

**COMMUNICATIONS
ALLIANCE LTD**



INDUSTRY GUIDELINE

G670:2023

FIBRE-READY MDUs FOR REAL ESTATE
DEVELOPMENT PROJECTS

G670:2023 Fibre-Ready MDUs for Real Estate Development Projects Industry Guideline

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INTRODUCTORY STATEMENT

The ***Fibre-Ready MDU's for Real Estate Development Projects*** Guideline (G670:2023) is designed to:

- outline the minimum standard for Telecommunications spaces within a multi-tenanted Building in a Real Estate Development Project to be considered a Fibre-Ready Facility;
- describe recommended processes for the design and installation of Telecommunications facilities for use in the deployment of Optical Fibre Lines in a multi-tenanted building in a Real Estate Development Project; and
- describe the recommended materials used in the design and installation of facilities.

The draft Guideline was released for public comment in 2023 as DR G670:2023 to:

- provide guidance on multi-unit and multi building developments.
- clarify the definition of telecommunications Conduit sizes; and
- maintain consistency with other industry documents.

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Chair
In Building Pathways Working Committee

December 2023

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1 GENERAL

1.1 Introduction

- 1.1.1 The development of the Guideline has been facilitated by Communications Alliance through a Working Committee comprised of representatives from the telecommunications industry.
- 1.1.2 The Guideline should be read in the context of other relevant codes, guidelines and industry documents.
- 1.1.3 The Guideline should be read in conjunction with related legislation, including the *Telecommunications Act 1997* (the Act).
- 1.1.4 If there is a conflict between the requirements of the Guideline and any requirements imposed on an entity by statute, the entity will not be in breach of the Guideline by complying with the requirements of the statute.
- 1.1.5 Compliance with this Guideline does not guarantee compliance with any legislation. The Guideline is not a substitute for legal advice.
- 1.1.6 Statements in boxed text are a guide to interpretation only and not binding as Guideline rules.

1.2 Scope

- 1.2.1 The Guideline applies to the following sections of the telecommunications industry under section 110 of the Act:
 - (a) Carriers; and
 - (b) persons who install:
 - (i) Optical Fibre Lines; or
 - (ii) facilities used, or for use, in or in connection with Optical Fibre Lines.
- 1.2.2 This Guideline is pertinent to Developers e.g. as an input to the design and construction of a fibre ready building.
- 1.2.3 The Guideline deals with the following activities:
 - (a) carrying on business as a Carrier;
 - (b) supplying Goods or Service(s) for use in connection with the supply of a Listed Carriage Service; or
 - (c) supplying passive telecommunications infrastructure for use in connection with the supply of a Listed Carriage Service.

- 1.2.4 The Guideline describes recommended processes for the design and installation of a Fibre-Ready Facility, for use in the deployment of Optical Fibre Lines in a Real Estate Development Project.
- 1.2.5 The Guideline does not describe maintenance procedures or arrangements following the completion of the installation of a Fibre-Ready Facility.

NOTE: Refer to Division 4, Part 1 of Schedule 3 to the Act for additional information on the maintenance of a facility by a Carrier.

- 1.2.6 The Guideline includes In premises telecommunications pathways i.e. beyond the Lead-In Conduit.

1.3 Objectives

The objectives of the Guideline are to:

- (a) outline the minimum standard for Telecommunications pathways within and in proximity to a Real Estate Development Project to be considered a Fibre-Ready Facility; and
- (b) describe recommended processes for the design and installation of facilities for use in the deployment of Optical Fibre Lines in a Real Estate Development Project..

1.4 Guideline review

The Guideline will be reviewed after 5 years, or earlier in the event of significant developments that impact on the Guideline or a chapter within the Guideline.

2 ACRONYMS, DEFINITIONS AND INTERPRETATIONS

2.1 Acronyms

For the purposes of the Guideline:

MDU

means Multi Dwelling Unit.

SDU

means Single Dwelling Unit.

2.2 Definitions

For the purposes of the Guideline:

Access

has the meaning given by section 372L of the Act.

Act

means the *Telecommunications Act 1997 (Cth)*.

Bend

means a preformed curvature in a Conduit.

Building Lot

has the meaning given by section 372Q of the Act.

Building Unit

has the meaning given by section 372S of the Act.

Cable

has the meaning given by AS/CA S009.

Cabling

has the meaning given by AS/CA S009.

Carrier

has the meaning given by section 7 of the Act.

Conduit

means a tube that physically accommodates Cables and offers mechanical protection for Cable(s), allowing them to be drawn in and/or replaced.

NOTE: The terms Pipe and Conduit are used interchangeably in this document. Both are used in industry and for the purposes of this document mean the same thing.

Ceiling Access Panel

means a separate portion of a conduit system that provides access through a removable cover to the conduit system at a junction or change of direction to facilitate cable hauling.

Developer

means the party (or their agent) commercially responsible for the Real Estate Development Project.

Entrance Room

has the meaning given by AS 3084.

Fibre-Ready Facility

has the meaning given by section 372W of the Act.

Lead-In Conduit

means Conduit that extends from an end wall of a Pit to the premises.

NOTE: A Lead-In Conduit may connect to an existing Starter Pipe.

Line

has the meaning given by section 7 of the Act.

Listed Carriage Service

has the meaning given by section 16 of the Act.

Network Termination Device

has the meaning given by AS/CA S009.

NOTE: A possible example of a Network Termination Device for an optical network includes the optical network termination unit that is located on a property.

Optical Fibre Line

has the meaning given by section 7 of the Act.

P20

means telecommunications Conduit that is white and has:

- (a) a wall thickness of between 1.4mm and 1.7mm;
- (b) an internal diameter of not less than 23.3mm; and
- (c) an outside diameter of not more than 26.7mm.

P50

means telecommunications Conduit that is white and has:

- (a) a wall thickness of between 3.1mm and 3.65mm;
- (b) an internal diameter of not less than 53.0mm; and
- (c) an outside diameter of not more than 60.3mm.

P100

means telecommunications Conduit that is white and has:

- (a) a wall thickness of between 4.5mm and 5.2mm;
- (b) an internal diameter of not less than 104.9mm; and
- (c) an outside diameter of not more than 113.9mm.

NOTES:

1. Refer to Appendix B for more information about differences between telecommunications Conduit and electrical Conduit.
2. Refer to Section 8.1 and Figure 18 of G645 for more information on the materials and nominal dimensions, including wall thickness, of P20, P50 and P100 Conduit.

Pipe

has the same meaning as Conduit.

NOTE: The terms Pipe and Conduit are used interchangeably in this document. Both terms are used in industry and for the purposes of this document mean the same thing.

Pit

means a manhole or any other access hole or chamber in the ground.

Real Estate Development Project

has the meaning given by section 372Q of the Act.

Reticulation Conduit

means Conduit within a Super Lot that joins Pits on branch routes.

Shared Trench Agreement

means an agreement between organisations (e.g. utilities) that install services in a trench in a Real Estate Development Project which includes specification of the:

- (a) depth below ground level of the services;
- (b) alignment of services; and
- (c) separation of the services from one another.

Starter Conduit

means Conduit that:

- (a) extends from an end wall of a Pit into each property beyond the property boundary point served from the Pit;
- (b) is more than 1 metre long,
- (c) is less than 10 metres long where it does not pass under a retaining wall or embankment; and
- (d) may be more than 10 metres long where it passes under a retaining wall or embankment.

NOTES:

1. *Starter Conduit is also referred to as a service Conduit or drop Conduit.*
2. *Where a Starter Conduit extends under a retaining wall or embankment then it should be locatable for subsequent work to connect it to a Building Unit.*
3. *Refer to clause 4.4.1 of G645 for more information on how a Starter Conduit may have a length up to 25m with prior Carrier consent.*

Super Lot

means a Building Lot that is:

- (a) intended for future development;
- (b) larger than a Building Lot used for a single dwelling unit (SDU); and
- (c) not used for a SDU.

NOTES:

1. *Examples of Super Lot use include for education, commercial, or light industrial development, or for Multi-Dwelling Units (MDUs) such as terraces or apartments.*
2. *A Super Lot is typically identified as part of a master planning stage of a Real Estate Development Project.*

Telecommunications Equipment Room

means a room that:

- (a) is an equipment room; and
- (b) contains a distribution enclosure.

NOTES:

1. There are Standards being drafted that may be of interest e.g. one has a working title of "Information technology — Physical network security for the accommodation of customer premises cabling infrastructure and information technology equipment".

Telecommunications Network

has the meaning given by section 7 of the Act.

2.3 Interpretations

In the Guideline, unless the contrary appears:

- (a) headings are for convenience only and do not affect interpretation;
- (b) a reference to a statute, ordinance, code or other law includes regulations and other instruments under it and consolidations, amendments, re-enactments or replacements of any of them;
- (c) words in the singular includes the plural and vice versa;
- (d) words importing persons include a body whether corporate, politic or otherwise;
- (e) where a word or phrase is defined, its other grammatical forms have a corresponding meaning;
- (f) mentioning anything after include, includes or including does not limit what else might be included;
- (g) words and expressions which are not defined have the meanings given to them in the Act; and
- (h) a reference to a person includes a reference to the person's executors, administrators, successors, agents, assignees and novatees.

3 GENERAL RULES

3.1 Introduction

- 3.1.1 The *Telecommunications Legislation Amendment (Fibre Deployment) Act 2011* amended the Act to:
- (a) enable the Minister to specify new developments in which fixed Lines which are installed need to use optical fibre;
 - (b) require passive infrastructure like pit and pipe that is installed to be fibre-ready;
 - (c) impose penalties on Developers that are constitutional corporations that sell property without fibre-ready passive infrastructure;
 - (d) enable Carriers to seek Access to passive infrastructure that is owned by a non-Carrier; and

NOTE: Carrier access to facilities owned by another Carrier can be managed by contacting Before You Dig for information and then the Carriers negotiating commercial arrangements between one another.

- (e) enable the Australian Communications and Media Authority to make standards for customer equipment and cabling for use with superfast networks.
- 3.1.2 This Guideline outlines the minimum requirements for Telecommunications installation within, and in proximity to, Real Estate Development Projects to be considered a Fibre-Ready Facility.
- 3.1.3 The rules of this Guideline are organised into 6 main sections:
- (a) **Section 4 Design**, outlines the permitted configurations and sizes of Pits and Conduit with the respect to the property allotments and roadways they pass.
 - (b) **Section 5 Multi Unit, Multi Building Developments**, outlines the rules for the design of multi-unit, multi-building developments including Super Lots.
 - (c) **Section 6 Telecommunications riser/closet to living unit**, outlines the rules for the placement of the Conduit in the ground; interconnection, bending and entry into Pits; and testing of the Conduit.
 - (d) **Section 7 Mixed Use / Residential / Commercial/ Industrial Developments**, outlines the minimum size of Lead-In Conduit(s) and prohibited locations for fibre distribution panels and equipment rooms.
 - (e) **Section 8 Documentation**, outlines the minimum level of documentation deemed acceptable for transfer of

Conduit to a Carrier under a 'build and transfer' arrangement.

3.2 Customisation based on Carrier advice

- 3.2.1 To avoid subsequent disruption to the Real Estate Development Project, the Developer shall engage with one or more Carriers at the design stage to incorporate Carrier specific requirements.

NOTES:

1. This assumes that only a Carrier with experience or plans to operate Telecommunications Network(s) that use Optical Fibre Lines would engage with a Developer in relation to a Fibre-Ready Facility.

2. Developers should arrange registration with a Carrier six months prior to their estimated project completion to allow sufficient time for provision of advice on Carrier requirements.

- 3.2.2 Developers should engage registered telecommunications engineer(s), or similar experts as required by state legislation, on the design of telecommunications infrastructure in buildings.

3.3 Shared Trenching

- 3.3.1 If a Real Estate Development Project will have multiple utility services (e.g. two or more of communications, electricity, gas, sewer and water) installed in one service trench then a Developer shall ensure there is in place a documented Shared Trench Agreement for the utility services to enable cost effective installation of Pit and Pipe infrastructure.

NOTE: The Developer should lodge information about installed infrastructure with BYD.

- 3.3.2 A Shared Trench Agreement should comply with recognised industry practices for safety and separation of services.

NOTES:

1. One example of practices for the separation of services is the use of barrier strips between service types, although this is not typically used between nests of Conduits of the same service type.

2. Refer to AS/CA S009 and AS/NZS 3000 for separation distances between electrical and telecommunications cables.

3. Refer to AS/NZS 4645.2, AS/NZS 4645.3 and AS/NZS IEC 60079.10.1 for separation distances from gas services.

4. Refer to section 6.5 of C524 for further Carrier responsibilities.

3.4 Certification

3.4.1 A Developer shall check if it needs to supply to:

- (a) State planning authorities; or
- (b) Local government authorities (e.g. council or shire)

certification that the design for Fibre-Ready Facilities within the Real Estate Development Project conforms to this guideline.

3.4.2 A Developer shall check if it needs to supply to:

- (a) State planning authorities; or
- (b) Local government authorities (e.g. council or shire)

certification that Fibre-Ready Facilities will be or have been installed within the Real Estate Development Project in a way that conforms to this Guideline.

NOTE: This certification might be provided by a Carrier providing communications services under clause 3.4.3.

3.4.3 Some authorities may require a Carrier to certify it will be providing communications services (of a certain type and standard) to the Real Estate Development Project before final approval is granted.

3.4.4 The nature of the telecommunications services provided to the Real Estate Development Project is for the Developer and approving authority to determine, subject to complying with provisions of Part 20A of the Act with regard to Fibre-Ready Facilities or where fixed Lines must be Optical Fibre Lines.

NOTE: In addition to legislation there are regulatory instruments that may be relevant.

3.5 Registration of Plans

The owner of completed Pit and Pipe assets in a building in a Real Estate Development Project, whether a Developer, a Carrier or a body corporate taking on the responsibility for cable, should register the service entry point with the Before You Dig Australia service.

NOTE: Before You Dig Australia is a national service designed to prevent damage and disruption to Pipe and cable networks. To contact the service visit the website at <https://www.byda.com.au/>

3.6 Change of Ownership

- 3.6.1 Where there is a change of ownership of installed Pits, closets, cables, and Conduits, there needs to be a legally documented and executed agreement facilitating the change of ownership.

NOTE: The ownership of Developer installed Pits, closets, cables and Conduits does not automatically transfer to another entity like a Carrier or a body corporate.

- 3.6.2 Where there is a change of ownership of installed Pits, closets, cables, and Conduits there should be an update of the information held by Before You Dig Australia as part of the change of ownership.

4 DESIGN

This section outlines the minimum permitted configurations and sizes of Pits and Conduit with respect to factors such as the property allotments and roadways they pass.

4.1 Before You Start

- 4.1.1 A Developer should check for existing infrastructure assets (e.g. electricity, gas and water mains) prior to the design of Pit and Conduit in a Real Estate Development Project.

NOTE: One way to check for existing infrastructure assets is to contact the Before You Dig Australia service. Another is to contact the local suppliers of utility services.

- 4.1.2 Design processes shall consider both the short and long term requirements of the building, including:
- (a) a need for Telecommunications Equipment Room(s);
 - (b) a need for telecommunications riser(s);
 - (c) how to handle exceptional cases (e.g. difficult access);
and
 - (d) site usage e.g. commercial sites.

NOTE: Refer to Section 7 for more information on site usage.

- 4.1.3 Design processes for Pit and Conduit in a Real Estate Development Project shall include engagement with non-telecommunications utilities e.g. electricity, gas, water.
- 4.1.4 Design processes for Pit and Conduit in a Real Estate Development Project should take into consideration physical properties of the site e.g. soil type.

4.2 Network Architecture(s)

Refer to Table 1 for important information related to the design of telecommunications pathways and spaces.

TABLE 1
Telecommunications Pathways and Spaces

Number of Sole-Occupancy Units in a building	Minimum Number of Building Entry Points	Minimum total wall spatial area of main equipment room (m²)	Minimum total wall spatial area of main equipment cupboard (m²) (Note 4)	Minimum total wall area of vertical riser cupboard per storey (width x height)	Minimum number of vertical riser shafts	Dedicated pathway by level: - Riser cupboard to apartment / tenancy in P20 conduit	Dedicated combined pathway by level: - Riser cupboard to apartment / tenancy in conduit and cable tray	Shared pathway by level: - Riser cupboard to apartment / tenancy
less than 5	1	2	2	400 x 1800	1	P20 (Note 6)	P50 rigid white conduit (truncation) or Cable tray with 100mm min space required and Rigid P20 white conduit (Note 7)	Cable tray with 100mm min. required space and Rigid P20 white conduit (Note 7)
5 to less than 60	1	2	2	400 x 1800	1			
60 to less than 100	1	5		400 x 1800	1			
100 to less than 250	1	6		750 x 2000	1			
250 to less than 500	1	8		750 x 2000	1			
500 to less than 1000	1 (Note 1)	11 (Note 3)		750 x 2000	2 (Note 5)			
1000 or more	1 (Note 1)	11 (Note 3)		750 x 2000	2 (Note 5)			

NOTES:

- 1: *It is preferred that a second building entry point be provided to allow for telecommunications diversity.*
2. *Based on the occupancy the additional equipment to support in excess of 1000 users would require a minimum of 1500 m² of space for each group of 200 users.*
3. *A main equipment cupboard is utilised where a main equipment room is not available. This is only for developments up to a total of up to 60 occupancy units.*
4. *The height and volume of units within the structure would determine the amount of riser shafts being installed.*
5. *The dedicated pathway is installed from the riser cupboard located in the common area on each level to the apartment / tenancy, in a rigid white telecommunications P20 Conduit with no more than 3 pre-formed Bends.*
6. *Ceiling Access Panel(s) are required where the rigid white telecommunications P20 Conduit from the apartment / tenancy meets one or more conduits or cable trays. Where there is only a cable tray from the riser cupboard to apartment / tenancy, Ceiling Access Panels are to be installed every 15m or at any change of direction; this is to assist in cable installation and maintenance.*
7. *Where there is insufficient space in a ceiling to access a Conduit, a Conduit should terminate less than 300mm from a Ceiling Access Panel or from where the cable(s) join a cable tray.*
8. *Where a Cable changes direction in the vertical plane it should be enclosed in a Conduit and/or Bend(s).*

4.3 Minimum Conduit Size

- 4.3.1 The Conduit installed in a Real Estate Development Project must be large enough to accommodate all anticipated telecommunications services in the current design phase.
- 4.3.2 Refer to Table 1 for the required size for various Conduit functions within the network architecture(s) where the only use of the Conduit is for:
- (a) installing fibre or cable for; or
 - (b) connecting fibre or cable to a public Telecommunications Network.

NOTE: Carrier Conduit is used exclusively for public Telecommunications Networks. In a greenfield estate where the Developer retains ownership of the Conduit and the Conduit contains cable for a public Telecommunications Network then separate cable infrastructure is required for private (e.g. an intercom) services.

- 4.3.3 While P20 is the default minimum size in Table 1 for Conduit to each living unit, a Developer may install more than one P20 Conduit or choose a larger size Conduit (e.g. a P50 Conduit in place of each P20 Conduit), where:
- (a) there is a Carrier nominated for the ownership of the Optical Fibre Lines; and
 - (b) the nominated Carrier has agreed in writing to the installation of the Conduits.

NOTES:

1. *The nominated Carrier should be able to demonstrate the chosen combination of internal Conduit diameter and bend radius is capable of permitting Access by another Carrier.*
2. *If there is another combination of Conduits that can be demonstrated to be equivalent to the minimum P20 Conduit then an interested party can contact Communications Alliance and propose it for inclusion in a revision of this document.*

- 4.3.4 For information on sizing and installation for Lead-In Conduits and Pits, refer to G645.
- 4.3.5 For information on cable location outside buildings, refer to C524.

NOTE: Refer to section 6.3 of C524 for further information on cable location e.g. that marker tape should be installed if using a common trench.

- 4.3.6 For information on marking of Conduit for telecommunications, refer to AS/CA S008.

4.3.7 The Conduit installed in a Real Estate Development Project must be large enough to accommodate all anticipated telecommunications services in the current design phase.

4.4 Minimum Working Space Above a Ceiling Access Panel

4.4.1 Refer to Table 2 for information on recommended minimum dimensions of safe working space above a Ceiling Access Panel.

TABLE 2
Minimum dimensions for working space above a Ceiling Access Panel

	Minimum Dimensions for working space		
	Length (mm)	Width (mm)	Depth of recess (mm)
1	450	450	200

4.4.2 If a Carrier requests a specific location to accommodate plant that is larger than the dimensions in Table 2, then this must be accommodated by the Developer, provided that:

- (a) the requested size is reasonably justified as fit for purpose; and
- (b) the exact location and size of the larger Ceiling Access Panels are specified prior to commencement of construction of the development.

4.4.3 It is strongly recommended that Developers consult with a Carrier about other space requirements.

5 MULTI UNIT, MULTI BUILDING DEVELOPMENTS

This section outlines the rules for the design of multi-unit, multi-building developments from the building lead-in location.

NOTE: G645 documents the requirements / details of providing telecommunications infrastructure to the building(s) in fibre ready estates, including Lead-In Conduit requirements. Some of that detail is represented in this document. Where there is cross over between this Guideline and G645 then the provisions in G645 take precedence.

5.1 Introduction

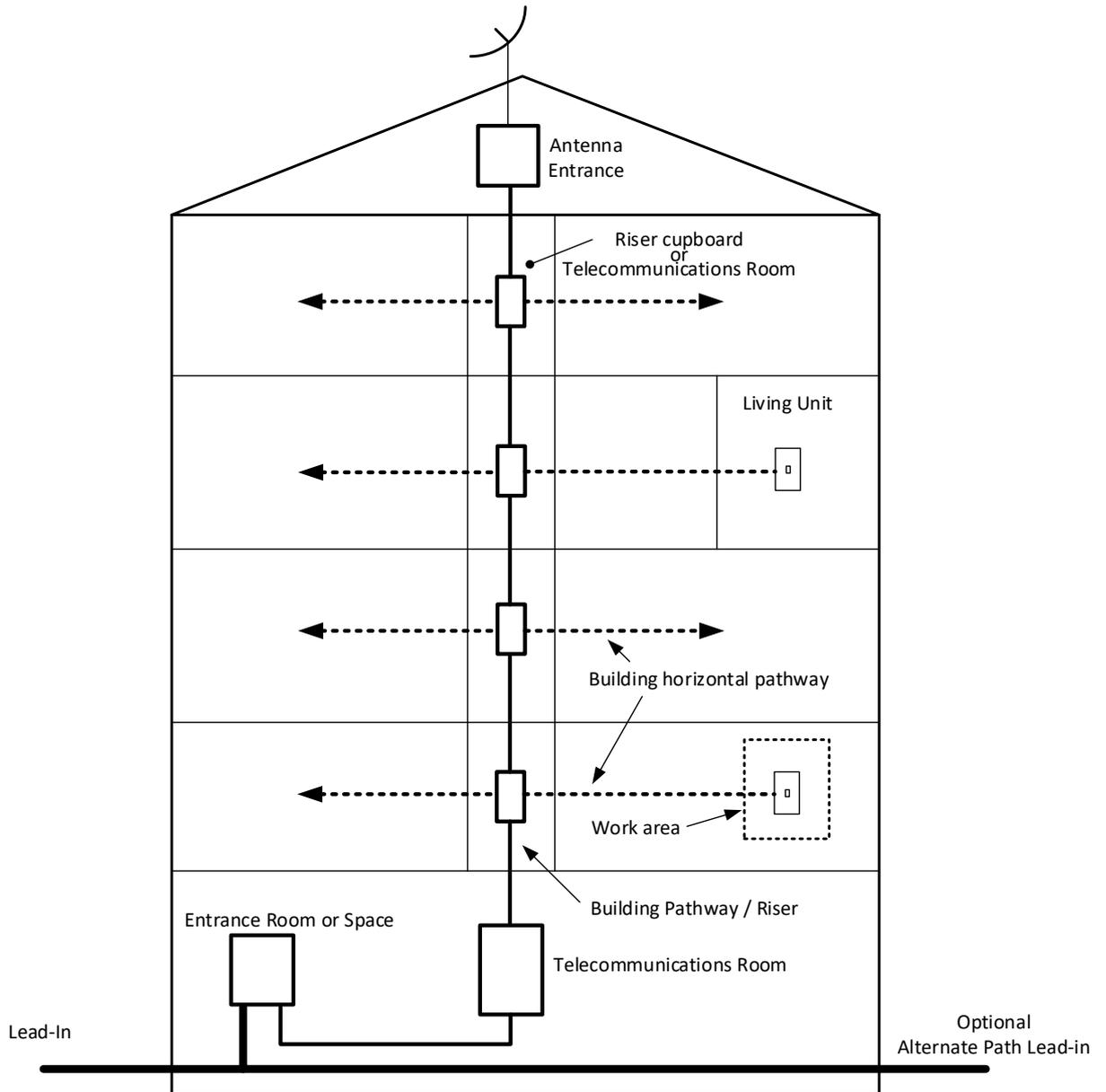
- 5.1.1 The requirement to provide fibre-ready infrastructure applies to all Real Estate Development Projects (i.e. not limited to subdivisions) including those occurring on a single lot involving the construction of one or more buildings and/or Building Units. (i.e. strata and group title developments, horizontal and vertical Multi-Dwelling Units (MDUs), commercial and industrial).
- 5.1.2 While the basic requirements of the design guidelines (G645 Section 4) apply, due to differing layouts of these developments, special focus is required to ensure appropriate infrastructure is installed in the correct location all the way to the living unit.

5.2 Key Requirements

- 5.2.1 Provision of suitable pathways from building lead-in location to each individual living unit or commercial space.
- 5.2.2 If Conduit is utilised the number of pre-formed 90 degree Bends (or equivalent) in a Conduit shall be not more than two.

5.3 Building Pathway Elements

Refer to Figure 1 for information on basic elements of multi-storey commercial / residential building pathways.



 Telecommunications Outlet

FIGURE 1
**Basic Elements of a Multi-storey
Commercial / Residential building pathways**

5.4 Residential Lead-In (from G645)

- 5.4.1 The minimum size of a Lead-In Conduit(s) to a building containing 2 Building Units shall be either a single P50 or two P20s.
- 5.4.2 The minimum size of a Lead-In Conduit to a building containing from 3 to 60 Building Units shall be P50.

- 5.4.3 For a small scale horizontal residential development (i.e. three or less Building Units) the minimum size of a:
- (a) Lead-In Conduit is P20; and
 - (b) Reticulation Conduit, if required, is P50.
- 5.4.4 The minimum size of a Lead-In Conduit to a building containing more than 60 Building Units shall be P100.

NOTES:

1. The use of P100 Conduit, instead of an alternate combination of smaller Conduits (e.g. two P50 Conduits), supports site access by multiple Carriers. This is relevant for the support of choice of service provider, which in turn supports the legislated objects for telecommunications services in section 3 of the Act.

2. To achieve the same cross-sectional area and access flexibility it should be noted that four P50 Conduits are equivalent to one P100 Conduit.

3. The increased use of pre-terminated fibre Cables in the telecommunications industry means the Conduit size should be sufficient to provide adequate clearance for the protection of the pre-terminated Cable ends.

5.5 Residential Pathways

- 5.5.1 Cables shall be supported with pathways where possible and adhere to cable separations requirements as detailed in AS/CA S009. Any alterations to the building infrastructure shall adhere to the Building Code of Australia.
- 5.5.2 Internal rated cables that have been installed externally shall be protected with a covered Cable pathway or Conduit for the sections that are external.
- 5.5.3 Cables installed in locations where pathways do not exist, such as in a wall and ceiling void, require the installation of a Conduit or accessible tray to those locations to enable
- (a) future replacement of Cabling; or
 - (b) future installation of new Cable.

NOTE: Flexible, convoluted or corrugated Conduit is not recommended because of the uncontrolled number of changes in direction that can occur and the additional stresses imposed on pre-terminated fibre Cables.

- 5.5.4 Conduits shall be used when crossing floors and fire sealing elements.

NOTE: Refer to AS/CA S009 for more information on cabling practices when crossing floors and fire sealing elements.

5.5.5 Pathways or Conduits:

- (a) shall not be placed directly up to distributors; and
- (b) shall remain outside the individual product clearances from the cable entry point.

NOTES:

1. This is to allow future access for additional cables to be installed.

2: A consequence of this requirement is that Cables may be exposed at distributors for short sections.

5.6 Risers and Closets

5.6.1 Risers are used for supporting backbone cabling running between floors.

5.6.2 Closets are used for housing passive fibre devices.

NOTES:

1. The main products commonly mounted in a telecommunications riser/closet are Fibre distribution terminals / distributors.

2. Whether the building requires risers or closets will depend on the building design.

5.6.3 Space allocation should be provisioned in consultation with a Carrier.

5.6.4 Cable trays may run adjacent to passive fibre devices.

5.7 Pathways in Risers

5.7.1 The telecommunications riser/closet is also required to have a minimum 50 mm x50 mm floor slot or one (1) x white telecommunications Conduit cut nominally 25 mm above or below the floor slab, as appropriate.

5.7.2 Refer to Figure 2 for an example of a floor slot for a telecommunications riser/closet floor or ceiling entry.

5.7.3 Refer to Figure 3 for an example of a Conduit sleeve for a telecommunications riser/closet floor or ceiling entry.

5.7.4 If there are living units above and below the floor slab, bi-directional access for Cables is required.

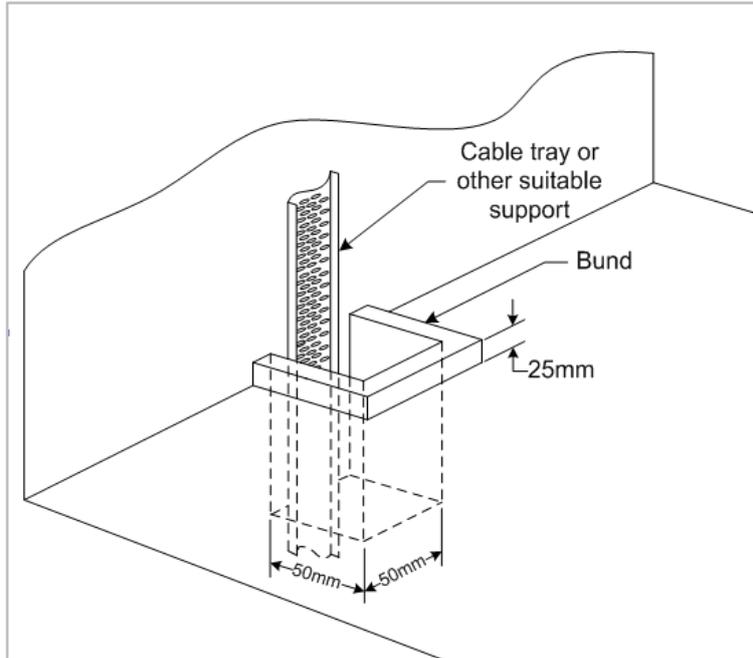


FIGURE 2

Slot example telecommunications riser/closet floor or ceiling entry

NOTE: Figure 2 does not include or address fire stopping requirements.

OR

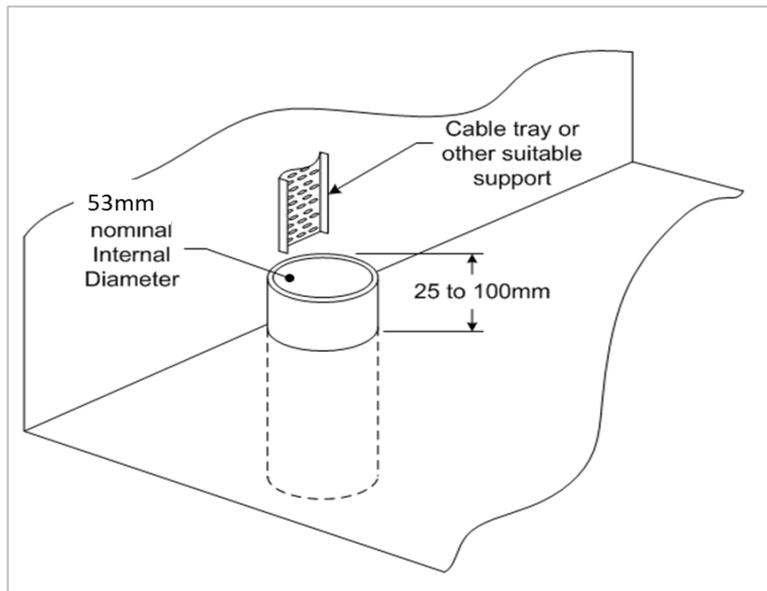


FIGURE 3

Sleeve example telecommunications riser/closet floor or ceiling entry

NOTE: Figure 3 does not include or address fire stopping requirements.

5.8 Heat Loading from Equipment

- 5.8.1 Where active equipment could be installed in an enclosed space (e.g. Telecommunications Equipment Room, the space above a Ceiling Access Panel) a building design should allow for the heat loading generated by the active equipment.
- 5.8.2 The heat loading for an enclosed space that could contain active equipment should be assessed by a suitably qualified building engineer e.g. one with expertise in heating, ventilation and cooling.

6 REQUIREMENTS FOR PATHWAYS FROM TELECOMMUNICATIONS RISER/CLOSET TO LIVING UNIT

Communications pathways may be provided using the options below.

6.1 Option 1: Dedicated Conduit

- 6.1.1 Cabling from the Building Unit to the telecommunications riser/closet requires a minimum of one P20 white telecommunication Conduit.

NOTE: P50 Conduits may be utilised.

- 6.1.2 A drawstring shall be installed in each Conduit from the telecommunications riser or closet location to each Network Termination Device location within a premise.
- 6.1.3 No section of conduit shall be longer than 15 m between pull/draw points and contain the equivalent of no more than three (3) 90 degree° 300 mm radius Bends.
- 6.1.4 Conduits can be surface mounted in common areas or cast 'in slab'.
- 6.1.5 All Conduits and drawstrings shall be labelled to reference the respective apartment/unit numbers.
- 6.1.6 A single 100 mm radius Bend may replace a 300 mm radius Bend where it is:
- (a) at the final transition from a horizontal plane to vertical plane; and
 - (b) with the agreement of the relevant carrier representative.
- 6.1.7 The minimum separation between the telecommunications network infrastructure and the Cable or infrastructure of other utilities shall be not less than 100 mm. Refer to AS/CA S009 for more information.
- 6.1.8 Refer to Figure 4 for an example of Pathways using all P20 dedicated Conduit to feed an apartment floor with multiple Building Units.

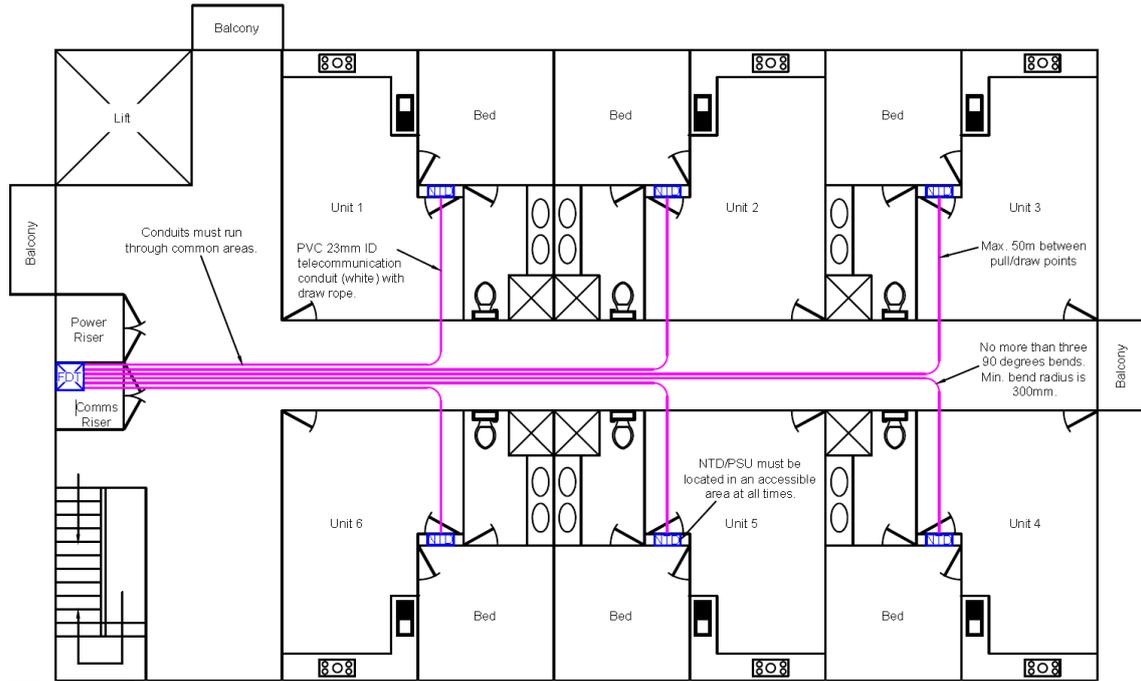


FIGURE 4

Example of Pathways using all P20 dedicated Conduit to feed an apartment floor with multiple Building Units

6.2 Option 2: Shared conduit

- 6.2.1 Where a combination of shared P50 Conduit(s) and dedicated Conduit(s) is utilised for cabling from the telecommunications riser/closet to the living unit, a Ceiling Access Panel shall:
- (a) Be provided at any Conduit transition point; and
 - (b) Align with the dimensions in Table 2.
- 6.2.2 A cable tray of minimum width 150 mm, or some other suitable anchor, shall act as a fixing point for Cables at the junction of Conduit(s) and cable tray(s).
- 6.2.3 Ceiling Access Panels shall be located not more than 300mm from the end of any Conduit or edge of any cable tray.
- 6.2.4 A Ceiling Access Panel shall be placed to avoid being located at heights that require specialist equipment to access it e.g. scissor platforms and boom lifts.
- 6.2.5 The minimum separation between the telecommunications network infrastructure and the cable or infrastructure of other utilities shall be not less than 100 mm. Refer to AS/CA S009 for more information.
- 6.2.6 The minimum clearance height above a cable tray:
- (a) shall be not less than 200 mm and
 - (b) should be not less than 300 mm.

NOTE: There are emerging standard(s) for privacy and safe working that defines a 300 mm clearance for safety purposes.

- 6.2.7 Refer to Figure 5 for an example of pathways using a combination of P50 and P20 shared Conduit to feed an apartment floor with multiple Building Units.

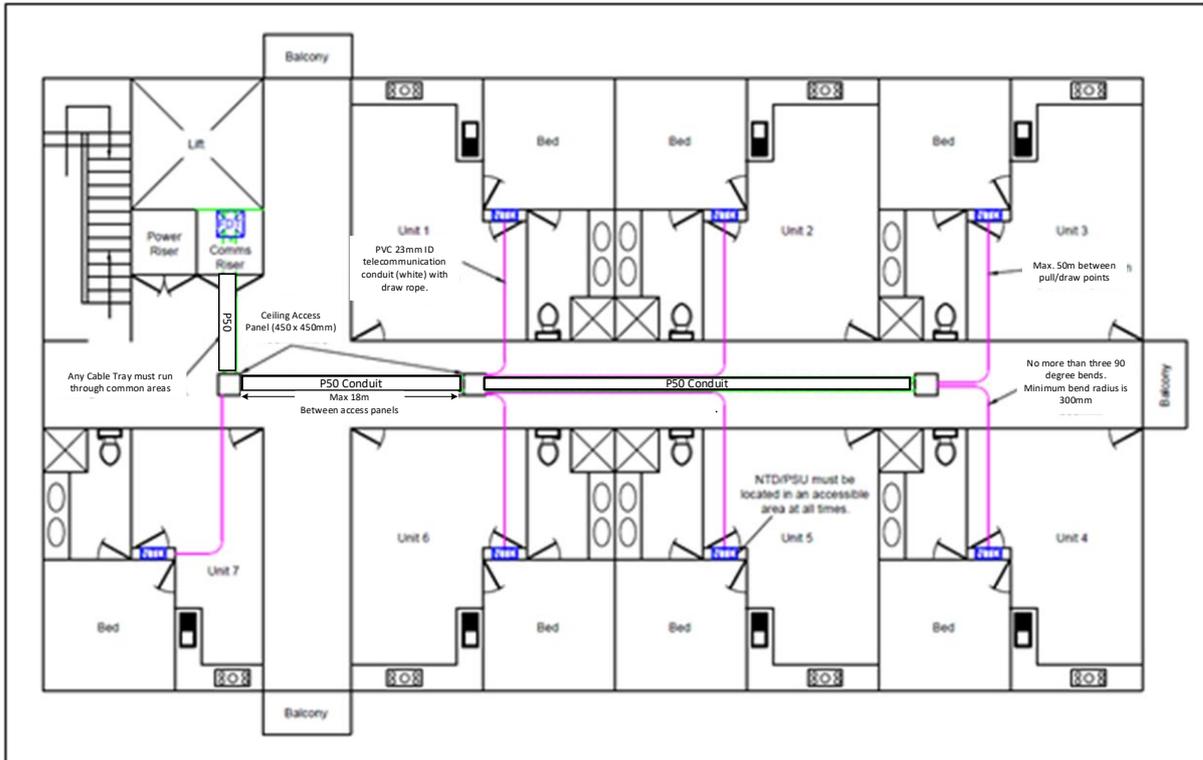


FIGURE 5

Example of pathways using a combination of P50 and P20 shared Conduit to feed an apartment floor with multiple Building Units

7 MIXED USE / RESIDENTIAL / COMMERCIAL/ INDUSTRIAL DEVELOPMENTS

7.1 Minimum size of a Lead-In Conduit

The minimum size of a Lead-In Conduit to a commercial, industrial or mixed use Building Unit shall be P50.

NOTE: Mixed use development combines a commercial or industrial Building Unit with one or more residential Building Units.

7.2 Larger commercial buildings

For larger commercial buildings Developers should:

- (a) engage during the design phase with Carrier(s) likely to install infrastructure in the building;
- (b) consider whether the minimum size of a Lead-In Conduit should be P100 or multiples of P100;
- (c) decide on the number of building entry points for telecommunications infrastructure.

NOTES:

1. Larger commercial buildings can have multiple Carriers installing infrastructure to deliver competing telecommunications services to building occupants.

2. Multiple building entry points for telecommunications infrastructure enables diverse paths for services, resulting in options for redundancy and backup that are valued by building occupants.

7.3 Prohibited Fibre Distribution Panel and Equipment Room Locations

Prohibited fibre distribution panel and equipment room locations include:

- (a) Areas of return air supply i.e. areas likely to be contaminated by return air, exhaust air systems and smoke extraction;
- (b) In a boiler, plant or machine room;
- (c) Areas subject to extreme or rapid temperature changes or, temperature/ humidity likely to cause condensation in equipment rack(s);
- (d) In areas where corrosive or flammable fumes or fluids are used or stored;
- (e) In a fire escape stairway;

- (f) In a fire control room or restricting access to a fire control centre/panel;
- (g) In a cupboard containing a fire hose reel;
- (h) Wet areas. This includes locations that are near a tap, bath, shower, basin, tub, fixed water container, spa pool, spa tub, swimming pool, fountain, water feature or water pump;
- (i) Within a refrigeration room or diesel generator room;
- (j) Within 1.5 m of a heater or air conditioner unit;
- (k) Within an EPR (earth potential rise) hazard zone;
- (l) Within a defined hazardous area;
- (m) In a stairwell;
- (n) In a lobby;
- (o) In unsecure communal areas;
- (p) In hallways or passageways; or
- (q) In kitchen or lunch areas.

8 DOCUMENTATION

This section outlines the minimum level of documentation deemed acceptable for transfer of the design information to a building owner, building manager or body corporate. The building owner, building manager or body corporate may require the information to be prepared in specific drawing formats (e.g. CAD) and/or use of particular symbols for each network element.

8.1 As-Built Documentation

8.1.1 Where a Developer is responsible for the construction of Pits and Conduits, and prior to the transfer of ownership of the Pits and Conduits from the Developer to the building owner, building manager or body corporate, the as-built documentation must be prepared by the Developer for hand over to the building owner, building manager or body corporate at the time of transfer.

8.1.2 The as-built documentation must include:

- (a) The location of all allotment and street boundaries;
- (b) The location of all Pits, Ceiling Access Panels and Conduits, relative to known fixed assets e.g. allotment boundaries;
- (c) The sizes of all Pits and Conduits;
- (d) The depth of cover for Conduits, measured as actual soil or back fill depth to the top of the Conduit and does not include coverings (for example paving);
- (e) details from within any Shared Trench Agreement, including trench cross sections showing all services within 2 metres of the installed Pits and/or Conduit; and
- (f) results of any mandrel testing for each Conduit section.

NOTES:

1. A drawing file would typically contain a legend with Pit types and dimensions.

2. Depth of cover is usually part of a Shared Trench Agreement.

3. Refer to Carrier guidelines and/or requirements and Australian Standards for the drawing formats for as-built documentation. For example, AS/NZS 3085.1 and AS/NZS 14763.2; or NBN Co specification NBN-TE-CTO-284.

4. Hand drawn updates to the as-built documentation should include a signature and date of signature from the:

- (a) civils contractor; or
- (b) Pit and Pipe contractor.

8.2 Records

- 8.2.1 The Carrier's representative should supply relevant documentation to allow the building owner, building manager or body corporate to update these records on completion of the works.
- 8.2.2 The Carrier's representative is to ensure all required certifications are provided to the building owner, building manager or body corporate within five business days of completion.

NOTE: The timeframe of five business days is derived from G571 (under revision at the time of publication).

9 REFERENCES

Publication	Title
Australian Standards	
AS/CA S009:2020	Installation requirements for customer cabling (Wiring rules) http://commsalliance.com.au/Documents/all/Standards/s009
AS/NZS 3000:2018	Electrical installations (known as the Australian/New Zealand Wiring Rules) https://store.standards.org.au/product/as-nzs-3000-2018
AS/NZS 3084:2017	Telecommunications installations - Telecommunications pathways and spaces for commercial buildings https://store.standards.org.au/product/as-nzs-3084-2017
AS/NZS 3085.1:2022	Telecommunications installations - Administration of communications cabling systems, Part 1: Basic requirements https://store.standards.org.au/product/as-3085-1-2022
AS/NZS 4645.2:2018	Gas distribution networks Part 2: Steel pipe systems https://store.standards.org.au/product/as-nzs-4645-2-2018
AS/NZS 4645.3:2018	Gas distribution networks Part 3: Plastics pipe systems https://store.standards.org.au/product/as-nzs-4645-3-2018
AS/NZS 14763.2:2020	Information technology — Implementation and operation of customer premises cabling, Part 2: Planning and installation (ISO/IEC 14763-2 (ED. 2.0) MOD) https://store.standards.org.au/product/as-nzs-14763-2-2020
AS/NZS IEC 60079.10.1:2022	Explosive atmospheres Part 10.1: Classification of areas - Explosive gas atmospheres https://store.standards.org.au/product/as-nzs-iec-60079-10-1-2022
Industry Codes	
C524:2013	External Communication Cable Networks http://commsalliance.com.au/Documents/all/codes/c524
Industry Guidelines	
G571:2002	Building Access Operations and Installation https://www.commsalliance.com.au/Documents/all/guidelines/g571

G645:2017	Fibre Ready Pit and Pipe Specification for Real Estate Development Projects
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<https://www.commsalliance.com.au/Documents/all/guidelines/g645>

NBN TE CTO 284	MDU building Engineering and Design Standard - New Developments
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<https://www.nbnco.com.au/develop-or-plan-with-the-nbn/new-developments/design-build-install/pathway>

International Standards

ISO/IEC AWI 24383	Information technology — Physical network security for the accommodation of customer premises cabling infrastructure and information technology equipment
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<https://www.iso.org/standard/78546.html>

Legislation

Telecommunications Act 1997

<http://www.comlaw.gov.au/Series/C2004A05145>

APPENDIX

A STARTER CONDUIT TERMINATION METHODS

Refer to Table 3 for links to examples of Starter Conduit termination methods.

TABLE 3
Examples of Starter Conduit termination methods

Company	Document title	URL
nbn™	New Property Developments	https://www.nbnco.com.au/develop-or-plan-with-the-nbn#newdevelopments
	Design and Build guidelines	https://www.nbnco.com.au/develop-or-plan-with-the-nbn/new-developments/design-build-install
	Deployment of pit and conduit network guideline	https://www.nbnco.com.au/develop-or-plan-with-the-nbn/new-developments/design-build-install/pit-and-pipe
OptiComm	Preparation and Installation Guides	https://www.opticomm.com.au/support/resources/

APPENDIX

B Telecommunications Conduit

Refer to Figure 6 for more information about telecommunications Conduit.



Note: The conduit sizes defined in this Guideline derive from AS/NZS 1477. These sizes are used by telecommunications carriers. Refer to the Definitions section for dimensions of these P20, P50 and P100 "carrier" conduits.

P20 and P50 "carrier" conduits have a significantly larger internal capacity than the nominal 20 mm and 50 mm conduits commonly used for electrical cabling (AS/NZS 2053 and AS/NZS 61386 series sizes). The two styles will not mate. Carrier cabling which fits through "carrier" size conduits may not fit through smaller conduits.

FIGURE 6
Telecommunications Conduits

PARTICIPANTS

The Working Committee that developed the Guideline consisted of the following organisations and their representatives:

Organisation	Membership	Representative
ACMA	Non-Voting	Dominic Byrne
Engineers Australia	Voting	Walter Green
nbn	Voting	Haydn Dale
Optus	Non-Voting	Chris Willis
Telstra	Voting	Geoff Gerrand
TPG Telecom	Voting	Liz Goyeneche
TPG Telecom	Non-Voting	Annie Leahy
Vocus	Voting	Justin Martin

James Duck of Communications Alliance chaired this Working Committee and provided project management support.

Communications Alliance was formed in 2006 to provide a unified voice for the Australian communications industry and to lead it into the next generation of converging networks, technologies and services.

In pursuing its goals, Communications Alliance offers a forum for the industry to make coherent and constructive contributions to policy development and debate.

Communications Alliance seeks to facilitate open, effective and ethical competition between service providers while ensuring efficient, safe operation of networks, the provision of innovative services and the enhancement of consumer outcomes.

It is committed to the achievement of the policy objective of the *Telecommunications Act 1997* - the greatest practicable use of industry self-regulation without imposing undue financial and administrative burdens on industry.



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