

Code of practice for

Installation of apparatus intended for connection to certain telecommunication systems

ICS 33.020

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- BR Telecommunications
- British Approvals Board for Telecommunications
- British Telecommunications plc
- Department of Trade and Industry
- Department of Trade and Industry (Telecommunications and Posts Division)
- EEA (the Association of Electronics, Telecommunications and Business Equipment Industries)
- Electrical Contractors' Association
- Electricity Association
- Independent Telecommunications Suppliers' Association
- Institution of Electrical and Electronics Incorporated Engineers
- Mercury Communications Limited
- National Communications Union
- Office of Telecommunications (OFTEL)
- Telecommunications Industry Association
- Telecommunications Users' Association (TUA)

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Foreword

This revised British Standard including amendments Nos. 1 and 2 has been prepared under the direction of the Telecommunications Standards Policy Committee. It is complementary to a series of British Standards produced following the commencement of liberalization in October 1981 of the supply of certain telecommunications apparatus within the United Kingdom. It supersedes BS 6701-1:1990 and BS 6701-2:1987 which are withdrawn.

This standard includes product specifications giving particular requirements for individual items of apparatus together with standards covering general requirements for the connection of apparatus to the various systems of network operators.

As a code of practice, this British Standard takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure that claims of compliance are not misleading.

The Secretary of State may stipulate certain recommendations of this standard as mandatory requirements for installation of some products which are to be connected directly or indirectly to the public telecommunication system under Section 22(6) of the Telecommunications Act 1984 and the relevant mandatory requirements will be listed by the Secretary of State together with the designation of the appropriate product standard.

Information on regulatory matters may be obtained from the Office of Telecommunications (OFTEL).

A number of reserved rights with respect to connection of apparatus are retained by public telecommunication operators.

Whilst every effort has been made to highlight certain specific aspects of safety in this standard, the Health and Safety at Work etc. Act 1974 imposes general duties on a wide range of persons including employers, the self-employed, manufacturers, suppliers and employees. In addition, other Acts and Regulations may specify particular requirements. Consequently it will be necessary to read this code of practice in conjunction with such legal requirements or guidance that may be relevant.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

In particular, attention is drawn to the following:

The Telecommunications Act 1984 [1];

Health and Safety at Work etc. Act 1974 [2];

The Companies Act 1948 [3];

The Electricity Supply Regulations, 1988 SI 1057 [4].

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 24, an inside back cover and a back cover.

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1 Scope

This British Standard makes recommendations for the installation (see note) of apparatus which is, or is to be, comprised in telecommunication systems other than public telecommunication systems. It does not cover those aspects of the installation of radio transmitters or receivers or antenna systems associated with them which are relevant to the emission or reception of radio frequency radiation by such apparatus. It does not cover the installation of apparatus which makes use of wiring serving to distribute electrical power for telecommunication purposes.

It makes recommendations for choice of accommodation and advises on structural design considerations.

Information and general recommendations for cabling and wiring are included in this British Standard but it may be necessary to refer to other relevant British Standards for more detailed recommendations for cabling and wiring for installation of specific telecommunication apparatus.

The recommendations of this standard apply to the installation of apparatus for connection to telecommunication systems which may not be connected to any public telecommunication system, or which may be connected to one or more such systems including cases where there is connection to systems run by different telecommunication operators.

Annex A gives advice on domestic and apparatus cleaning and annex B gives advice on accommodation redecoration, maintenance or alteration.

Annex C gives general advice on certification of satisfactory installation.

Unless otherwise stated in this standard, voltages and currents are r.m.s. with a nominal frequency of 50 Hz.

NOTE Although this standard is intended primarily for the installer of apparatus, it has been considered expedient also to include recommendations and advice directed towards the supplier of, user of and maintenance contractor for the apparatus and to designers and architects of buildings intended to house the apparatus.

2 References

2.1 Normative references

This British Standard incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on page 24. For dated references, only the editions cited applies; any subsequent amendments to or revisions of the cited publication apply to this British Standard only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This British Standard refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on page 24, but reference should be made to the latest editions.

3 Definitions and abbreviations

For the purposes of this British Standard the following definitions and abbreviations apply.

3.1 Definitions

3.1.1

aerial cable

a cable (3.2.3) suitable for use when suspended overhead in outdoor situations

3.1.2

apparatus

one or more attachments that are, or are to be, connected to a telecommunication system (whether or not thereby comprised within that system)

3.1.3

cable

an assembly of insulated conductors contained within a common sheath or tube

3.1.4

conductor

substance or body that allows electric current to pass along it

3.1.5

drop wire

a type of aerial cable used for the provision of overhead services to a building

3.1.6 floor distribution point (FDP)

a point at which a connection device is used to connect floor distribution cables (serving the terminal equipment) to a larger multi-pair (feed) cable or cables

3.1.7 interconnection point

the point where a number of distribution cables are directly connected to one larger cable

3.1.8 jointing chamber

a generic term for any structure giving access to any underground duct routes and/or cables (e.g. manhole, joint box)

3.1.9 line

two or more conductors comprising an electrical circuit

3.1.10 main earthing terminal

the terminal or bar provided for the connections of protective conductors, including equipotential bonding conductors and conductors for functional earthing, to the means of earthing, in accordance with BS 7671:1992¹⁾

3.1.11 network

a means of providing telecommunications service by a system of interconnected elements

NOTE When the network is a public telecommunication system, the service is provided by a person other than the user.

3.1.12 network termination point (NTP)

a point at which apparatus installed in accordance with this standard is to be connected to a network

NOTE If the network is a public telecommunication system then the NTP is part of the network termination and test apparatus (NTTA) which is part of the public telecommunication system.

3.1.13 network termination and test apparatus (NTTA)

apparatus comprised in a public telecommunication system, providing means for the connection to that system of approved apparatus comprised in a non-public telecommunication system

NOTE The NTTA contains means for disconnecting and testing the correct functioning of the public telecommunications systems independently from the non-public telecommunications system.

3.1.14 premises

land or buildings (or part of a building) or both contained within a single continuous boundary, but excluding other premises contained therein, which is lawfully occupied by one legal person

3.1.15 public telecommunication system

any telecommunication system designated as a public telecommunication system by an order made under Section 9 of the Telecommunications Act 1984

3.1.16 second comer

the party whose plant when installed causes an intersection or proximity to come into being

3.1.17 telecommunications

branch of technology concerned with the communication of information over distances

3.1.18 telecommunication system

one or more items of apparatus that together serve to convey information (such as sounds, visual images, text, or signals to actuate machinery) between points by means of cable, waveguide (including optical waveguide) or radio

3.1.19 telecommunication distribution system

assembly of conductors and associated connecting devices to allow interconnection (by electrical or other appropriate means) between any defined telecommunication terminal devices within the same premises, or between devices within the premises and any network(s)

3.1.20 user

the person by whom or on whose behalf apparatus is to be installed in accordance with this standard

3.1.21 shared cabling

the use of a common cable in which circuits carry signals whose spectral characteristics may differ one from another necessarily and significantly and which may be analogue or digital in any mix

¹⁾ *Regulations for the electrical equipment of buildings*, IEE Wiring Regulations 16th edition, Institution of Electrical Engineers, is published by BSI as BS 7671:1992.

3.1.22**back box**

a box without cover or lid suitable for containing one or more electrical accessories and for recessing into or mounting on a wall or ceiling, or similar flat surfaced structure

NOTE A box conforming to BS 4662 is suitable.

3.1.23**preconnection inspection (PCI)**

an inspection carried out by the public telecommunications operator (PTO), to whose network the configurable apparatus is to be connected

NOTE The inspection ensures, before connection is made to the network, that the branch system is in accordance with the conditions specified for its approval. It does not ensure that the branch system is functional.

3.1.24**network connection procedure (NCP)**

a procedure carried out by a person or organization approved by the regulatory authority on such apparatus as specified by the licence under which the system is, or is to be, run before the apparatus comprised within the system is connected to a PTO network

3.2 Abbreviations

FDP	Floor distribution point
FE	Functional earth
IDC	Insulation displacement connection
NCP	Network connection procedure
NTP	Network termination point
NTTA	Network termination and test apparatus
PCI	Preconnection inspection
PE	Protective earth
PTO	Public telecommunications operator
ROEP	Rise-of-earth-potential

4 Licence obligations

The installer and the user should ensure that when apparatus is installed and connected to the user's system there will be no breach of any condition or other requirement of any licence under which the system is, or is to be, run.

5 Apparatus**5.1 System selection and design factors**

Foreseeable telecommunications requirements over the planned life of the apparatus should be ascertained as accurately as possible by consultation between the user (or the user's agent) and the supplier.

Typically, the following factors should be considered:

- a) types of apparatus, size and forecast growth;
- b) date to be brought into service;
- c) space and environmental factors specified by the supplier;
- d) additional space and environmental requirements for maintenance purposes, personnel, or apparatus supplied by other contractors;
- e) wiring and cabling facilities, including the capacity of ducts, conduits and trunking.

5.2 Network circuits

NOTE If the network is a public telecommunication system the NTP is within the NTTA.

5.2.1 The network operator(s) should be advised by the user (or the user's agent) of the foreseeable network circuit requirements.

5.2.2 It is essential that sufficient early notice of installation is given to the network operator(s) by the user (or the user's agent). This should include the type of apparatus to be installed.

5.2.3 The user (or the user's agent) normally in consultation with the installer should agree with the network operator(s):

- a) the precise physical location of the network termination point(s) [NTP(s)];
- b) the supply and capacity of the apparatus which provides the NTP(s);
- c) the identification and numbering of individual circuits at each NTP;
- d) any additional line facility required (e.g. night busy, meter pulses);
- e) the technical and operational acceptability of the maintenance demarcation boundaries;
- f) the liaison arrangements whereby the network operator, the user and, where appropriate, the maintainer, contact each other;
- g) the procedures to be followed by the user in reporting all types of faults.

5.3 Maintenance**5.3.1 Level of service**

It is recommended that the user should establish the level of maintenance service that will be provided by all maintainers under contract to the user.

5.3.2 Acceptance

If the apparatus is to be maintained in situ, it is recommended that acceptance of the layout is obtained from the intended maintainer.

5.3.3 Records and plans

Explanatory documentation and any details of the location of the apparatus and the cable/duct/conduit marking schemes should be provided by the installer for retention on site.

5.4 Delivery and installation of apparatus

Delivery of apparatus to site should not be made, nor installation commence, before the accommodation has reached an acceptable and maintainable standard or suitable storage space is available for delivered apparatus.

5.5 Observance of installation dependent parameters

5.5.1 Parameters specified by the supplier and/or manufacturer

Failure to observe the installation dependent parameters, including environmental factors, specified by the supplier and/or manufacturer could lead to unsatisfactory performance of the apparatus.

NOTE It is recommended that users should check the installation dependent parameters specified by the supplier and/or manufacturer in any maintenance or warranty agreement.

5.5.2 Approval conditions (Telecommunications Act 1984)

If the approval of the apparatus sets conditions relevant to its installation or connection these conditions should be observed. Failure to observe these conditions breaches the approval status of the installed apparatus.

NOTE It is recommended that users should seek information about approval conditions from the supplier.

5.5.3 Power loading

If a mains electricity supply is required it should be adequate to cater for the operation of the apparatus at all times, in some cases a three-phase supply may be necessary. Consideration should be given to the effect of a failure of the mains electricity supply and provision made for a stand-by power supply if required.

6 Accommodation

6.1 General

6.1.1 Allocation of accommodation

According to its size and type, an installation may share accommodation or may require the dedicated use of one or more rooms for:

- a) apparatus;
- b) operators' consoles;
- c) power supplies or batteries;
- d) maintenance/stores accommodation;
- e) welfare accommodation.

6.1.2 Hazardous areas (see also 8.1 and 8.2)

6.1.2.1 During the planning of the location for apparatus, the user should consider and inform the supplier and installer whether or not the accommodation is adjacent to, accessed via or affected by hazardous areas. It is recommended that advice should be sought from an authority on the type of hazard present.

6.1.2.2 Before installation commences, the installer should verify that due consideration has been given to the allocation of accommodation for telecommunications use, particularly with regard to proximity to or effects from hazardous areas.

6.1.2.3 It is essential that where risks of fire or explosion are involved, the recommendations of BS 5345 should be observed.

6.1.3 Other services

Telecommunication apparatus may be endangered or adversely affected by other services or conditions which may be obvious or hidden within the fabric of the accommodation. The user should advise on the presence of, typically:

- a) processes producing electricity, fumes, dusts, gases or radiation (e.g. contamination from photocopying and fire prevention equipment);
- b) drainage or sewer pipes and access points;
- c) electrical meters, switchgear or cables (non-telecommunication);
- d) fire sprinkler systems (see 8.2.7 on fire extinguishing schemes);
- e) water pipes;
- f) gas meters, pipes or appliances;
- g) dampness;
- h) vibration;
- i) risk of flooding;
- j) ambient noise.

6.1.4 Lighting

Whilst natural lighting is desirable to provide suitable working conditions for maintenance staff, the level of illumination provided, when maintenance is required in situ, should not be lower than normal office level.

6.2 Access

6.2.1 The user should ensure that the means of access is safe and suitable for its purpose. Consideration should be given to access requirements for maintenance, in-house general repairs, domestic cleaning, and user's staff having specific duties within the accommodation in which the apparatus is located.

6.2.2 The location of accommodation should take into account the need to deliver and remove items of apparatus. It is essential that a safe route should be established with suitable access and adequate floor loading to allow the passage of apparatus together with any mechanical aid and personnel required to make the delivery or removal. The supplier should provide information on the size and weights of individual items of apparatus, and any special handling or delivery requirements.

6.3 Accommodation: technical details

6.3.1 The supplier should provide advice on the permissible distances (cable or linear) between items of apparatus.

6.3.2 When locating accommodation, consideration should be given to the method of providing building telecommunication cabling, or of linking to a telecommunication distribution system.

6.4 Security

6.4.1 Wiring

It should not be possible to alter or interfere with wiring without the use of tools except in locations to which access is restricted to maintenance staff or other authorized staff.

6.4.2 Power supply

If the apparatus is supplied directly from the mains electricity supply, a means of disconnecting the supply should be provided in accordance with the requirements of BS 7671:1992. Arrangements should be made to avoid the inadvertent disconnection of the mains electricity supply to the apparatus.

Standby power facilities may be provided to maintain system operation during failures of the normal supply. It is common practice for these to be realized by a rechargeable battery (together with a prime-mover generator, where justified).

6.4.3 Apparatus

The user should consider whether for security or safety reasons, apparatus should be placed in a room (or other suitable area) where controlled access is restricted to authorized personnel only.

6.5 Floor loading

It is essential that floor loading should be calculated for each individual unit or combination of units of apparatus, based upon the weights of all apparatus which would be installed at maximum growth, in order to choose accommodation having adequate floor strength.

6.6 Provision for operating staff

6.6.1 Working areas should provide sufficient space for safe operation, supervision and maintenance.

6.6.2 Neither natural nor artificial light should interfere with the visibility of any lamps, visual displays or signals.

6.6.3 Operator's console areas should be free from, or be protected from, external noise, because an excessive level of ambient noise may interfere with the operator's ability to handle telephone calls.

6.6.4 Where vibrations may cause a problem the supplier should be consulted.

6.6.5 It is recommended that refreshments are not prepared or consumed within the working area. Spillages of food and/or drink on items of equipment could cause damage and, in the extreme, safety hazards to users or network personnel.

6.7 Batteries

6.7.1 It is essential that the accommodation of lead-acid stationary batteries other than those known as sealed batteries conforms to BS 6133.

6.7.2 For other types of batteries and those lead-acid types known as sealed batteries the supplier should advise on containment and should provide information regarding any special conditions which could apply to their accommodation. Such special conditions should be met.

6.8 On-site maintenance and stores

6.8.1 Consideration should be given to providing secure accommodation for any spare parts retained on site.

6.8.2 Consideration should be given to the provision of suitable accommodation for maintenance and installation staff to enable them to carry out on-site tasks and the necessary associated administration duties (e.g. amending records, consulting and amending appropriate manuals and documentation).

6.8.3 Space should be made available to accommodate any test equipment kept on site. Environmental and other conditions should take account of the need to avoid deterioration in this equipment and disturbance to its calibration.

7 Cabling, wiring, connections and ducting

7.1 General

7.1.1 Concealed wiring systems should be used wherever possible.

7.1.2 Distribution cables should be capable of being identified at termination boxes at all points where they enter or emerge from concealment. Accurate records of the cables in the terminating boxes should be maintained such that the cables are easily identifiable.

NOTE This recommendation does not apply to the apparatus wiring connecting a terminating station to a local FDP.