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STANDARDS
Australia



Telecommunications installations — Administration of communications cabling systems

Part 1: Basic requirements



AS 3085.1:2022

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- Energy Networks Australia
- Engineers Australia
- KNX National Group
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- NBN Co
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- VTI Services

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee CT-001, Interconnection of Information Technology Equipment to supersede AS/NZS 3085.1:2004.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to provide a standard format for cabling requirements used in tender and construction drawings. This document provides basic specifications for identification and recording of components during design and at the time of installation in order to aid in the administration of application, maintenance and reconfiguration of telecommunications cabling infrastructure. It also includes consideration of the application of Building Information Modelling (BIM) software in the production of cabling infrastructure physical layout drawings.

This document —

- (a) facilitates standardized methods for specifying, recording and interpreting plant by all staff and contractors;
- (b) allows single person or single contractor dependencies to be avoided;
- (c) facilitates planning and administration by remote staff, such as information systems administrators, centralized help desks, or specialist consultants;
- (d) increases the speed of network troubleshooting and reduces down-time;
- (e) allows rapid identification and restoration of services after major building events, e.g. fire, flood or vandalism damage;
- (f) provides backup records allowing labels on plant to be restored if removed or damaged; and
- (g) facilitates standardization of engineering drawings prepared for the purpose of tender specifications, contract documents; and as-built records including drawings and cross connections.

The particular requirements of this Standard supplement the general requirements specified in AS/NZS 14763.2 *Information technology — Implementation and operation of customer premises cabling, Part 2: Planning and installation (ISO/IEC 14763-2 (ED. 2.0) MOD)*. This document is intended to be read in conjunction with AS/NZS 14763.2.

Where AS/NZS 14763.2 specifies generic requirements for cabling infrastructure administration including labelling, capture of test results and database record systems, this document covers the methodology for documenting components of the cabling and pathway systems by way of infrastructure drawings and for the recording of installation particulars.

The respective coverage of topics associated with cabling infrastructure documentation and administration in this document as compared to AS/NZS 14763.2 is summarized in the cross reference matrix provided in [Appendix F](#).

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

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Australian Standard®

Telecommunications installations — Administration of communications cabling systems

Part 1: Basic requirements

1 Scope

This document provides a standard format for cabling requirements used in tender and construction drawings. This document also provides basic specifications for identification and recording of components, during design and at the time of installation in order to aid in the administration of application, maintenance and reconfiguration of telecommunications cabling infrastructure. It includes consideration of the application of Building Information Modelling (BIM) software in the production of cabling infrastructure physical layout drawings in [Appendix G](#).

2 Application

This document is intended for use by architects, consultants and engineers specifying building works, and building owners and managers who wish to have a basic record of installations in order to facilitate access, and changes, to the telecommunications infrastructure.

A diagram showing the application of this document relative to other Australian Standards, Joint Australian/New Zealand Standards and other National Standards is provided in AS/NZS 11801.1, in the figure detailing “Customer cabling Standards in Australia”.

3 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS/NZS 14763.2, *Information technology — Implementation and operation of customer premises cabling, Part 2: Planning and installation (ISO/IEC 14763-2 (ED. 2.0) MOD)*

AS/CA S009, *Installation requirements for customer cabling (Wiring rules)*

4 Terms and definitions

For the purposes of this document, the terms and definitions, given in AS/NZS 11801.1, AS/NZS 14763.2, and the following apply.

4.1.1

building

substantial structure with a roof and walls

4.1.2

Building Information Modelling

BIM

software used for creating three dimensional models of physical building structures and services infrastructure

4.1.3

container

<1> enclosure or surface to which a specific equipment item or closure is mounted

<2> cable pathway item, such as conduit, haul pit, cable tray, catenary, or trunking, supporting a specific cable

4.1.4 documentation

collection of schematic, site, location and layout drawings showing the communications cabling infrastructure installed at a site together with the test results for that cabling

4.1.5 carrier lead-in cable route

carrier's telecommunications network cabling from the property entry point to the public network interface (network boundary)

4.1.6 may

indicates the existence of an option

4.1.7 premises

any land together with its building(s) used as a place of business or residence

4.1.8 records

paper or electronic documents, files or databases describing the allocation of copper or fibre conductor pairs to signals being carried on the communications cabling infrastructure and how each signal is cross-connected or inter-connected at distributors by jumpers or patches

4.1.9 shall

indicates that a statement is mandatory

4.1.10 should

indicates a recommendation

5 Minimum requirements

5.1 General

The clauses of AS/NZS 14763.2 relating to documentation and administration state the minimum requirements for cabling infrastructure administration, including component identification, labelling and recording which is based on the size and criticality of the infrastructure.

5.2 Identifiers

5.2.1 Introduction

AS/NZS 14763.2 and documents referenced therein provide a default scheme for the assignment of identifiers. Providing the requirement for uniqueness of the identifier for each element of the cabling infrastructure is met, other identification schemes are permitted. Alignment to any identification scheme already established on the site or on related premises is recommended.

5.2.2 Containers

The methods set out in AS/NZS 14763.2 for allocating equipment container identifiers in equipment rooms and telecommunications rooms shall be used across all rooms and sites.

The “row and position” method should be used where racks to standard floor footprints are used or spaces reserved for them. The first position (1A) should be the one furthest from the room main door, with position numbers along a row and row numbers increasing with proximity to the door.

NOTE Depending on the door position relative to the space, this can result in identifiers increasing from right to left, or from left to right.

5.2.3 Selection of terminal equipment and cable identification method

One of the three methods for identifying terminal equipment, closures and devices shall be selected and consistently applied under the “campus-building-floor distributor room rack” hierarchy defined in AS/NZS 14763.2:2020 Clause 9.2.3.

These methods comprise equipment type and one of the following:

- (a) Position in the rack (the default scheme specified in AS/NZS 14763.2:2020 Clause 9.2.3).

NOTE 1 This is not recommended in dynamic environments where equipment may move around the respective rack, enclosure or wall, because all labels and records associated with the item will become invalid after that item is moved and require replacement.

- (b) A sequential alphabetic character or number starting with the top-level item in the equipment hierarchy and continuing to all units in hierarchy order or order of installation.

NOTE 2 If the equipment and its connections are moved around within the same container, its identity does not change. This is the method recommended for general use and used in the examples in this document.

- (c) Sequential numbering of items across an entire site or campus without any “building-floor distributor room – rack” prefix.

NOTE 3 This method may be used where the infrastructure is managed and maintained by means of an asset management system and/or electronic database record system for ease of integration with those systems. Cables may also have unique identifiers across the site or the entire infrastructure and outdoor plant is readily identified in exactly the same way.

NOTE 4 Where such a method as (c) is used, a fresh batch of unique number ranges for each equipment, closure and cable should be obtained by the specifiers for use in the design documentation for new infrastructure to be built at each site, including in drawings and cable schedules. The format of cable schedules and patch records should be such that the as-built versions can be directly imported to the administration software. The location of items is captured in asset attributes and may be by rack or container identity housing the item or geographic coordinates, grid coordinates or measurements from structural or road lines.

5.3 Labelling

5.3.1 General

The general requirements and recommendations of AS/NZS 14763.2 apply in addition to the requirements and recommendations given in this document.

5.3.2 Telecommunications outlets

Telecommunications outlets shall be labelled on the permanently fixed part of the outlet plate. If the outlet fitting includes a removable cover plate that covers the label on the fixed part, a label with the same text shall also be provided to the cover plate.

The label colouring, text height, and orientation shall be such to render the label readable from a distance of at least 0.75 m or greater. The minimum text height of the label shall be at least 3.5 mm (10 point).

5.3.3 Containers

Containers including distributor cabinets, racks or wall frames, pits, and pathway elements where applicable, shall be fitted with a large label that is readily visible and legible from a range of at least 2 m, showing the container identification. The minimum text height of the label shall be 10 mm (28 point).

NOTE A text height of 20 mm is recommended if it can be accommodated.

5.3.4 Consolidation points

Consolidation points (CP) shall be fitted with a label indicating the maximum cable run length from the CP to a connected telecommunications outlet.

5.3.5 Multi-user telecommunication outlets

Multi-user telecommunication outlets shall be fitted with a label indicating the maximum fly lead length that may be used to connect to terminal equipment.

5.3.6 Fibre optic patch fields

Fibre optic patch fields shall be labelled with laser safety warning signs conforming to AS/CA S009.

Where mixed multimode fibre core sizes are used on the same site (for example 62.5/125 µm and 50/125 µm), a means of distinguishing the core size shall be provided at the connector and on patch cords in order to prevent mismatched fibres from inadvertently being patched.

5.3.7 Machine readable labels

Where the infrastructure owner or end user requires machine readable labels for an asset tracking and management system, machine readable labels shall be provided in a format compatible with the respective system. Machine readable labels shall also conform to AS/NZS 14763.2.

5.3.8 Patch cord and fly lead labels

Where AS/NZS 14763.2 requires cross-connect patch cord and fly lead labels, such labels shall be affixed within 150 mm of the plug connector at each end.

NOTE 1: A simplified form of site-wide serial numbering may be used in lieu of the default labelling scheme, provided the connections are wholly within the same container. A sequence of pairs of serial numbered labels (typically 3 or more digits) may be pre-printed and applied to cords as they are removed from their factory packaging and placed into service. This allows the ends of each mated connection to be verified post installation and cords to be repatched or re-used without relabelling.

Where a patch cord runs between containers (such as fibre connections through optical fibre trunking), a label shall be provided at both ends. The label shall include the default container, equipment and port identifier string for each end of the connection, and a description of the service carried or the subnetwork it belongs to. If the connection is one of a redundant pair or group of connections, a text or numeric character suffix shall be included to indicate which connection of the group is carried by that patch cord.

NOTE 2: An example of the service description on the labels for a redundant pair of connections is "Corp LAN Trunk A Bldg J — Bldg D" and "Corp LAN Trunk B Bldg J — Bldg D".

Patch cord and fly labels shall conform to the requirements specified in AS/NZS 14763.2:2020 Clause 9.2.4.1.

5.4 Records

For installations of Level 2 and Level 3 infrastructure complexity, as defined in AS/NZS 14763.2, the minimum documentation and records that shall be kept are as follows:

- (a) Description of the identifiers used in the administration scheme of the cabling and pathways.

NOTE 1 The description should include the colour code used in the cable elements and the numbering convention of the cable elements and terminations.
- (b) Scale site and building/floor location plans showing the location and size of the pathways and the type of cables installed therein.

NOTE 2 Scale may be estimated by eye to represent approximate spatial relationships if measurements or accurate computer-aided design (CAD) files are not available.
- (c) Acceptance test results to AS/NZS 14763.2 for the respective cable type.
- (d) Schematic diagrams detailing the quantity and type of cables linking distributors and serving outlets, showing the interconnection between these components and point of termination.
- (e) A description of the current system configuration.

NOTE 3 This should include a list of the current cross-connections and patches and may also include logical network architecture schematics for each supported network or system. It should always be possible to trace the route of a particular connection from a terminal device or equipment port to the associated upstream service or serving equipment port.

Where the base site and floor plans are not available in CAD format, aerial photographs (for outdoor plant) or scanned document images may be used as an externally referenced underlay over which the new infrastructure can be recorded on a range of layers as needed.

The following as-built drawing items shall be provided:

- (i) One working print-out or plot of every drawing for retention and viewing on site.
- (ii) One Portable Document Format (PDF) export of each drawing (with layer based information retained and able to be selectively shown or hidden).
- (iii) Computer files of all drawings in native application editable format.

NOTE 4 Depending on the CAD system used for the drawings, computer files exported in an industry standard default file format capable of being read and edited by most CAD application software may be needed for ongoing administration or importation into other management applications.

6 Drafting symbols

[Appendices A](#) and [B](#) reproduce a number of drafting symbols for use on diagrams relating to the provision of building communications infrastructure, and for outdoor cabling in campus-style building clusters.

7 Indoor infrastructure diagrams

The documentation for cabling within buildings shall comprise:

- (a) Scale plan (or proportional hand drawing) of the floor showing the physical location of —
 - (i) major cable pathways, including the riser shaft(s);
 - (ii) the location of the floor distributor(s); and

- (iii) the location and designation of the telecommunications outlets.
- (b) Backbone cabling diagram illustrating the interconnection of the distributors and cross-connects together with details of pair, fibre or coax utilization.
- (c) Distributor layout diagram. Where the distributor is installed on equipment racks or shelves containing or adjoining active electronic equipment, the diagram shall include the active equipment.

These requirements may be met by relevant “as-installed” drawings. In smaller installations, diagrams may be combined to provide all details on the one sheet for easy use.

NOTE See [Appendix C](#) for details and an example of an indoor infrastructure diagram.

8 Outdoor infrastructure diagrams

8.1 Documentation

The documentation for campus backbone cabling or other cabling between buildings shall comprise a plan of the site (which may be in simplified form) showing the physical location of —

- (a) campus distributor;
- (b) each building distributor;
- (c) carrier lead-in cable route;
- (d) pathways, including depth or height, for aerial pathways;

NOTE 1 Documentation should also show the distance from road kerb or building lines, along with a description of the capacity of such pathways.

- (e) cables, including types installed; and
- (f) pits and other infrastructure.

NOTE 2 See [Appendix B](#) for details and for an example of an outdoor infrastructure diagram see [Figure B.1](#).

8.2 Pits

Telecommunications pits shall not form part of pits for electrical services. The relative location should be clearly identified in cases where an electrical pit could be mistaken for a telecommunications pit or vice versa.

9 Test results and cabling records

9.1 General

Cabling infrastructure shall be checked and tested. The results shall be captured and retained in accordance with AS/NZS 14763.2.

Results that are hand recorded shall be scanned to PDF or typed into a spreadsheet or word processor table for electronic transfer and archiving.

9.2 Cabling records

Cabling records for installation with a complexity of Level 2 or Level 3, as per AS/NZS 14763.2, shall be —

- (a) created in a manually generated electronic file format; or

- (b) captured into an automated cable record system database.

Manually generated records shall be in spreadsheet format. Manually generated records shall comprise a list of all distribution and network equipment ports (together with any patch cable identifier if assigned), the service or link purpose (either backbone or end device connection) and the identifier components of the remote port.

NOTE 1 An example of a completed cabling record is shown in [Appendix D](#).

NOTE 2 An example of a typical cabling record form is included in [Appendix E](#).

NOTE 3 The format required for pair managed frames is slightly different to that for modular and optical cross connects and interconnects.

NOTE 4 Optical fibre cross connection records may need to be adapted to suit the respective fibre connector and signal types. Variants include:

- (a) Single fibre duplex with single fibre connectors or single fibre WDM.
- (b) Transmit and receive on separate but adjacent single fibre connectors.
- (c) Duplex fibre circuits and connectors (labelled as a duplex pair).
- (d) Multi-fibre push-on (MPO) connectors of various fibre core counts.

9.3 Electronic files

File formats shall conform to AS/NZS 14763.2.

The file naming convention for the results captured shall include the site and owner or customer details, stage or area of cabling covered by the file contents, and a media identifier (e.g. F for fibre, U for U/UTP, S for screened or shielded cables such as F/UTP or S/FTP).

Test results should be subject to a backup and archiving strategy in order to ensure a permanent record with off-site or cloud backup in case of records loss at the original storage location.

Appendix A (informative)

Drafting symbols for indoor infrastructure diagrams

A.1 Introduction

The recommended symbols for indoor infrastructure diagrams are shown herein, with a minimum size indicated. The minimum size is the smallest that should be used on any original drawing. If necessary, symbols may be increased in size, but the individual and relative proportions should be maintained.

A.2 Lettering

The height of lettering applicable to customer cabling diagrams should generally be confined to 2.5 mm, 3.5 mm and 5.0 mm for hand drawn diagrams. CAD diagrams may also use 1.5 mm and 1.8 mm text sizes. The thickness of the lines used to form the characters should be 0.1 h, where h is the height of the character, with a minimum thickness of 0.25 mm for smaller text. This will ensure reliable scanning and photocopy reproduction of hard copies.

A.3 Line thickness

Electronic plotters using laser, ink jet and electrostatic printing methods may use smaller pen sizes than those available for manual drafting. On location plans, small pen sizes such as 0.13 mm and 0.18 mm should be used to show background architectural and incidental detail to allow the telecommunications symbols, routes and notes to stand out.

The thickness of lines used in indoor cable diagrams and equipment location diagrams should be consistent, legible and in accordance with [Table A.1](#).

Table A.1 — Drafting line thicknesses

Item	Line Thickness
Incidental detail (paths and landscaping, furniture)	0.13 mm
General architectural detail (e.g. partition walls)	0.18 mm
Text inside symbols or symbol qualifiers	0.25 mm
Cable	0.35 mm
Underground conduits	0.5 mm
Symbols	0.35 mm (unless shown otherwise)
Distributor verticals	0.70 mm

In circuit schematic and high-level layout overviews, linework representing building outlines, container boundaries, or borders between levels or rooms, should be of a line thickness that contrasts the boundaries from the infrastructure that the drawing represents.

CAD plans using screen colours to match plotted pen sizes should be provided with the associated colour table file, or contain a legend of colours and pen sizes outside the paper space printable area. This will enable other users of the CAD file to reproduce the file to paper as intended.