



DPC: 23 / 30472964 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

Date: 19 April 2023

Origin: International

Latest date for receipt of comments: 5 July 2023

Project No. 2022/00881

Responsible committee: IST/6 Data communications

Interested committees:

Title: BS ISO/IEC 14763-5 Information technology - Implementation and operation of customer premises cabling
Part 5: Sustainability

Please notify the secretary if you are aware of any keywords that might assist in classifying or identifying the standard or if the content of this standard

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

**WARNING: THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD.
THIS DRAFT IS NOT CURRENT BEYOND 5 July 2023**

This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

No copying is allowed, in any form, without prior written permission from BSI except as permitted under the Copyright, Designs and Patent Act 1988 or for circulation within a nominating organization for briefing purposes. Electronic circulation is limited to dissemination by e-mail within such an organization by committee members.

Further copies of this draft may be purchased from BSI Shop <http://shop.bsigroup.com> or from BSI Customer Services, Tel: +44(0) 20 8996 9001 or email cservices@bsigroup.com. British, International and foreign standards are also available from BSI Customer Services.

Information on the co-operating organizations represented on the committees referenced above may be obtained from <http://standardsdevelopment.bsigroup.com>

Responsible Committee Secretary: **Committee Service Centre (BSI)**
Direct tel: **020 8996 7009**
E-mail: csc@bsigroup.com

 **Documents**
Document Sharing Hub

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
------------------	------------------------

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/Figure/ Table/Note	Type of comment	Commend (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



JTC1-SC25/3148/CD

COMMITTEE DRAFT (CD)

PROJECT NUMBER:
ISO/IEC 14763-5 ED1

DATE OF CIRCULATION:
2023-04-14

CLOSING DATE FOR COMMENTS:
2023-08-04

SUPERSEDES DOCUMENTS:
JTC1-SC25/3123/CD, JTC1-SC25/3134A/CC

IEC ISO/IEC JTC 1/SC 25 : INTERCONNECTION OF INFORMATION TECHNOLOGY EQUIPMENT

SECRETARIAT:
Germany

SECRETARY:
Mr Marco Peter

OF INTEREST TO THE FOLLOWING COMMITTEES:

PROPOSED HORIZONTAL STANDARD:

☐

Other TC/SCs are requested to indicate their interest, if any, in this CD to the secretary.

FUNCTIONS CONCERNED:

☐ EMC

☐ ENVIRONMENT

☐ QUALITY ASSURANCE

☐ SAFETY

This document is still under study and subject to change. It should not be used for reference purposes.

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

TITLE:

Information technology – Implementation and operation of customer premises cabling – Part 5 Sustainability

NOTE FROM TC/SC OFFICERS:

Copyright © 2023 International Electrotechnical Commission, IEC. All rights reserved. It is permitted to download this electronic file, to make a copy and to print out the content for the sole purpose of preparing National Committee positions. You may not copy or "mirror" the file or printed version of the document, or any part of it, for any other purpose without permission in writing from IEC.

CONTENTS

1		
2		
3	FOREWORD	4
4	INTRODUCTION	5
5	1 Scope	7
6	2 Normative references	7
7	3 Terms, definitions and abbreviations	7
8	3.1 Terms and definitions	7
9	3.2 Abbreviations	8
10	4 Conformance	9
11	5 Cabling design	9
12	5.1 General	9
13	5.2 Cabling design selection criteria	9
14	5.3 Reduction of waste materials during the lifetime of the installation	10
15	5.4 Cabling infrastructure installation planning and practices	10
16	5.5 Impact of cabling infrastructure on energy requirements	11
17	5.6 Designing for quality to reduce re-work	11
18	5.7 Balancing Sustainability and other Considerations	11
19	5.8 Recommended Metrics to evaluate Cabling Sustainability	11
20	5.9 Creating sustainability mind-set among stakeholders	11
21	5.10 Economic aspects of sustainability	12
22	5.11 Transparency of documents for sustainable cabling system	12
23	6 Selection, packaging and transportation of components and related materials	13
24	6.1 General	13
25	6.2 Selection of components and related material	13
26	6.3 Packaging of components and related material	13
27	6.4 Transportation of components and related material	13
28	7 Installation, Operation and maintenance	14
29	7.1 General	14
30	7.2 Process of Installation, maintenance and operation	14
31	7.2.1 General	14
32	7.3 Installation practices	15
33	7.3.1 General	15
34	7.3.2 Recommendations for Installation practices	15
35	7.3.3 Pre installation step	16
36	7.3.4 Installation step	16
37	7.3.5 Post Installation step	16
38	7.4 Operation	16
39	7.4.1 General	16
40	7.4.2 Requirements	17
41	7.4.3 Recommendations	17
42	7.5 Maintenance	17
43	7.5.1 General	17
44	7.5.2 Requirements	17
45	7.5.3 Recommendations	18
46	8 Management of waste materials	18
47	8.1 General	18
48	8.2 Cabling waste hierarchy	18
49	8.3 Waste Electrical and Electronic Equipment (WEEE)	19

50	8.4	Waste assessment.....	19
51	8.5	Documentation	19
52	8.5.1	General	19
53	8.5.2	Waste management plan.....	20
54	8.5.3	Proof of assessment	21
55	8.5.4	Certificate of Recycling	21
56	8.6	Waste storage and handling.....	21
57	8.6.1	Storage and handling.....	21
58	8.6.2	Risks.....	21
59	8.7	Waste actions.....	22
60	8.7.1	General	22
61	8.7.2	Reuse	22
62	8.7.3	Repurpose	22
63	8.7.4	Recycle	23
64	8.7.5	Dispose	23
65	9	Skill sets and training objectives	23
66	9.1	General	23
67	9.1.1	Needs of Stakeholders.....	23
68	9.2	Work performance abilities, Competency, and skill set	24
69	9.3	Generic Work Performance Ability Requirements	24
70	9.3.1	Understanding of and Contribution to SDGs.....	24
71	9.3.2	Collaboration with Stakeholders	25
72	9.3.3	Education and training	25
73	9.4	Specialized work performance ability requirements	26
74	9.4.1	General	26
75	9.4.2	Understanding of requirements for sustainable cabling systems	26
76	9.4.3	Approaches for reduction of environmental footprints	26
77	9.4.4	Designing practice	26
78	9.4.5	Installation Management and Evaluation Practice	27
79	9.4.6	Installation Practice	28
80	9.4.7	Operation, Management/Maintenance of Sustainable Systems	30
81	9.5	Best practices, education and training	30
82	9.5.1	Collection and publication of best practices	30
83	9.5.2	Expert for sustainable cabling system and the training	30
84	9.5.3	Criteria and means of evaluation	31
85	Annex A (informative)	Example of Skill sets for Work performance.....	32
86	Annex B (informative)	Example of syllabus.....	34
87	Bibliography.....		35

List of figures

91	Figure 1 - Schematic representation of cabling standards in system lifecycle	6
92	Figure 2 - Schematic relationship between ISO/IEC 14763-5 and other relevant standards	6
93	Figure 3 - Process flow from Design to Disposal.....	14
94	Figure 4 - Cabling waste hierarchy.....	19
95	Figure 5 - Work performance ability requirements designated for stakeholders.....	24

List of tables

99	Table 1 - Aspects valued by stakeholders and satisfaction indexes.....	23
----	--	----

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**INFORMATION TECHNOLOGY –
IMPLEMENTATION AND OPERATION OF CUSTOMER PREMISES CABLING
–
SUSTAINABILITY****FOREWORD**

- 1) ISO (International Organization for Standardization) and IEC (International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards. Their preparation is entrusted to technical committees; any ISO and IEC member body interested in the subject dealt with may participate in this preparatory work. International governmental and non-governmental organizations liaising with ISO and IEC also participate in this preparation.
- 2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.
- 3) The formal decisions or agreements of IEC and ISO on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC and ISO member bodies.
- 4) IEC, ISO and ISO/IEC publications have the form of recommendations for international use and are accepted by IEC and ISO member bodies in that sense. While all reasonable efforts are made to ensure that the technical content of IEC, ISO and ISO/IEC publications is accurate, IEC or ISO cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 5) In order to promote international uniformity, IEC and ISO member bodies undertake to apply IEC, ISO and ISO/IEC publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any ISO/IEC publication and the corresponding national or regional publication should be clearly indicated in the latter.
- 6) ISO and IEC provide no marking procedure to indicate their approval and cannot be rendered responsible for any equipment declared to be in conformity with an ISO/IEC publication.
- 7) All users should ensure that they have the latest edition of this publication.
- 8) No liability shall attach to IEC or ISO or its directors, employees, servants or agents including individual experts and members of their technical committees and IEC or ISO member bodies for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication of, use of, or reliance upon, this ISO/IEC publication or any other IEC, ISO or ISO/IEC publications.
- 9) Attention is drawn to the normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 10) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 14763-5 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This International Standard has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

150

INTRODUCTION

151 Sustainability is most often defined as meeting the needs of the present without compromising
 152 the ability of future generations to meet theirs. It has three main pillars: economic,
 153 environmental, and social - although there appears to be no recorded origin of this concept.
 154 True sustainability is generally recognized as being where the three pillars (objectives) overlap.

155 Focussing on sustainability, it is widely recognized that generic cabling in accordance with
 156 ISO/IEC 11801 standards is intended to provide the user with an information technology
 157 infrastructure, to support both wired and wireless solutions, with extended life expectancy.

158 IT cabling systems are not only defined to transport data. More and more they are used for
 159 remote powering. Therefore, energy efficiency and power loss are becoming an important
 160 aspect of sustainability during operation.

161 As highlighted in the Introduction in many of the ISO/IEC 11801 standards *“life expectancy of
 162 generic cabling systems can vary depending on environmental conditions, supporting
 163 applications, aging of materials used in cables, and other factors, such as access to pathways
 164 (campus pathways are more difficult to access than building pathways)”* and *“a lack of design
 165 foresight, the use of inappropriate components, incorrect installation, poor administration or
 166 inadequate support can threaten quality of service and have commercial consequence for all
 167 types of users”*.

168 Those purchasing cabling infrastructures, and the interconnected information technology
 169 equipment, seek solutions which meet their business, technical and social objectives.

170 Commercial pressures can result in a reduction of environmental sustainability of the cabling
 171 infrastructure by forcing imminent requirements to take priority over strategic planning resulting
 172 in short-term decisions being taken regarding design, installation and quality assurance of the
 173 cabling infrastructure. In such cases, design choices may be made which, while reducing initial
 174 installation costs, can frequently incur medium- to long-term losses due to substantial repair
 175 and maintenance costs. There are numerous cases in which the standards have not been
 176 complied with even if they are understood, which results in a reduction of sustainability.

177 To support the long-term viability of the infrastructure, it is necessary to address the skill levels
 178 of those involved in the design and installation process by improving:

- 179 • the definition of the necessary skill sets to support the application of ISO/IEC 14763-2 and
 180 associated standards rather than relying on proprietary knowledge and specifications used
 181 by individual companies,
- 182 • The clarity of these defined skill sets to support the training and employment of skilled
 183 workers,
- 184 • the understanding of the cabling design and installation standards along with how they
 185 balance the sustainability pillars,
- 186 • the selection, use, and support of equipment needed in the cabling lifecycle, including for
 187 test and maintenance purposes.

188 Recognizing that elements of the cabling infrastructure and information technology equipment
 189 will likely be replaced during their lifetime, a reduction of both the impact of material usage and
 190 of disruption of services provided by the cabling infrastructure is pursued.

191 This document is intended for all the following stakeholders of cabling systems.

192	Supplier:	cabling component and infrastructure suppliers
193	Owner:	building owners and managers
194	Operator:	operators of information technology cabling installations
195	Constructor:	designers, installers of information technology cabling installations
196	User:	users of information technology cabling installations
197	Educator:	organisations delivering training to improve the skill sets of designers, installers and users of information technology cabling installations
198		

Figure 1 shows a schematic relationship between the general procedure for installing the sustainable cabling system and the contents of each clause of this document.

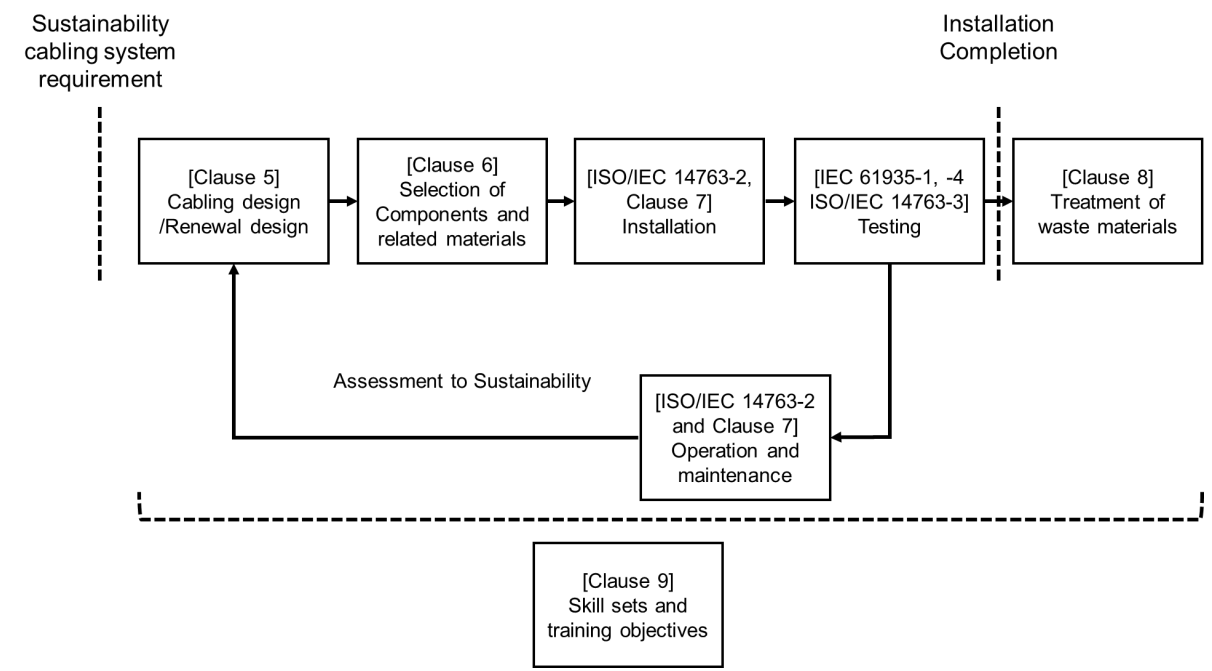


Figure 1 Schematic representation of cabling standards in system lifecycle

This International Standard is one of several documents prepared in support of international standards and technical reports for cabling design produced by ISO/IEC JTC 1/SC 25. Figure 2 shows the inter-relationship between these standards and technical reports.

Users of this document should be familiar with the applicable cabling design standard of the ISO/IEC 11801 series and ISO/IEC 14763-2.

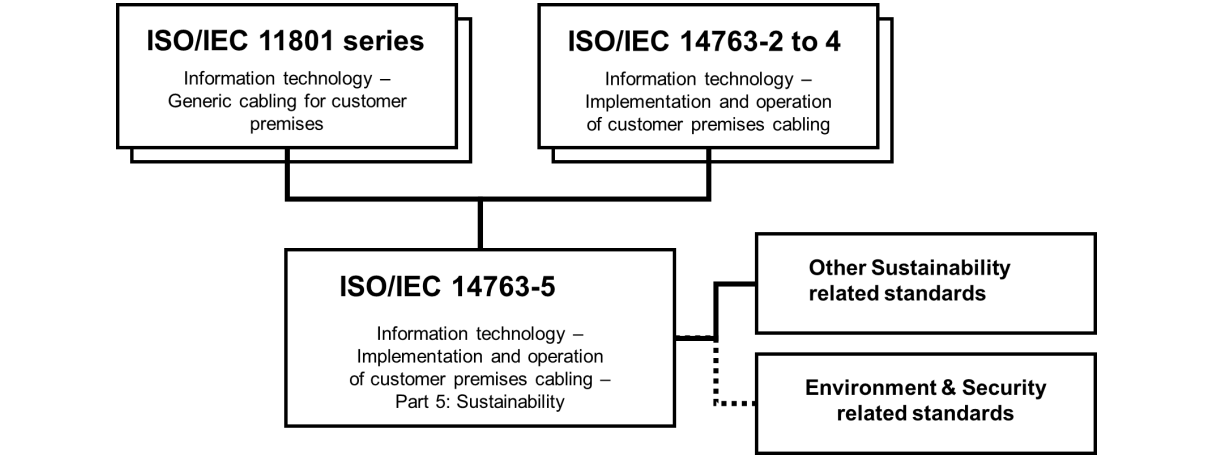


Figure 2 Schematic relationship between ISO/IEC 14763-5 and other relevant standards

NOTE Telecommunications and cabling infrastructure affects raw material consumption. The cabling infrastructure design and installation process can influence the product life and sustainability of the system. It is recommended to research local building practices for a sustainable environment and conservation of fossil fuels.

**INFORMATION TECHNOLOGY –
IMPLEMENTATION AND OPERATION OF CUSTOMER PREMISES CABLING
–
Part 5: SUSTAINABILITY**

1 Scope

This document specifies requirements and recommendations to maximize the sustainability of cabling systems including both customer premises infrastructure and the accommodation of information technology equipment by addressing the

- a) cabling design,
- b) selection, packaging and transportation of components and related materials,
- c) installation, operation and maintenance,
- d) management of waste materials,
- e) skill sets necessary for designers, installers and users.

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.

ISO 14001, *Environmental management systems – Requirements with guidance for use*

ISO/IEC 14763-2, *Information technology – Implementation and Operation of Customer premises cabling – Part 2: Planning and Installation*

ISO/IEC TR 14763-2-1, *Information technology – Implementation and Operation of Customer premises cabling – Part 2: Planning and Installation-Identifies within Administration System*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at <https://www.electropedia.org/>
- ISO Online browsing platform: available at <https://www.iso.org/obp>

3.1.1 cabling

system of telecommunications cables, cords and connecting hardware that supports the connection of information technology equipment

3.1.2 cabling system lifecycle

Lifecycle in a cabling system. It includes design, construction, operation/management, maintenance, and waste management

3.1.3 distributor

functional element enabling the termination and connection of cabling subsystems to other cabling subsystems or transmission equipment

259 **3.1.4**
 260 **recyclability**
 261 ability of component parts, materials or both to be separated and reprocessed from products
 262 and systems and subsequently used as material input for the same or different use or function

263 **3.1.5**
 264 **recyclable**
 265 characteristic of a product or associated component that can be diverted from the waste stream
 266 through available processes and programmes and can be collected, processed, and returned
 267 to use in the form of raw materials or products

268 **3.1.6**
 269 **repurpose**
 270 operation by which cabling and associated infrastructure is used for a purpose for which it was
 271 not conceived, with or without the support of auxiliary products present on the market

272 **3.1.7**
 273 **reusability**
 274 ability of a material, product, component, or system to be used in its original form more than
 275 once and maintain its value and functional qualities during recovery to accommodate
 276 reapplication for the same or any purpose

277 **3.1.8**
 278 **reuse**
 279 operation by which cabling and associated infrastructure is used for the same purpose for which
 280 it was conceived, with or without the support of auxiliary products present on the market

281 **3.1.9**
 282 **stakeholder**
 283 all counterparts in direct or indirect interests (impacts) for an information technology cabling
 284 system. Or, all stakeholders surrounding a cabling system

285 **3.1.10**
 286 **sustainable cabling system**
 287 information technology cabling system which enables cost effective sustainment and provides
 288 added values for all stakeholders, considering social, environmental and economic aspects,
 289 through its lifecycle

290 **3.1.11**
 291 **document for sustainable cabling system**
 292 set of documents containing the required information specified in this standard
 293 Note 1 to entry: It is provided by facility owner for design, operation, and maintenance of the sustainable
 294 cabling system.

295 **3.1.12**
 296 **sustainability specialist**
 297 specialized expert that certified by the education that defined in clause 9 of this document.

298 **3.2 Abbreviations**

299 For the purposes of this document the following abbreviations apply.

300	CPD	Continuing Professional Development
301	FMD	Full Materials Disclosure
302	MIR	Materials Ingredient Reporting
303	SDG	Sustainable Development Goal
304	WEEE	Waste Electrical and Electronic Equipment
305		

4 Conformance

This document prescribes requirements to maximize sustainability of the generic cabling systems, including both infrastructure in customers' premises and application of information technologies.

The cabling system that claims conformance to this document shall meet the following requirements:

- a) the cabling design and installation planning shall meet the requirements of clause 5,
- b) the selection, packaging and transportation of components and related materials shall meet the requirements of clause 6,
- c) the installation, operation and maintenance of the cabling system shall meet the requirements of clause 7,
- d) the treatment of components and related materials removed from the installation shall meet the requirements of clause 8,
- e) the skills development programs shall meet the requirements of clause 9.

In all cases, local regulations, shall be met.

In addition to the installation requirements prescribed by ISO/IEC14763-2, a sustainability document shall be prepared by the owner of facility, or a party entrusted by the owner of facility, and approved by a sustainability specialist.

5 Cabling design

5.1 General

Clause 5 provides requirements, recommendations and considerations for cabling design to realize sustainability of generic cabling systems.

In order to maintain and enhance added values of a cabling system, the following consideration should be made in designing:

- a) For the distributed part on the consumer side, move, add, or update necessary equipment to adapt the latest standard and/or applications.
- b) For the general-purpose part, which is the core of a system, design and construction should enable operation/maintenance to minimize environmental footprint during the system lifecycle.
- c) Maintenance needed to minimize environmental footprint should be conducted regularly.

Awareness and consideration of sustainability during generic cabling design is fast becoming as equally important as the other considerations that have defined cabling design in the ISO/IEC 11801 series of information technology standards. This clause describes additional cabling design considerations that impact sustainability as a critical aspect of the complete cabling infrastructure eco-system. These considerations include:

- 1) consideration of sustainability at every step of the cabling design,
- 2) encouraging sustainability as a long-term strategic design innovation,
- 3) prioritizing sustainability considerations with other design considerations,
- 4) performing the necessary trade-offs between the various cabling design considerations to optimize the complete cabling ecosystem.

A key objective is to equip cabling system designers with the necessary skills and sensitivity regarding the environmental impact of cabling infrastructure design, including the environmental impact of supported information technology equipment.

In addition, in the case of additional construction to an existing cabling system, an investigation of the cabling facilities is also required before the redesign.

5.2 Cabling design selection criteria

This hierarchical star topology divides the cabling into

- a) campus backbone,

- b) building backbone,
- c) horizontal distribution (floor cabling).

The sustainability approach can be applied to all 3 sub-systems using sustainability principles of minimizing the short term and long-term impact to the environment. The cabling design selection criteria listed below should include:

- 1) Select a generic cabling design based on ISO/IEC 11801 series to support multiple applications over multiple life cycles of equipment. General product declarations are defined in ISO 14025 and ISO 21930. More detailed life cycle assessment is defined in IEC 63366 with refers to the product specific rules in IEC TR 62839-1 and IEC TR 62839-2.
- 2) Select a quality and flexible generic cabling system that can easily be re-purposed for changing information technology requirements.
- 3) Consider cabling designs that will minimize materials while providing needed functionality.
- 4) Consider lowest loss cabling designs that are practical while maximizing energy efficiency.
- 5) The application of flexible and accessible installation practices in accordance with ISO/IEC 14763-2 to maximize the utility and lifecycle of the cabling infrastructure, while reducing additional cabling works.
- 6) Deliberate planning of the cabling infrastructure, including pre-cabling to support current and forecasted information technology functions.

Editor's Note:

This part of IEC 62839 specifies the PSR (product specific rules) for wires and cables used for communication, data, control and command. This PSR covers the use, installation and end-of-life stages and provides methodological precisions to PEP/PCR (ecopassport®) writing for "wires and cables and accessories" products used for communication, data, control and command. PSR and general rules all together form the product category rules.

5.3 Reduction of waste materials during the lifetime of the installation

A fundamental principle of sustainability is to reduce materials used to provide a given Information technology functionality. Reducing materials includes reducing waste materials generated during the installation that have to be removed from the installation resulting in negative impact on the environment. Key items to consider include:

- a) when lengths smaller than 100 m are needed, cables packaged in boxes instead of reels can result in reducing packaging material,
- b) calculating exact lengths using CAD software can reduce cable waste,
- c) source materials utilising sustainable supply chains, so spares are available,
- d) supply chains with flexible delivery and return options can be utilized to optimize the availability of correct amount and type of material during installation and minimize excess material on site at the end of the project improving sustainability,
- e) local supply chains improve sustainability.

5.4 Cabling infrastructure installation planning and practices

Infrastructure planning is the foundation of a robust long-lasting cabling system supporting a large range of Information technology functions in buildings. With proper routing, spare capacity, and easy access, the cabling infrastructure will enable sustainable practices adapting to the evolving needs of Information technology in the building. Sustainability considerations for cabling infrastructure installation planning and practices include:

- a) use drawings to layout known and anticipated equipment outlet locations,
- b) calculate the number of cables to each location and combinations of these going back to the distributor,
- c) size the pathways sufficiently with spare space for anticipated applications and associated cabling,
- d) a cabling design compliant with ISO/IEC 11801-6 will generally provide full coverage for the building, and allow flexibility for future changes,