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Standard Guide for Dimensional Coordination of Rectilinear Building Parts and Systems[1]

This standard is issued under the fixed designation E 577; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

INTRODUCTION

The concept of coordinating the dimensions of buildings and building parts with the dimensions of manufactured components and assemblies by means of a common dimensional factor, or module, was pioneered in the United States in the 1920s and 1930s. The terms "modular coordination" and "dimensional coordination" were adopted for the use of the basic building module and preferred dimensions in building design, production, and construction.

In 1939, the American Standards Association (now ANSI) organized project A62, a cooperative study of dimensional coordination, resulting in the issue of a series of standards concerning the subject between 1945 and 1971. Responsibility for the continuation of the work was transferred to ASTM and under the general supervision of Committee E-6 on Performance of Building Constructions. Subcommittee E06.62, Coordination of Dimensions for Building Materials and Systems, has the specific task to develop standards in this field, including metric versions that use the international building module of 100 mm.

In 1976, ASTM Committee E-6 approved ANSI/ASTM E 577 to set voluntary standards for the dimensional coordination of rectilinear building parts and systems in either metric (SI) or inch-pound units, using a basic incremental dimension (*M*) with the value 100 mm in SI units, or 4 in. in inch-pound units.

Subcommittee E06.62 has now prepared companion standards in acceptable metric and inch-pound units so that designers wishing to apply the principles of dimensional coordination can select preferences in line with the measurement system used in their documentation. Except for the dimensions ascribed to the basic building module and, therefore, its multiples, the companion standards are identical in text.[2]

1. Scope

1.1 This guide covers the application of dimensional coordination in building design and the fabrication of rectilinear building parts and systems. A minimum number of preferred dimensions are recommended to give a range of alternatives that should result in economies in design, detailing, production, and construction. Dimensional coordination should be used where benefits in documentation, fabrication, installation, and maintenance can be established, but is not intended to eliminate uncoordinated custom design.

1.2 Specifically, the guide covers:

1.2.1 Descriptions of terms used in dimensional coordination.

1.2.2 The basis for the dimensional coordination of building parts and systems in the design of buildings.

1.2.3 Preferred horizontal and vertical dimensions for building parts and for the coordination of systems.

1.3 This guide does not state preferred dimensions and sizes for building components, except for general principles.

1.4 Basic guidelines for dimensioning in modular drawing practice are given.

1.5 Where practicable, recommendations in international standards prepared by the International Organization for Standardization (ISO) have been taken into account.

[1] This guide is under the jurisidiction of ASTM Committee E-6 on Performance of Buildings and is the direct responsibility of Subcommittee E06.62 on Coordination of Dimensions for Building Materials and Systems.

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[2] The standards replace ANSI/ASTM E 577-76 and supersedes ANSI A62.1-1957, A62.5-1965, and A62.7-1969.

2. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *basic building module (basic module)*—a unit dimension used as the standard increment in the dimensional coordination of buildings and building parts.

2.1.1.1 *Discussion*—For dimensional coordination in metric (SI) units, the basic building module has the internationally agreed value of 100 mm; the basic building module is designated by the symbol *M*; for example: 100 mm = 1 *M*; 1200 mm = 12 *M*. For dimensional coordination in inch-pound units, the basic building module has the value of 4 in.; the basic building module is designated by the symbol *M*; for example: 4 in. = *M*; 48 in. or 4 ft 0 in. = 12 *M*.

2.1.2 *building part*—a piece or unit of building material including joints, or an item of building equipment. Rectilinear building parts have sides that are at right angles to each other.

2.1.3 *ceiling height*—the dimension that extends from the coordinating interface of a wall component at the floor to its coordinating interface at the ceiling (see Fig. 1 (*B*)).

2.1.4 *ceiling space dimension*—the dimension measured from the wall-to-ceiling interface to the lowest point of the horizontal structural elements, generally applicable only for suspended ceilings and includes the ceiling construction and the plenum above, if any (see Fig. 1 (*F*)).

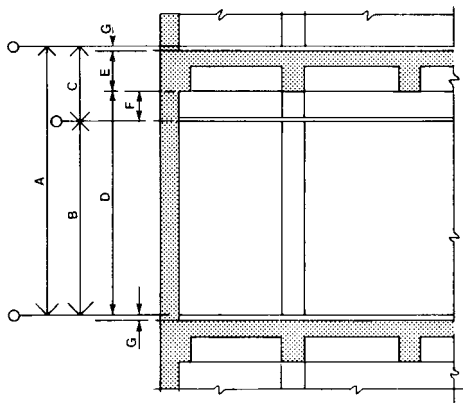
2.1.5 *change in level*—the vertical difference between two adjacent floor or roof planes, or both (see Fig. 2).

2.1.6 *clear structure height*—the clear distance between the highest point of the horizontal structure of one story to the lowest point of the horizontal structure of the story above (see Fig. 1 (*D*)).

2.1.7 *controlling dimension*—a modular coordinating dimension between controlling planes, for example, story height, ceiling height, distance between axes of columns, thickness of controlling zone.

2.1.8 *controlling plane or line*—a plane or line that represents a major building space reference in dimensional coordination.

2.1.9 *controlling zone*—a zone between controlling planes.



A—Story height
C—Floor-ceiling thickness
D—Clear structure height
E—Horizontal structure thickness
F—Ceiling space dimension
G—Thickness of finished floor

FIG. 1 Preferred Vertical Dimensions

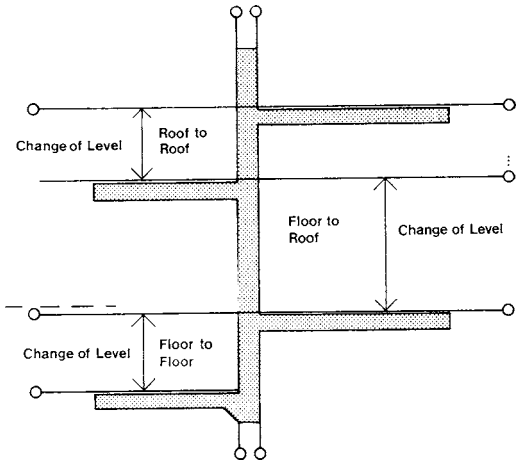


FIG. 2 Changes of Level at Floors or Roofs

2.1.10 *coordinating dimension*—a preferred dimension between coordinating planes or lines that is a whole multiple of the module and used in the coordination of building parts and components, including allowances for joints and tolerances.

2.1.11 *coordinating line or plane*—the theoretical line or plane by reference to which one building part or component is coordinated with another.

2.1.12 *custom dimension*—any dimension that is not a whole multiple of the basic module.

2.1.13 *dimension*—a linear distance, such as length, width, height, depth, or thickness.

2.1.14 *dimensional coordination*—a comprehensive approach to the coordination of the geometry of buildings, building parts, components, and systems, through a set of dimensional preferences derived from the basic module; a relationship between sizes and dimensions of building parts that will permit their assembly and erection without modification or adjustment (see Fig. 3).

2.1.15 *dimensionally coordinated product*—building product, the dimensions of which are established in conformance with this guide, and which include allowances for joint thicknesses and dimensional tolerances (see Fig. 4).

2.1.16 *floor-ceiling thickness*—the dimension from the ceiling plane to the finished floor plane of the story immediately above (see Fig. 1 (*C*)).

2.1.17 *horizontal structure thickness*—the vertical dimension of the structural floor or roof system; in the case of structural floors, the dimension between the structural floor and the lowest point of that structural floor system (see Fig. 1 (*E*)).

2.1.18 *intermediate controlling dimension*—a preferred dimension used for control of openings or other elements; for example, door heads and jambs (see Fig. 5).

2.1.19 *joint*—the space formed by two adjacent building parts or components, when these are put together, fixed, or combined with or without a jointing product (see Fig. 4).

2.1.20 *modular coordination*—dimensional coordination employing the basic building module or multimodules.

2.1.21 *modular grid*—a reference grid with lines or planes at right angles, the spacing of which are either the basic building module or multiples. The spacing of lines or planes in a modular grid need not be the same in difference directions.