

Glossary

abrasion resistance Durability that enables interior partitions in high-traffic areas to resist surface damage from contact with people, furniture, etc. Achieved by increasing the surface and core strength of the partition facing, by applying a coating or wall covering over the surface, or by increasing the thickness of the partition facing.

absorption The taking up and holding (or sometimes dissipating) of matter or energy, as a sponge takes up water. Absorption is the opposite of reflection. *See also porosity.*

abuse resistance A property that helps protect a material such as gypsum board from surface damage (abrasion and indentation).

accelerator An additive that shortens the setting time for gypsum plasters or setting-type joint compounds.

acoustical ceiling A system with highly effective sound-absorbing and/or sound attenuating qualities.

acoustical ceiling board (lay-in panel) Acoustical material used in conjunction with a lay-in grid system, usually in 24" x 24" or larger panels.

acoustical consultant (acoustical engineer, acoustician) A trained professional qualified to recommend solutions to sound problems and to design facilities to meet specific sound criteria.

acoustical panels Normally a 24" x 24" or larger piece of pre-finished material (with various surface finishes) installed in a suspension system to provide improved sound absorption.

acoustical sealant Special caulking material designed to seal gaps and cracks to reduce sound flanking in an assembly. For example, SHEETROCK acoustical sealant from USG.

acoustical tile Normally a 12" x 12" or 12" x 24" piece of pre-finished material (with various surface finishes) installed in a concealed suspension system or adhered to a ceiling or upper wall surface to provide sound absorption.

acoustic privacy Prevention of the passage of airborne sound—and dampening of impact sound. Achieved by installing assemblies between two spaces.

acoustics A science dealing with the production, control, transmission, reception and effects of sound, and the process of hearing.

admixture Any substance added to a plaster component or plaster for the purpose of modifying its properties.

aggregate Sand, gravel, crushed stone or other material that is a main constituent of Portland cement concrete and aggregated gypsum plaster. Also, polystyrene, perlite and vermiculite particles used in texture finishes.

AIA American Insurance Association, successor to the National Board of Fire Underwriters and Nonprofit Organization of Insurance Companies. Also *American Institute of Architects.*

airborne sound Sound traveling through air and subsequently through partitions and openings.

all-purpose joint compound A material formulated and manufactured for use in taping and/or finishing gypsum panel products.

ambient light The generally available surrounding or pervading light in an interior space, including outside light entering through windows.

amplitude (sound) The maximum pressure displacement from the at-rest position of the particles of the transmitting medium. The amplitude of a sound wave is determined by the energy of the sound source.

anchor A metal securing device embedded or driven into masonry, concrete, steel or wood.

anchor bolt A heavy, threaded bolt embedded in a building's foundation to secure the sill to the foundation wall, or the bottom plate of the exterior wall to the concrete floor slab.

annular ring nail A deformed shank nail with improved holding qualities specially designed for use with gypsum board.

ANSI American National Standards Institute, a nonprofit national technical association that publishes standards covering definitions, test methods, recommended practices and materials specifications. Formerly the American Standards Association (ASA) and the United States of America Standards Institute (USASI).

architectural acoustics The handling of sound within a single area (reflection, reverberation, absorption, etc.). It does not address sound transmission through elements of the structure.

Architecture 2030 A U.S. nonprofit environmental advocacy group that addresses climate change and the global greenhouse gas (GHG) emissions produced by the building sector.

area separation wall A residential fire wall, usually with a two- to four-hour rating, designed to prevent the spread of fire from an adjoining occupancy. An area separation wall extends from the foundation to or through the roof. Identified by codes as a *fire wall*, *party wall* or *townhouse separation wall*.

articulation class A classification that rates the degree of speech recognition that can be transmitted through ceilings or partitions.

ASA American Standards Association. Now referred to as American National Standards Institute (ANSI).

ASTM International Formerly American Society for Testing and Materials. A nonprofit technical society that publishes definitions, standards, test methods, recommended installation practices and materials specifications.

attenuate To resist the passage of sound energy.

attenuation In acoustics, the diluting or holding back of the energy of sound waves as they pass through a material. Materials are rated for

their ability to prevent sounds from traveling through them. *See also ceiling attenuation class, CAC.*

back blocking A short piece of gypsum board adhesively laminated behind the joints between each framing member to reinforce the joint. Also, a method of attaching additional framing to support gypsum board where no framing is present.

backup strips Pieces of wood nailed at the ceiling-sidewall corner to provide fastening for ends of plaster base or gypsum panels.

balloon frame A method of framing exterior walls in which studs extend the full length or height of the wall, running past/not stopping at each floor line.

bar joist An open-web, flat-truss structural member used to support a floor or roof structure. The web section is made from bar or rod stock, and chords are usually fabricated from "T" or angle sections.

basecoat The first layer or layers of plaster applied over a lath or other substrate. The first application is normally called a "scratch coat." The second application is a "brown coat."

basecoat floating The finishing action of spreading, compacting and smoothing basecoat plaster to a reasonably true plane.

batten A narrow strip of wood, plastic, metal or gypsum board used to conceal an open joint.

beam A load-bearing member spanning a distance between supports.

bearing A support area on which a construction assembly rests, such as the point on bearing walls where the weight of the floor joist or roof rafter is borne.

bed To set firmly and permanently in place.

bending Bowing of a member that results when a load is applied laterally between supports.

board foot (Bd. Ft.) A segment of wood with nominal dimensions of 1" thick x 12" wide x 1' long. Lumber is sold by the board-foot measure.

bonding agent A material applied to a surface to improve the quality of the bond between it and the succeeding plaster application. For instance, monolithic concrete and cement board require the addition of a bonding agent before plaster is applied.

brick veneer Non-load-bearing brick facing applied to a wall to present the appearance of solid-brick construction. Bricks are fastened to a backup structure with metal ties embedded in mortar joints.

bridging Framing members attached between floor joists to distribute concentrated loads over more than one joist and to prevent joist rotation. Solid bridging consists of joist-depth lumber installed perpendicular to and between the joists. Cross-bridging consists of pairs of braces set in an "X" form between joists.

brown coat The second coat in three-coat gypsum plaster application.

building codes Legal requirements concerning construction and occupancy—intended to safeguard public health and safety. Sustainable building design must be supported with construction methods and technologies that comply with relevant building codes and that adhere to the specific product's recommended installation procedures.

building construction joint See **construction joint**.

CAC See **ceiling attenuation class**.

calcine To change the chemical composition of a mineral by heating it, ranging from the removal of chemically combined water through the reduction of the mineral to its oxide state.

calcined gypsum A dry powder, primarily calcium sulfate hemihydrate, resulting from calcination of gypsum; a cementitious base used in the production of most gypsum plasters. Also called *plaster of Paris*; sometimes called *stucco*.

calcium sulfate The chemical compound CaSO_4 .

calculations Determinations by mechanical engineers of the total loss (or gain) for a building resulting from heat transfer through the ceilings, walls, floors, windows, doors and any other surface exposed to the elements.

camber Curvature built into a beam or truss to compensate for loads that will be encountered when it is in place, and the load is applied. The crown is placed upward. Insufficient camber results in unwanted deflection when the member is loaded.

cant beam A beam with edges chamfered or beveled.

cant strip A triangular section laid at the intersection of two surfaces to ease or eliminate the effect of a sharp angle or projection.

carbon-neutral A building that produces net zero carbon emissions. This is achieved by calculating emissions, reducing them through design and conservation, substituting fossil energies with renewable energies, and offsetting remaining emissions through actions such as purchasing carbon offsets or planting trees that absorb carbon.

carrying channel The main supporting member of a suspended ceiling system to which furring members or channels attach.

casement A glazed sash or frame hung to open like a door.

casing Trim around windows, doors, columns or piers.

ceiling attenuation class (CAC) A sound rating developed especially for acoustical ceilings. Ratings are determined by AMA1-II ceiling sound transmission tests. Results were previously called *CSTC value*.

Ceiling STC (CSTC) Now obsolete. See **ceiling attenuation class (CAC)**.

cement board A factory-manufactured panel, 5/16" to 5/8" thick, 32" to 48" wide, and 3' to 10' long, made from aggregated and reinforced Portland cement.

certification, LEED A nationally recognized benchmarking system for sustainable construction. LEED® provides technical guidance and third-party certification measures that evaluate project sustainability by analyzing critical aspects of building design and construction. A project may receive one of four levels of LEED certification by earning points in six categories of assessment.

chalk line A straight working line made by snapping a chalked cord stretched between two points, transferring chalk to a surface.

CHPS Collaborative for High Performance Schools (CHPS), an organization that promotes research, testing and development of effective environmental management strategies for schools and other specialized building projects, such as healthcare facilities.

cladding Gypsum panels, gypsum bases, gypsum sheathing, cement board, etc. applied to framing; can refer to both sides of the framing.

Class A A fire classification for a product with a flame spread rating of no more than 25 and a smoke-developed rating not exceeding 50, when tested in accordance with ASTM E84.

Coefficient of Thermal Conductance (c) The amount of heat (in Btu) that passes through a specific thickness of a material (either homogeneous or heterogeneous) per hr., per SF, per °F. Measured as the temperature difference between the material's two surfaces.

The "c" value of a homogeneous material equals the "k" value divided by the material thickness:

$$c = k/t \text{ where } t = \text{thickness of material in inches.}$$

It is impractical to determine a "k" value for some materials, such as building paper or materials formed as a thin membrane; only "c" values are given for these.

Coefficient of Thermal Conductivity (k) A convenient factor that represents the amount of heat (in Btu) that passes by conduction through a 1" thickness of homogeneous material, per hr., per SF, per °F. Measured as temperature difference between the material's two surfaces.

Coefficient of Heat Transmission (U) Total amount of heat that passes through an assembly of materials, including air spaces and surface air films. Expressed in Btu per hr., per SF, per °F temperature difference between inside and outside air (beyond the surface air films). "U" values are often used to measure heat transmission through wall and ceiling assemblies, floors and windows.

Note: "k" and "c" values cannot simply be added to obtain "U" values. "U" can be obtained only by adding the thermal resistance (reciprocal of "c") of individual items and dividing the total into 1.

Coefficient of Hygrometric Expansion See **hygrometric expansion**.

Coefficient of Thermal Expansion See **thermal expansion**.

column A vertical load-bearing member.

combustible Capable of burning. *See also noncombustible.*

comfort, occupant Characteristics including humidity, ventilation, air circulation, acoustics and lighting, used to form a comprehensive assessment of IEQ.

compression Force that presses particles of a body closer together.

compression strength The measure of a material's maximum unit resistance to a crushing load. Expressed as force per unit of cross-sectional area, e.g., pounds per square inch (psi).

concrete footing Generally, the wide, lower part of a foundation wall that spreads the weight of a building over a larger area. Its width and thickness vary according to the weight of the building and the type of soil on which the structure is erected.

condensation The water produced when warm, moist air is cooled.

conduction, thermal The transfer of heat from one part of a body to another part of that body, or to another body in contact, without any movement of bodies involved. The hot handle of a skillet is an example. The heat travels from the bottom of the skillet to the handle by conduction.

construction joint A designed separation of materials within construction that allows movement of all component parts of the building in any plane. (Movement may be caused by thermal, seismic, wind loading or any other force.) The separation is accomplished by one of the following methods: (1) manufactured devices suitable for this application, (2) field fabrication of suitable materials. Construction joints are sometimes confused with *control joints*.

construction practices Methods used by a contractor and crew throughout the work performed on site to build or remodel a structure—from demolition/initial site work through all phases of construction. Proper construction practices include aspects such as appropriate material delivery times and storage and drying times to avoid later indoor air quality problems with moisture and mold.

construction waste Materials to be disposed of—from the manufacturing process, construction or demolition. For information on alternatives to the use of landfills for gypsum product waste disposal, contact your local USG Sales Representative or visit USG's website (usg.com).

control joint A division within the face of a partition or ceiling, the purpose of which is to limit cracking due to tensile or compressive movement in a membrane resulting from thermal, hygrometric or structural effects.

convection Transmission of heat from one point to another by movement of a liquid or a gas (e.g., water or air). Natural convection is caused by expansion of a liquid or gas when it is heated. Expansion reduces the density of the medium, causing it to rise above the cooler, denser portions of the medium. Gravity heating systems are examples of the profitable use of natural convection. The air, when heated by the furnace, becomes less dense (consequently lighter) and rises,

distributing heat to the various areas of the building without any type of blower. When a blower is used, the heat transfer method is called *forced convection*.

core (of gypsum board) The hardened material filling the space between the face and back papers. It consists substantially of rehydrated gypsum with additives.

corner brace A structural framing member used to resist diagonal loads that cause racking of walls and panels due to wind and seismic forces. May consist of a panel or diaphragm, or a diagonal flat strap or rod. Bracing must function in both tension and compression. If the brace performs only in tension, two diagonal tension members must be employed in opposing directions as “X” bracing.

corner post Timber or other member forming the corner of a frame. May be solid or built-up as a multi-piece member.

cradle to cradle A calculation of environmental impacts (both negative and positive) across a material's life cycle. Product cradle to cradle may evaluate the embodied energy of the product and would include energy needed to extract and transport raw materials used as product ingredients; to manufacture the item ready for installation or use; to transport the finished product to the distributor; to install, use and maintain it; to deconstruct it at the end of its useful life; and then to reuse or recycle it. Other terms describing the product's life stages for energy use and other life cycle assessment criteria include “cradle to market,” which includes all the same processes as cradle to cradle, except the product is disposed in a landfill, versus being recycled or reused at the end of its use.

cradle to gate A portion of a product's life cycle covering manufacture (“cradle”) and handling up until it leaves the factory (“gate”). This does not include transportation or use of the product, nor its disposal at the end of its use. Environmental product declarations (EPD) are used to assess sustainability for this phase.

creep Plastic flow or deformation of a material or a composite resulting from the sustained application of a force or load. Creep is typically greater at higher temperatures.

creep deflection Permanent deflection in a building system caused by deformation under a sustained force or load. An example is the sag in a new building's concrete floor slab caused by sustained dead and live loads on the floor. This deformation or sag often causes partition cracking when the center of a partition span occurs near the area of greatest creep deflection. Creep deflection is a structural problem that decreases after a building stabilizes, one or two years after construction. Another cause of partition cracking, sometimes confused with that from creep deflection, is racking of structural components. Partition cracking caused by racking (as a result of thermal expansion and contraction or wind loads on the building) must be treated, for example by the proper placement and installation of control or expansion joints.

cripple A short stud such as that used between a door or window header and the top plate.

critical light Strong, angular or harsh light that can show imperfections in reflecting surfaces. Most common sources are skylights, wall sconces and directed track lights such as those used in art galleries.

crowned joint Over-filling (with compound) the location where two boards or panels meet.

curtain wall Exterior wall of a building that is supported by the structure and carries no part of the vertical load except its own. Curtain walls must be designed to withstand wind loads and transfer them to the structure.

cycle (acoustic) One full repetition of a motion sequence during periodic vibration. Movement from zero to +1, then back to zero to -1, then back to zero. Frequency of vibration is expressed in Hertz (cycles per second; see also **frequency**).

daylighting Admitting natural light into a space with consideration of distributing light at uniform levels, controlling glare and reflections and reducing the need for artificial light.

darby A hand float or trowel used by plasterers and concrete finishers in preliminary floating and leveling operations.

dead load Load on a building element contributed by the weight of the building materials.

decibel (dB) A measure adopted for convenience to represent vastly different sound pressures. The sound pressure level (SPL) in decibels is 10 times the logarithm to the base 10 of the squared ratio of the sound pressure to a reference pressure of 20 micropascals. This reference pressure is considered the lowest value at 100 Hz that the ear can detect. For every 10 dB increase or decrease in SPL, a sound is generally judged to be about twice or half as loud as before the change.

decoupling Separation of elements to reduce or eliminate the transfer of sound, heat or physical loads from one element to the other.

deflection Displacement that occurs when a load is applied to a member or assembly. The dead load of the member or assembly itself causes some deflection—as may occur in roofs or floors at mid-span. Under applied wind loads maximum deflection occurs at mid-height in partitions and walls.

deflection limitation Maximum allowable deflection is dictated by the bending limit of the finish material under the required design load (usually 5 psf for interior partitions). Often expressed as ratio of span (L) divided by a criterion factor (120, 180, 240, 360). For example, in a 10' (or 120") high wall, the allowable deflection under L/240 criterion equals 120"/240 or 1/2" maximum. Selection of limiting heights and spans is frequently based on minimum code requirements and accepted industry practice. However, USG recommendations are as follows: (a) L/240 for gypsum panel surfaces and veneer plaster finish surfaces, (b) L/360 for conventional lath and plaster surfaces and any brittle material finishes. Horizontal applications such as floors require special consideration for the increased deflection due to the dead load. The contribution to deflection from these dead loads requires

stiffer floor systems, especially for large format heavy stone, marble or tile floors.

deformation Change in the shape of a body brought about by the application of a force—either internal or external. Internal forces may result from temperature, humidity or chemical changes. External forces from applied loads can also cause deformation.

degree day A unit representing daily mean temperature of one degree below 65°F. An indication of heat load required over a given period of time.

density The quantity per unit volume of a material; the mass of a substance per unit volume.

design load Combination of weight (dead load) and other applied forces (live loads) for which a building or part of a building is designed.

desulfo gypsum Calcium sulfate dehydrate (gypsum) produced as a byproduct of scrubbing industrial smoke stacks to meet environmental clean air standards. Also known as *synthetic gypsum*.

dew point The temperature at which air becomes saturated with moisture and below which condensation occurs.

direct lighting Lighting aimed at objects or surfaces. Direct lighting mounted in ceilings de-emphasizes the ceiling surface and highlights horizontal surfaces below, such as work surfaces and the floor.

door buck Structural element of a door opening; may be the frame, as in the case of heavy steel frames.

dot A small lump of plaster placed on a surface (usually scarified basecoat) between grounds to assist the plasterer in obtaining the proper plaster thickness and to aid in aligning the surface.

double-hung window Window sash that slides vertically and is offset in a double track.

double-up Successive plaster coat applications with no setting or drying time allowed between coats; usually associated with veneer plastering. The double-up coat is applied (from the same mix) to a scratch coat over a gypsum base.

drip Interruption or offset in an exterior horizontal surface, such as a soffit, immediately adjacent to the fascia. Designed to prevent the migration of water back along the surface.

drywall Generic term for interior surfacing material, such as gypsum panels, applied to framing using dry construction methods, e.g., mechanical fasteners or adhesive. See also **SHEETROCK brand gypsum panels**.

Dyne (acoustics) A unit of force required to accelerate one gram of mass at a rate of 1 cm per second.

echo Sound reflected back to the source from a reflective surface, received with enough interval and loudness to be distinguished from the original sound.

ecological footprint The impact that an entity such as an operating facility, individual, city or nation has on the local, regional or global ecosystem. Factors include direct and indirect consumption of natural resources and waste production.

edge (of gypsum board) The paper-bound edges of a manufactured panel.

efflorescence A deposit of white, powdery, water-soluble salts on the surface of masonry or plaster. It is caused by the migration of the dissolved salts to the surface. Also called *whiskering* or *saltpetering*.

embodied energy The total amount of energy used across a product's life. Usually cradle to gate or cradle to market embodied energies are used to compare construction products and are a critical measure of a product's sustainability. Generally, the lower the product's measure of embodied energy, the higher its sustainability rating.

emissions Vapors that may be off-gassed by building components. Some are harmless in themselves, but may react with moisture or vapors from other products, including carpeting, paint and adhesives, and even furnishings, to form potentially hazardous airborne compounds.

emissivity The relative ability of a surface to emit radiant heat.

end (of gypsum board) The ends perpendicular to the paper-bound edges, as manufactured. The gypsum core is always exposed on the ends.

energy conservation Reducing energy use and waste by various means, including equipment efficiencies, insulation and business practices.

EPA The U.S. Environmental Protection Agency.

EPD Environmental product declarations. A standardized tool based on life cycle analysis used to rate the environmental performance of a product.

expansion joint See **building construction joint** and **construction joint**.

exterior insulation and finish systems (EIFS) Exterior cladding assembly consisting of a polymer finish over a reinforcement adhered to foam plastic insulation that is fastened to masonry, concrete, building sheathing or directly to the structural framing. The sheathing may be cement board, gypsum sheathing or another acceptable substrate.

extrapolate To project tested values, assuming a continuity of an established pattern, to obtain values beyond the limit of the test results. Not necessarily reliable.

F & T ratings Flame-resistance and temperature ratings usually associated with "through-penetration" testing. F rating (flame-resistance rating) is the time period a firestop system remains in place during an ASTM E814 fire test. T rating is the time period it takes for the temperature on the unexposed surface, the firestop and the penetrating item to rise 325 °F above the initial temperature.

factor of safety Ratio of the ultimate unit stress to the working or allowable stress.

fascia board Board fastened to the ends of the rafters or joists forming part of a cornice.

fast track A building method that telescopes or overlaps phases of the traditional design-construction process.

fatigue Condition of a building material under stress. Involves some degree of loss of the material's power of resistance as a result of repeated application of stress, particularly if stress reversals occur as with positive and negative cyclical loading.

feather Gradual thinning of joint compound from the thickness over the joint to the outer edge of a coat.

finish coat Final layer of plaster applied over a basecoat or other substrate.

finish coat floating Spreading, compacting and smoothing the finish coat plaster or stucco to a specified surface texture.

finishing compound See **topping compound**.

fire blocking A construction element used as an obstruction in a cavity for the purpose of resisting the passage of flame.

fire endurance Measure of elapsed time during which an assembly continues to exhibit fire resistance under specified conditions of test and performance. As applied to elements of buildings, fire endurance is measured by the methods and to the criteria defined in ASTM E119, Standard Test Methods for Fire Tests of Building Construction and Materials and ASTM Methods E814, Fire Tests of Penetration Firestop Systems.

fire hazard classification Rating of interior and surface materials based on testing according to ASTM Standard E84.

fireproof Able to withstand damage from fire. Use of this term in reference to buildings is discouraged because few, if any, building materials can withstand extreme heat for an extended time without some effect. The term *fire-resistive* or *resistant* is more descriptive for this purpose.

fire resistance A relative term, used with a numerical rating or modifying adjective to indicate the extent to which a material or structure resists the effects of fire.

fire-resistive Refers to properties or designs that resist effects of any fire to which a material or structure may be expected to be subjected.

fire-retardant Denotes a substantially lower degree of fire resistance than "fire-resistive." Often used to describe materials that are combustible, but have been treated to retard ignition or spread of fire under conditions for which they were designed.

firestop system A system for protecting against the spread of fire through a penetration in a wall or floor where a pipe or other penetrant passes through a fire-rated system. A firestop is the specific

construction using materials designed to fill the annular space around the penetrant for the purpose of preventing the passage of fire through the fire-resistive partition or floor/ceiling assembly.

fire wall A fire-resistant partition extending to or through the roof of a building to retard the spread of fire. *See also* **area separation wall**.

flame-proof Able to resist ignition and flame propagation under test conditions.

flame spread An index of the capacity of a material to spread fire under test conditions, as defined by ASTM Standard E84. Materials are rated by comparison with the flame-spread index of red oak flooring (assigned a value of 100) and inorganic reinforced cement board (assigned a value of 0).

flammable A combustible material's capability to ignite easily, burn intensely or have rapid rate of flame spread.

flanking paths Paths by which sound travels around an element intended to impede it, usually a structural component that is continuous between rooms and rigid enough to transmit the sound. For example, a partition separating two rooms can be "flanked" by the floor, ceiling or walls surrounding the partition if they run uninterrupted from one room to the other. Ducts, conduits, openings, structural elements, rigid ties, etc., can be sound flanking paths. The acoustic effect of sound flanking paths is dependent on many factors.

flashing Strips of metal or waterproof material used to make joints waterproof, as in the joining of curtain wall panels.

flexural strength The maximum load sustained by a standard specimen of a sheet material when subjected to a bending force.

footcandle Measurement of light emitted over distance. One foot-candle is the amount of direct light thrown by one candela onto a surface one foot away and equal to one lumen per square foot.

footing The lower extremity of a foundation or load-bearing member that transmits and distributes the load to the substrate or soil.

force Amount of applied energy to cause motion, deformation or displacement and stress to a body.

form oil Oil applied to the interior surface of formwork to promote easy release from the concrete when forms are removed.

foundation Component that transfers the weight of the building and its occupants to the earth.

framing member A stud, plate, track, joist, furring or other support to which a gypsum panel product or metal plaster base is attached.

frequency (sound) The number of complete vibrations or cycles or periodic motion per unit of time.

furring Means of supporting a finished surfacing material away from the structural wall or framing. An element for mechanical or adhesive attachment of paneling. Also used to level uneven or damaged surfaces or to provide space between substrates.

gable Uppermost portion of the end wall of a building that comes to a triangular point under a sloping roof.

gauging plaster Used in combination with lime putty, this material provides setting properties to increase dimensional stability during drying, and provides initial surface hardness in lime finish coats.

girder A beam, especially a long, heavy one; the main beam supporting floor joists or other smaller beams.

global warming Increase in global temperatures resulting from many natural and man-made causes including the emission of gases that trap the sun's heat within Earth's atmosphere.

grain The weight of water vapor in air is usually measured in grains per pound of dry air. A pint of water weighs about 7,000 grains (one pound).

green A term to describe freshly applied plaster that has set, but has not dried.

green building Design, construction and product selection that minimizes a structure's impact on the natural environment.

Green Cross International An organization whose mission is to "help ensure a just, sustainable and secure future for all by fostering a value shift and cultivating a new sense of global interdependence and shared responsibility in humanity's relationship with nature."

Green Globes An international organization that provides a rating system for building owners and managers to assess the environmental performance of existing buildings.

GreenGuard Environmental Institute (GEI) An industry-independent, ANSI-authorized, nonprofit developer of standards for indoor products, environments and buildings.

Green Guide A database of green building materials and products for schools, healthcare and other facilities.

Green Home Building Standards (Model Green Home Building Standards) A whole-building rating system developed by the National Association of Home Builders.

greenhouse effect The effect when light transfers through a medium (e.g., the atmosphere or glass) and is refracted and reflected, giving off heat upon impact. The more the light bounces around and is trapped, the more the light transfers into heat.

greenwash The overstating of benefits of the sustainable properties of a product, process or structure. To market a product as sustainable even though its green characteristics may be minimal or offset by other unsustainable factors.

ground (1) A piece of wood or metal attached to the framing or plaster base so that its exposed surface acts as a gauge to define the thickness of plaster to be applied. (2) Plaster thickness. *See also* **screeed**.

grout Gypsum or Portland cement plaster used to fill crevices or hollow metal frames. More commonly a mixture of cement, water and sand used to fill spaces between ceramic tile.

gusset A wood or metal plate riveted, bolted, glued or pressed (wood trusses) over joints to transfer stresses between connected members.

gypsum The mineral consisting primarily of fully hydrated calcium sulfate, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ or calcium sulfate dihydrate.

gypsum fiber panels Gypsum panels with fiber reinforcement concentrated on each face of the panel. They are part of a new-technology series of panel products called FIBEROCK brand panels, which produce stronger, more abuse-resistant, water-resistant walls and ceilings than those produced with conventional drywall. There are variations for interior drywall applications in dry and wet areas, sheathing applications and flooring applications. Very-high impact (VHI) products are further reinforced on the backside by a fiberglass mesh.

gypsum lath A gypsum board used as the base for application of gypsum plaster.

gypsum moulding plaster A calcined gypsum plaster used primarily for plaster casts or molds, sometimes used as a gauging plaster.

gypsum neat plaster A calcined gypsum plaster without aggregate; common usage is for gypsum plaster as a basecoat.

gypsum plaster The generic name for a family of powdered cementitious products consisting primarily of calcined gypsum with additives to modify physical characteristics, and having the ability, when mixed with water, to produce a plastic mortar or slurry that can be formed to the desired shape by various methods and will subsequently set to a hard, rigid mass.

gypsum sheathing Gypsum board used as a backing for exterior surface materials, manufactured with water-repellent paper and a water-resistant core. Newer versions of gypsum sheathing have a glass mat facing.

gypsum, synthetic A chemical form of gypsum—often a byproduct of a manufacturing process. The production process may be included as a descriptor of the material, e.g., *Flue-gas desulfurization (FGD) synthetic gypsum*. Synthetic gypsum comes from substances recovered or recaptured as a byproduct of removing polluting gases from the stacks of burning coal. (Sulfur dioxide, chemically combined with limestone, produces gypsum and carbon dioxide. The more sulfur in the coal, the more gypsum is produced.) Because this process captures harmful materials that would otherwise be released into the atmosphere, these materials are referred to as *recaptured gypsum*.

harmonic (acoustics) A secondary tone of a frequency that is a whole-number multiple of the frequency of a fundamental tone.

high-performance building A building that is energy- and water-efficient, healthy and comfortable for its occupants.

header A horizontal framing member across the ends of the joists. Also the member over a door or window opening in a wall.

head of wall A type of construction joint where two fire-rated assemblies intersect. Head-of-wall assemblies occur where a wall intersects

a floor/ceiling or roof/ceiling. In these construction intersections, a fire-protective assembly is needed to protect against the spread of fire. An example is where a partition intersects a fluted steel deck. Head-of-wall and other construction joints are evaluated under UL Standard 2079 for their ability to resist flame and temperature transmission, as well as the force and expansion from a hose stream.

heat A form of energy thought to be characterized by the rate of vibration of the molecules of a substance. The hotter the substance, the faster the molecules vibrate. On the other hand, when there is no heat present, it is thought the molecules will be at rest, which theoretically occurs at absolute zero, -459.7°F (-273.2°C or 0.0 K).

heat quantity (Btu) A common unit of measure of the quantity of heat—British thermal unit (Btu). One Btu is the amount of heat required to raise one pound of water from 63°F to 64°F ($1\text{ Btu} = 1055.06\text{ J}$). This is about the amount of heat given off by one wooden match. A pound of coal can produce 13,000 Btu.

heat transfer Heat always flows toward a substance of lower temperature until the temperatures of the two substances equalize. Heat travels by one or more of three methods: conduction, convection or radiation.

heel of rafter The seat cut in a rafter that rests on the wall plate.

hemihydrate The dry powder, calcium sulfate hemihydrate, resulting from calcination of $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, calcium sulfate dihydrate. *See also* **calcined gypsum**.

Hertz Unit of measure of sound frequency, named for Heinrich H. Hertz. One Hertz (Hz) equals one cycle per second.

holistic design Integration of all building's systems to maximize sustainable and/or economic functioning by considering many factors including use of energy and other resources, building materials, site preservation and indoor air quality. The goal is a structure that can operate at its maximum efficiency, enhance user health, comfort and productivity and have the least environmental impact.

honeycomb Any substance or material having multiple cells such as those built by the honeybee. Some hollow-core doors use the honeycomb principle in their construction.

HUD U.S. Department of Housing and Urban Development, a federal agency.

HUD Manufactured Home Standards Officially, the Manufactured Home Construction and Safety Standards, a national, pre-emptive building code covering manufactured homes. Includes the following agencies: DAPIA—Design Approval Primary Inspection Agency, and IPIA—Production Inspection Primary Inspection Agency.

HVAC Heating, ventilating and air conditioning. (The American Society of Heating, Refrigerating & Air Conditioning Engineers, Inc. *ASHRAE Guide* is a leading technical reference source.)

hydrate To chemically combine with water, as in the hydration of calcined gypsum or slaking of quicklime. Also, the product resulting from this combination.

hygrometric expansion All materials, particularly those of organic origin, expand and contract in relation to their moisture content, which varies with environment. The Hygrometric Coefficient of Expansion is expressed in *inches per inch per percent of relative humidity*. Example: gypsum board has a coefficient of 7.2×10^{-6} in. per in per % R.H. This means that with an increase in relative humidity of from 10% to 50%, a gypsum board wall 300' long will have an unrestrained linear expansion of 1.0368" or 1-1/32".

IEQ Indoor environmental quality and occupant comfort. An important criterion for green, or sustainable, building design. Includes humidity, ventilation and air circulation, acoustics and lighting.

impact isolation class (IIC) A single number rating used to compare and evaluate the performance of floor-ceiling constructions in isolating impact noise.

impact noise rating (INR) Obsolete rating system for floor-ceiling construction in isolating impact noise. INR ratings can be converted to approximate IIC ratings by adding 51 points (with a variation of 1 or 2 points).

impact sound pressure level (ISPL) The sound (in decibels), measured in a receiving room, resulting from the transmission of impact sound through floor construction, produced by a standard "tapping" machine.

impact sound transmission Sound that originates by contact with the structure and travels through the structure.

incident sound Noise that is directly received from the source, as distinguished from sound that is reflected from a surface.

incombustible See **noncombustible**.

indirect lighting Reflected light. For ceilings, this is typically light from luminaires, distributed upward. This type of lighting is used to reduce glare and hot spots, providing a more uniform source of light.

industrial construction Construction of residential or commercial structures (in a factory environment) that will later be assembled on the building site. Includes HUD-Code manufactured homes as well as residential and commercial modular construction.

insulation (thermal) Any material that measurably retards heat transfer. There is wide variation in the insulating value of different materials. A material having a low density (weight/volume) will usually be a good thermal insulator.

integrated design Also referred to as **holistic** or **whole building design**. A design method that integrates, early in the process, the whole building team, including all disciplines. For a sustainable building, resource efficiencies, indoor air quality and other goals can be achieved most effectively with this approach.

intensity A measure of acoustic energy per unit area of a sound wave. Measured in watts per square meter or micro-watts per square centimeter. The intensity is proportional to the square of the amplitude.

interpolate To estimate untested values that fall between tested values.

ISO International Standards Organization, an organization similar in nature to ASTM.

jamb One of the finished upright sides of a door or window frame.

jamb stud A wood or metal stud adjacent to the door jamb.

joint banding The visible striping of each panel joint—usually a result of over-sanding or uneven absorption of the primer due to differences in surface texture. More noticeable under critical lighting.

joint tape A type of paper, fabric or glass mesh commonly used with joint compounds to reinforce the joints between adjacent gypsum boards.

joist A small beam that supports part of the floor, ceiling or roof of a building.

joist hanger A metal shape formed to hang on the main beam—to provide support for the end of a joist.

Keene's cement (RED TOP Keenes Cement) An anhydrous gypsum plaster characterized by a low mixing water requirement and special setting properties. Primarily used with lime to produce a hard, dense finish coat.

key Grip or mechanical bond of one coat of plaster to another coat, or to a plaster base. A key may be accomplished by the penetration of wet mortar or crystals into paper fibers, perforations or scoring irregularities, or by the embedment of the lath.

kiln-dried lumber Lumber that has been dried and seasoned with carefully controlled heat in a kiln.

Label Service (UL) A program allowing a manufacturer to place Underwriters Laboratories Inc. labels on its products that have met UL requirements. A UL representative visits the manufacturing location to obtain samples of the products for testing. In some cases, UL also purchases samples on the open market for testing. The public is thereby assured that products bearing the UL label continually meet its specifications.

lamination Placing a layer of gypsum board over either another gypsum board or another type of substrate using an adhesive product for attachment.

landfill avoidance Practices that minimize the amount of debris that goes into landfills. Approaches include deconstruction, in which materials from an existing building are methodically removed, separated and either reused in the new structure or recycled.

laser level A mechanical device whose primary function is to establish level or plumb lines on a construction site with a very high degree

of precision. In acoustical ceiling installations, a laser level uses a high-intensity light beam that rotates in a level plane. See Chapter 14, "Tools & Equipment," for more information.

lath A metal or gypsum (or wood in the past) material applied to interior wall or ceiling structures to serve as a base for plaster.

lay-in panel Any panel designed to be supported by an accessible suspension system.

leaks (sound) Small openings at electrical boxes and plumbing, cracks around doors, loose-fitting trim and closures that allow sound to pass through, reducing the acoustical isolation of a wall, floor or ceiling system.

ledger strip Strip fastened to the bottom edge of a flush girder to help support the floor joists.

LEED® (Leadership in Energy and Environmental Design) A whole building rating system developed by the U.S. Green Building Council (USGBC) to evaluate project sustainability by analyzing critical aspects of building design and construction. A project may receive one of four levels of LEED certification by earning points in six categories of assessment. LEED is the most widely accepted national guideline for environmentally responsible building. It also provides technical guidance and third-party certification measures.

life cycle assessment (LCA) An approach used to measure a product's or building's environmental performance, from raw materials through manufacture, transportation, installation, use, recycling and waste management. USG defines sustainability in terms of building and resource economics as well, including life cycle costs.

life cycle cost (LCC) The cost of a building system over its useful life, including installation, use (e.g., related energy costs), anticipated repairs and maintenance.

life-cycle costing Selection of the most economical material and systems based on initial costs, maintenance costs and operating costs for the life of the building.

life cycle inventory (LCI) A collection of data to facilitate life cycle assessment and environmental impact studies. NREL (the National Renewable Energy Laboratory) and its partners have created the U.S. LCI Database to provide "a cradle-to-grave accounting of the energy and material flows into and out of the environment that are associated with producing a material, component or assembly."

limiting height The maximum height for design and construction of a partition or wall without exceeding the structural capacity or allowable deflection under given design loads.

limpness Characteristic of a member that reduces vibration, thereby dampening sound.

lintel A horizontal member spanning an opening such as a window or door. Also referred to as a *header*.

live load Part of the total load on structural members that is not a permanent part of the structure. May be variable, as in the case of loads contributed by occupancy, and wind and snow loads.

load The force provided by weight, external or environmental sources such as wind, water and temperature, or other sources of energy.

load-bearing partition A partition designed to support a portion of the building structure.

locally sourced material Construction materials that are extracted and processed near the location where these materials are used (in the manufacturing and installation into a finished building). Use of local materials minimizes energy consumption for transportation.

loudness A subjective response to sound pressure. The loudness of sound is not directly proportional to the amount of sound pressure or energy. Moreover, the apparent loudness—the way the sound is heard by a human—varies from person to person. *See also* **decibel**.

louver An opening with slanted fins (to keep out rain and snow) used to ventilate attics, crawl spaces and wall openings.

lumen A standard unit for measuring light emission. Generally speaking, one lumen is the amount of light emitted by one candle. More specifically, a lumen is the unit of measure for the flow of light through a unit solid angle from a uniform point source equal to one candela. One candela roughly approximates the intensity of light emitted by a single burning candle.

luminaire A complete lighting unit, consisting of a lamp or lamps, together with parts designed to distribute the light, to position and protect the lamps and to connect to the power source.

masking sound Background noise used to cover unwanted sounds, provide privacy or avoid a “quiet” area that otherwise may be acoustically “dead.”

mass Property of a body that resists acceleration and produces the effect of inertia. The weight of a body is the result of the pull of gravity on the body’s mass.

mechanical bond The attachment created when plaster penetrates into or through the substrate or envelops irregularities in the substrate’s surface.

member A general term for a structural component of a building, such as a beam or column.

metric terms Metric units shown as equivalents in this Handbook are from the International System of Units in use worldwide, as established by the General Conference of Weights and Measures in 1960. Metric terms in the Handbook comply with the Metric Conversion Act of 1975, which committed the United States to a coordinated voluntary conversion to the metric system of measurement. For more on metric conversion, see the Appendix.

miter A joint formed by two pieces of material cut to meet at an angle.

model code Building code written and published by a building-official association, available to states, counties and municipalities for adoption (for a fee) in lieu of their own, e.g., the *International Building Code* (IBC).

modular building A structure intended for residential or commercial use that is at least partially completed in a factory complying with state or local code requirements.

module (1) In architecture, a selected unit of measure used as a basis for building layout; (2) In industrialized housing, a three-dimensional section of a building, factory-built, shipped as a unit and interconnected with other modules to form the complete building. Single-family units factory-built in two halves are usually referred to as "sectionals."

modulus of elasticity (E) Ratio between stress and unit deformation, a measure of the stiffness of a material.

moisture management Construction and maintenance methods that protect a building from the structural and indoor air quality problems that can result from condensation or water intrusion.

moment of inertia (I) Calculated numerical relationship (expressed in inches to the 4th power) of a member's resistance to bending. Moment of inertia is a function of the member's cross-sectional shape and size. A measure of the stiffness of a member based on its shape. Larger moments of inertia indicate greater resistance to bending for a given material.

mortar A mixture of gypsum plaster or Portland cement with aggregate or hydrate lime (or both) and water to produce a trowelable fluidity.

moulding (also molding) Narrow decorative strip applied to a surface.

MTS The Institute for Market Transformation to Sustainability. An organization that promotes sustainable product standards.

mud Slang term for **joint compound**.

mud pan Rectangular, angle-sided pan, shaped like bread pan, used by joint finisher to handle portions of joint compound. Straight-cut lip of pan ensures that taping knife can be regularly cleaned.

mullion Vertical bar or division in a window frame separating two or more panes.

muntin Horizontal bar or division in a window frame separating multiple panes or lites.

nail pop The protrusion of a nail from a wall or ceiling, usually attributed to the shrinkage of or use of improperly cured wood framing.

NBFU National Board of Fire Underwriters, now merged into the American Insurance Association.

NBS National Bureau of Standards, a federal agency.

neutral axis The plane through a member (at the geometric center of the section in symmetrical members) where the fibers are neither under tensile nor compressive stress.

NFPA National Fire Protection Association. An international technical society that disseminates fire prevention, fire fighting and fire protection information. NFPA technical standards include the *National Electrical Code*, which is widely adopted.

noise reduction coefficient (NRC) Arithmetic average of sound absorption coefficients at 250, 500, 1,000 and 2,000 Hz.

nominal Term indicating that the full measurement is not used. Usually slightly less than the full net measurement, as with 2" x 4" studs that have an actual size when dry of 1-1/2" x 3-1/2".

noncombustible Definition paraphrased from the ICC 2009 *International Building Code*:

1. Material of which no part will ignite and burn when subjected to fire.
2. Material having a structural base of noncombustible materials as defined, with a surface not over 1/8" thick that has a flame spread rating of 50 or less.

The term does not apply to surface finish materials.

octave Interval between two sounds having a basic frequency ratio of two. The formula is $2n$ times the frequency, where n is the desired octave interval. The octave band frequency given in sound test results is usually the band center frequency. Thus the 1,000 Hz octave band encompasses frequencies from 707 Hz to 1,414 Hz ($n = \pm 1/2$). The 1,000 Hz one-third octave band encompasses frequencies from 891 Hz to 1,122 Hz ($n = \pm 1/6$).

OSU Ohio State University, an independent fire-testing laboratory, currently not active.

parapet wall An extension of an exterior wall above and/or through the roof surface.

parting oil Material used to prevent bonding of concrete to a surface, such as to forms. Parting oil on concrete surfaces must be removed, along with grease and efflorescence, before gypsum products are applied.

passive solar Design strategies that contribute to a building's needed supply of heat (water and air) without an energy input (pumps or fans). For example, windows and building mass collect heat without the need for power. Passive solar designs are categorized as direct gain, sunspaces or Trombe walls.

penny (d) A suffix designating the size of nails, such as 6d (penny) nail, originally indicating the price, in English pence, per 100 nails. Does not designate a constant length or size, and will vary by type (e.g., common and box nails).

performance specification A statement of how a building element must perform—as opposed to describing equipment, products or systems by name.

perimeter relief A gap left around the perimeter of a wall, floor or ceiling membrane, such that it will not be in direct contact with the membrane of adjoining assemblies. This gap is normally caulked with acoustical sealant.

perm A unit of measurement of Water Vapor Permeance (ASTM E96). *See also* **permeance**.

permeability The property of a porous material that permits a fluid (or gas) to pass through it. In construction, commonly refers to water vapor permeability of a sheet material or assembly and is defined as water vapor permeance per unit thickness, using a metric unit of measure (metric perms per centimeter of thickness). *See also* **permeance**.

permeance (water vapor) The ratio of the rate of water vapor transmission (WVT) through a material or assembly (between its two parallel surfaces) to the vapor pressure differential between the surfaces. The metric unit for measuring permeance is the metric perm, 1 g/24 h. x m² x mm Hg; U.S. unit, 1 grain/h x ft.² x in. Hg.

photographing *See* **shadowing**.

photovoltaics (PVs) Devices that convert sunlight directly into electricity. PVs generate power without noise, pollution or fuel consumption.

pilaster Projecting, square column or stiffener forming part of a wall.

pillar Column supporting a structure.

pitch of roof Slope of the surface, generally expressed in inches of vertical rise per 12" horizontal distance, such as "4-in-12 pitch."

plaster base Gypsum panel with specially treated face paper to serve as a stable backing for plaster applications. Two types of plaster base are available; one type is usually 3/8" thick, 16" wide and 4' long and is used for conventional (thick) coat plastering. The other is typically 1/2" or 5/8" thick and 4' wide (lengths vary) and is used for veneer plaster system applications.

plaster bonder *See* **bonding agent**.

plate "Top" plate is the horizontal member fastened to the top of the studs or wall on which the rafters, joists or trusses rest. The "sole" plate is positioned at bottom of the studs or wall.

platform Floor surface raised above the ground or floor level.

platform framing Technique of framing where walls can be built and tilted up on a platform floor, and in multi-story construction are erected sequentially from one platform to another. Also known as *Western framing*.

plenum (1) Chamber in which the air pressure is higher (as in a forced-air furnace system) than that of the surrounding air. (2) The space above a suspended ceiling.

plenum barrier Vertical surface framed from the structure above to the finished ceiling and sealed to prevent the passage of air.

porosity The propensity of certain materials, such as wallboard paper, to absorb water.

Portland cement Hydraulic cement produced by pulverizing clinker consisting essentially of hydraulic calcium silicates, usually containing one or more forms of calcium.

post-consumer waste Recycled materials that have been used and discarded by households or commercial uses.

pre-consumer waste Materials and by-products of manufacturing. Also known as **post-industrial waste**. Includes waste generated by manufacturers, such as trimmings and overruns that are used to manufacture additional products.

prescription specification Traditional procedure used on building projects to describe by name products, equipment or systems to be used.

purlin Horizontal member in a roof supporting common rafters, such as at the break in a gambrel roof. Also, a horizontal structural member perpendicular to main beams in a flat roof.

3 Rs of sustainability (reduce, recycle, renew) USG seeks to maximize all three, as follows:

Reduce Products and packaging designed to minimize the amount of raw materials and energy consumed during the manufacturing process greatly contribute to overall sustainability. Lightweight materials typically require less energy to transport. Production waste can also be minimized through the use of high-efficiency design and manufacturing processes. In drywall production, USG uses 97% of the raw material in its finished panels. A portion of the remaining 3% is utilized for transportation spaces (also known as “spacers” or “dunnage”).

Recycle Effective recycling during manufacturing reduces raw material consumption, energy demands, and landfill waste. Materials that are discarded or damaged in the course of manufacturing are reprocessed into the same product. This waste is also reused to manufacture different products with shared ingredients, or repurposed for altogether new applications. The extensive use of recycling processes at every stage of manufacturing is a major element of USG’s environmental management strategy.

Renew Responsible manufacturing minimizes the environmental impact of resource consumption by utilizing renewable materials that are regenerated in a shorter time frame than conventional resources. Key ingredients of grain-based fuels used as sources of production energy, for example, are renewable in less than two years.

racking Forcing out of plumb of structural components, usually by wind, seismic stress or thermal expansion or contraction.

radiation Transfer of heat energy through space by wave motion. Although the radiant energy of heat is transmitted through space, no heat is present until this energy strikes and is absorbed by an object. Not all of the radiant heat energy is absorbed; some is reflected to travel in a new direction until it strikes another object. The amount

reflected depends on the nature of the surface the energy strikes. This fact explains the principle of insulating foil and other similar products that depend on reflection of radiant heat for their insulating value.

rafter Framing member forming the slanting frame of a roof or top chord of a truss. Also known as *hip*, *jack* or *valley rafter* depending on its location and use.

rafter tail The part of a rafter that extends beyond the wall plate—the overhang.

rapidly renewable materials (RRM) Raw materials such as cork, bamboo and straw, that can be re-grown quickly and are therefore considered sustainable.

ready-mixed plaster A calcined gypsum plaster with aggregate added during manufacture. A powder product that requires the addition of water.

recycled content The percent of the total material content (by the combination of post-consumer waste, pre-consumer material and post-industrial material) versus the percent of content that is virgin material.

reflected heat See **radiation**.

reflected sound Sound that has struck a surface and “bounced off.” Sound reflects at the same angle as light reflects in a mirror; the angle of incidence equals the angle of reflection. Large curved surfaces tend to focus (concave) or diffuse (convex) the sound when reflected. However, when the radius of the reflecting surface is less than the wavelength of the sound, this does not hold true. Thus, a rough-textured surface has little effect on diffusion of sound.

reflective insulation Material that reflects and thus retards the flow of radiant heat. The most common type is aluminum foil. The effectiveness of reflective barriers is diminished by the accumulation of dirt and by surface oxidation.

relative humidity The ratio of actual water vapor pressure to the saturation water vapor pressure at the same temperature, expressed as a percentage.

renewable energy Energy from natural resources that replenish themselves, such as the sun, wind, rain, tides and geothermal sources.

resonance The production of relatively intense sound vibrations by exposure to a small sound stimulus. Every medium and object has a resonant frequency at which it will, under favorable conditions, re-radiate a received sound of the same frequency.

retarder An admixture used to delay the setting action of plasters or other cementitious materials.

reverberation The perpetuation of sound within a space after the source has ceased, such as an echo.

reverberation time The number of seconds it takes for the sound pressure to die down to one-thousandth of its original value after the source has ceased.

ridge Peak of a roof where the roof surfaces meet at an angle. Also may refer to the framing member that runs along the ridge and supports the rafters.

rise Measurement in height of an object. The converse is "fall."

riser Vertical face of a step supporting the tread in a staircase.

rough framing Structural elements of a building or the process of assembling elements to form a supporting structure where finish appearance is not critical.

sabin Measure of sound absorption of a surface, equivalent to 1 SF of a perfectly absorptive surface.

safing Firestop material in the space between a floor slab and a curtain wall in multi-story construction.

safing off Installation of fire safety insulation around floor perimeters, between floor slab and spandrel panels. Insulation helps retain integrity of fire-resistance ratings.

scab Small piece or block of wood that bridges several members or provides a connection or fastening between them.

screed To level or straighten a plaster coat application with a rod, darby or other similar tool.

screed (noun) See **ground**. Screeds are made from basecoat plaster; they are created between plaster dots or grounds.

section modulus (S) Numerical relationship, expressed in inches to the third power, of the resistance to the stress of a member. Section modulus is equal to the moment of inertia divided by the perpendicular distance from the neutral axis to the extremity of the member.

set The hardening and hydration of a gypsum plaster or setting-type joint compound. See also **setting time**.

setting time The elapsed time required for a gypsum plaster or setting-type joint compound to attain a specified hardness and strength after mixing with water.

shadowing An undesirable condition where the joint finish shows through the surface decoration.

shaft wall Fire-resistant wall that isolates the elevator, stairwell and vertical mechanical chase in high-rise construction. This wall must withstand the fluctuating (positive and negative) air-pressure loads created by elevators or air distribution systems.

shear Force that tends to slide or rupture one part of a body from another part of the body or from attached objects.

sheathing Plywood, gypsum, wood fiber, expanded plastic or composition boards encasing walls, ceilings, floors and roofs of framed buildings. May be structural or non-structural, thermal-insulating or non-insulating, fire-resistant or combustible.

SHEETROCK Leading brand of gypsum panel for interior wall and ceiling surfaces, developed and improved by United States Gypsum Company.

shoring Temporary member placed to support part of a building during construction, repair or alteration. Also may support the walls of an excavation.

sill Horizontal member at the bottom of a door or window frame. Provides support and closure.

sill plate Horizontal member laid directly on a foundation on which the framework of a building is erected.

slab Flat (although sometimes ribbed on the underside) reinforced concrete element of a building that provides the base for the floor or roofing materials.

SMaRT® A multiple sustainability attribute product rating system/standard.

soffit Undersurface of a projection or opening; bottom of a cornice between the fascia board and the outside of the building; underside of a stair, floor or lintel.

sole plate See **plate**.

sound A wave motion in an elastic medium caused by a vibrating object.

sound absorption The dissipation of sound by conversion of the acoustical energy into heat or another form of energy. Friction produces heat as the energy passes over and agitates the fibers of a sound-absorbing material.

sound attenuation Reduction of sound energy as it passes through a conductor (which resists the transmission).

sound barrier A material installed in a plenum or partition to prevent the passage of sound from one area to another. Sound-deadening board and lead sheet or special insulations make good sound barriers.

sound control Measures taken to control three types of sound: airborne sound transmission, impact sound transmission and architectural acoustics.

sound damping The use of fibrous sound-absorbing material in a partition to reduce sound transmission. Damping in floor/ceiling construction has a wider application for impact sound than for airborne sound.

sound insulation, isolation Use of building materials or constructions that reduce or resist the transmission of sound. Decoupling is one isolation method, in which the elements of a partition are separated to retard transmission of structure-borne sound.

sound leak Opening in a partition that allows air (and sound) to pass through. Examples include small holes in a wall, openings for electrical boxes and plumbing, and cracks around doors.

sound pressure The change in pressure resulting from vibration in the audible frequency range. Conversational speech at close range produces a sound pressure of about one dyne per sq. cm.

sound pressure level (SPL) Expressed in decibels, the SPL is 20 times the logarithm to the base 10 of the ratio of the sound pressure to a reference pressure of 20 micropascals. *See also* **decibel**.

sound transmission The transfer of sound energy from one space to another, through air, structure or other conductor. Unwanted sound in a room may be the result of sound transmission from sources outside the room. The degree to which sound transmission is acceptable depends on the quantity and source of the sound and the use of the adjacent space. Sound transmitted at a level below the receiving room ambient level would be acceptable.

sound transmission class (STC) A single-number rating for evaluating the effectiveness of a construction system in isolating audible airborne sound transmission across 16 frequencies. Higher numbers indicate more effectiveness. Tested per ASTM E90.

span Distance between supports, usually beams or joists.

spandrel beam Horizontal member that spans exterior columns or other vertical structural elements and supports a floor or roof.

spandrel wall Exterior wall panel, usually between columns, that extends from the window opening on one floor to one on the next floor.

speed of sound In air varies with atmospheric pressure and temperature, but is the same at all frequencies. For most architectural work, the speed of sound should be taken as 1,130' per second.

splayed hangers Hangers installed at an angle rather than perpendicular to the support grid or channel.

spot To treat fastener heads with joint compound material. As the fastener sets below the surface of the board, an indentation is formed, allowing a recess, which is filled by spotting.

square edge In context of acoustical tile, a square-edge is not beveled and creates a hairline joint when installed. Drywall panels also may have square edges, although they are typically tapered.

starved joint A poorly bonded joint, resulting from inadequate adhesive.

stile Vertical outside member in a piece of millwork, such as a door or sash.

stirrup Hanger to support the end of the joist at the beam.

stop Strip of wood fastened to the jambs and head of a door or window frame against which the door or window closes.

strain Unit deformation in a body as a result of stress.

stress Unit resistance of a body to an outside force that tends to deform the body by tension, compression or shear.

stringer Heavy horizontal timber that supports other members of the frame in a wood or brick structure. Also a support for steps.

structure-borne sound Sound energy imparted directly to and transmitted by the elements of a structure. Plumbing noises traveling through pipes are a good example.

strut Slender structural element that resists compressive forces acting lengthwise.

stucco (1) A mixture of Portland cement and aggregate designed for use on exterior or interior surfaces exposed to high levels of moisture. May also contain hydrated lime to improve working characteristics. (2) A gypsum plaster mix including aggregate for use on interior surfaces. (3) Calcined gypsum used to produce plaster, gypsum wallboard and related products. This terminology is specific to the gypsum processing industry.

stud Vertical load-bearing or non-load-bearing framing member.

subfloor Rough or structural floor placed directly on the floor joists or beams to which the finished floor is applied. As with resilient flooring, an underlayment may be required between subfloor and finished floor.

substrate Underlying material to which a finish is applied, or by which it is supported.

surface burning characteristic Rating of interior and surface finish material providing indexes for flame spread and smoke developed, based on testing conducted according to ASTM Standard E84.

suspended ceiling A ceiling that is hung from the structure typically with wire hangers.

sustainable design Design that considers all environmental and human health and well-being aspects, as well as resource efficiency. USG's SHEETROCK and FIBEROCK AQUA-TOUGH lines of gypsum panels meet nearly every criterion of sustainable design: low embodied energy, high recycled content and free of VOC and formaldehyde emissions.

synthetic gypsum A chemical product consisting primarily of calcium sulfate dehydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) derived primarily from an industrial process. See also **Desulfo gypsum**.

take-up The loss of water from plaster into the absorptive substrate during application, as evidenced by a moderate stiffening of the plaster coat.

tapered edge An edge formation of gypsum board that provides a shallow depression at the paper-bound edge to receive joint reinforcement. Typical edge on drywall panels; edges may also be square.

taping compound (embedding compound) A compound specifically formulated and manufactured for use in embedding of joint reinforcing tape at gypsum board joints.

task lighting Lighting directed to a specific work surface or area.

temper To bring plaster to the proper consistency by moistening and mixing.

temperature Measurement of the intensity (not quantity) of heat. The Fahrenheit (°F) scale places the freezing point of water at 32° and the boiling point at 212°. The Centigrade or Celsius (°C) scale, used by most countries and in scientific work, places the freezing point of water at 0° and the boiling point at 100°. On the Kelvin (K) scale, the unit of measurement equals the Celsius degree and measurement begins at absolute zero 0° (-273°C).

tensile strength Maximum tensile stress that can be developed in a given material under axial tensile loading. Also the measure of a material's ability to withstand stretching.

tension Force that tends to pull the particles of a body apart.

thermal expansion All materials expand and contract to some extent with changes in temperature. The thermal coefficient of linear expansion is expressed *inches per inch per degree Fahrenheit*. Example: gypsum board has a coefficient of 9.0×10^{-6} in. per in. per °F. This means that with an increase in temperature of 50°, a gypsum board wall 100' in length will have a linear expansion of 0.54" or an excess of 1/2". The expansion characteristics of some other building materials are more pronounced. For example, a 50° temperature increase would produce expansion in a 100' length of approx. 3/4" in aluminum, 3/8" in steel and 1/2" in concrete.

thermal resistance (R) Resistance of a material or assembly to the flow of heat. It is the reciprocal of the heat transfer coefficient: (1/C, or 1/U)

For insulating purposes, low "c" and "U" values and high "R" values are the most desirable.

thermocouple A thermoelectric junction of two dissimilar metals used to measure temperature differences.

threshold Raised member at the floor within the door jamb. Its purpose is to provide a divider between dissimilar flooring materials and/or serve as a thermal, sound or water barrier.

through-penetration An opening through a fire-resistive partition or floor/ceiling assembly to provide for an item (such as piping) to pass through it. Through-penetrations usually require the use of a firestop system to protect against the spread of fire through the opening.

through-penetration firestop A system for sealing through-penetrations in fire-resistant floors, walls and ceilings.

time-temperature curve Rate at which the temperature increases in a fire-testing furnace. Developed by ASTM, NFPA and UL, this curve is adhered to in all fire-resistive testing.

toenail Method of fastening two boards or studs together as in a "T" by driving nails into the board that forms the stem of the "T" at an angle so they enter the other board and cross each other.

tone A sound that produces a definite sensation of pitch, loudness and timbre.

tongue-and-groove joint A joint where the projection or “tongue” of one member engages the mating groove of the adjacent member to minimize relative deflection and air infiltration. A method widely used in sheathing, flooring and paneling. Tongues may be in “V,” round or square shapes.

topping compound A compound specifically formulated and manufactured for use over taping or all-purpose compounds to provide a smooth, level surface for applying decoration.

transmission loss (TL) The decrease in energy during transmission from one surface of a medium to another, such as, through a panel or wall.

tread The horizontal plane or surface of a stair step.

trimmer Double joists or rafters framing the opening of a stairwell, dormer opening, etc.

truss Open, lightweight framework of members, usually designed to replace a large beam where spans are great.

TSP (trisodium phosphate) A cleaning agent used to remove grease, soot and paint dust from a surface, usually in preparation for painting.

U of C University of California, an independent fire-testing laboratory.

“U” factor The coefficient of heat transfer, “U” equals 1 divided by (hence, the reciprocal of) the total of the resistances of the various materials, air spaces and surface air films in an assembly. *See also thermal resistance.*

Underwriters Laboratories, Inc. (UL) A not-for-profit laboratory operated for the purpose of testing devices, systems and materials as they relate to life, fire and casualty hazards, in the interest of public safety.

USASI United States of America Standards Institute, now referred to as American National Standards Institute.

U.S. Green Building Council (USGBC) A nonprofit coalition of leaders drawn from across the building industry whose purpose is to promote sustainable building. USG is proud to be a founder and charter member of the Council. The LEED (Leadership in Energy and Environmental Design) Green Building Rating System developed by USGBC is the most widely accepted national guideline for environmentally responsible building.

vapor retarder A material used to retard the flow of water vapor through walls and other spaces where it may condense at a lower temperature.

velocity The speed of sound in air at room temperature is 1,130' per second; in steel, 16,500' per second; in hardwood, 13,000' per second. The speed sound travels depends only on the density and elasticity of the medium through which it passes. Its speed is unaffected by loudness and frequency.

veneer plaster Calcined gypsum plaster specially formulated to provide specific workability, strength, hardness and abrasion resistance

characteristics when applied in thin coats (1/16" to 3/32" nom.) over veneer gypsum base or other approved base. The term *thin-coat plaster* is sometimes used in reference to veneer plaster.

volatile organic compounds (VOCs) Chemicals, such as formaldehyde, that are harmful when released (off-gassed) from building products after installation. VOCs are also found in cleaning supplies and furnishings and are also emitted by some plants, trees, microorganisms, and even by humans. VOCs may be present during all stages of a building's life cycle—materials manufacturing, construction/installation and occupancy—and may pose real health and comfort issues.

water-absorption The amount of water absorbed by a material under specified test conditions. Commonly expressed as a weight percent of the test specimen.

water-repellent paper Gypsum board paper surfacing that has been formulated or treated to resist water penetration.

water vapor transmission The rate of water vapor flow, under steady specified conditions, through a unit area of a material, between its two parallel surfaces. Metric unit of measurement is 1 g/24 h. x m² x mm Hg. *See also permeance.*

watt A basic unit of power equal to 10,000,000 dyne-cm.

wave front The surface of the wave sphere created when sound waves radiate from the source in all directions, forming a spherical shape.

wavelength (sound) A wave is one complete cycle of sound vibration passing through a medium (such as air) from compression through rarefaction and back to compression again. The physical length of this cycle is termed the wavelength. Wavelengths in air vary from about 11/16" for a 20,000-cycle per second (see **frequency**) sound, to approximately 56'-6" for a 20-cycle per second sound (the two approximate extremes of human hearing sensitivity). There are waves outside of this range, but generally, they cannot be heard by humans.

weep hole A small aperture at the base of an exterior wall cavity intended to drain trapped moisture.

wet sand To smooth a finished joint with a small-celled wet sponge. This method produces less dust than is created by the dry sanding method.

WHI Warnock Hershey International, an independent fire-testing laboratory.

whole design solution A design approach that considers and integrates all building systems, starting with the early design stages—for optimum efficiency and sustainability in the structure. Also **holistic**, **integrated** or **whole building design**.

wind power Energy from wind, usually collected by wind turbines.

wood-fibered plaster A calcined gypsum plaster containing shredded or ground wood fiber added during manufacture.

zero-net energy building (ZEB) or net zero energy building A building that has a net energy consumption of zero over a year.