

AS/NZS ISO/IEC 15018:2005
ISO/IEC 15018:2004
ISO/IEC 15018:2004/Amd 1:2009
(Incorporating Amendment No. 1)

Australian/New Zealand Standard™

Information technology—Generic cabling for homes



AS/NZS ISO/IEC 15018:2005

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CT-001, Communications Cabling. It was approved on behalf of the Council of Standards Australia on 16 December 2004 and on behalf of the Council of Standards New Zealand on 23 December 2004. This Standard was published on 4 February 2005.

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This Standard was issued in draft form for comment as DR 04495.

Australian/New Zealand Standard™

Information technology—Generic cabling for homes

First published as AS/NZS ISO/IEC 15018:2005.
Reissued incorporating Amendment No. 1 (August 2013).

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ISBN 0 7337 6463 0

PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CT-001, Communications Cabling.

This Standard is identical with, and has been reproduced from, ISO/IEC 15018:2004, *Information technology—Generic cabling for homes* and its Amendment 1 (2009), which has been added at the end of the document.

ISO/IEC 15018:2004 was prepared by an ISO/IEC international Standards Committee which involved active participation and contribution from the members of the Joint Standards Australia/Standards New Zealand Committee CT-001, Communications Cabling.

The objective of this Standard is to provide home owners, architects, designers, manufacturers, installers, maintainers and users, with requirements to ensure compatibility with equipment and services and to ensure performance of infrastructure to meet present and foreseeable future requirements.

The terms ‘normative’ and ‘informative’ are used to define the application of the annex to which they apply. A normative annex is an integral part of a standard, whereas an informative annex is only for information and guidance.

As this Standard is reproduced from an international standard, the following applies:

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References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

<i>Reference to International Standard</i>		<i>Australian/New Zealand Standard</i>	
IEC		AS	
60512	Electromechanical components for electronic equipment—Basic testing procedure and measuring methods	3726	Electromechanical components for electronic equipment—Basic testing procedure and measuring methods
60512-2	Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests	3726.2	Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests
60512-3	Part 3: Current-carrying capacity tests	3726.3	Part 3: Current-carrying capacity tests
IEC		AS/NZS	
61935	Generic cabling systems—Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801	3087	Telecommunications installations—Generic cabling systems
61935-1	Part 1: Installed cabling	3087.1	Part 1: Specification for the testing of balanced communication cabling

Only referenced documents that have been adopted as Australian or Australian/New Zealand Standards have been listed.

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INTRODUCTION

This standard specifies a generic cabling for three groups of applications in homes:

- Information and Communications Technologies (ICT);
- Broadcast and Communications Technologies (BCT);
- Commands, Controls and Communications in Buildings (CCCB);

as shown in Figure 1, and it is intended to guide installations in new buildings or refurbishments. (Cabling is a part of the infrastructure that supports home systems.)

This standard also applies where cabling is installed to support only one or two of the three application groups listed above.

This standard specifies a generic cabling infrastructure based upon balanced cabling and/or coaxial cabling. ICT channels specified in this standard include optical fibre. The wider use of fibre optical cabling in a home is for further study.

These groups of applications may also be supported by different types of cabling, which may be subject to other standards. For example, ISO/IEC 11801 specifies generic cabling for ICT applications in general for the office environment. While the cabling structure and reference implementations are matched to the home environment in this standard, the channel performances specified for ICT are identical to those specified in ISO/IEC 11801.

This standard specifies a generic cabling for a home that may support ICT, BCT and CCCB application groups. Because it is designed to cover the three major groups, the cabling system may be installed prior to the selection of specific applications. The home may contain one or more buildings (e.g. farm) or may be within a building which contains more than one home (e.g. one home in a multi-dwelling building).

The campus or backbone cabling connecting individual homes is built according to the relevant standard (for instance ISO/IEC 11801 or IEC 60728).

Generic cabling realised according to this standard:

- a) allows deployment of a wide range of applications without changes to the fixed cabling infrastructure;
- b) provides a platform to support moves, adds and changes of connectivity.

This standard provides:

- users with an application-independent generic cabling for applications run in homes;
- users with a flexible cabling scheme such that changes are both easy and economical;
- building professionals (for example, architects) with guidance for accommodating cabling before specific requirements are known, i.e. in the initial planning either for construction or refurbishment;
- industry and applications standardisation bodies (e.g. ITU-T, ISO/IEC JTC 1/SC 6, ISO/IEC JTC 1/SC 25/WG 1, IEC TC 100) with a cabling system that supports current products and provides a basis for future product development in home electronic systems;
- users, designers and manufacturers of application-specific cabling systems with advice on interfacing to this generic cabling;
- suppliers of cabling components and installers of cabling with relevant requirements;
- service providers with a distribution system for their services.

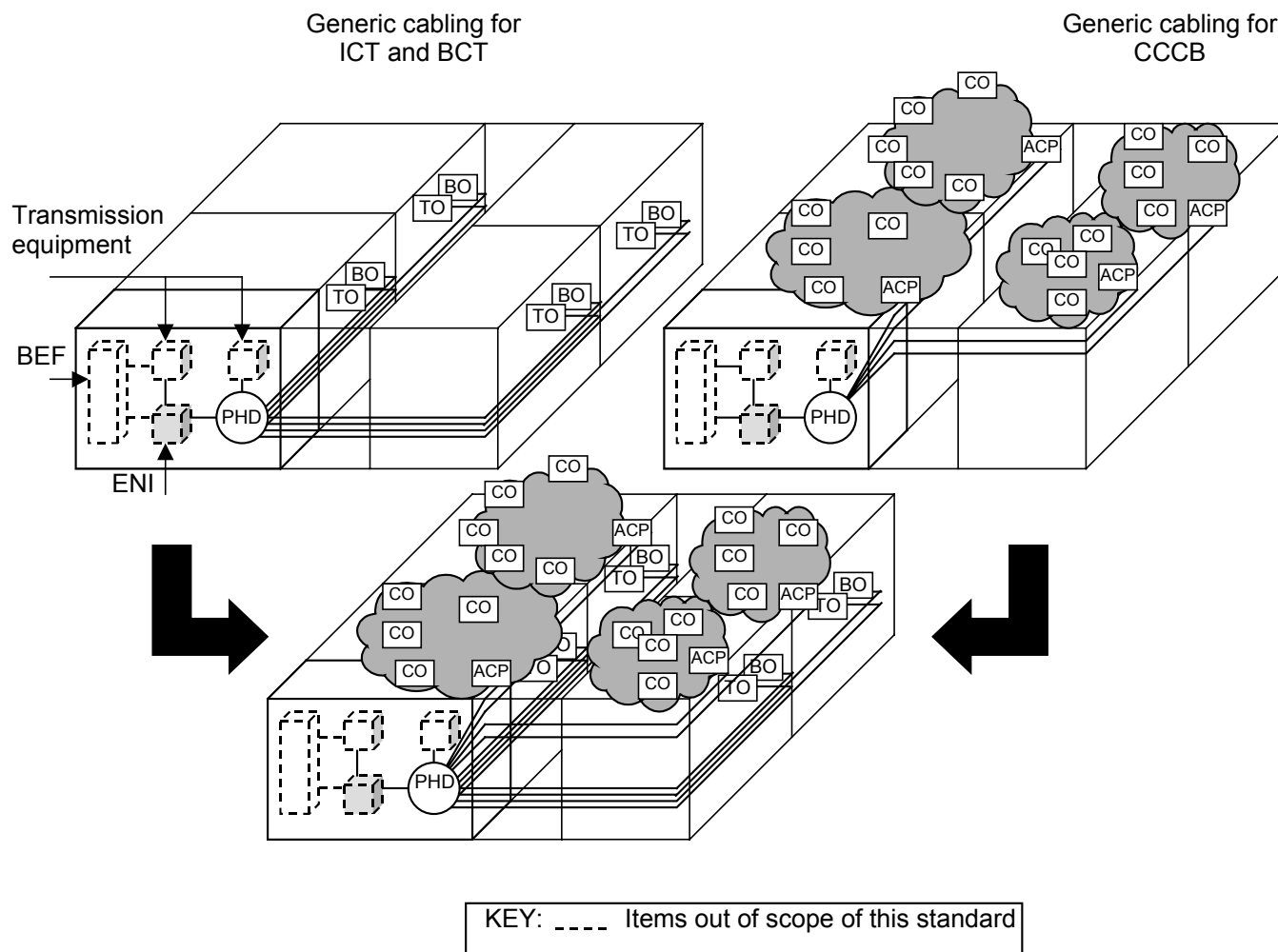


Figure 1 – Overview of a generic cabling for home

A number of ICT, BCT and CCCB applications have been analysed to determine the requirements for a generic cabling (see Table D.2) and to specify the minimum performance of channels given in clause 7. These requirements, together with the logical and physical models described in clauses 5 and 6, have been used to develop the requirements for cabling components and to stipulate their arrangement into generic cabling systems.

Wireless and (unguided) infrared as well as Power Line Communication may also be used for applications mentioned above. Media used for these technologies are not covered in this standard.

AUSTRALIAN/NEW ZEALAND STANDARD

Information technology—Generic cabling for homes**1 Scope**

This International Standard specifies generic cabling for homes. A home may contain one or more buildings or may be within a building that contains more than one home.

This standard specifies a generic cabling for three groups of applications:

- Information and Communications Technologies (ICT);
- Broadcast and Communications Technologies (BCT);
- Commands, Controls and Communications in Buildings (CCCB).

It specifies cabling that comprises one or more of the following:

- balanced cabling;
- coaxial cabling;
- optical fibre cabling.

The standard specifies the requirements for the design and configuration of the generic cabling with respect to:

- a) structure and topology;
- b) minimum configuration;
- c) performance requirements for permanent links and channels;
- d) density and location of connection points;
- e) interfaces to application-specific equipment and external networks;
- f) coexistence with other building services.

Although safety (electrical, fire, etc.) and electromagnetic compatibility (EMC) requirements are outside the scope of this International Standard and are covered by other standards and regulations, information given in this International Standard may be of assistance in meeting these requirements.

NOTE 1 National regulations and local codes may preclude carrying certain services on the cabling specified in this standard.

NOTE 2

- Test requirements in this standard are for system designers.
- The installation tests should be decided between supplier and customer or according to the relevant installation guide.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60189-1:1986, *Low-frequency cables and wires with PVC insulation and PVC sheath – Part 1: General test and measuring methods*
Amendment 3 (1992)

IEC 60352-3, *Solderless connections – Part 3: Solderless accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-4, *Solderless connections – Part 4: Solderless non-accessible insulation displacement connections – General requirements, test methods and practical guidance*

IEC 60352-6, *Solderless connections – Part 6: Insulation piercing connections – General requirements, test methods and practical guidance*

IEC 60364-4-41, *Electrical installations of buildings – Part 4-41: Protection for safety – Protection against electric shock*

IEC 60512-2:1985, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 2: General examination, electrical continuity and contact resistance tests, insulation tests and voltage stress tests*

IEC 60512-25-1, *Connectors for electronic equipment – Tests and measurements - Part 25-1: Test 25a – Crosstalk ratio*

IEC 60512-25-2, *Connectors for electronic equipment – Tests and measurements – Part 25-2: Test 25b – Attenuation (insertion loss)*

IEC 60512-25-4, *Connectors for electronic equipment – Tests and measurements – Part 25-4: Test 25d - Propagation delay*

IEC 60512-25-5, *Connectors for electronic equipment – Tests and measurements – Part 25-5: Test 25e – Return loss¹*

IEC 60512-3, *Electromechanical components for electronic equipment; basic testing procedures and measuring methods – Part 3: Current-carrying capacity tests*

IEC 60603-7, *Connectors for frequencies below 3 MHz for use with printed boards – Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features, with assessed quality*

IEC 60603-7-1:2002, *Connectors for electronic equipment – Part 7-1: Detail specification for 8-way, shielded free and fixed connectors with common mating features, with assessed quality*

IEC 60603-7-2, *Connectors for electronic equipment – Part 7-2: Detail specification for 8-way unshielded free and fixed connectors, for data transmission with frequencies up to 100 MHz¹*

IEC 60603-7-3, *Connectors for electronic equipment – Part 7-3: Detail specification for 8-way shielded connectors for frequencies up to 100 MHz¹*

IEC 60603-7-4, *Connectors for electronic equipment – Part 7-4: Detail specification for 8-way, unshielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz (CAT 6, unshielded)¹*

IEC 60603-7-5, *Connectors for electronic equipment – Part 7-5: Detail specification for 8-way, shielded, free and fixed connectors, for data transmissions with frequencies up to 250 MHz (CAT 6, shielded)¹*

IEC 60603-7-7:2002, *Connectors for electronic equipment – Part 7-7: Detail specification for 8-way, shielded, free and fixed connectors, for data transmission with frequencies up to 600 MHz (category 7, shielded)*

IEC 60728 (all parts), *Cabled distribution systems for television and sound signals*

¹ To be published.

IEC 60966-1, *Radio frequency and coaxial cable assemblies – Part 1: Generic specification – General requirements and test methods*

IEC 60966-2-4, *Radio frequency and coaxial cable assemblies – Part 2-4: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 to 3 000 MHz, IEC 60169-2 connectors*

IEC 60966-2-5, *Radio frequency and coaxial cable assemblies – Part 2-5: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 to 1 000 MHz, IEC 61169-2 connectors*

IEC 60966-2-6, *Radio frequency and coaxial cable assemblies – Part 2-6: Detail specification for cable assemblies for radio and TV receivers – Frequency range 0 to 3 000 MHz, IEC 60169-24 connectors*

IEC 61024 series, *Protection of structures against lightning*

IEC 61076-3-104, *Connectors for electronic equipment – Part 3-104: Rectangular connectors – Detail specification for 8 way, shielded free and fixed connectors for data transmissions with frequencies up to 600 MHz minimum*

IEC 61140, *Protection against electric shock – Common aspects for installation and equipment*

IEC 61156 (all parts), *Multicore and symmetrical pair/quad cables for digital communications*

IEC 61156-1, *Multicore and symmetrical pair/quad cables for digital communications – Part 1: Generic specification*

IEC 61156-5, *Multicore and symmetrical pair/quad cables for digital communications – Part 5: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Horizontal floor wiring - Sectional specification*

IEC 61156-6, *Multicore and symmetrical pair/quad cables for digital communications – Part 6: Symmetrical pair/quad cables with transmission characteristics up to 600 MHz – Work area wiring - Sectional specification*

IEC 61156-7, *Multicore and symmetrical pair/quad cables for digital communications – Part 7: Symmetrical pair cables with transmission characteristics up to 1 200 MHz -Sectional specification for digital and analog communication cables*

IEC 61169-1, *Radio-frequency connectors – Part 1: Generic specification – General requirements and measuring methods*

IEC 61169-2, *Radio-frequency connectors – Part 2: Sectional specification - Radio frequency coaxial connectors of type 9,52*

IEC 61169-24, *Radio-frequency connectors – Part 24: Sectional specification – Radio frequency coaxial connectors with screw coupling, typically for use in 75 ohm cable distribution systems (type F)*

IEC 61196 (all parts), *Radio-frequency cables*

IEC 61935-1:2000, *Generic cabling systems – Specification for the testing of balanced communication cabling in accordance with ISO/IEC 11801 – Part 1: Installed cabling Amendment (2002)*

ISO/IEC 11801:2002, *Information technology – Generic cabling for customer premises*

ISO/IEC 14763-1, *Information technology – Implementation and operation of customer premises cabling – Part 1: Administration*

ISO/IEC TR 14763-2, *Information technology – Implementation and operation of customer premises cabling – Part 2: Planning and installation*

ITU-T K.31, *Bonding configurations and earthing of telecommunication installations inside a subscriber's building*

EN 50289-1-14, *Communication cables – Specifications for test methods – Part 1-14: Electrical test methods – Coupling attenuation or screening attenuation of connecting hardware*

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this International Standard, the following definitions apply.

3.1.1 application

system, with its associated transmission method, that is supported by cabling

3.1.2 application outlet

point at which equipment may be connected to the generic cabling in support of ICT and/or BCT application

3.1.3 area connection point (ACP)

point at which coverage area cabling is connected to area feeder cabling

3.1.4 balanced cable

cable consisting of one or more metallic symmetrical cable elements (twisted pairs or quads) [ISO/IEC 11801]

3.1.5 broadcast and communications technologies (BCT)

group of applications including sound radio and TV

NOTE These applications are also called HES class 3 in ISO/IEC TR 15044.

3.1.6 building entrance facility (BEF)

facility that provides all necessary mechanical and electrical services, that complies with all relevant requirements, for the entry of telecommunications cables into a building

3.1.7**cable element**

the smallest construction unit (for example balanced pair, balanced quad, coaxial pair or single optical fibre) in a cable; a cable element may have a screen

3.1.8**cable unit**

single assembly of one or more cable elements of the same type or category; the cable unit may have a screen

3.1.9**cabling**

system of telecommunications cables, cords, and connecting hardware that can support the connection of information technology and other equipment

3.1.10**channel**

end-to-end transmission path connecting any two pieces of application-specific equipment

NOTE 1 Channels specified in this standard are within the boundaries of generic cabling and may only comprise passive components.

NOTE 2 A channel may use one or more pairs, may share a pair with another channel, e.g. power feeding and information may run over the same pair.

3.1.11**coaxial pair**

a uniform transmission line consisting of two cylindrical conductors with the same axis [see IEC 60050, term IEV 151-12-39]

3.1.12**commands, controls and communications in buildings (CCCB)**

group of applications such as appliance control and building control

NOTE These applications are also called HES class 1 in ISO/IEC TR 15044.

3.1.13**connection**

mated device or combination of devices including terminations connecting two cables or cable elements in a not permanent way

3.1.14**connector sharing**

ability of a connector to accept multiple plugs in one socket such as 4 one-pair plugs in one 4 pair socket while maintaining the required performance; this may also be achieved by means of an external adapter

3.1.15**coverage area**

area within a home covered by any application

3.1.16**cross-connect**

apparatus enabling the termination of cable elements and their cross-connection, primarily by means of patch cords or jumpers [ISO/IEC 11801]

NOTE Incoming and outgoing cables are terminated at fixed points [ISO/IEC 11801]; they are connected with the help of a third cable, a patch cord or a jumper cable.

3.1.17**distributor**

term used for a collection of components (such as patch panels, patch cords) used to connect cables

[ISO/IEC 11801]

3.1.18**equipment cord**

cord connecting equipment to a distributor

[ISO/IEC 11801]

3.1.19**equipment interface (EI)**

interface at which application specific equipment is connected to the cabling

NOTE An application outlet is an example of an EI.

3.1.20**home**

physical structure used as a dwelling place, such as a house or an apartment

NOTE This may be an individual building, part of a larger building or more than one building.

3.1.21**home electronic system (HES)**

electronic systems within homes that are interconnected in accordance with ISO/IEC TR 14543

3.1.22**information and communications technologies (ICT)**

group of applications using information and communications (telecommunications) technologies

NOTE These applications are also called HES class 2 in ISO/IEC TR 15044.

3.1.23**intercom**

communication system for voice and optionally video, internal to the premises often including door opening functions

3.1.24**interconnect**

technique enabling equipment cords (or cabling subsystems) to be terminated and connected to the cabling subsystems without using a patch cord or jumper

[ISO/IEC 11801]

NOTE Incoming or outgoing cables are terminated at a fixed point.

[ISO/IEC 11801]

3.1.25**link**

transmission path between an outlet or distributor to another outlet or distributor of a generic cabling; it excludes equipment cords

3.1.26**network access cabling**

cabling that brings services to the home from a source outside the home (see Figure 7)

3.1.27**optical fibre cable (or optical cable)**

cable comprising one or more optical fibre cable elements
[ISO/IEC 11801]

3.1.28**pathway**

facility dedicated to the placement of cable or area reserved for the placement of cable

3.1.29**permanent link**

transmission path between two mated interfaces of generic cabling, excluding equipment cords, work area cords and cross-connections, but including the connecting hardware at each end

3.1.30**primary home distributor (PHD)**

the primary distributor within a home where cables terminate

3.1.31**remote power feeding**

the supply of power different from mains power to application-specific equipment via cabling specified in this standard

3.1.32**requirement to be met by design**

requirement which may be met by calculation and selection of appropriate materials and installation techniques, where either there is no test method specified that allows verification or there is no requirement for verification by testing

3.1.33**screened balanced cable**

balanced cable with an overall screen and/or screens for the individual elements
[ISO/IEC 11801]

3.1.34**secondary home distributor (SHD)**

optional distributor used to provide additional infrastructure flexibility and/or allocate transmission equipment between the primary home distributor and coverage areas (e.g. for homes with multiple floors)

3.1.35**space**

area or volume defined by markings or fittings intended for the containment of connecting hardware

3.1.36**terminal equipment**

equipment (e.g. telephone handset) that provides user access to an application / service at an outlet

3.1.37**transmission equipment**

active equipment used to distribute applications from distributors to other distributors and to outlets

3.1.38**twisted pair**

cable element consisting of two insulated conductors twisted together in a regular fashion to form a balanced transmission line
[ISO/IEC 11801]

3.1.39**unscreened balanced cable**

electrically conducting balanced cable without any screen

3.2 Abbreviations

a.c.	alternating current
ACP	Area Connection Point
ACR	Attenuation to Cross-talk Ratio
BCT	Broadcast and Communications Technologies
BCT B	BCT supported by balanced cabling
BCT C	BCT supported by coaxial cabling
BCT-H	BCT high (signal level)
BCT-L	BCT low (signal level)
BCT-M	BCT medium (signal level)
BEF	Building Entrance Facility
BO	Broadcast Outlet
CATV	Community Antenna TV
CC	Cross-Connect
CCCB	Commands, Controls and Communications in Buildings
CCTV	Closed Circuit TV
CO	Control Outlet
d.c.	direct current
EI	Equipment Interface
ELFEXT	Equal Level Far End Cross-talk attenuation (loss)
EMC	Electromagnetic Compatibility
ENI	External Network Interface
EQP	Transmission Equipment
FEXT	Far End Cross-talk
ffs	for further study
HES	Home Electronic System
HVAC	Heating, Ventilating, and Air-Conditioning
ICT	Information and Communications Technology
IEV	International Electrotechnical Vocabulary
ISDN	Integrated Services Digital Network
IL	Insertion Loss
lg	Logarithm with the basis 10
N/A	Not Applicable
NEXT	Near-End cross-talk attenuation (loss)

OF	Optical Fibre
PELV	Protective Extra Low Voltage
PHD	Primary Home Distributor
PS	Power Source
PS ACR	Power Sum ACR
PS ELFEXT	Power Sum ELFEXT
r.m.s.	root mean square
SELV	Safety Extra Low Voltage
SHD	Secondary Home Distributor
TE	Terminal Equipment
TI	Test Interface
TO	Telecommunications Outlet
TV	Television

4 Conformance

For a cabling installation to conform to this International Standard the following shall apply.

- a) The cabling shall support ICT applications.
- b) The structure of cabling in support of ICT applications shall conform to the requirements in clause 5.
- c) The structure of cabling in support of BCT applications shall conform to the requirements in clause 5.
- d) The structure of cabling in support of CCCB applications shall conform to the requirements in clause 6.
- e) The interfaces to the cabling at the TO and the BO shall conform to the requirements of clause 10 with respect to mating interfaces and performance.
- f) Connecting hardware at other places in the cabling structure shall meet the performance requirements specified in clause 10.
- g) All channels and links shall meet the necessary level of performance specified in clause 7 and/or Annex B respectively. This shall be achieved by one of the following:
 - 1) a channel design and implementation ensuring that the prescribed channel is met;
 - 2) attachment of appropriate components to a permanent link design meeting the prescribed performance class of Annex B. Channel performance shall be assured where a channel is created by adding more than one cord to either end of a link meeting the requirements of Annex B;
 - 3) using the reference implementations of clause 8 and compatible cabling components conforming to the requirements of clauses 9 and 10, based upon a statistical approach of performance modelling.
- h) System administration shall meet the minimum requirements of ISO/IEC 14763-1.
- i) Regulations concerning safety and EMC shall be met as applicable to the location of the installation.

5 Structure of the generic cabling system to support ICT and/or BCT applications

5.1 General

This clause identifies the functional elements of a generic cabling system to support ICT and/or BCT applications, describes how they are connected together to form subsystems and identifies the interfaces at which application-specific components are connected to the generic cabling infrastructure.

5.2 Functional elements

The functional elements of generic cabling are as follows:

- primary home distributor (PHD);
- primary home cable;
- secondary home distributor (SHD);
- secondary home cable;
- application outlet (TO or BO).

NOTE The SHD and secondary home cable are optional functional elements.

The type and number of functional elements used depends upon the type of premises and the application group(s) served. It is possible to combine multiple functional elements into a single element.

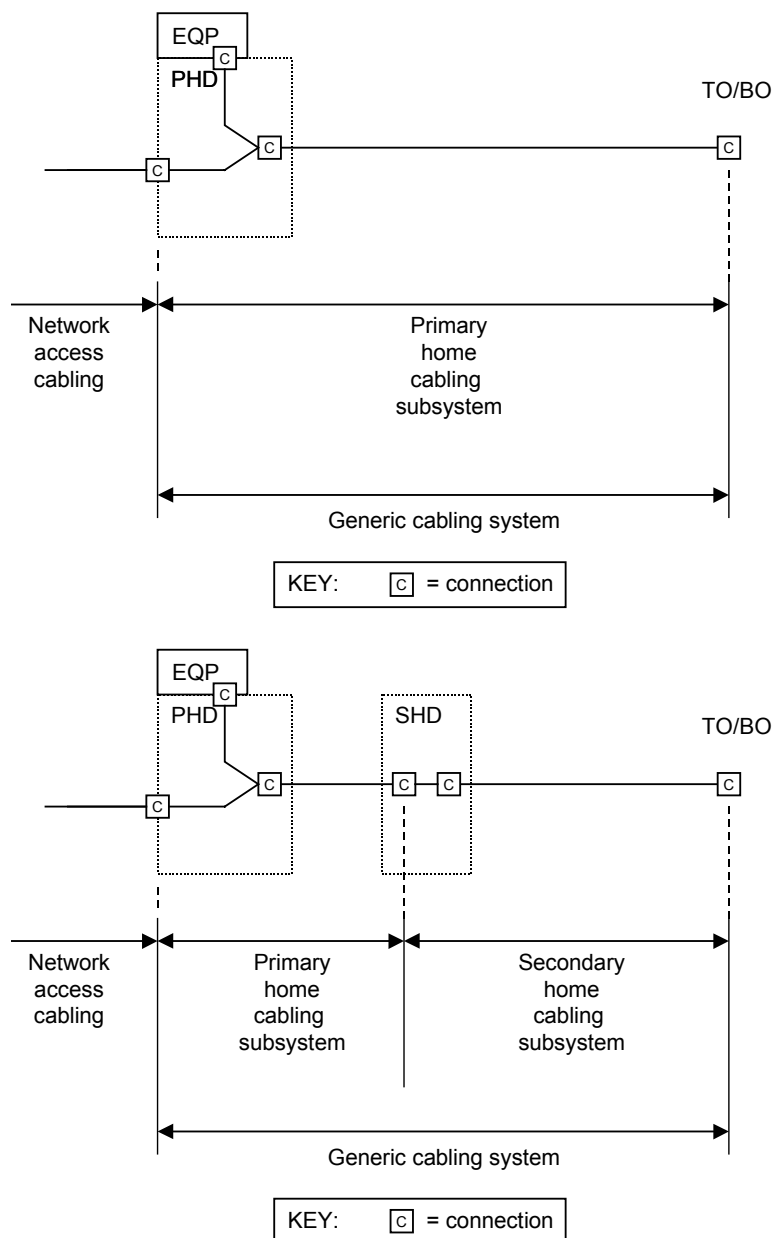
The functional elements used within a given implementation of a generic cabling system are connected together to form cabling subsystems. The connection of equipment at the application outlets and distributors supports applications.

Equipment is not included within the functional elements. The accommodation of functional elements and the facilities for co-location of equipment and functional elements are discussed in 5.7.

5.3 Cabling subsystems for ICT and BCT

5.3.1 General

Generic cabling schemes to support ICT and/or BCT applications contain a maximum of two cabling subsystems: the primary home cabling subsystem and the secondary home cabling subsystem, as shown in Figure 2.



NOTE The dotted elements represent the boundaries of functional elements and not the enclosure that contains the functional elements.

Figure 2 – Structure of the generic cabling system

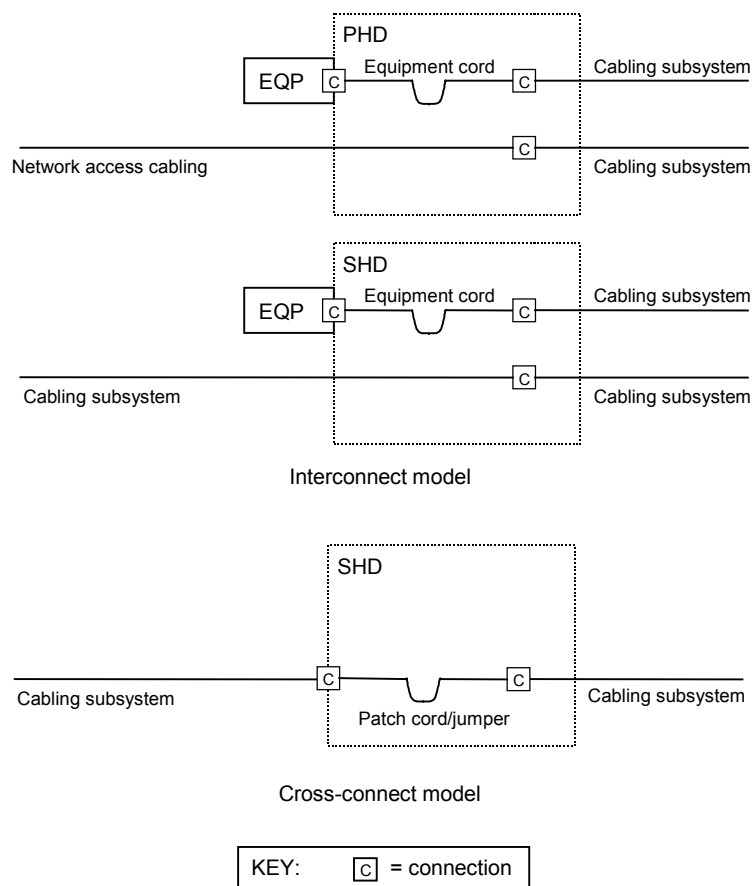
The composition of the subsystems is described in 5.3.2 and 5.3.3. Conformance to this standard does not require the presence of a secondary home cabling subsystem.

Distributors and application outlets provide the means for configuring the cabling to support topologies in addition to those implemented by the installed cables.

Connections between the cabling subsystems at the SHD are either active, requiring application-specific equipment, or passive using cross-connections by way of either patch cords or jumpers (see Figure 3).

Connection to application-specific equipment at the distributors generally adopts an interconnect approach (see Figure 3).

Passive connections between the primary home cabling subsystem and the network access cabling at the PHD are generally achieved by using cross-connections.



NOTE The dotted elements represent the boundaries of functional elements and not the enclosure that contains the functional elements.

Figure 3 – Interconnect and cross-connect models

5.3.2 Primary home cabling subsystem

The primary home cabling subsystem extends from the PHD to the application outlet.

When an SHD is used, the primary home cabling subsystem extends from the PHD to the secondary home cabling subsystem.

The subsystem includes:

- the primary home cables;
- the mechanical termination of the primary home cables at the SHD or application outlet as appropriate;
- the mechanical termination of the home cables at the PHD including the connecting hardware, e.g. of the interconnect or cross-connect (see Figure 3);
- any interconnection to application-specific equipment at the PHD;
- any cross-connection to network access cabling at the PHD;
- TO or BO (where a SHD is not used).

Although equipment cords are used to connect the transmission equipment to the cabling subsystem, they are not considered part of the cabling subsystem because they are application-specific.

The primary home cabling subsystem does not include the interface to the network access cabling at the PHD.

5.3.3 Secondary home cabling subsystem

The secondary home cabling subsystem extends from a SHD to the application outlet.

The subsystem includes:

- the secondary home cables;
- the mechanical termination of the secondary home cables at the TO or BO;
- the mechanical termination of the secondary home cables at the SHD;
- any interconnection to application-specific equipment at the SHD;
- any cross-connection at the SHD;
- TO or BO.

Although equipment cords are used to connect the transmission equipment to the cabling subsystem, they are not considered part of the cabling subsystem because they are application-specific.

5.4 Cabling structure for ICT and BCT applications

For generic cabling to support ICT and/or BCT applications, the functional elements of the cabling subsystems are connected to form a hierarchical structure, as shown in Figure 4.

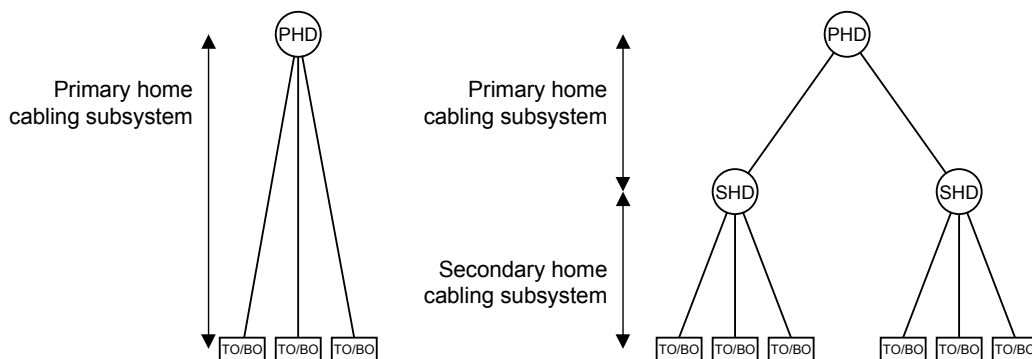


Figure 4 – Hierarchical structure of a generic cabling system in support of ICT and BCT applications

For ICT and BCT applications, the cabling shall have a star topology from the distributors to the application outlet (see Figure 4).

NOTE Buses should be created at the HD or SHD. If cabling is connected to a cabling subsystem to create bus or multi-drop connections this configuration is outside the scope of this standard.

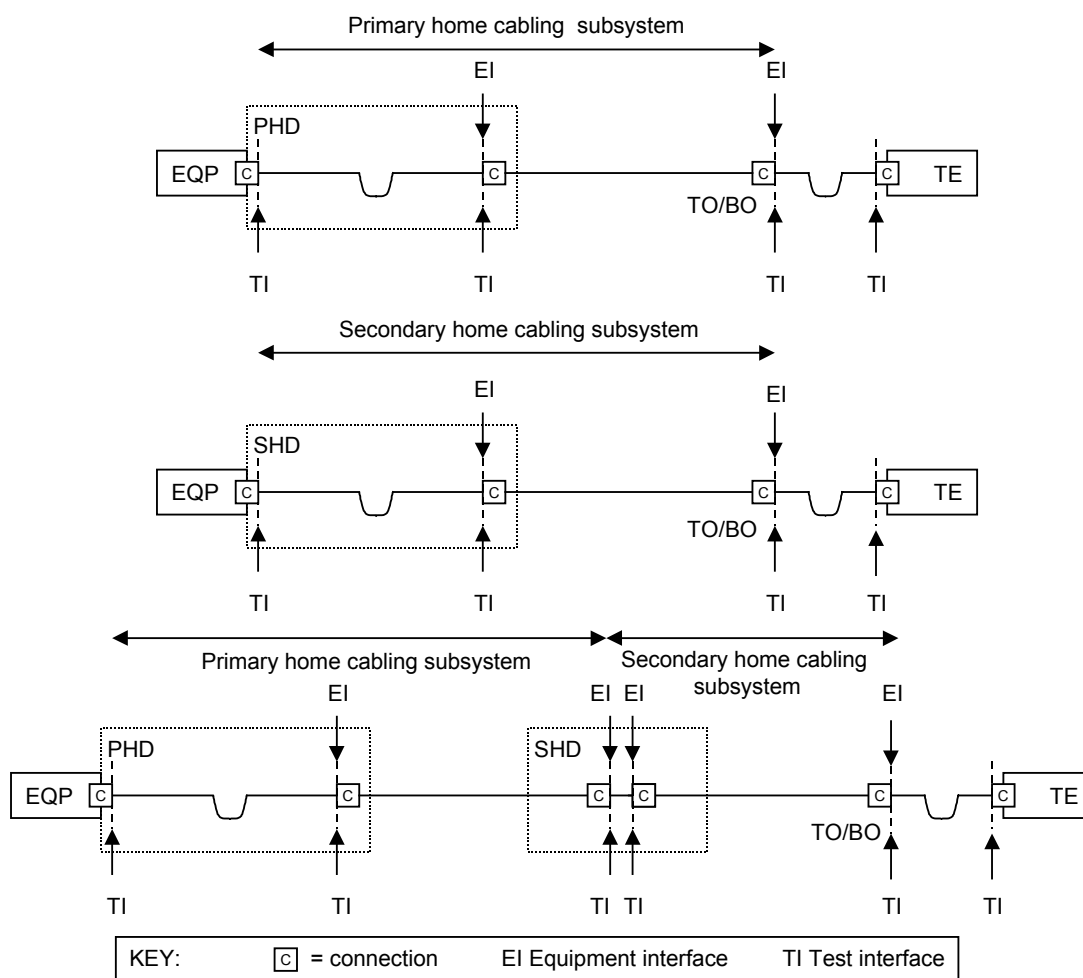
5.5 Interfaces

5.5.1 Equipment interfaces and test interfaces

Equipment interfaces to generic cabling are located at distributors and application outlets. Test interfaces to cabling are located at the ends of each subsystem.

Figure 5 shows the potential equipment interfaces and potential test interfaces within the generic cabling system.

Transmission and terminal equipment are generally connected to the equipment interface using an equipment cord.



NOTE 1 The dotted elements represent the boundaries of functional elements and not the enclosure that contains the functional elements.

NOTE 2 For BCT-C applications (see clause 7) the test interface is defined according to IEC 61169-1.

Figure 5 – Equipment and test interfaces in support of ICT and BCT applications

5.5.2 Channel and permanent link

5.5.2.1 Channel

The channel is any signal transmission path or power, other than mains, feeding path comprising passive cabling components between:

- connections to the network access cabling and application-specific equipment;
- sender(s) and receiver(s) or between power source and associated load of application-specific equipment.

For cabling to support ICT and/or BCT applications, the channel consists of the home cabling subsystem(s) together with the equipment cord(s), as shown in Figure 6.

It is important that the cabling channel is designed to meet the required class of performance for the applications that are to be run. The performance of the channel excludes the connections at the application-specific equipment.

The transmission performance of channels is detailed in clause 7.

The creation of a channel between two application outlets via a passive cross-connection at the distributors is allowed provided that the relevant channel performance of clause 7 is met.

The maximum channel lengths for each application group are dependent upon the performance of the cable and connecting hardware used (see Table 1 and Table 7 for maximum channel lengths using the reference implementations of clause 8).

Where the performance requirements of an application allow, longer channels may be formed by the passive connection of cabling subsystems together with equipment cords where appropriate.

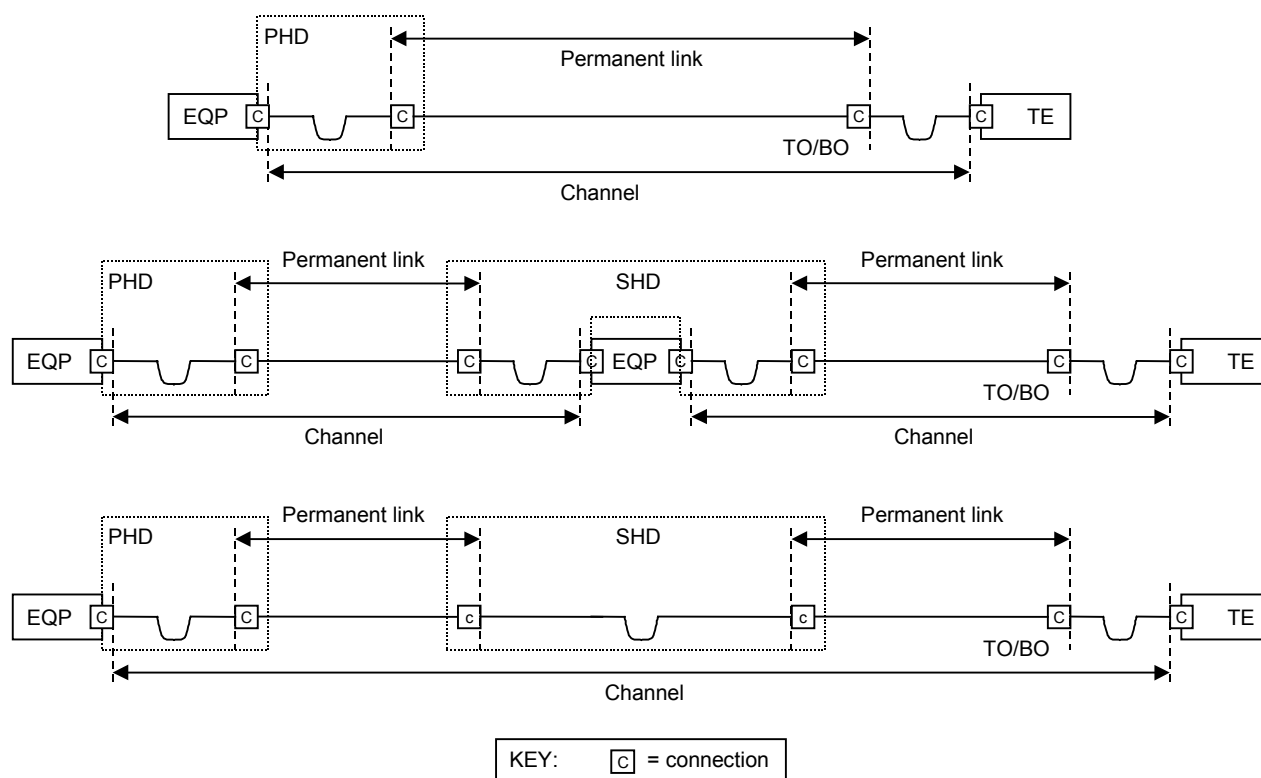
5.5.2.2 Permanent link

If there is no SHD, the permanent link consists of the primary home cable and the termination of that cable at the application outlet and the PHD, as shown in Figure 6.

If there is an SHD, the permanent link consists of the primary or secondary home cable and the termination of that cable at the SHD and the PHD or the application outlet respectively as shown in Figure 6.

The permanent link includes the connections at the ends of the installed cabling.

The transmission performance of permanent links is detailed in Annex B.



NOTE The dotted elements represent the boundaries of functional elements and not the enclosure that contains the functional elements.

Figure 6 – Channels and permanent links within the home

5.5.3 Network access cabling

Network access cabling is presented at the PHD as shown in Figure 7.

In premises containing a single home the network access cabling provides the connection between the external network interfaces (public or private) and the PHD.

In premises containing multiple homes the network access cabling may, subject to national or local regulation, also provide the connection between:

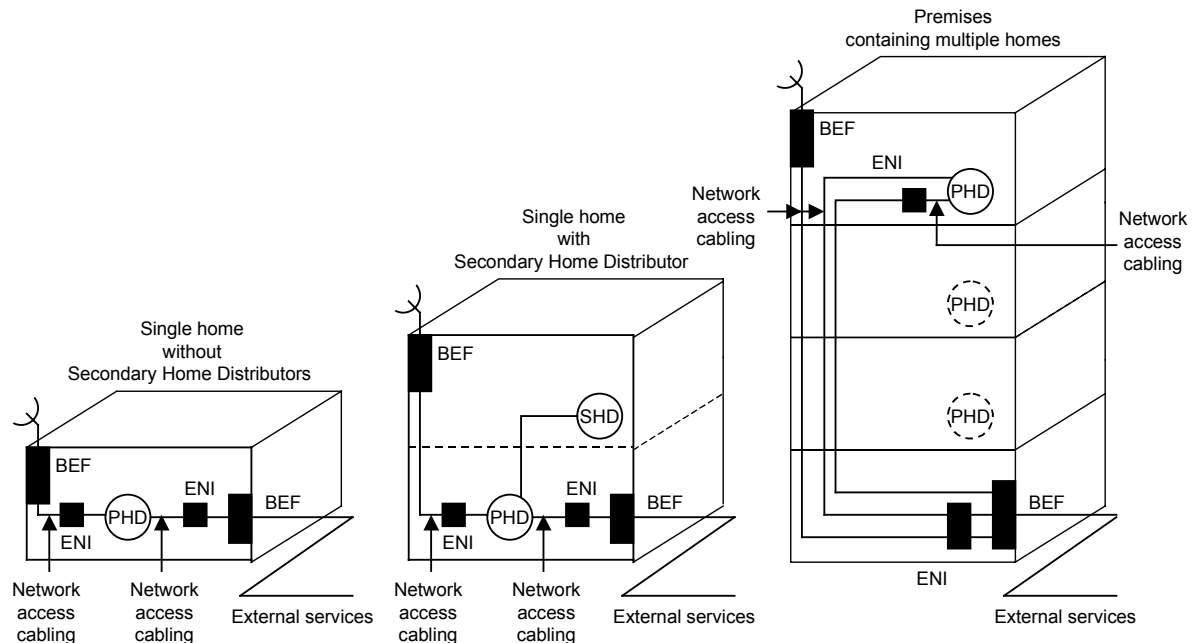
- individual homes in the same premises;
- premises external network interfaces (public or private) and the PHD in each home.

When used to provide a direct connection between the generic cabling system and an external network interface in the home, the performance of the network access cabling should be considered as part of the initial design and implementation of customer applications.

When used to provide a direct connection between the generic cabling system and an external network interface in the same premises (but not within the home served by the home distributor), the network access cabling shall be in accordance with:

- ISO/IEC 11801 for ICT applications;
- IEC 60728 for BCT applications.

The only interfaces to network access cabling within a home shall be those serving that home.



NOTE Some network access cabling uses bus structure.

Figure 7 – Examples of interconnection of home and network access cabling

5.5.4 External network interface

Connections to external networks for the provision of external telecommunications services are made at external network interfaces. The location of external network interfaces, if present, and the facilities required may be specified by national, regional, and local regulations. The service provider(s) shall be contacted to locate the external network interface(s).

5.6 Accommodation of functional elements

5.6.1 Distributors

5.6.1.1 PHD

Each home shall be served by one PHD. The physical volume of the PHD depends upon the complexity of the infrastructure being served.

The PHD shall be located in a designated area with adequate access and space to house the cabling, the transmission equipment and to enable management of the cabling connections. The PHD shall have access to the mains power required for application-specific equipment.

Other requirements for the accommodation of PHDs should be based upon the general recommendations of ISO/IEC TR 14763-2 for other distributors.

5.6.1.2 SHD

Where used, SHDs shall be located in a designated area with adequate access and space to house the cabling, the transmission equipment and to enable management of the cabling connections. SHDs shall be provided with access to the mains power required for the application-specific equipment.

Other requirements for the accommodation of SHDs should be based upon the general recommendations of ISO/IEC TR 14763-2 for other distributors.

5.6.2 Application outlets

The number and distribution of application outlets depends upon the size and function of the coverage area.

For ICT and/or BCT applications the coverage area corresponds to a room or to every 10 m² within a larger room. Each coverage area should be provided with a minimum of one TO for ICT applications and one BO for BCT applications.

It should be noted that in certain cases an application outlet within a coverage area may be located on the external surface of the building or in a separate building within the premises (see Figure 8).

The cabling provided to a coverage area shall be for ICT and/or BCT channels, as specified in clause 7:

- at least 4 balanced pairs within at least one cable capable of supporting ICT channels in accordance with 7.2. For channels exploiting the maximum length specified in Table 1, the cable shall be either an ICT cable in accordance with 9.2 or a balanced BCT cable in accordance with 9.3.1;

and, in support of BCT channels as specified in clause 7, either

- at least 1 balanced pair within at least one balanced BCT cable capable of supporting BCT channels in accordance with 7.3. For channels exploiting the maximum length specified in Table 1 this cable shall be a balanced cable in accordance with 9.3.1

or

- a least 1 coaxial BCT cable capable of supporting BCT channels in accordance with 7.3. For channels exploiting the maximum length specified in Table 1 this cable shall be a coaxial cable in accordance with 9.3.2.

All cable elements within a coverage area shall be terminated at application outlets. A cable element shall not be terminated at more than one application outlet. (This does not mean impedance matching.)

NOTE 1 Cabling configurations beyond the application outlet that provide such connections (e.g. physical bus) are application-specific and not within the scope of this standard.

NOTE 2 Where the pairs are provided to an application outlet by more than one cable, care shall be exercised to ensure that the channel requirements of clause 7 are met.

Additional balanced cables (for ICT and/or BCT applications) or coaxial cables (for BCT applications) should be provided as defined by the:

- number and mix of applications (e.g. satellite feed, multi-cable feed of CATV, in-house generated video);
- number of application outlets to be served.

NOTE 3 Some applications, such as direct satellite feeds, use frequencies above 1 000 MHz that are only supported by the higher bandwidth BCT-C channels.