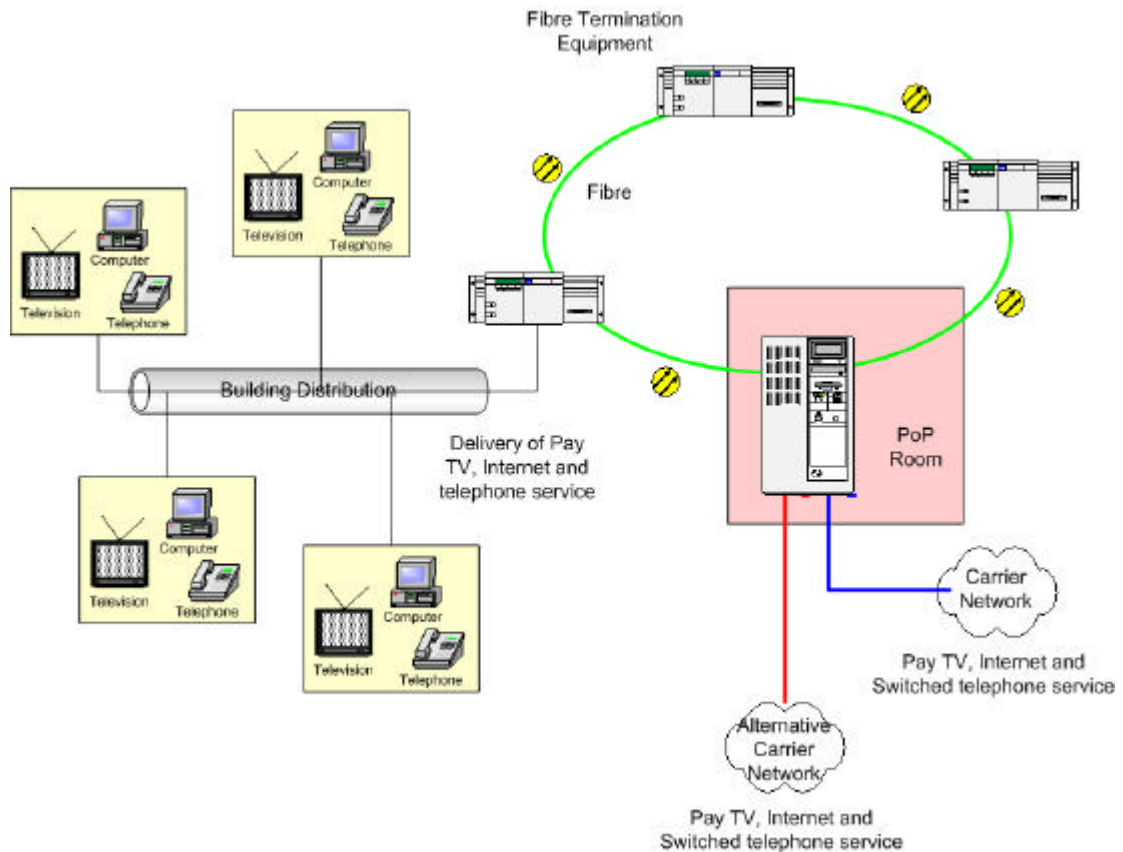


Figure 2 - KGVN Network Diagram

The POP room will connect to the backbone telecommunications duct infrastructure that has already been deployed throughout the village to ensure the protection of street infrastructure and promote competition to provide enhanced and innovative services at the lowest price to tenants. Whilst it would be consistent with the ICT vision for the Village to promote the preferred ICT service provider it is not practicable to restrict what is a legal right of telecommunications carriers to supply services to their clients. This could require provision of alternate access for other carriers to prevent the carriers digging up the street infrastructure.

4. STRUCTURED CABLING SYSTEM

The design of the POP room, and its associated cabling access infrastructure, shall be consistent with the structured cabling system design criteria as documented in the separate Requirements for Developers document.

5. BUILDING LEAD IN DUCTS

Ducts shall be installed in accordance with the general requirements for ducts and pits for KGUU.

The optic fibre cable will generally enter the building via the conduits installed for the optic fibre service (Property Entry Point).

The route between the Property Entry Point and the equipment location/s in the POP Room will be selected in accordance with the following criteria:

- Ease of installation.
- Minimisation of bends and use of suitable existing support facilities.
- The likelihood of accidental damage is avoided or minimised.
- The shortest practical route shall be used.

Cable entry for up to five telecommunications providers needs to be allowed for in the design.

5.1 Cable Entry

The following points shall be considered during the design when it is necessary to construct a cable entry into a building:

- Conduits are placed between manholes, pits and used to access buildings for the placement of cable
- Conduits are placed either by open trenching or boring construction methods and to be in line with Australian Codes of Practice
- Splicing chambers in the form of pits or manholes are placed to house cable coils or cable splices at pre-determined locations
- Duct and sub duct entry will be installed to the building telecommunications equipment room where the optic fibre termination equipment is installed
- Conduit provides protection to the cable network, accessibility for network upgrades, cable installation and maintenance activities
- There will be a minimum of six ducts and typically eight ducts to allow for the provision of Telstra services.
- Ducts will be closed effectively to prevent the entry of water and pests
- Sealing penetrations
- Tanking of foundations
- Drainage
- Penetration into a concealed space/ceilings
- Cable identification

An allowance also needs to be made for a cable path to the roof for receiving a television or microwave radio signal.

5.2 Conduit Specification

PVC Conduit

- Conduit shall be rigid 100mm diameter PVC, white in colour and manufactured in accordance with AS2053.

- In areas where conduit is exposed, adequate rigid protection is to be provided to minimise the possibility of accidental damage to the cable. This may include the use of a metal plate to cover the exposed conduit so that no object or person can put undue pressure on the cable.

Bends

- All 90 degree bends shall be of the pre-fabricated large radius type.
- Bend radius shall not be less than 300 mm.
- Any slight changes of direction shall be carried out using easy sets.

6. POP ROOM REQUIREMENTS

The primary function of the POP Room is to house the hardware necessary to provide connection between the optic fibre cables that enter the building from the carrier network and the KGUV distribution network. The POP room is also likely to house other equipment such as servers and switching equipment supporting ICT service delivery to most, if not all, buildings throughout the Village.

6.1 Room Location

The following general conditions shall be observed in the selection of the POP Room for any system configuration:

- The building selected for the POP should be centrally located.
- The POP Room should be located close to the cable entry point to minimise the distance the optic fibre cables have to be run through the building.
- The equipment room should be sized at a minimum of 25m² with no dimension less than 2.4 metres. A recommended size is 30m². The height should be a minimum of 2.8 metres throughout to allow for cable trays to be installed above the racks.
- If additional equipment, such as wireless or television distribution equipment are to be housed in the room, then additional floor and wall space should be added according to the space requirements of that equipment and associated cabling and mechanical requirements.
- POP Room space shall be dedicated to the telecommunications function and related support facilities. Telecommunications Equipment Rooms shall not be shared space with electrical, mechanical or cleaning facilities.
- The location/s should be selected in an area to which 24-hour access is available.
- The room must offer a high level of security with multiple keys provided to service providers via the Body Corporate.
- There should be no windows for security and heat gain reasons.
- Fire alarms installed.
- Telecommunications equipment rooms shall be free of all plumbing.
- Not prone to flooding but with a drain or sump if at all possible.
- Equipment should be sited as close as possible to the Property Entry Point (the point at which the optic fibre cable enters the premises).
- Locations should not be chosen in areas subject to risk of Earth Potential Rise, as defined in TS009. Generally, this precludes a location immediately adjacent to a sub-station or other high voltage installation.
- Floors, walls, and ceiling shall be treated to eliminate dust. Finishes will be light in colour to enhance room lighting.

- Control of heat and humidity to be maintained between 18°C and 25°C and between 15%RH and 95%RH non-condensing. (Current network equipment generates 341.25 BTU per 24 data ports installed; cooling the maximum number of current and future data ports that can be installed, in addition to other heat generating equipment to be installed in the telecommunications room. The specified environmental requirements must be able to be maintained 24 hours per day, 365 days per year. Redundant systems are preferred)

Equipment shall not be located in the following areas:

- Boiler rooms.
- Workshops.
- Any area where toxic, corrosive, cleaning or inflammable chemicals are stored or used.
- Wet areas, including water treatment, chlorination plant or pump rooms and areas subject to the possibility of flooding.
- In any area exposed to weather.
- Cooling towers.
- Within a hemispherical area of 500mm radius centred on any fire sprinkler head.
- Areas which have no natural or forced-air ventilation.
- Areas subject to extreme or rapid changes in temperature or where conditions of temperature/humidity are likely to cause condensation on in within equipment cubicles.
- Areas in which gas or fuel supplies are stored, metered or pumped.
- Fresh air plant rooms.
- Return air or supply air ducts or in areas likely to be contaminated by return air, exhaust air systems or smoke spill.
- Air supply plenums.
- Fire Control Rooms.
- Electrical substations involving supplies greater than 1KV.
- Within 2 metres of any electrical switchboards, motor control centres, busways, chillers or other electrical equipment involving load currents exceeding 25KVA.
- Diesel generator rooms.

6.2 Electrical Requirements

The minimum electrical and lighting requirements for the equipment room is: -

- Power to the room must be via multiple permanent connection outlets (ie no switch). The building body corporate will pay the cost of power used in the room.

- It is preferable for a centralised UPS and generator power backup to be provided for the total POP room. If the building is equipped with Emergency Power or Uninterruptible Power Supply (UPS), consideration should be given to connecting the equipment outlets to this. Note - If UPS is not available from the building supply the infrastructure provider will need to supply this equipment in the POP room.
- Fluorescent lights will be installed in the room to illuminate the front and rear of the rack location.
- Lighting shall be a minimum of 500 lux, measured 1 metre above the finished floor in the middle of the aisles between the racks and cabinets. The lighting is to be controlled by one or more switches located near the entrance door to the room. Lighting fixtures will not be powered by the same circuit as the other outlets in the room.
- Power into the room shall three phase connected to a distribution panel in the room. Number of circuits and locations will be determined at the time of the design as load requirements are determined.
- Dedicated 240 V, 20 Amp circuits connected to a separate circuit breaker on the power distribution panel will be installed in such a manner to distribute electrical power to each of the 19-inch equipment racks.
- The POP room shall be equipped with smoke detectors. If a building alarm system is present, the telecommunications room shall be connected to it. If a building alarm system is not present, an audible and visual alarm shall be provided outside of the telecommunications room door.

6.3 Equipment Layout

The equipment layout within the equipment room needs to allow for: -

- Space for two rows of equipment racks, approximately 2.2 m high, unless otherwise advised. There needs to be at least 1m clearance in front of the row of rack and 0.5 m on the other sides.
- Cable trays must be installed above the equipment racks and will lead to the cable duct entry point. There is to be appropriate support for optic fibre and building cabling to ensure that the minimum bending radiuses are maintained through the use of cable trays or other appropriate method.
- A wall-mounted optic fibre termination patch panel is the preferred method to terminate up to 24 optic fibre cores from the carrier network and 12 optic fibre cores from each building within KGUV. This will be mounted at a height with the top of the termination panel no higher than 1.8 metres from the ground. Provision must be allowed for future optic fibre terminations for internal building cabling.
- Rack mounted or wall mounted optic fibre termination panels will be used for any additional optic fibre cores from each unit and business with KGUV. The current design for the KGUV development allows for 1,000 residential units plus 250 businesses.

A sample floor layout for a 6m x 4.4m room is shown in Figure 3 - Sample Floor Plan.

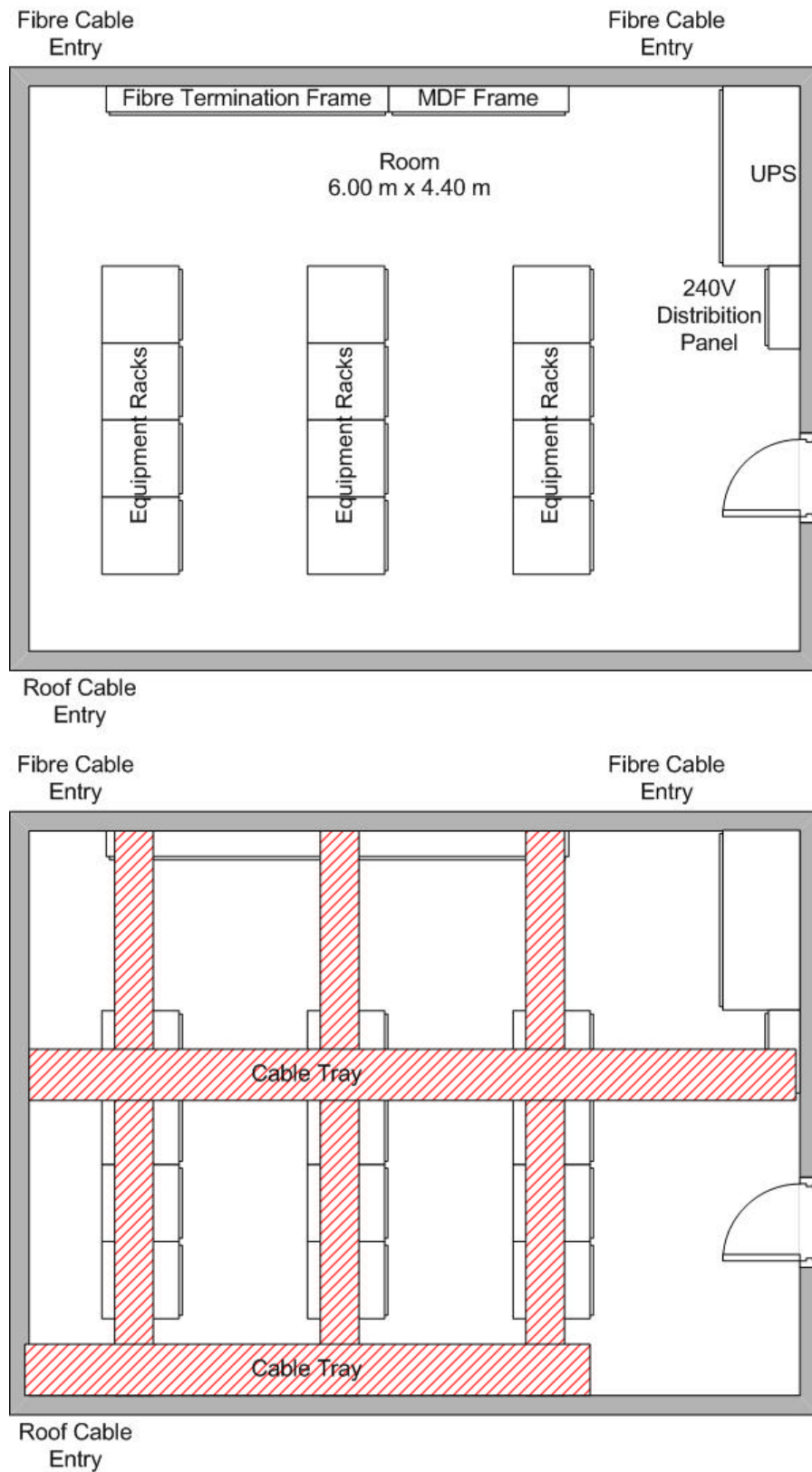


Figure 3 - Sample Floor Plan

7. DESIGN DRAWINGS

Design drawings for the Point of Presence Equipment Room should include, but not be limited to:

- Point of Presence telecommunication equipment room location;
- Point of Presence telecommunication equipment room layout;
- Point of Presence telecommunication equipment room details;
- Cable routing diagrams;
- Cable schematic diagrams, including cable sizes;
- Identification of optic fibre core usage and spares;
- Conduit / cable tray routing, elevations in relation to other mechanicals and building structures, sizes, and pull box and access point locations;
- Other supporting structures for telecommunications cabling; and
- Grounding schematic for Point of Presence telecommunication equipment room.

8. RELEVANT STANDARDS

The following Australian standards apply to telecommunications installations in Australia.

- DR 02639 Telecommunications installations - Administration of communications cabling systems - Part 1: Basic requirements
- ACA TS 102-1998 Telecommunications Technical Standard (Customer Equipment and Customer Cabling)
- HB 27:1996 Handbook for field testing of balanced cable installations
- HB 29-2000 Communications Cabling Manual, Module 2: Communications Cabling Handbook
- HB 243-2000 Communications Cabling Manual, Module 1: Australian regulatory arrangements
- ACIF C559:2001 Unconditioned Local Loop Service - Network Deployment Rules
- AS/ACIF G571:2002 Building Access Operations and Installation
- AS/ACIF G586:2001 Access to Telecommunications for People with Disabilities
- AS/ACIF G610:2003 Superseding ACA TS 001-1997
- AS/ACIF S009:2001 Installation requirements for customer cabling
- AS 1049-2003 Telecommunication cables - Insulation, sheath and jacket
- AS 3815-1998 A guide to coaxial cabling in single and multiple premises
- AS/ACIF S009:2001 Australian Standard - Installation requirements for customer cabling (Wiring Rules)
- AS/NZS 3080:2003 Telecommunications Installations – Generic cabling for commercial premises
- AS/NZS 3084:2003, Telecommunications installations - Telecommunications Pathways and Spaces for Commercial Buildings.
- AS/NZS 3085.1:1995 Telecommunications installations - Administration of communications cabling systems - Basic requirements
- AS/NZS 3086:1996 Telecommunications installations - Integrated telecommunications cabling systems for small office/home office premises
- AS/NZS 3087.1:2003 Telecommunications installations - Generic cabling systems - Specification for the testing of balanced communication cabling
- AS/NZS 3087.2:2003 Telecommunications installations - Generic cabling systems - Specification for the testing of patch cords in accordance with AS/NZS 3080
- AS 3815-1998, A guide to Coaxial Cabling in Single and Multiple Premises.

9. AGENCIES

The following is a list of agencies and their responsibilities.

Australian Communications Authority (ACA)

This agency handles cabling complaints and technical enquiries related to on site compliance to legislated documents such as the Telecommunications Act 1997.

Australian Communications Industry Forum (ACIF)

This is the industry sponsored forum comprising industry representatives that deals with ongoing industry issues. The Cabling Reference Panel (CRP) deals specifically with cabling industry issues.

National Electrical Contractors Association (NECA)

Formerly, under the regulated system in Australia, Austel controlled a cabling license system. The license is now known as an ACA license and is administrated by NECA. This license requires that any person involved in the installation of telecommunications cabling in Australia is to be ACA licensed.

Standards Australia

Standards for the installation of telecommunications cabling are produced by Standards Australia. Standards Australia also issues the Communications Cabling Manual (CCM), which is a collection of the latest AS/NZS standards and associated publications.