



Standard Classification for Building Floor Area Measurements for Facility Management¹

This standard is issued under the fixed designation E 1836; 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 approval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This classification provides a systematic basis for categorising how floor area in buildings is measured for certain specified purposes, such as facility management, occupant requirements, space planning, or strategic facility planning.

1.2 This classification does not specify what measurements must be conducted.

1.3 Annex A1 may be used to classify floor area in one or more specific functional types of building, such as offices, laboratory, or manufacturing buildings and building-related facilities.

1.4 This classification can be applied to owned, rented and leased buildings.

1.5 The classification in Annex A1 is not intended for use in lease negotiations with owners of commercial office buildings or related properties. For that purpose, users are referred to the American National Standard published by the American National Standards Institute under the designation ANSI Z65.1 and commonly known as the ANSI-BOMA standard.

1.6 This classification is not intended for, and is not suitable for, use for regulatory purposes, nor for fire hazard assessment nor for fire risk assessment.

1.7 This classification, developed for use within North America, is similar to the ISO 9836 Performance standards in building—Definition and calculation of area and space indicators.

1.8 This classification contains the following information in the sections indicated:

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Annex

A1

2. Referenced Documents

2.1 ASTM Standards:

E 631 Terminology of Building Constructions²

E 1480 Terminology of Facility Management (Building-Related)²

E 1664 Classification for the Serviceability of an Office Facility for Layout and Building Factors²

2.2 ANSI Standard:

ANSI Z65.1 – 96 Standard Method for Measuring Floor Area in Office Buildings³

3. Terminology

3.1 Definitions:

3.1.1 *building, n, vt*—(1) a shelter comprising a partially or totally enclosed space, erected by means of a planned process of forming and combining materials; (2) the act or process of constructing. **E 631**

3.1.2 *facility, n*—a physical setting used to serve a specific purpose.

3.1.2.1 *Discussion*—A facility may be within a building, or a whole building, or a building with its site and surrounding environment; or it may be a construction that is not a building. The term encompasses both the physical object and its use. **E 631**

3.2 Definitions of Terms Specific to This Standard:

3.2.1 The descriptions of terms listed below also appear in Annex A1.

3.2.2 *building projection, n*—a convector, baseboard heating unit, radiator, or other building element located in the interior of a building adjacent to a wall that prevents the use of that space for furniture, equipment, circulation, or other functions.

3.2.3 *excluded area, n*—fully enclosed spaces with adequate clear headroom that, for some reason, are not intended for or are not suitable for occupancy by people or equipment, but not

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² Annual ASTM Book of Standards, Vol 04.11.

³ Effective June 21, 1989, is available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

spaces that are temporarily unusable due to flood, fire damage, construction, or renovation activity.

3.2.3.1 *Discussion*—Examples of excluded areas are unfinished attic spaces, attic spaces without unobstructed access, damp or flooded basements, and confined spaces requiring permits for entry.

3.2.4 *finished surface, n*—a wall, ceiling, or floor surface, including glass, as prepared for tenant or occupant use, excluding the thickness of any special surfacing materials such as panelling, furring strips, and carpet.

3.2.5 *interstitial area, n*—the area of load-bearing surfaces, located above or below occupied building floors, that are not available for general occupancy due to inadequate clear head-room, but may contain building mechanical or electrical systems predominantly serving adjacent floors or provide access to such systems.

4. Significance and Use

4.1 This classification can be used to facilitate comparison of areas that have been measured but does not specify what measurements must be conducted.

4.2 This classification can be used in space programming and forecasting of space requirements.

4.3 This classification can be used to classify areas for internal cost accounting purposes.

4.4 This classification can be used to compare space use between organizations.

5. Basis for Classification

5.1 The basis for classification of floor area measurements for certain functional types of building is contained in Annex A1.

5.2 In the future, additional annexes are expected to be added to this document to classify floor area measurements in other functional types of building and to compare floor area classifications for different purposes or from different countries.

5.3 Task groups of E06.25 exist to develop other annexes to this classification, for some other functional types of building, and to enable comparison to area measurements from other jurisdictions, including Japan and Europe.

5.4 A method for estimating the effect of building loss features is contained in Classification E 1664.

6. Report

6.1 Annex A1 gives guidance for reporting measurements for certain functional types of building for those purposes stated in Section 1.

6.2 When reporting floor area that has been categorised in accordance with the guidance in Annex A1, identify the method that was used and note any exceptions to its methods. Where possible, the extent of variation shall be assessed and stated as an estimate.

7. Keywords

7.1 area; building; building floor area; facility; facility management; floor area; measurement; occupant requirement

ANNEX

(Mandatory Information)

A1. CLASSIFICATION OF BUILDING FLOOR AREA MEASUREMENTS IN OFFICES, RESEARCH, LABORATORY, AND MANUFACTURING BUILDINGS AND BUILDING-RELATED FACILITIES⁴

A1.1 Introduction

A1.1.1 This annex describes standard methods of measuring facility floor areas in office, research, laboratory, and manufacturing buildings. The purpose is to provide consistent terms and definitions for floor area measurements to facilitate comparison of space measurements among different organizations.

A1.2 Scope

A1.2.1 This annex of the classification is applicable to measurement of space in both leased and owner occupied buildings. The document is applicable to office, research, laboratory, and manufacturing buildings.

A1.2.2 This annex of the classification is intended for use by facility managers and occupants of buildings and building-

related facilities. It is suitable for such purposes as strategic facility planning, space management, and internal chargeback to occupant organizations.

A1.2.3 This annex of the classification is not intended for use in lease negotiations with owners of commercial office buildings or related properties. For that purpose, users are referred to the American National Standard published by the American National Standards Institute under the designation ANSI Z65.1 and commonly known as the ANSI-BOMA standard.

A1.2.4 The scope of this annex includes the following categories of floor area measurement. The relationships among them are listed in A1.2.5 and are diagrammed in Fig. A1.1.

A1.2.4.1 *building exterior gross area*, measures all floor areas on all levels of a building. The measurement indicates total constructed space and is useful for building efficiency and construction cost comparisons.

⁴ This acknowledges the cooperation of the International Facility Management Association (IFMA) and its Standards Committee on the development of this standard.

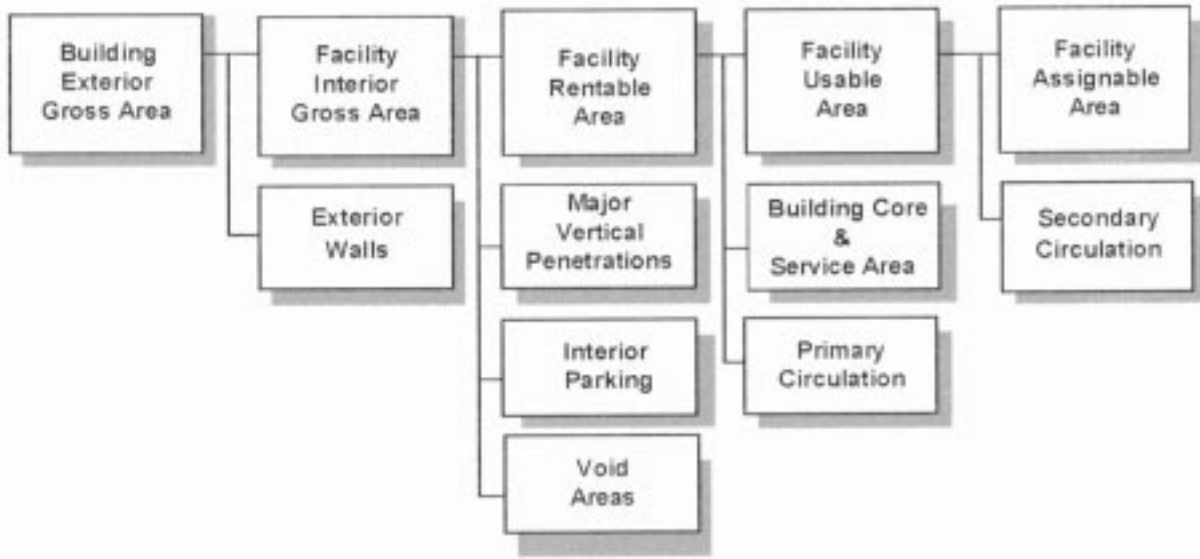


FIG. A1.1 Floor Area Measurement Relationships

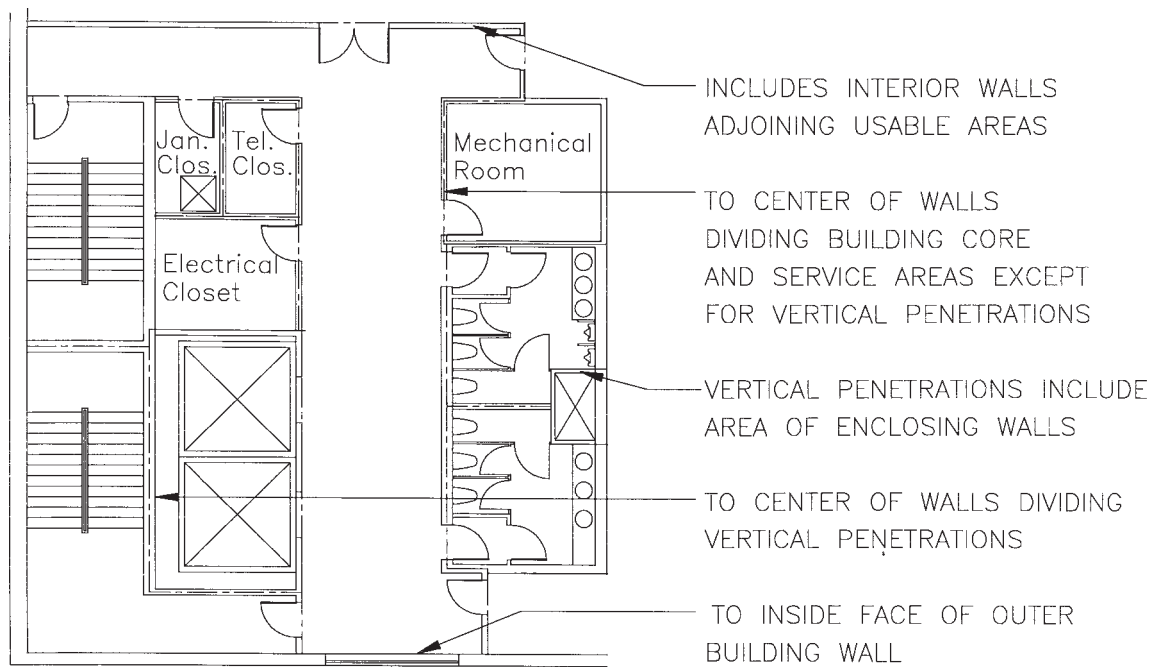


FIG. A1.2 Building Core and Service Area Using Recommended Area Classification Method

A1.2.4.2 *facility interior gross area*, is the measurement of area at the floor surface plane as it intersects the exterior wall.

A1.2.4.3 *facility rentable area*, is useful as a consistent basis for comparison with other buildings. The calculation is applicable to both leased buildings and owner-occupied buildings. Facility rentable area as defined in this classification is not necessarily the basis for lease agreements.

A1.2.4.4 *facility usable area*, calculates the portion of a building or floor area used for secondary circulation and to

house personnel, furniture, and equipment. Facility usable area is a measurement for programming, planning, and allocating space.

A1.2.4.5 *facility assignable area*, measures the portion of a floor or building used to house personnel, furniture, and equipment. Facility assignable area is useful for *detailed* programming, planning, allocating, and layout of space.

A1.2.5 *Relationships among Floor Area Measurements:*

Facility interior gross area	=	Building exterior gross area – Exterior walls
Facility rentable area	=	Facility interior gross area – Major vertical penetrations, interior parking, and void areas
Facility usable area	=	Facility rentable area – Building core and service area and primary circulation
Facility assignable area	=	Facility usable area – Secondary circulation

A1.3 Terminology

A1.3.1 *building projection*—a convector, baseboard heating unit, radiator, or other building element located inside a building adjacent to a wall that prevents the use of that space for furniture, equipment, circulation, or other functions.

A1.3.2 *excluded area*—fully enclosed spaces with adequate clear headroom that, for some reason, are not intended for or are not suitable for occupancy by people or equipment, but not spaces that are temporarily unusable due to flood, fire damage, construction, or renovation activity.

A1.3.2.1 *Discussion*—Examples of excluded areas are unfinished attic spaces, attic spaces without unobstructed access, damp or flooded basements, and confined spaces requiring permits for entry.

A1.3.3 *finished surface*—a wall, ceiling, or floor surface, including glass, as prepared for tenant or occupant use, excluding the thickness of any special surfacing materials such as panelling, furring strips, and carpet.

A1.3.4 *interstitial area*—the area of load bearing surfaces, located above or below occupied building floors, that are not available for general occupancy due to inadequate clear headroom but may contain building mechanical or electrical systems predominantly serving adjacent floors or provide access to such systems.

A1.4 Floor Area Measurement Guidelines

A1.4.1 The following guidelines apply to all space categories:

A1.4.1.1 *Measurements*—All measurements shall be made along the plane of the floor to the points where floors and walls intersect.

A1.4.1.2 *Clear Headroom*—Floor area that does not have sufficient clear, unobstructed headroom to conform to local building codes or that has headroom less than that required for occupancy (typically 2.0 to 2.3 m (6.5 to 7.5 ft)) shall not be included in any floor area measurement.

A1.4.1.2.1 *Discussion*—Floor area under objects such as pipes, ductwork, and equipment that are physically attached to the building and that obstruct the zone between the floor and the height above the floor for required headroom is considered obstructed. Where an area with sufficient clear headroom can only be accessed through an obstructed area, then the area with clear headroom is also considered obstructed area.

A1.4.1.3 *Floor Area*—This standard includes only areas that are totally enclosed within the building. Climate conditions and construction practices will dictate the degree of weather tightness typical for exterior walls in a local area. Basements, enclosed porches, penthouses, mechanical equipment rooms, lobbies, mezzanines, corridors, interior parking, and enclosed loading docks are included. Spaces outside the exterior walls or without a roof covering are not included in the floor area measurement. Interstitial areas and excluded areas are not included in floor area measurement.

A1.4.1.4 *Void Areas*—The floor areas of rooms more than one story in height and having void areas on upper floors, such as atria, light wells, or lobbies, are included in the area measurement. Major vertical penetrations are not considered void areas.

A1.4.1.5 *Exterior Bridges and Tunnels*—Totally enclosed, constructed areas connecting two or more buildings. Exterior bridges and tunnels shall be assigned to one building or apportioned between buildings.

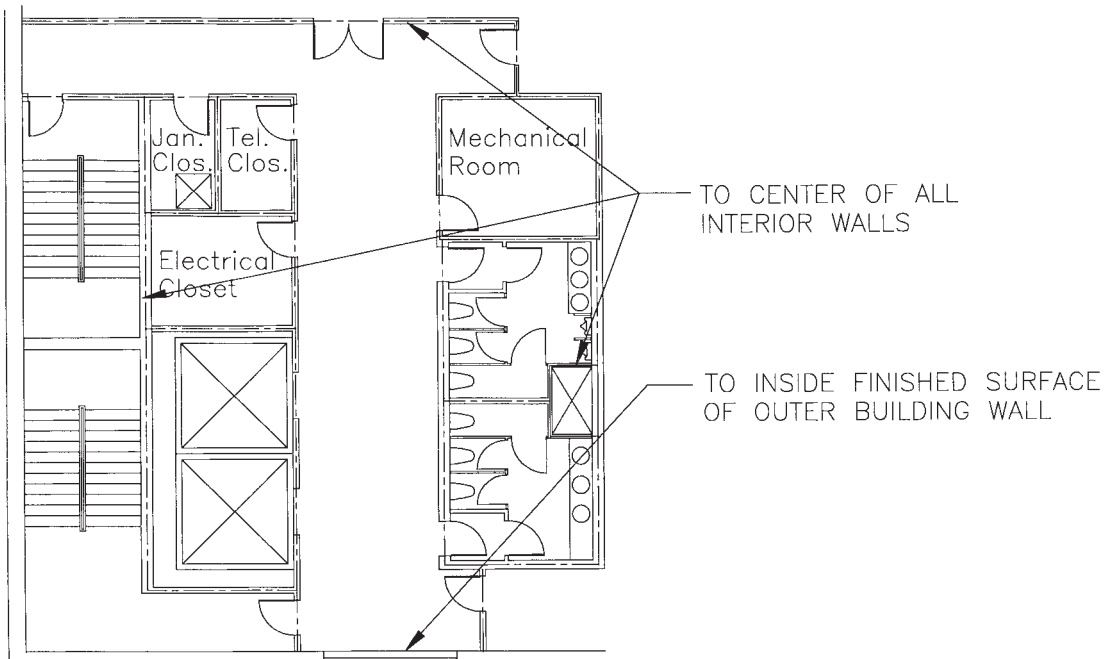


FIG. A1.3 Building Core and Service Area Using Alternate Classification Method

A1.4.1.6 Tenant Support Area—The floor area of a tenant used to support operations of the tenant and not available for use by any other tenant nor the building. Examples include tenant photocopier rooms, computer rooms, mailrooms, etc.

A1.4.1.7 Reporting Exceptions—If an organization chooses to exclude building columns and projections from the calculation of facility usable or facility assignable areas, this practice should be noted when reporting area measurement. If the alternate method of calculating building core and service area as shown in Fig. A1.3 is used, this should also be noted.

A1.5 Building Exterior Gross Area

A1.5.1 Building exterior gross area is the sum of the floor areas on all levels of a building that are totally enclosed within the building (see Fig. A1.4). Measure building exterior gross area to the outside face of exterior walls, disregarding canopies, cornices, pilasters, buttresses, balconies that extend beyond the wall face, and courtyards that are enclosed by walls but have no roof. The building gross area of basement space includes the area measured to the outside face of basement or foundation walls.

A1.5.2 If the property line lies within a building wall that is common with an adjoining building, measure the building exterior gross area to the property line. If the property line does not lie within a building wall but the wall is structurally common with an adjoining building, measure building exterior gross area to the center of the structural portion of the common wall.

A1.5.3 Exterior bridges and tunnels that are totally enclosed, constructed areas connecting two or more buildings are included in building exterior gross area.

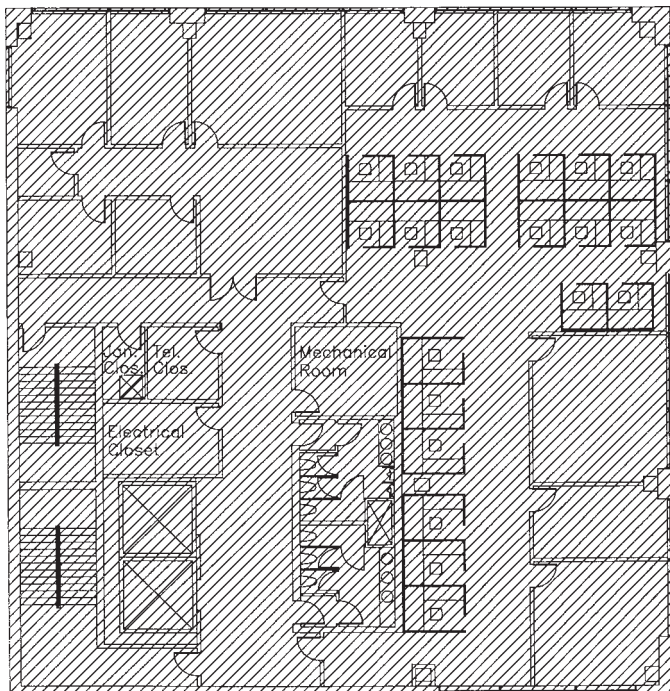


FIG. A1.4 Building Exterior Gross Area

A1.6 Facility Interior Gross Area

A1.6.1 Facility interior gross area is building exterior gross area less the thickness of exterior walls.

A1.7 Exterior Walls

A1.7.1 Exterior walls are measured at the intersection of the plane of the finished floor and the finished interior surface of the walls.

A1.8 Facility Rentable Area

A1.8.1 Facility rentable area is useful as a consistent basis of comparison with other buildings (see Fig. A1.5). Facility rentable area can be calculated for any building, whether leased or owner-occupied. Facility rentable area as defined in this classification is not necessarily the basis for lease agreements.

A1.8.2 Facility rentable area is calculated by measuring the major vertical penetrations, interior parking, and void areas and subtracting their total area from facility interior gross area. For sloping walls, floor area measurements will be made at the intersection of the plane of the finished floor.

A1.8.3 The areas of columns and building projections are included in facility rentable area. Excluded from facility rentable area are exterior walls, major vertical penetrations, interior parking, and void areas.

A1.9 Major Vertical Penetrations

A1.9.1 Major vertical penetrations shall include stairs, elevator shafts, flues, pipe shafts, vertical ducts and their enclosing walls. Stairs and elevator shafts shall be considered major vertical penetrations for all affected floors, even the lowest level at which they originate. Not included in this category are stairs, dumbwaiters, and lifts that do not serve a general building circulation function but exclusively serve a specific tenant. In calculating the area of vertical penetrations, disregard areas less than 0.1 m² (1 ft²).

A1.9.2 This definition of major vertical penetrations is consistent with that given in ANSI Z65.1.

A1.10 Interior Parking

A1.10.1 Interior parking that is totally enclosed within the building is included in interior building gross area but is not included in facility rentable area.

A1.11 Void Areas

A1.11.1 Void areas are included in the facility rentable area of only the lowest floor, not the upper floors.

A1.12 Facility Usable Area

A1.12.1 Facility usable area is the floor area of a facility that can be assigned to occupant groups (see Fig. A1.6). Facility usable area excludes exterior walls, major vertical penetrations, interior parking, void areas, primary circulation, building core, and building service areas.

A1.12.2 Facility usable area is calculated by measuring the building core and service areas, and primary circulation and subtracting their total area from facility rentable area.

A1.12.3 When determining the facility usable area of a department or leasehold, measure to the center of the common walls dividing the space from adjoining facility usable areas.

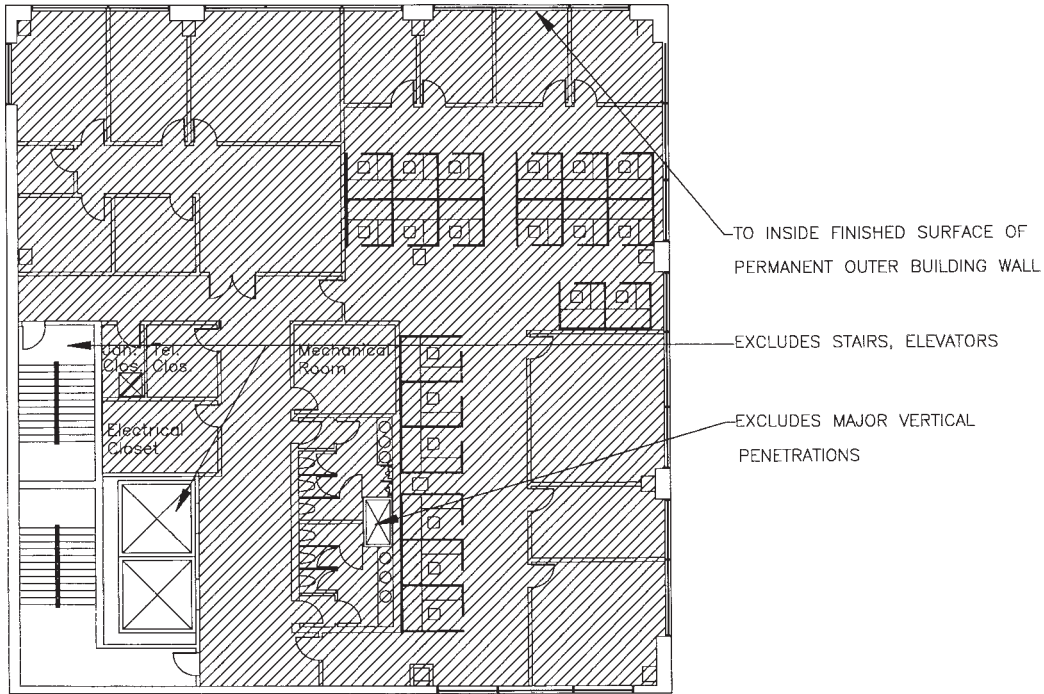


FIG. A1.5 Facility Rentable Area

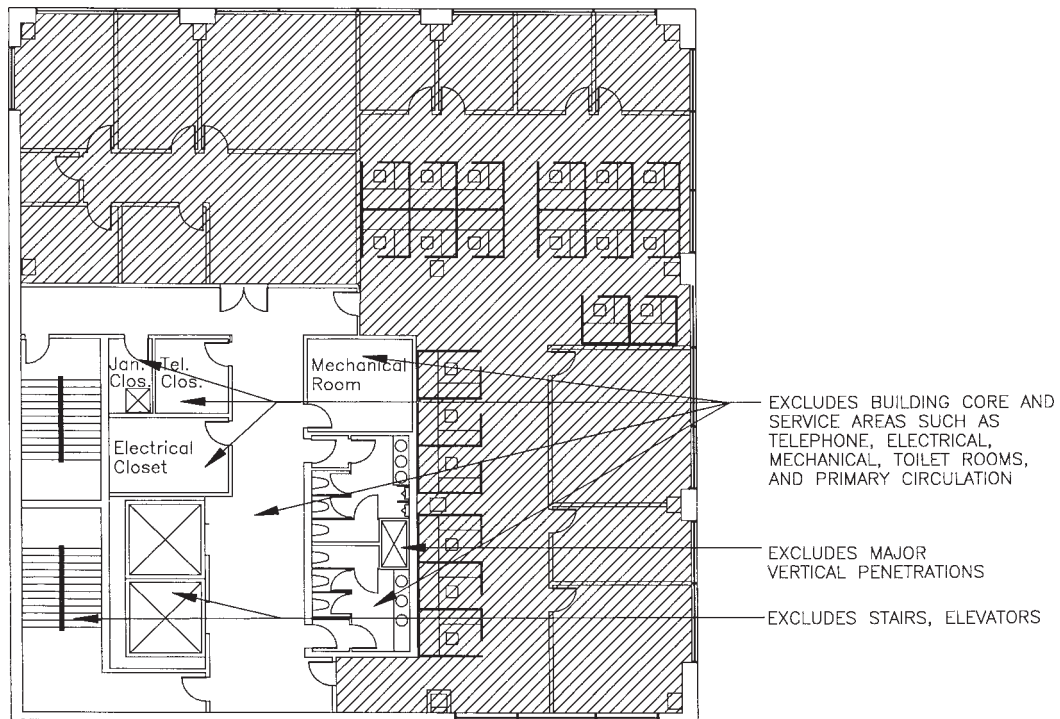


FIG. A1.6 Facility Usable Area

A1.13 Building Core and Service Area

A1.13.1 Building core and service area are the floor area of a facility necessary for the operation of the facility and are not available for general occupancy.

A1.13.2 Building core and service area include the following: building lobbies, mechanical rooms, electrical rooms,

telephone rooms, toilet rooms, restrooms, custodial rooms, and utility tunnels that are not used for any other purpose.

A1.13.3 Rooms such as mechanical rooms, electrical rooms, and telephone rooms that serve only the *special* needs of an individual tenant or occupant and are not required for the operation of the building are not part of building core and

service area. They shall be included in the facility usable area for the tenant or occupant they serve.

A1.13.4 A toilet room that is considered private (accessible only from a private office or limited in use to a specific group of people) shall be classified as a private toilet room and not included as part of building core and service area. It shall be counted as facility usable area for the tenant or occupant that it serves.

A1.13.5 Loading docks used for more than one tenant or to service the functions of the building as a whole shall be classified as service area.

A1.13.6 Loading docks used by one tenant in a multi-tenant building shall not be included as part of building core and service area; they shall be included as part of the tenant's facility assignable area.

A1.14 Building Core and Service Area Measurement Methods

A1.14.1 Two methods for calculating building core and service area are defined. (Refer to Figs. A1.2 and A1.3.) These methods are similar except in the treatment of wall thicknesses.

A1.14.2 The recommended method is to calculate the area of building core and service spaces by measuring to the center of all interior walls, except in the following cases:

A1.14.2.1 Where a major vertical penetration adjoins a building core and service area, the thickness of the wall shall be included in the major vertical penetration, or

A1.14.2.2 Where a building core and service area adjoins facility usable area, the thickness of the wall shall be included in the area of the building core and service area.

A1.14.2.3 An alternate method is to measure to the center of the wall and so note when reporting area measurements. (See Fig. A1.3)

A1.15 Primary Circulation

A1.15.1 Primary circulation area is the portion of a building that is a public corridor or lobby or is required for access by all occupants on a floor to stairs, elevators, toilet rooms, building entrances, and tenant space entry points on multi-tenant floors.

A1.15.2 Primary circulation is determined by identifying the reasonable minimum circulation connecting stairs, elevators, toilet rooms, building entrances, and tenant space entry points on multi-tenant floors. Bridges, tunnels, and atria that do not meet this strict definition but are used for primary circulation even though they may be used for other purposes shall be considered primary circulation.

A1.15.3 Circulation required to access rooms or closets for building electrical, building mechanical, and building telephone and data equipment when access to such rooms or closets is not dedicated to the use of a single tenant shall be considered primary circulation.

A1.15.4 Primary circulation does not necessarily include all circulation required for life safety access and egress. However, if dedicated circulation required for egress can serve no normal secondary circulation function, it shall be considered primary circulation.

A1.15.5 In space layouts where several alternative circulation routes connect stairs, elevators, toilet rooms, and entrances, one route should be designated as primary circulation with the remaining circulation routes designated as secondary circulation. This differentiation is important to ensure validity of measurements for comparison purposes.

A1.16 Facility Assignable Area

A1.16.1 Facility assignable area is the portion of facility usable area that can be assigned to occupant groups or

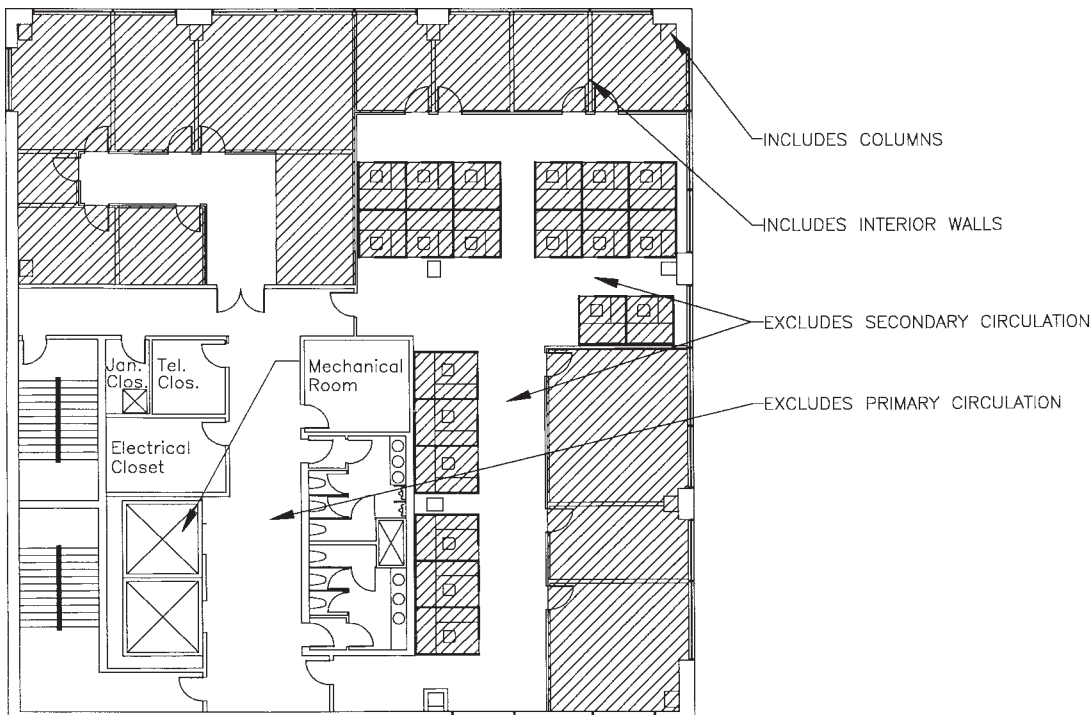


FIG. A1.7 Facility Assignable Area

functions (see Fig. A1.7). Facility assignable area includes interior walls, building columns, and projections. Facility assignable area excludes exterior walls, major vertical penetrations, interior parking, void areas, building core and service area, primary circulation, and secondary circulation.

A1.16.2 Facility assignable area is calculated by measuring the portions of a floor used to house tenant personnel, tenant furniture, tenant equipment, tenant support areas, and common support areas. Facility assignable area excludes secondary circulation.

A1.16.3 For each assignable area, measure to the outside of the enclosing wall or furniture panel except in the following case:

A1.16.3.1 Where a wall or furniture panel is common to more than one assignable area, measure to the center of the wall or furniture panel.

A1.17 Secondary Circulation Area

A1.17.1 Secondary circulation area is the portion of a building or floor required for access to some subdivision of

space that is not defined as primary circulation. Secondary circulation may or may not be surrounded by walls or furniture panels.

A1.17.2 Secondary circulation is calculated by measuring each facility assignable area and subtracting the total of all facility assignable areas from facility usable area.

A1.18 Common Support Areas

A1.18.1 Facility assignable area includes the area devoted to common support services. Common support area is the portion of the facility usable area not attributed to any one occupant but provides support for several or all occupant groups. Examples of common support areas are cafeterias, vending areas, auditoriums, fitness facilities, building mail-rooms, and first aid rooms. These may be separately identified as a sub-category of facility assignable area if required.

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