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APPROVED: MAY 23, 2019

# TIA STANDARD

# Telecommunications Pathways and Spaces

**TIA-569-E**
**(Revision of TIA-569-D)**

**May 2019**

TELECOMMUNICATIONS INDUSTRY ASSOCIATION
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# TELECOMMUNICATIONS PATHWAYS AND SPACES

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## FOREWORD

(This foreword is not considered part of this Standard.)

This Standard was developed by TIA Subcommittee TR-42.3.

### Approval of this Standard

This Standard was approved by TIA Subcommittee TR-42.3, TIA Engineering Committee TR-42, and the American National Standards Institute (ANSI).

ANSI/TIA reviews standards every 5 years. At that time, standards are reaffirmed, withdrawn, or revised according to the submitted updates. Updates to be included in the next revision should be sent to the committee chair or to ANSI/TIA.

### Contributing organizations

More than 40 organizations within the telecommunications industry (including manufacturers, consultants, end users and other organizations) contributed their expertise to the development of this Standard.

### Documents superseded

This Standard replaces ANSI/TIA-569-D dated April, 2015, and its addenda.

### Major changes from previous edition

Major changes from ANSI/TIA-569-D include:

- Updating of references;
- Incorporation of revised temperature and humidity requirements of ANSI/TIA-569-D-1;
- Incorporation of additional pathway and space considerations for support remote powering over balanced twisted-pair cabling of ANSI/TIA-569-D-2.

### Relationship to other TIA standards and documents

The following are related standards regarding various aspects of structured cabling that were developed and are maintained by Engineering Committee TIA TR-42. Figure 1 shows the schematic relationship between TIA telecommunications cabling standards.

- *Generic Telecommunications Cabling for Customer Premises* (ANSI/TIA-568.0);
- *Commercial Building Telecommunications Cabling Standard* (ANSI/TIA-568.1);
- *Balanced Twisted-Pair Telecommunications Cabling and Components Standard* (ANSI/TIA-568.2);
- *Optical Fiber Cabling and Components Standard* (ANSI/TIA-568.3);
- *Broadband Coaxial Cabling and Components Standard* (ANSI/TIA-568.4);
- *Residential Telecommunications Infrastructure Standard* (ANSI/TIA-570);
- *Administration Standard for Telecommunications Infrastructure* (ANSI/TIA-606);
- *Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises* (ANSI/TIA-607);

- *Customer-owned Outside Plant Telecommunications Infrastructure Standard* (ANSI/TIA-758);
- *Structured Cabling Infrastructure Standard for Intelligent Building Systems* (ANSI/TIA-862);
- *Telecommunications Infrastructure Standard for Data Centers* (ANSI/TIA-942-B);
- *Telecommunications Infrastructure Standard for Industrial Premises* (ANSI/TIA-1005);
- *Healthcare Facility Telecommunications Infrastructure Standard* (ANSI/TIA-1179); and
- *Telecommunications Infrastructure Standard for Educational Facilities* (ANSI/TIA-4966);
- *Standard for Sustainable Information Communications Technology* (ANSI/TIA-4994); and
- *Telecommunications Physical Network Security Standard* (ANSI/TIA-5017)

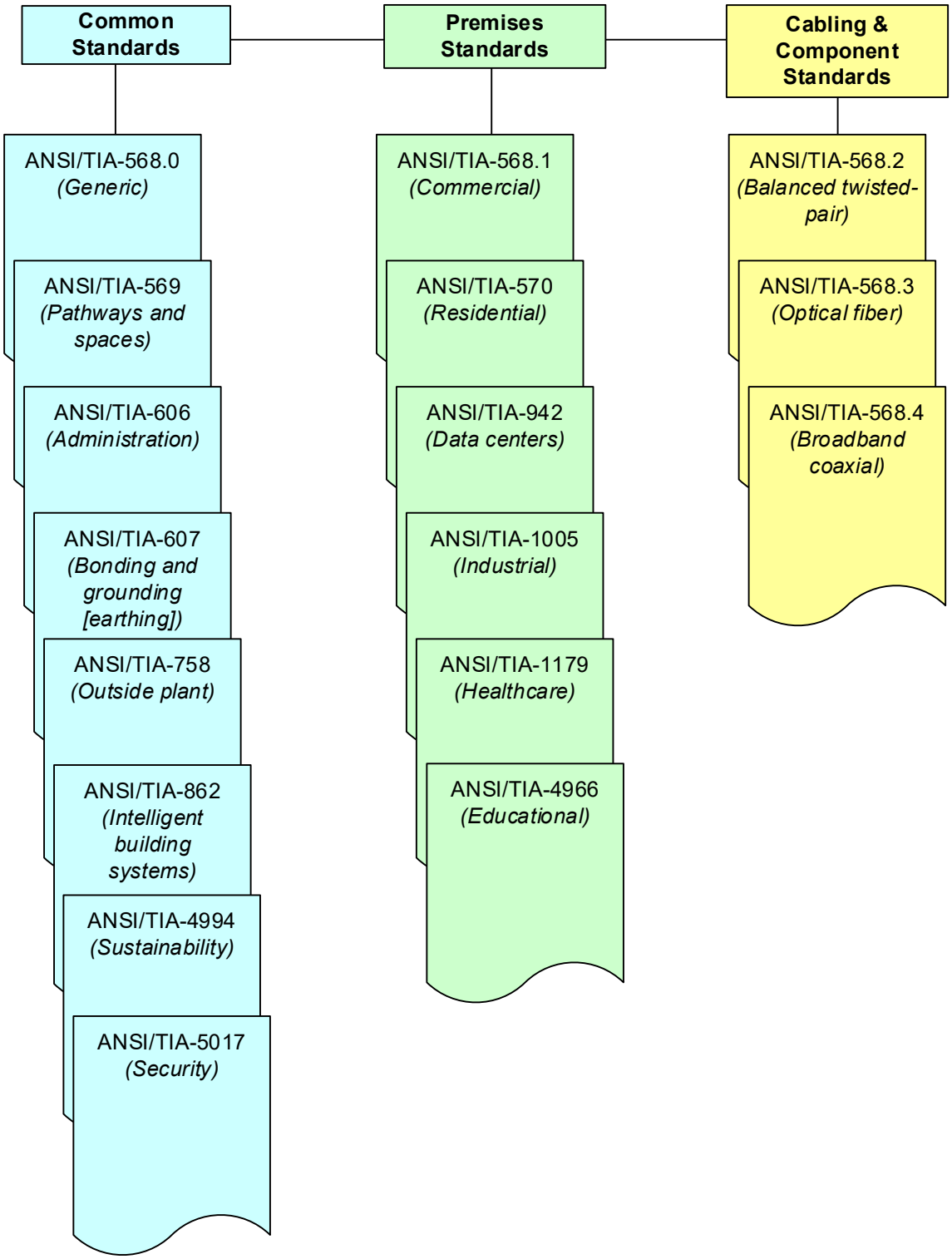


**Figure 1 – Relationship between relevant TIA standards**

The following documents may be useful to the reader:

- *National Electrical Safety Code*® (IEEE C2-2017); and
- *National Electrical Code*® *(NEC*®*)* (NFPA 70-2017)

Useful supplements to this Standard are the following BICSI documents: the *Telecommunications Distribution Methods Manual*, the *Outside Plant Design Manual*, and the *Information Transport Systems Installation Methods Manual*. These manuals provide practices and methods by which many of the requirements of this Standard are implemented.

Other references are listed in Annex C.

### Annexes

This Standard has four annexes. Annex A is normative and considered a requirement of this Standard. Annexes B, C and D are informative and not considered a requirement of this Standard.

### Introduction

This Standard recognizes three fundamental concepts related to telecommunications and buildings:

- Buildings are dynamic. Over the life of a building, remodeling is more the rule than the exception. This Standard recognizes, in a positive way, that change takes place.
- Building telecommunications systems and media are dynamic. Over the life of a building, both telecommunications equipment and media change. This Standard recognizes this fact by maintaining independence from specific vendor equipment and media.
- Telecommunications is comprised of more than just voice and data. Telecommunications also encompasses many other building systems including environmental control, security, audio, television, sensing, alarms and paging. Indeed, telecommunications embraces all wired and wireless means of conveying information within buildings.

This Standard also recognizes an important precept: in order to have a building successfully designed, constructed, and provisioned for telecommunications, it is imperative that the telecommunications design be incorporated during the preliminary architectural design phase, and reviewed throughout construction.

Both architectural and telecommunications terminology are used in this Standard, which may cause some difficulty to readers experienced in one area but perhaps not in the other. The reader can reduce confusion by remembering that this Standard does not standardize the media or equipment; it only standardizes the pathways and spaces up to and within buildings into which telecommunications media and equipment are placed.

This Standard recognizes the evolving nature of building tenant needs, the building's inherent limitations in adapting to changing tenant needs once the building has been constructed, and the special attention to telecommunications pathways and spaces design necessitated during the initial planning stages of new building designs.

This Standard recognizes that floor space is occupied by each tenant, which usually occurs after the building has been provisioned. In a multi-tenant building the build out design of the tenant space may include telecommunications pathways and spaces, in addition to the base building design, to accommodate distinct tenant needs. It is expected that, at the time of occupancy,

individual tenants will design their telecommunications infrastructure in conformance with ANSI/TIA-569-E and the relevant premises standard (see figure 1). As a result, the build-out design may also include pathways and spaces to support a two-level cabling hierarchy for each tenant.

Multi-tenant buildings have life cycles that mirror that of single-tenant buildings. Many buildings are over 100 years old. Over time, these older buildings have become severely challenged to support escalating demands on their pathways and spaces as a result of tenants' ever increasing needs for telecommunications connectivity.

Telecommunications pathways and spaces in multi-tenant buildings are further challenged by the phased nature of their use. After the building is constructed and the first group of tenants move in, the tenant's telecommunications needs may immediately cause modifications to the building. Over a span of years, as tenants cycle through the building, evolving tenant needs will continue to force the building to adapt to the demands of its tenants.

Although the scope is limited only to the telecommunications aspect of building design, this Standard significantly influences the design of other building services, such as electrical power and HVAC. It also sets minimum requirements for the size of telecommunications spaces.

### Stewardship

Telecommunications infrastructure affects raw material consumption. The infrastructure design and installation methods also influence product life and sustainability of electronic equipment life cycling. These aspects of telecommunications infrastructure impact our environment. Since building life cycles are typically planned for decades, technological electronic equipment upgrades are necessary. The telecommunications infrastructure design and installation process magnifies the need for sustainable infrastructures with respect to building life, electronic equipment life cycling and considerations of effects on environmental waste. Telecommunications designers are encouraged to research local building practices for a sustainable environment and conservation of fossil fuels as part of the design process.

### Purpose

The purpose of this Standard is to standardize specific pathway and space design and construction practices in support of telecommunications media and equipment within buildings.

### Expected usefulness

A principal goal of this Standard is to be useful to the building owners and occupants who otherwise would live with the daily problems associated with buildings that are not properly designed and constructed to support telecommunications. A properly designed and constructed facility is adaptable to change over the life of the facility. Owners and occupants should assume that better telecommunications facilities are constructed through the use of this Standard. Indeed, part of the expected usefulness of this Standard is that it be referenced in documents such as bid requests, specifications, and contracts leading up to the construction of the facilities.

This Standard should also prove useful to the team that is responsible for delivering a well-designed facility to the owner – the architects, engineers, and the construction industry. A good understanding of this Standard by this team will significantly reduce unforeseen problems associated with the telecommunications infrastructure. Two organizations, in particular, are lauded for their supportive role as this Standard was initially developed – the American Institute of Architects (AIA) and the Construction Specifications Institute (CSI).

Other organizations will also benefit from an understanding of the Standard. In particular, the Building Owners and Managers Association (BOMA), BICSI, a telecommunications association, and the International Facility Management Association (IFMA) will find this Standard closely aligned with their goals for good building design and construction.

This Standard generally makes no specific recommendations among the design alternatives available for telecommunications pathways and spaces. For example, the choice between a conduit system versus a tray system is not delineated. It is up to the telecommunications designer to properly select among the alternatives based upon the applications at hand and the constraints imposed. Readers, especially end users and owners, should ensure that qualified designers of telecommunications pathways and spaces are selected to implement this standard.

**Specification of criteria**

Two categories of criteria are specified; mandatory and advisory. The mandatory requirements are designated by the word "shall"; advisory requirements are designated by the words "should", "may", or "desirable", which are used interchangeably in this Standard.

Mandatory criteria generally apply to protection, performance, administration and compatibility; they specify minimally acceptable requirements. Advisory criteria are presented when their attainment may enhance the general performance of the cabling system in all its contemplated applications.

A note in the text, table, or figure is used for emphasis or offering informative suggestions, or providing additional information.

**Metric equivalents of United States customary units**

The units of measure in this Standard are metric or US customary with approximate conversion to the other.

For building sizes it is assumed that 1 $m^2$ is equal to 10 $ft^2$.

**Life of this Standard**

This Standard is a living document. The criteria contained in this Standard are subject to revisions and updating as warranted by advances in building construction techniques and telecommunications technology.

**Basic building elements**

Telecommunications has an impact on most every area within and between buildings. Because of this, and the additional fact that the useful life of a building may span many decades, it is important that the design and construction of new or remodeled buildings be performed with an objective of avoiding obsolescence. When a building is designed with its life cycle in mind, the resulting building will be responsive to the many changes that occur in both telecommunications media and systems over the life of the building.

Figure 2 illustrates the relationships between the major telecommunications pathway and space elements within a building. The list of these elements that follow the figure describes the characteristics of each element; numbers are keyed to respective sections within this Standard.

Figure 3 is a representative model of the various functional elements that comprise multi-tenant pathways and spaces in a building; this is not intended to be an all-inclusive representation. It depicts the relationship between the elements and how they are configured to create a total system.

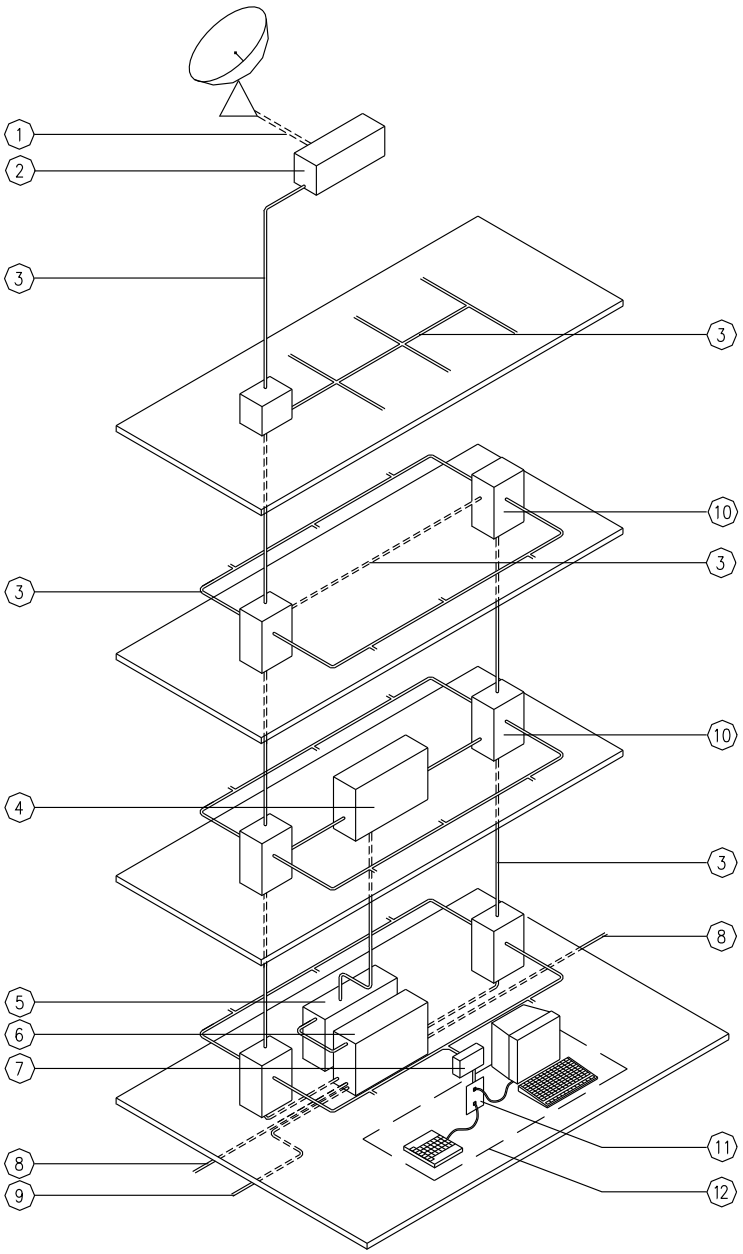


**Figure 2 – Example of pathways and spaces in a single-tenant building**

| | Description | Clause or subclause | | Description | Clause or subclause |
|---|---|---|---|---|---|
| 1 | Wireless service entrance pathway | 6.5.2 | 7 | Distributor enclosure | 6.6 |
| 2 | Entrance room | 6.5 | 8 | Service entrance pathway | 6.5.2 |
| 3 | Building pathways | 9 | 9 | Diversity of entrance routes | 5.5 |
| 4 | Distributor room | 6.3.10 | 10 | Distributor room | 6.3.10 |
| 5 | Access provider space, service provider space | 7 | 11 | Equipment outlet | 6.6 |
| 6 | Entrance room | 6.5 | 12 | Equipment outlet location | 6.7.3 |

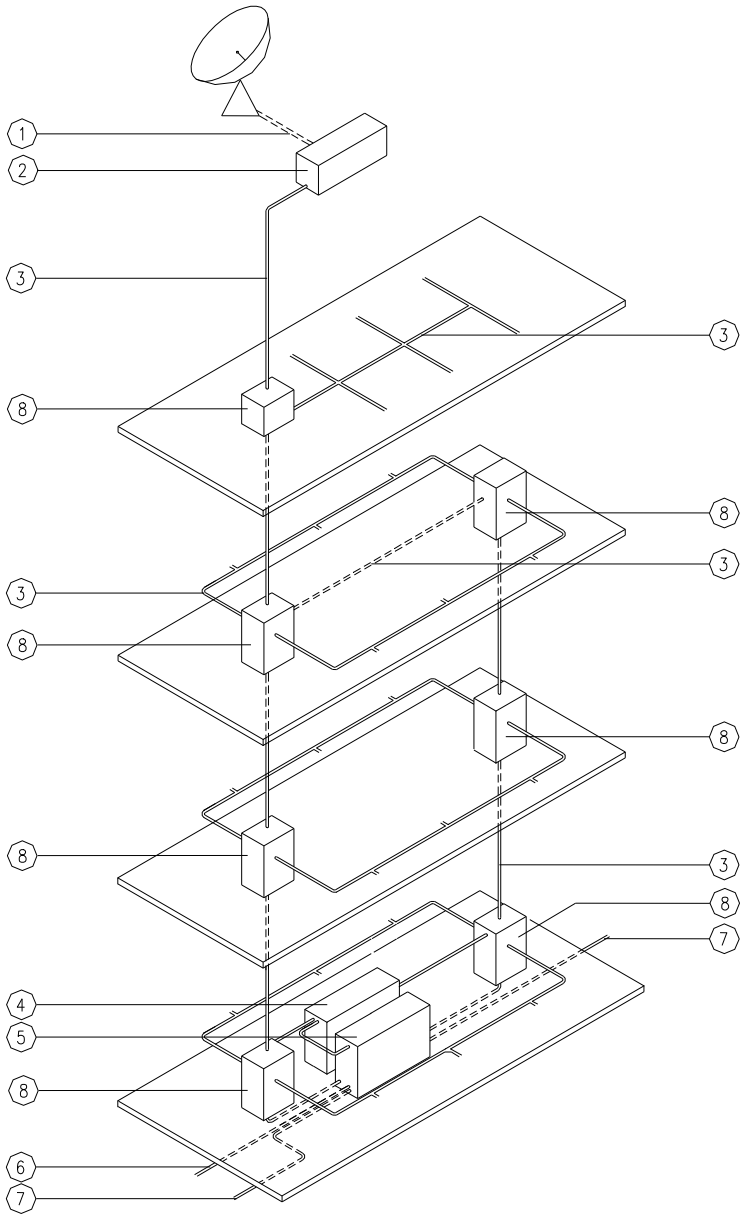


**Figure 3 – Example of common pathways and spaces in a multi-tenant building**

| | Description | Clause or subclause | | Description | Clause or subclause |
|---|---|---|---|---|---|
| 1 | Wireless service entrance pathway | 6.5.2 | 5 | Entrance room | 6.5 |
| 2 | Entrance room | 6.5 | 6 | Service entrance pathway | 6.5.2 |
| 3 | Common building pathways | 9 | 7 | Diversity of entrance routes | 5.5 |
| 4 | Access provider space, service provider space | 7 | 8 | Common distributor room | 8.2 |

# 1 SCOPE

This standard specifies requirements for telecommunications pathways and spaces.

**NOTE –** The diversity of services currently available, coupled with the continual addition of new services, means that there may be cases where limitations to desired performance occur. When applying specific applications to the infrastructure described in this Standard, the user is cautioned to consult application standards, regulations, equipment vendors, and system and service suppliers for applicability, limitations, and ancillary requirements.

Telecommunications Industry Association

ANSI/TIA-569-E-1-2022
APPROVED: JUNE 17, 2022

# TIA STANDARD

# Telecommunications Pathways and Spaces Addendum 1- Revised Temperature and Humidity Requirements

ANSI/TIA-569-E-1
(Addendum to TIA-569-E)

June 2022

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