

2. SCOPE

2.1 This standard provides

- a. minimum energy-efficient requirements for the design and construction, and a plan for operation and maintenance of
 1. new buildings and their systems,
 2. new portions of buildings and their systems,
 3. new systems and equipment in existing buildings, and
 4. new equipment or building systems specifically identified in the standard that are part of industrial or manufacturing processesand
- b. criteria for determining compliance with these requirements.

2.2 The provisions of this standard do not apply to

- a. single-family houses, multifamily structures of three stories or fewer above grade, manufactured houses (mobile homes), and manufactured houses (modular) or
- b. buildings that use neither electricity nor fossil fuel.

2.3 Where specifically noted in this standard, certain other buildings or elements of buildings shall be exempt.

2.4 This standard shall not be used to circumvent any safety, health, or environmental requirements.

3. DEFINITIONS, ABBREVIATIONS, AND ACRONYMS

3.1 **General.** Certain terms, abbreviations, and acronyms are defined in this section for the purposes of this standard. These definitions are applicable to all sections of this standard. Terms that are not defined shall have their ordinarily accepted meanings within the context in which they are used. Ordinarily accepted meanings shall be based upon American standard English language usage as documented in an unabridged dictionary accepted by the adopting authority.

3.2 Definitions

above-grade wall: see *wall*.

access hatch: see *door*.

addition: an extension or increase in floor area or height of a building outside of the existing building envelope.

adopting authority: the agency or agent that adopts this standard.

air economizer: see *economizer, air*.

air system balancing: see *balancing, air system*.

alteration: a replacement or addition to a building or its systems and equipment; routine maintenance, repair, and service, or a change in the building's use classification or category shall not constitute an alteration.

annual fuel utilization efficiency (AFUE): an efficiency descriptor of the ratio of annual output energy to annual input energy as developed in accordance with the requirements of U.S. Department of Energy (DOE) 10 CFR Part 430.

astronomical time switch: a device that turns the lighting on at a time relative to sunset and off at a time relative to sunrise, accounting for geographic location and day of year.

attic and other roofs: see *roof*.

authority having jurisdiction: the agency or agent responsible for enforcing this standard.

automatic: self-acting, operating by its own mechanism when actuated by some nonmanual influence, such as a change in current strength, pressure, temperature, or mechanical configuration.

automatic control device: a device capable of automatically turning loads off and on without manual intervention.

balancing, air system: adjusting airflow rates through air distribution system devices, such as fans and diffusers, by manually adjusting the position of dampers, splitter vanes, extractors, etc., or by using automatic control devices, such as constant-air-volume or variable-air-volume (VAV) boxes.

balancing, hydronic system: adjusting water flow rates through hydronic distribution system devices, such as pumps and coils, by manually adjusting the position valves or by using automatic control devices, such as automatic flow control valves.

ballast: a device used in conjunction with an electric-discharge lamp to cause the lamp to start and operate under the proper circuit conditions of voltage, current, wave form, electrode heat, etc.

electronic ballast: a ballast constructed using electronic circuitry.

hybrid ballast: a ballast constructed using a combination of magnetic core and insulated wire winding and electronic circuitry.

magnetic ballast: a ballast constructed with magnetic core and a winding of insulated wire.

baseline building design: a computer representation of a hypothetical design based on the proposed building project. This representation is used as the basis for calculating the baseline building performance for rating above-standard design.

baseline building performance: the annual energy cost for a building design intended for use as a baseline for rating above-standard design.

below-grade wall: see *wall*.

boiler: a self-contained, low-pressure appliance for supplying steam or hot water.

modulating boiler: a boiler that is capable of more than a single firing rate in response to a varying temperature or heating load.

packaged boiler: a boiler that is shipped complete with heating equipment, mechanical draft equipment, and automatic controls, and that is usually shipped in one or more sections. A packaged boiler includes factory-built boilers manufactured as a unit or system, disassembled for shipment, and reassembled at the site.

boiler system: one or more boilers and their piping and controls that work together to supply steam or hot water to heat output devices remote from the boiler.

branch circuit: the circuit conductors between the final overcurrent device protecting the circuit and the outlet(s); the final wiring run to the load.

bubble point: the refrigerant liquid saturation temperature at a specified pressure.

budget building design: a computer representation of a hypothetical design based on the actual proposed building design. This representation is used as the basis for calculating the energy cost budget.

building: a structure wholly or partially enclosed within exterior walls, or within exterior and party walls, and a roof, affording shelter to persons, animals, or property.

building entrance: any doorway, set of doors, revolving door, vestibule, or other form of portal that is ordinarily used to gain access to the building or to exit from the building by its users and occupants. This does not include doors solely used to directly enter mechanical, electrical, and other building utility service equipment rooms.

building envelope: the exterior plus the semi-exterior portions of a building. For the purposes of determining building envelope requirements, the classifications are defined as follows:

exterior building envelope: the elements of a building that separate conditioned spaces from the exterior.

semi-exterior building envelope: the elements of a building that separate conditioned space from unconditioned space or that enclose semiheated spaces through which thermal energy may be transferred to or from the exterior, to or from unconditioned spaces, or to or from conditioned spaces.

building envelope trade-off schedules and loads: the schedules and internal loads¹, by building area type, to be used in the building envelope trade-off option simulations described in Appendix C.

building exit: any doorway, set of doors, or other form of portal that is ordinarily used only for emergency egress or convenience exit.

building grounds lighting: lighting provided through a building's electrical service for parking lot, site, roadway, pedestrian pathway, loading dock, or security applications.

building material: any element of the building envelope, other than air films and insulation, through which heat flows and that is included in the component U-factor calculations.

building official: the officer or other designated representative authorized to act on behalf of the authority having jurisdiction.

C-factor: see *thermal conductance*.

circuit breaker: a device designed to open and close a circuit by nonautomatic means and to open the circuit automatically

at a predetermined overcurrent without damage to itself when properly applied within its rating.

class of construction: for the building envelope, a subcategory of roof, above-grade wall, below-grade wall, floor, slab-on-grade floor, opaque door, vertical fenestration, or skylight. (See *roof, wall, floor, slab-on-grade floor, door, and fenestration*.)

code official: see *building official*.

coefficient of performance (COP)—cooling: the ratio of the rate of heat removal to the rate of energy input, in consistent units, for a complete refrigerating system or some specific portion of that system under designated operating conditions.

coefficient of performance (COP), heat pump—heating: the ratio of the rate of heat delivered to the rate of energy input, in consistent units, for a complete heat pump system, including the compressor and, if applicable, auxiliary heat, under designated operating conditions.

computer room: a room whose primary function is to house equipment for the processing and storage of electronic data and that has a design electronic data equipment power density exceeding 20 W/ft² of conditioned floor area.

computer room energy: annual energy use of the data center, including all IT equipment energy, plus energy that supports the IT equipment and computer room space, calculated in accordance with industry-accepted standards defined as Total Annual Energy (see Informative Appendix E).

condensing unit: a factory-made assembly of refrigeration components designed to compress and liquefy a specific refrigerant. It consists of one or more refrigerant compressors, refrigerant condensers (air cooled, evaporatively cooled, and/or water-cooled), condenser fans and motors (where used), and factory-supplied accessories.

conditioned floor area, gross: see *floor area, gross*.

conditioned space: see *space*.

conductance: see *thermal conductance*.

construction: the fabrication and erection of a new building or any addition to or alteration of an existing building.

construction documents: drawings and specifications used to construct a building, building systems, or portions thereof.

continuous air barrier: the combination of interconnected materials, assemblies, and sealed joints and components of the building envelope that minimize air leakage into or out of the building envelope.

continuous daylight dimming: method of automatic lighting control using daylight photosensors, where the lights are dimmed continuously, or using at least four preset levels with at least a five-second fade between levels, where the control turns the lights off when sufficient daylight is available.

continuous insulation (c.i.): insulation that is uncompressed and continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

1. Schedules and internal loads, by building area type, are located at <http://sspc901.ashraeps.org/content.html>.

control: to regulate the operation of equipment.

control device: a specialized device used to regulate the operation of equipment.

cooldown: reduction of space temperature down to occupied setpoint after a period of shutdown or setup.

cooled space: see *space, conditioned space*.

cooling degree-day, base (CDD): see *degree-day*.

cooling design temperature: the outdoor dry-bulb temperature equal to the temperature that is exceeded by 1% of the number of hours during a typical weather year.

cooling design wet-bulb temperature: the mean coincident outdoor wet-bulb temperature utilized in conjunction with the cooling design dry-bulb temperature, often used for the sizing of cooling systems.

critical circuit: the hydronic circuit that determines the minimum differential pressure that the pump must produce to satisfy the zone loads (e.g., the circuit with the most-open valve). The critical circuit is the one with the highest pressure drop required to satisfy its load. At part-load conditions, the critical circuit can change based on zone loads.

daylight area:

daylight area under roof monitors: the daylight area under roof monitors is the combined daylight area under each roof monitor within each space. The daylight area under each roof monitor is the product of

- a. the width of the vertical fenestration above the ceiling level plus, on each side, the smallest of
 1. 2 ft,
 2. the distance to any 5 ft or higher vertical obstruction, or
 3. the distance to the edge of any primary sidelighted area

and

- b. the smaller of the following horizontal distances inward from the bottom edge of the vertical fenestration (see Figure 3.2-1):
 1. The monitor sill height (MSH) (the vertical distance from the floor to the bottom edge of the monitor glazing)
 2. The distance to the nearest face of any opaque vertical obstruction, where any part of the obstruction is farther away than the difference between the height of the obstruction and the monitor sill height (MSH – OH).

daylight area under skylights: the daylight area under skylights is the combined daylight area under each skylight within a space. The daylight area under each skylight is bounded by the opening beneath the skylight and horizontally in each direction (see Figure 3.2-2), the smaller of

- a. 70% of the ceiling height ($0.7 \times CH$), or
- b. the distance to the nearest face of any opaque vertical obstruction, where any part of the obstruction is farther away than 70% of the distance between the top

of the obstruction and the ceiling ($0.7 \times [CH - OH]$, where CH = the height of the ceiling at the lowest edge of the skylight and OH = the height to the top of the obstruction).

primary sidelighted area: the total primary sidelighted area is the combined primary sidelighted area within each space. Each primary sidelighted area is directly adjacent to vertical fenestration below the ceiling (see Figure 3.2-3).

- a. The primary sidelighted area width is the width of the vertical fenestration plus, on each side, the smaller of
 1. one half of the vertical fenestration head height (where head height is the distance from the floor to the top of the glazing) or
 2. the distance to any 5 ft or higher opaque vertical obstruction.
- b. The primary sidelighted area depth is the horizontal distance perpendicular to the vertical fenestration which is the smaller of
 1. one vertical fenestration head height or
 2. the distance to any 5 ft or higher opaque vertical obstruction.

secondary sidelighted area: the total secondary sidelighted area is the combined secondary sidelighted area within a space. Each secondary sidelighted area is directly adjacent to a primary sidelighted area (see Figure 3.2-4):

- a. The secondary sidelighted area width is the width of the vertical fenestration plus, on each side, the smaller of
 1. one half of the vertical fenestration head height or
 2. the distance to any 5 ft or higher opaque vertical obstruction.
- b. The secondary sidelighted area depth is the horizontal distance perpendicular to the vertical fenestration, which begins at the edge of the primary sidelighted area depth and ends at the smaller of
 1. one vertical fenestration head height or
 2. the distance to any 5 ft or higher opaque vertical obstruction.

If the adjacent primary sidelighted area ends at a 5 ft or higher opaque vertical obstruction, there is no secondary sidelighted area beyond such obstruction.

daylighted area: the floor area substantially illuminated by daylight.

dead band: the range of values within which a sensed variable can vary without initiating a change in the controlled process.

decorative lighting: see *lighting, decorative*.

dedicated replacement air: see *makeup air*.

degree-day: the difference in temperature between the outdoor mean temperature over a twenty-four-hour period and a given base temperature. For the purposes of determining

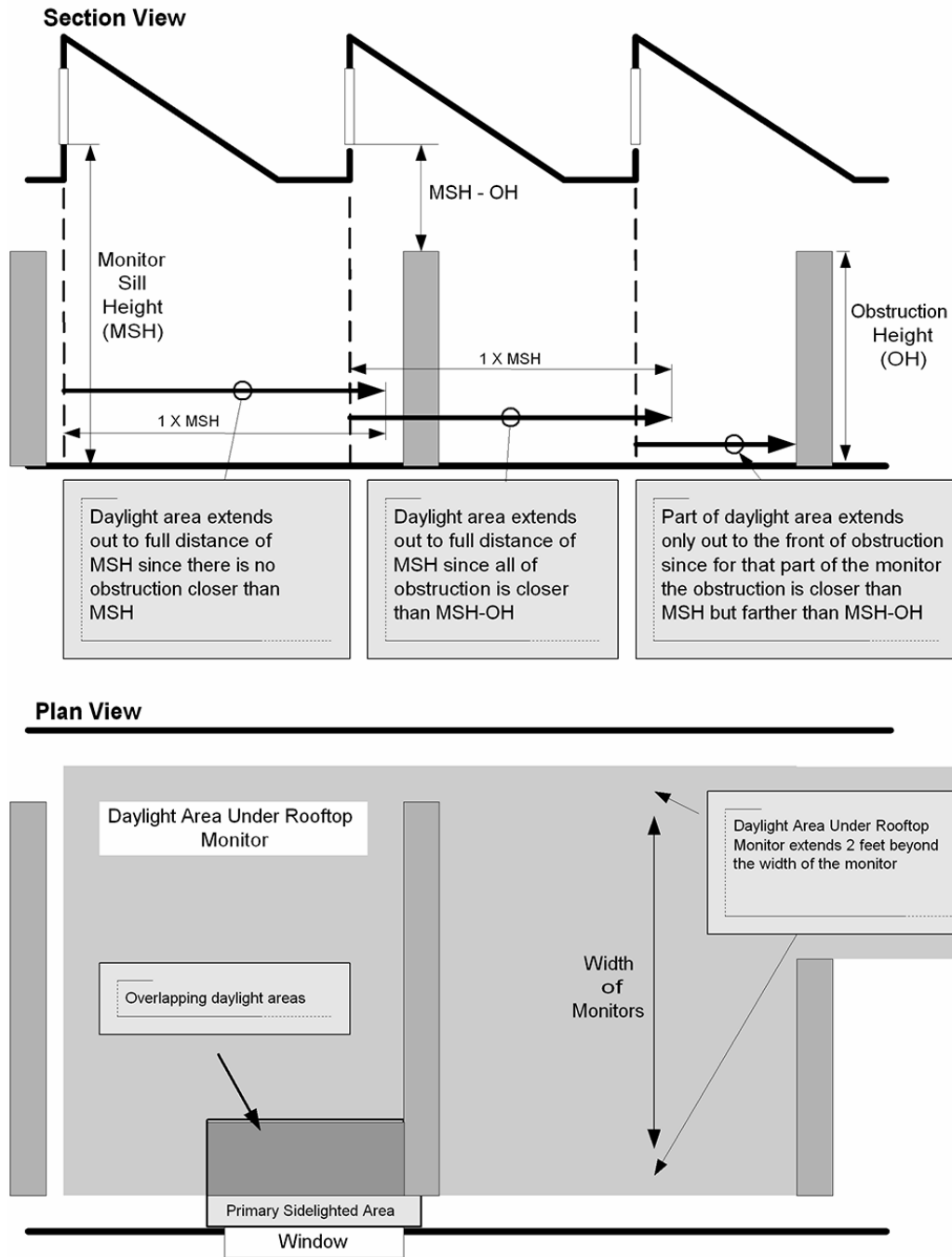


Figure 3.2-1. Computing the daylight area under roof monitors.

building envelope requirements, the classifications are defined as follows:

cooling degree-day base 50°F (CDD50): for any one day, when the mean temperature is more than 50°F, there are as many degree-days as degrees Fahrenheit temperature difference between the mean temperature for the day and 50°F. Annual cooling degree-days (CDDs) are the sum of the degree-days over a calendar year.

heating degree-day base 65°F (HDD65): for any one day, when the mean temperature is less than 65°F, there are as many degree-days as degrees Fahrenheit temperature difference between the mean temperature for the day

and 65°F. Annual heating degree-days (HDDs) are the sum of the degree-days over a calendar year.

demand: the highest amount of power (average Btu/h over an interval) recorded for a building or facility in a selected time frame.

demand control ventilation (DCV): a ventilation system capability that provides for the automatic reduction of outdoor air intake below design rates when the actual occupancy of spaces served by the system is less than design occupancy.

design capacity: output capacity of a system or piece of equipment at design conditions.