

GENERAL SPECIFICATION

TELECOMMUNICATION

GS EP TEL 410

Installation rules

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1. Scope

This general specification identifies the general rules to be complied with for the installation of telecommunications systems.

This Specification applies to any and all industrial sites, campus or offices.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
ISO/IEC 11801	Information technology – Generic cabling for customer premises
EIA/TIA-568-C.2	Balanced Twisted-Pair Telecommunications Cabling and Components Standards
IEC 60038	IEC standard voltages
IEC 60079-20-1	Explosive Atmospheres - Part 20-1 : material characteristics for gas and vapour classification - Test methods and data
IEC 60169	Radio frequency connectors
IEC 60215	Safety requirements for radio transmitting equipment
IEC 60364	Electrical installations of buildings
IEC 60533	Electrical and electronic installations in ships - Electromagnetic compatibility (EMC) - Ships with a metallic hull
IEC 60529	Degrees of protection provided by enclosures (IP code)
IEC 60793	Optical fibres: measurement methods and test procedures
IEC 60794	Optical fibres cables
IEC 60874-1	Fibre optic interconnecting devices and passive components – Connectors for optical fibres and cables –Part 1: Generic specification
ITU-T K Series	Protection against interferences
ITU-T K.11	Principles of protection against overvoltages and overcurrents
ITU-T manual	Directives concerning the protection of telecommunications lines against harmful effects from electrical power and electrified railway lines - Volume VI: Danger and disturbance
ITU-T K.18	Calculation of voltage induced into telecommunication lines from radio station broadcasts and methods of reducing interference

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Reference	Title
Directive 94/9/EC	Directive of the European concerning equipment and protective systems intended for use in potentially explosive atmospheres

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published.

Reference	Title
GS EP CIV 202	Drainage and underground networks
GS EP CIV 401	Minimum requirements for building design and construction
GS EP CIV 406	Thermal and acoustic insulation
GS EP ELE 001	Electrical design criteria
GS EP ELE 031	Design of earthing and bonding systems for Offshore Installations
GS EP ELE 032	Design of earthing and bonding systems and lightning protection for Onshore Installations
GS EP ELE 081	Lighting
GS EP ELE 151	DC uninterruptible power Systems (UPS)
GS EP ELE 161	Electrical cables
GS EP ELE 311	Cable trays\ladders
GS EP ELE 364	Electrical installations
GS EP ELE 765	Subsea cables
GS EP HVA 100	HVAC Basis of design
GS EP INS 115	Instrument Earthing
GS EP INS 135	Cybersecurity Requirements for Industrial Information Systems (SII)
GS EP SAF 216	Area classification
GS EP SAF 311	Rules for the selection of fire-fighting systems
GS EP SAF 312	Fire and Gas detection
GS EP SAF 380	Safety engineering requirements for an F(P)SO
GS EP TEL 190	Offshore optical fibres based telecommunications
GS EP TEL 191	Telecom Fibre Optic System Design

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Reference	Title
GS EP TEL 414	Telecommunication Cables
GS EP TEL 710	Telecom equipment numbering

3. General requirements

Telecommunications equipment shall be standardized on Site, independent of Contractor for the different modules or package of the Site. Different models of equipment to serve different functional requirements may be used, but equipment according to the same functional requirement shall be standardized (manufacturer and model).

For new installations, all Telecom equipment, and supplied items for the installation work, shall be new, original (or licensed copy) and unused, of current manufacture, of the highest grade and free from all defects and imperfections that could affect performance, and in all ways be suitable for their required performance.

4. Buildings

4.1 General Requirements

Telecommunications equipment shall be installed in specific rooms, separate from other facilities.

Construction material shall follow the requirement of thermal and acoustic insulation stipulation made in [GS EP CIV 406](#).

Basic electrical design shall follow the [GS EP ELE 001](#). Specific equipments dedicated for telecommunication equipment are detailed bellow.

If the building has several floors, telecommunications equipment shall be installed on upper floors.

The vital parts of telecommunications equipment (transmitter-receiver, terminals, radio base, etc.) shall not be installed in hazardous areas as defined in [GS EP SAF 216](#). On a case by case basis, telecommunication equipments shall be ATEX certified according to [Directive 94/9/EC](#) and comply with [IEC 60079-20-1](#).

Whatever be its location on the site, telecommunications equipment shall be installed in waterproof buildings.

Also, the telecommunication equipments shall be installed in an enclosure that provides a protection against the intrusion of solid object, dust, accidental contact and water according to the IP Code defined in [IEC 60529](#). The level of protection will depend on the equipment and the place where it is installed

All cable penetrations shall be sealed against the ingress of dust, moisture and will be fire retardant.

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4.2 Architectural and structural requirements

4.2.1 General Rooms Definitions

Telecommunications equipment shall be hosted into the following type of rooms:

- A Telecom Equipment Room (TER) is the main Telecom technical room which contains the main Telecom Equipments (WAN, LAN, Telephony, etc). When TER is located more than 20 meters far from the bottom of the mast, a Telecom Shelter shall be created at the bottom of the mast.
- Telecom Shelter (TS) usually contains Radio equipment (UHF, VHF), VSAT system, INMARSAT, lightning arrestor frame,...
- A Radio Telecom Room connected to the TER which contains all radio equipment. This room is usually close to the Telecom mast to reduce the length of coaxial cable and wave guide.
- Distribution Room(s) (DR). Rooms connected to the Telecom Equipment Room through cables (copper, fibre optics...) using redundant routes. These rooms might contain Telecom Equipments (data equipment ...) and will distribute all the office RJ45 sockets. Distribution rooms shall be linked together with Optical fibre cables. TER and Distribution Rooms shall be connected through a meshed cabling network
- Technical Rooms (Telecom Equipment Room (TER), Telecom Shelter (TS), Distribution Rooms (DR)) shall include equipment dedicated for Telecom and not directly used by operators (central systems, distribution frames, Telecom cabinets, etc.). These rooms shall be supplied with 20% spare floor capacity, with cabinet's support, to allow the installation of future new cabinets.
- Operational Rooms (Radio Room, Network Operations Centre (NOC), Safe Heaven, Crisis Room, Security Room etc.)
 - These rooms shall include equipment used by operators (Telecom or others) for operating, control and monitoring functions (radio console, paging console, public address console, transceivers, etc.).
 - This type of equipment shall be integrated in specific console in the furniture of the rooms.
- Telecom workshops
 - These rooms shall include equipment used by Telecom operators for maintenance and repair of Telecommunications equipment.
 - Telecommunication workshop shall be adjacent to the Technical Room. The workshop surface shall be 16m² as a minimum and shall be equipped with storage shelves, work benches and anti-static workshop desk.
- Telecom shafts
 - These rooms shall include transmission lines installed indoors, to allow vertical cable distribution to all floors.
 - Telecom shafts shall not include any active equipment.

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- The shaft shall be sized according to cabling requirements, cabling segregation and installation requirements, with 20% spare capacity.

All of the above rooms shall be designed in a way to reduce as much as possible the length of coaxial cables or waveguides, and copper cabling.

Operational rooms, Technical Rooms and Telecom workshops shall have enough accessibility for equipment and racks unloading.

4.2.2 Sizing

Sizing of telecommunications equipment rooms shall be based, not only on the equipment to be installed, but shall also provide additional space for possible future extensions.

The surface area of the TER main telecom room shall be greater than the surface of Distribution Rooms (which shall not be less than 7 m² with a minimum width of 2.6 m). Spare parts and auxiliary equipment (power supplies, batteries, electrical boards, air conditioning equipment, etc.) shall not be hosted in Telecom technical rooms. Installation of batteries shall comply with [GS EP ELE 151](#).

4.2.3 Floor and Ceiling

In Telecom technical rooms, the height between the bottom of the cabinets and the ceiling shall be minimum 3 m.

Floors shall be designed to support loads as per [GS EP CIV 401](#).

Raised floors shall be based on 600x600mm square tiles, supporting 2000kg/m² as a minimum designed for data center.

Raised floor shall not be less than 80 cm and shall not exceed 100 cm height.

4.2.4 Noise

The maximum acceptable noise level shall be according to [GS EP CIV 401](#) and [GS EP CIV 406](#).

4.2.5 Colors

When selecting paint colors for surfaces the following considerations shall be made:

- Light
- Directional situation
- Space
- Height of room
- Use of room.

As a general rule, colors selected shall be in harmony with the color of equipment.

4.2.6 Security

Windows or picture windows, if any, shall be reinforced or protected to avoid external intrusion of person.