

Cement and Concrete Terminology

Reported by ACI Committee 116

Hamid Farzam
Chairman

Glen Bollin
Bernard J. Erlin
Fred K. Gibbe
Robert L. Henry
Mark B. Hogan
Edward P. Holub

Richard H. Howe
Henri L. Isabelle
Lawrence J. Kaetzel
Tarek S. Khan
James R. Libby
Mark D. Luther

Joaquin Marin
Bryant Mather
Alvaro G. Meseguer
Richard C. Mielenz
Austin H. Morgan, Jr.
Todd Rutenbeck

FOREWORD

This report is the authoritative glossary for cement and concrete technology. It is to be used generally and specifically in ACI technical communications, correspondence, and publications. One mission of Committee 116 is to produce and maintain a list of terms with their meaning in the field of cement and concrete technology.

Committee 116 has tried to produce a glossary that will be useful, comprehensive, and up-to-date. It recognizes, however, that the listing may not be complete and that some definitions may be at variance with some commonly accepted meanings.

Users of the glossary are invited to submit suggestions for changes and additions to ACI Headquarters for consideration by Committee 116 when preparing future editions. In the event that a user disagrees with any of the definitions, it is hoped that the reasons for such will be given to the committee.

The committee is aware that some of the definitions included may seem entirely self-evident to an expert in the concrete field. This occurs because no term has been discarded if there was reason to believe it would appear to be technical in nature to a casual reader of the ACI literature.

The committee voted to use the following procedural rules:

1. Each definition shall be stated in one sentence;
2. Each definition shall consist of the term printed in boldface, a dash, and the definition statement;
3. The definition statement shall not repeat the term and should state the class or group and identify the features unique to the term; as “**mathematics**—the science of numbers and spaces”;
4. Verbs should be stated in the infinitive rather than the participle; for example the term to be defined should be “**abrade**” not “**abrading**”;
5. Notes may be appended to definition statements;
6. Cross references may take the place of a definition as “**green concrete**—see **concrete, green**.” They also may call attention to related items as “**flint**—a variety of chert. (See also **chert**).” Where the committee has found two or more terms with the same meaning, the definition is given where the preferred term appears, the synonyms are cross referenced to the preferred term, and in many cases, the fact is stated;
7. Generally, where there are a number of terms, the last word of which is the same, the definitions are given where the terms are listed in the inverted form, as “**cement, low-heat**” rather than “**low-heat cement**,” but under the latter entry, there will be a cross reference “see **cement, low-heat**,” and
8. In selecting terms and definitions, there shall be coordination with the terminology subcommittees of ASTM Committees C-1 on Cement, and C-9 on Concrete and Concrete Aggregates.

The invaluable contributions of the past chairmen of Committee 116, B. J. Erlin, R. C. Mielenz, D. L. Bloem, W. H. Price, R. E. Davis, Jr., J. R. Dise, K. F. Gibbe, Robert L. Henry, M. D. Luther, B. Mather, and E. Senbetta, those of the present members of the committee, as well as the diligent efforts of William Lorman and Lewis H. Tuthill, are gratefully acknowledged.

For drafting this edition, all members, both associates and voting, participated.

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Reference to this document shall not be made in contract documents. If items found in this document are desired by the Architect/Engineer to be a part of the contract documents, they shall be restated in mandatory language for incorporation by the Architect/Engineer.

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A

Abrams' law—see **law, Abrams'.**

abrasion damage—see **damage, abrasion.**

abrasion resistance—see **resistance, abrasion.**

absolute specific gravity—see **specific gravity, absolute.**

absolute volume—see **volume, absolute.**

absorbed moisture—see **moisture, absorbed.**

absorbed water—see **moisture, absorbed.**

absorption—the process by which a liquid is drawn into and tends to fill permeable voids in a porous solid body; also, the increase in mass of a porous solid body resulting from the penetration of a liquid into its permeable voids.

abutment—in bridges, the end structure (usually of concrete) that supports the beams, girders, and deck of the bridge, or combinations thereof, and sometimes retains the earthen bank or supports the end of the approach pavement slab; in prestressing, the structure against which the tendons are stressed in producing pretensioned precast members or post-tensioned pavement; and in dams, the side of the gorge or bank of the stream against which a dam abuts.

accelerating admixture—see **admixture, accelerating.**

acceleration—increase in velocity or in rate of change, especially the quickening of the natural progress of a process such as setting or strength development (hardening) of concrete. (See also **admixture, accelerating.**)

accelerator—see **admixture, accelerating.**

accidental air—see **air, entrapped.**

acrylic resin—see **resin, acrylic.**

addition—a material that is interground or blended in limited amounts into a hydraulic cement during manufacture either as a “processing addition” to aid in manufacturing and handling the cement or as a “functional addition” to modify the use properties of the finished product.

advancing-slope grouting—see **grouting, advancing-slope.**

additive—see **agent.**

adhesion—the state in which two surfaces are held together by interfacial effects that may consist of molecular forces, interlocking action, or both.

adhesives—the group of materials used to join or bond similar or dissimilar materials; for example, in concrete work, the epoxy resins.

adiabatic—a condition in which heat neither enters nor leaves a system.

adiabatic curing—see **curing, adiabatic.**

adjustment screw—see **screw, adjustment.**

admixture—a material other than water, aggregates, hydraulic cement, and fiber reinforcement, used as an ingredient of a cementitious mixture to modify its freshly mixed, setting, or hardened properties and that is added to the batch before or during its mixing.

admixture, accelerating—an admixture that causes an increase in the rate of hydration of the hydraulic cement and thus shortens the time of setting, increases the rate of strength development, or both.

admixture, air-entraining—an admixture that causes the development of a system of microscopic air bubbles in concrete, mortar, or cement paste during mixing, usually to increase its workability and resistance to freezing and thawing. (See also **air, entrained.**)

admixture, retarding—an admixture that causes a decrease in the rate of hydration of the hydraulic cement and lengthens the time of setting.

admixture, water-reducing—an admixture that either increases slump of freshly mixed mortar or concrete without increasing water content or maintains slump with a reduced amount of water, the effect being due to factors other than air entrainment.

admixture, water-reducing (high-range)—a water-reducing admixture capable of producing large water reduction or great flowability without causing undue set retardation or entrainment of air in mortar or concrete.

adobe—unburnt brick dried in the sun.

adsorbed water—see **water, adsorbed.**

adsorption—development (at the surface of either a liquid or solid) of a higher concentration of a substance than exists in the bulk of the medium; especially formation of one or more layers of molecules of gases, of dissolved substances, or of liquids at the surface of a solid (such as cement, cement paste, or aggregates), or of air-entraining agents at the air-water interfaces; also, the process by which a substance is adsorbed. (See also **water, adsorbed.**)

advancing-slope grouting—see **grouting, advancing-slope.**

advancing-slope method—see **method, advancing-slope.**

aerated concrete—see **concrete, cellular** and **concrete, foamed.**

A/F ratio—see **ratio, A/F.**

afwillite—a mineral with composition $3\text{CaO} \cdot 2\text{SiO}_2 \cdot 3\text{H}_2\text{O}$ occurring naturally in South Africa, Northern Ireland, and California, and artificially in some hydrated portland cement mixtures.

agent—a general term for a material that may be used either as an addition to cement or an admixture in concrete; for example, an air-entraining agent.

agent, air-entraining—see **admixture, air-entraining.**

agent, bonding—a substance applied to a suitable substrate to create a bond between it and a succeeding layer.

agent, parting—see **agent, release** (preferred term).

agent, release—material used to prevent bonding of concrete to a surface. (See also **bond breaker** and **oil, form.**)

agent, surface-active—a substance that markedly affects the interfacial or surface tension of solutions when present even in low concentrations.

agent, wetting—a substance capable of lowering the surface tension of liquids, facilitating the wetting of solid surfaces, and permitting the penetration of liquid into the capillaries.

agglomeration—a gathering into a ball or mass.

aggregate—granular material, such as sand, gravel, crushed stone, crushed hydraulic-cement concrete, or cinder.

furnace slag, used with a hydraulic cementing medium to produce either concrete or mortar. (See also **aggregate, heavyweight** and **aggregate, lightweight**.)

aggregate, angular—aggregate particles that possess well-defined edges formed at the intersection of roughly planar faces.

aggregate, coarse—aggregate predominantly retained on the 4.75 mm (No. 4) sieve, or that portion retained on the 4.75 mm (No. 4) sieve. (See also **aggregate**.)

aggregate, crusher-run—aggregate that has been mechanically broken and has not been subjected to subsequent screening.

aggregate, dense-graded—aggregates graded to produce low void content and maximum density when compacted. (See also **aggregate, well-graded**.)

aggregate, fine—aggregate passing the 9.5 mm (3/8 in.) sieve, almost entirely passing the 4.75 mm (No. 4) sieve, and predominantly retained on the 75 μ m (No. 200) sieve; or that portion passing the 4.75 mm (No. 4) sieve and predominantly retained on the 75 μ m (No. 200) sieve. (See also **aggregate** and **sand**.)

aggregate, gap-graded—aggregate graded so that certain intermediate sizes are substantially absent.

aggregate, heavyweight—aggregate of high density, such as barite, magnetite, hematite, limonite, ilmenite, iron, or steel, used in heavyweight concrete.

aggregate, lightweight—aggregate of low density, such as: a) expanded or sintered clay, shale, slate, diatomaceous shale, perlite, vermiculite, or slag; b) natural pumice, scoria, volcanic cinders, tuff, and diatomite; and c) sintered fly ash or industrial cinders, used in lightweight concrete.

aggregate, mineral—aggregate consisting essentially of inorganic nonmetallic rock materials, either natural or crushed and graded.

aggregate, normalweight—aggregate that is neither heavyweight nor lightweight.

aggregate, open-graded—aggregate in which the voids are relatively large when the aggregate is compacted.

aggregate, reactive—aggregate containing substances capable of reacting chemically with the products of solution or hydration of the portland cement in concrete or mortar under ordinary conditions of exposure, resulting in some cases in harmful expansion, cracking, or staining.

aggregate, refractory—aggregate having refractory properties that, when bound together into a conglomerate mass by a matrix, forms a refractory body.

aggregate, single-sized—aggregate in which a major portion of the particles is in a narrow size range.

aggregate, well-graded—aggregate having a particle-size distribution that produces maximum density, that is, minimum void space.

aggregate blending—the process of intermixing two or more aggregates to produce a different set of properties, generally, but not exclusively, to improve grading.

aggregate-cement ratio—see **ratio, aggregate-cement**.

aggregate gradation—see **grading** (preferred term).

aggregate interlock—the effect of portions of aggregate particles from one side of a joint or crack in concrete protruding into recesses in the other side of the joint or crack so as to transfer load in shear and maintain alignment.

aggregate transparency—discoloration of a concrete surface consisting of darkened areas over coarse aggregate particles immediately below the concrete surface.

agitating speed—see **speed, agitating**.

agitating truck—see **truck, agitating**.

agitation—

1. the process of providing motion in mixed concrete just sufficient to prevent segregation or loss of plasticity; and
2. the mixing and homogenization of slurries or finely ground powders by either mechanical means or injection of air. (See also **agitator**.)

agitator—a device for maintaining plasticity and preventing segregation of mixed concrete by agitation. (See also **agitation**.)

aids, grinding—materials used to expedite the process of grinding by eliminating ball coating, dispersing the finely ground product, or both.

air—

air, accidental—see **air, entrapped** (preferred term).

air, entrained—microscopic air bubbles intentionally incorporated in mortar or concrete during mixing, usually by use of a surface-active agent; typically between 10 and 1000 μ m (1 mm) in diameter and spherical or nearly so. (See also **air entrainment**.)

air, entrapped—air voids in concrete that are not purposely entrained and that are larger, mainly irregular in shape, and less useful than those of entrained air; and 1 mm or larger in size.

air blow pipe—air jet used in shotcrete gunning to remove rebound or other loose material from the work area.

air-blown mortar—see **shotcrete** (preferred term).

air content—the volume of air voids in cement paste, mortar, or concrete, exclusive of pore space in aggregate particles; usually expressed as a percentage of total volume of the paste, mortar, or concrete.

air-cooled blast-furnace slag—see **blast-furnace slag**.

air entraining—the capability of a material or process to develop a system of microscopic bubbles of air in cement paste, mortar, or concrete during mixing. (See also **air entrainment**.)

air-entraining agent—see **admixture, air-entraining**.

air-entraining hydraulic cement—see **cement, air-entraining hydraulic**.

air entrainment—the incorporation of air in the form of microscopic bubbles (typically smaller than 1 mm) during the mixing of either concrete or mortar. (See also **air entraining** and **air, entrained**.)

air lift—equipment whereby slurry or dry powder is lifted through pipes by means of compressed air.

air meter—see **meter, air**.

air-permeability test—see **test, air-permeability** and **test, Blaine**.

air ring—see **ring, air**.



air

air separator—see **separator, air**.

air void—see **void, air**.

air-water jet—see **jet, air-water**.

akermanite—a mineral of the melilite group, $\text{Ca}_2\text{MgSi}_2\text{O}_7$.
(See also **gehlenite**, **melilite**, and **merwinite**.)

alabaster—a compact, crystalline, weakly textured form of practically pure gypsum.

alignment wire—see **wire, ground** (preferred term).

alite—a name used to identify tricalcium silicate, including small amounts of MgO , Al_2O_3 , Fe_2O_3 , and other oxides; a principal constituent of portland-cement clinker. (See also **belite**, **celite**, and **felite**.)

alkali—salts of alkali metals, principally sodium and potassium; specifically, sodium and potassium occurring in constituents of concrete and mortar, usually expressed in chemical analyses as the oxides Na_2O and K_2O . (See also **cement, low-alkali**.)

alkali-aggregate reaction—see **reaction, alkali-aggregate**.

alkali-carbonate rock reaction—see **reaction, alkali-carbonate rock**.

alkali reactivity (of aggregate)—see **reactivity (of aggregate)**, **alkali**.

alkali-silica reaction—see **reaction, alkali-silicate**.

alkyl aryl sulfonate—synthetic detergent used to entrain air in hydraulic cement mixtures.

allowable bearing capacity—the maximum pressure to which a soil or other material should be subjected to guard against shear failure or excessive settlement.

allowable load—see **load, service dead** and **load, service live**.

allowable stress—see **stress, allowable**.

alternate-lane construction—see **construction, alternate-lane**.

alumina—aluminum oxide (Al_2O_3).

aluminate cement—see **cement, calcium-aluminate**.

aluminate concrete—see **concrete, aluminate**.

aluminous cement—see **cement, calcium-aluminate**.

amount of mixing—the extent of mixer action employed in combining the ingredients for either concrete or mortar; in the case of stationary mixers, the mixing time; and in the case of truck mixers, the number of revolutions of the drum at mixing speed after the intermingling of the cement with water and aggregates. (See also **mixing time**.)

amplitude—the maximum displacement from the mean position in connection with vibration.

analysis, dynamic—analysis of stresses in framing as functions of displacement under transient loading.

analysis, mechanical—the process of determining particle-size distribution of an aggregate. (See also **analysis, sieve**.)

analysis, sieve—particle-size distribution; usually expressed as the mass percentage retained upon each of a series of standard sieves of decreasing size and the percentage passed by the sieve of finest size. (See also **grading**.)

anchor—in prestressed concrete, to lock the stressed tendon in position so that it will retain its stressed condition; in precast-concrete construction, to attach the precast units

to the building frame; and in slabs on grade or walls, to fasten to rock or adjacent structures to prevent movement of the slab or wall with respect to the foundation, adjacent structure, or rock. (See also **anchor, form**.)

anchor, form—device used to secure formwork to previously placed concrete of adequate strength; the device is normally embedded in the concrete during placement.

anchor bolt—see **bolt, anchor**.

anchorage—in post-tensioning, a device used to anchor the tendon to the concrete member; in pretensioning, a device used to maintain the elongation of a tendon during the time interval between stressing and release; in precast-concrete construction, the devices for attaching precast units to the building frame; and in slab or wall construction, the device used to anchor the slab or wall to the foundation, rock, or adjacent structure.

anchorage, dead-end—the anchorage at that end of a tendon that is opposite the jacking end.

anchorage, end—

1. length of reinforcement, mechanical anchor, hook, or combination thereof, beyond the point of nominal zero stress in the reinforcement of cast-in-place concrete; and
2. mechanical device for transmitting prestressing force to the concrete in a post-tensioned member. (See also **anchorage**.)

anchorage, mechanical—any mechanical device capable of developing the strength of the reinforcement without damage to the concrete.

anchorage, threaded—an anchorage device that is provided with threads to facilitate attaching the jacking device and to effect the anchorage.

anchorage, wedge—a device for anchoring a tendon by wedging.

anchorage bond stress—see **stress, anchorage bond**.

anchorage deformation—see **deformation, anchorage** or **slip**.

anchorage device—see **anchorage** (preferred term).

anchorage loss—see **deformation, anchorage**.

anchorage slip—see **deformation, anchorage** or **slip**.

anchorage zone—see **zone, anchorage**.

angle float—see **float, angle**.

angle of repose—the angle between the horizontal and the natural slope of loose material below which the material will not slide.

angular aggregate—see **aggregate, angular**.

anhydrite—a mineral, anhydrous calcium sulfate (CaSO_4); gypsum from which the water of crystallization has been removed, usually by heating above 325 F (160 C); natural anhydrite is less reactive than that obtained by calcination of gypsum.

anhydrous calcium chloride—see **calcium chloride, anhydrous**.

apparent specific gravity—see **specific gravity, absolute**.

architect-engineer or **engineer-architect**—the architect, engineer, architectural firm, engineering firm, or architectural and engineering firm issuing professional engineering documents.

and specifications, or administering the work under contract specifications and drawings, or both.

architectural concrete—see **concrete, architectural**.

arc spectrography—spectrographic identification of elements in a sample of material heated to volatilization in an electric arc or spark.

area of steel—the cross-sectional area of the steel reinforcement. (See also **effective area of reinforcement**.)

arenaceous—composed primarily of sand; sandy.

argillaceous—composed primarily of clay or shale; clayey.

arris—the ridge formed by the meeting of two surfaces.

arripping tool—see **tool, arripping**.

artificial pozzolan—see **pozzolan, artificial**.

asbestos-cement products—products manufactured from rigid material composed essentially of asbestos fiber and portland cement.

ashlar—see **masonry, ashlar**.

ashlar, patterned—see **masonry, ashlar**.

ashlar masonry—see **masonry, ashlar**.

ashlar, random—see **masonry, ashlar**.

asphalt—a dark brown to black cementitious material in which the predominating constituents are bitumens that occur in nature or are obtained in petroleum processing.

asphalt cement—see **cement, asphalt**.

asphaltic concrete—see **concrete, asphaltic**.

atmospheric-pressure steam curing—see **curing, atmospheric-pressure steam**.

Atterberg limits—see **limits, Atterberg**.

Atterberg test—see **test, Atterberg**.

autoclave—a pressure vessel in which an environment of steam at high pressure may be produced; used in the curing of concrete products and in the testing of hydraulic cement.

autoclave curing—see **curing, autoclave**.

autoclave cycle—see **cycle, autoclave**.

autoclaved—see **curing, autoclave**.

autoclaving—see **curing, autoclave**.

autogenous healing—see **healing, autogenous**.

autogenous length change—see **length change, autogenous**.

autogenous volume change—see **volume change, autogenous**.

automatic batcher—see **batcher**.

auxiliary reinforcement—see **reinforcement, auxiliary**.

average bond stress—see **bond stress, average**.

average compressive strength—see **compressive strength, average**.

axis, neutral—a line in the plane of a structural member subject to bending where the longitudinal stress is zero.

axle load—see **load, axle**.

axle steel—see **steel, axle**.

axle-steel reinforcement—see **reinforcement, axle-steel**.

B

b/b₀—see **factor, coarse-aggregate** (preferred term).

bacillus, cement—see **ettringite** (preferred term).

backfill concrete—see **concrete, backfill**.

back form—see **form, top** (preferred term).

back plastering—plaster applied to one face of a lath system following application and subsequent hardening of plaster applied to the opposite face. (See also **parge**.)

back stay—see **brace** (preferred term).

backshores—shores placed snugly under a concrete slab or structural member after the original formwork and shores have been removed from a small area without allowing the entire slab or member to deflect or support its own mass or existing construction loads.

bacterial corrosion—see **corrosion, bacterial**.

bag (of cement; also sack)—a quantity of portland cement: 94 lb (43 kg) in the U.S.; for other kinds of cement, quantity indicated on the bag.

balanced load—see **load, balanced**.

balanced moment—moment capacity at simultaneous crushing of concrete and yielding of tension steel.

balanced reinforcement—an amount and distribution of reinforcement in a flexural member such that in working-stress design the allowable tensile stress in the steel and the allowable compressive stress in the concrete are attained simultaneously; or such that in strength design, the tensile reinforcement reaches its specified yield strength simultaneously with the concrete in compression reaching its assumed ultimate strain of 0.003.

ball mill—see **mill, ball**.

ball test—see **test, ball**.

band iron—thin metal strap used as a form tie, hanger, etc.

bar—an element, normally composed of steel, with a nominal uniform cross-sectional area used to reinforce concrete.

bar, coated—a bar on which a coating has been applied, usually to increase resistance to corrosion.

bar, deformed—a reinforcing bar with a manufactured pattern of surface ridges intended to reduce slip and increase pullout resistance of bars embedded in concrete.

bar, epoxy-coated—a reinforcing bar coated by an epoxy-resin system, usually to increase resistance to corrosion.

bar, high-bond—see **bar, deformed** (preferred term).

bar, plain—a reinforcing bar without surface deformations, or one having deformations that do not conform to the applicable requirements.

bar, reinforcement—see **reinforcement**.

bar, standard hooked—a reinforcing bar with the end bent into a hook to provide anchorage.

bar, tie—bar at right angles to, and tied to reinforcement to keep it in place.

bar bender—a tradesman who cuts and bends steel reinforcement; or a machine for bending steel reinforcement.

bar-end check—a check of the ends of reinforcing bars to determine whether they fit the devices intended for connecting the bars. (See also **mechanical connection**.)

bar mat—an assembly of steel reinforcement composed of two or more layers of bars placed at angles to each other and secured together either by welding or tying.

bar schedule—a list of the reinforcement, showing the shape, number, size, and dimensions of every reinforcement required for a structure or a portion of a structure.

bar

bar spacing—the distance between parallel reinforcing bars, measured center to center of the bars perpendicular to their longitudinal axes.

bar support—hardware used to support or hold reinforcing bars in proper position to prevent displacement before and during concreting. (See also **bat**; **bolster**, **slab**; **chair**.)

barite—a mineral, barium sulfate (BaSO_4), used in either pure or impure form as concrete aggregate primarily for the construction of high-density radiation shielding concrete; designated “barytes” in the UK.

barrage—a low dam erected to control the level of a stream.

barrel (of cement)—a quantity of portland cement: 376 lb (4 bags) in the U.S. (obsolete); also wood or metal container formerly used for shipping cement.

barrel-vault roof—see **roof**, **barrel-vault**.

barrier, moisture—a vapor barrier.

barrier, vapor—membranes located under concrete floor slabs that are placed on grade to retard transmission of water vapor from the subgrade.

bars, bundled—a group of not more than four parallel reinforcing bars in contact with each other, usually tied together.

bars, stem—bars used in the wall section of a cantilevered retaining wall or in the webs of a box; when a cantilevered retaining wall and its footing are considered as an integral unit, the wall is often referred to as the stem of the unit.

base—a subfloor slab or “working mat,” either previously placed and hardened or freshly placed, on which floor topping is placed in a later operation; also the underlying stratum on which a concrete slab, such as a pavement, is placed. (See also **mud slab** and **subbase**.)

base bead—see **base screed** (preferred term).

base coat—any plaster coat or coats applied before application of the finish coat.

base course—a layer of specified select material of planned thickness constructed on the subgrade or subbase of a pavement to serve one or more functions, such as distributing loads, providing drainage, or minimizing frost action; also the lowest course of masonry in a wall or pier.

base plate—a plate of metal or other material formerly placed under pavement joints and the adjacent slab ends to prevent the infiltration of soil and moisture from the sides or bottom of the joint opening; also a steel plate used to distribute vertical loads, as for bridge beams, building columns, or machinery.

base screed—a preformed metal screed with perforated or expanded flanges to provide a guide for thickness and planeness of plaster and to provide a separation between plaster and other materials.

basic creep—see **creep**, **basic**.

basket—see **load-transfer assembly** (preferred term).

bassanite—calcium sulfate hemihydrate, $2\text{CaSO}_4 \cdot \text{H}_2\text{O}$. (See also **hemihydrate** and **plaster of paris**.)

bat—a broken brick sometimes used to support reinforcement. (See also **bar support**.)

batch—*n.* quantity of either concrete or mortar mixed at one time; *v.* to weigh or volumetrically measure and introduce

into the mixer the ingredients for a quantity of either concrete or mortar.

batch, trial—a batch of concrete prepared to establish or check proportions of the constituents.

batch box—container of known volume used for measuring constituents of a batch of either concrete or mortar in proper proportions.

batch mixer—see **mixer**, **batch**.

batch plant—an installation for batching or for batching and mixing concrete materials.

batch weights—the quantities of the various ingredients (cement, water, the several sizes of aggregate, and admixtures if used) that compose a batch of concrete.

batched water—the mixing water added by a batcher to a cementitious mixture either before or during the initial stages of mixing (also called batch water).

batcher—a device for measuring ingredients for a batch of concrete.

batcher, automatic—a batcher equipped with gates or valves that, when actuated by a single starter switch, will open automatically at the start of the weighing operation of each material, and will close automatically when the designated quantity of each material has been reached, interlocked in such a manner that: a) the charging mechanism cannot be opened until the scale has returned to zero; b) the charging mechanism cannot be opened if the discharge mechanism is open; c) the discharge mechanism cannot be opened if the charging mechanism is open; d) the discharge mechanism cannot be opened until the designated quantity has been reached within the allowable tolerance; and e) if different kinds of aggregates or different kinds of cements are measured cumulatively in a single batcher, interlocked sequential controls are provided.

batcher, manual—a batcher equipped with gates or valves that are operated manually, with or without supplementary power (pneumatic, hydraulic, or electrical), the accuracy of the weighing operation being dependent on the operator’s observation of the scale.

batcher, semiautomatic—a batcher equipped with gates or valves that are separately opened manually to allow the material to be weighed but that are closed automatically when the designated quantity of each material has been reached.

batching, cumulative—measuring more than one ingredient of a batch in the same container by bringing the batcher scale into balance at successive total weights as each ingredient is accumulated in the container.

batten (also batten strip)—a narrow strip of wood placed over the vertical joint of sheathing or paneling; also used to hold several boards together. (See also **cleat**.)

batter—inclination from the vertical or horizontal.

batter boards—pairs of horizontal boards nailed to wooden stakes adjoining an excavation; used as a guide to elevations and to outline the building.

batter pile—see **pile**, **batter**.

bauxite—a rock composed principally of hydrous aluminum oxides; the principal ore of aluminum and a raw material for manufacture of calcium-aluminate cement.

bay—the space, in plan, between the centerlines of adjacent piers, mullions, or columns; a small, well-defined area of concrete placed at one time in the course of placing large areas, such as floors, pavements, or runways.

beam—a structural member subjected to primarily flexure, but also to axial load; and, the graduated horizontal bar of a weighing scale on which the balancing poises ride. (See also **beam**, **spandrel**; **girder**; **girt**; **joist**; **ledger**; **purlin**; and **stringer**.)

beam, double-tee—a precast concrete member composed of two stems and a combined top flange, commonly used as a beam but also used vertically in exterior walls.

beam, drop-in—a precast element simply supported on adjacent cantilevered elements.

beam, edge—a stiffening beam at the edge of a slab.

beam, grade—a reinforced concrete beam, usually at ground level, that strengthens or stiffens the foundation or supports overlying construction.

beam, simple—a beam without rotational restraint or continuity at its supports; also known as a simply supported beam.

beam, slender—a beam that, if loaded to failure without lateral bracing of the compression flange, would fail by buckling rather than in flexure.

beam, spandrel—a beam in the perimeter of a building, spanning between columns and usually supporting a floor or roof.

beam-and-slab floor (roof)—a reinforced concrete system in which a slab is supported by and is often monolithic with reinforced-concrete beams.

beam bottom—soffit or bottom form for a beam.

beam-column—a structural member subjected to axial load and flexure forces but primarily axial load.

beam form—a retainer or mold so erected as to give the necessary shape, support, and finish to a concrete beam.

beam form-clamp—any of various types of tying or fastening units used to hold the sides of beam forms.

beam hanger—a wire, strap, or other hardware device that supports formwork from structural members.

beam pocket—opening left in a vertical member in which a beam is to rest; also an opening in the column or girder form where forms for an intersecting beam will be framed.

beam saddle—see **beam hanger** (preferred term).

beam side—vertical or sloping side of a beam.

beam test—a method of measuring the flexural strength (modulus of rupture) of concrete by testing a standard unreinforced beam.

bearing capacity—see **allowable bearing capacity**.

bearing stratum—the soil or rock stratum on which a concrete footing or mat bears or that carries the load transferred to it by a concrete pile, caisson, or similar deep foundation unit.

belite—a name used to identify one form of the constituent of portland-cement clinker now known when pure as dicalcium silicate ($2\text{CaO}\cdot\text{SiO}_2$). (See also **alite**; **celite**; and **felite**.)

bench—see **pretensioning bed**.

bending moment—see **moment**, **bending**.

bending moment diagram—a graphical representation of the variation of bending moment along the length of the member for a given stationary system of loads.

beneficiation—improvement of the chemical or physical properties of a raw material or intermediate product by the removal or modification of undesirable components or impurities.

bent, pile—two or more piles driven in a row transverse to the long dimension of the structure and fastened together by capping and (sometimes) bracing.

bent bar—a reinforcing bar bent to a prescribed shape. (See also **hook**; **bar**, **hooked**; **stirrup**; and **tie**.)

bentonite—a clay composed principally of minerals of the montmorillonoid group, characterized by high adsorption and very large volume change with wetting or drying.

Berliner—a type of terrazzo topping using small and large pieces of marble paving, usually with a standard terrazzo matrix between pieces, also called Palladiana.

billet steel—see **steel**, **billet**.

binder—a cementing material, either a hydrated cement or reaction products of cement or lime and reactive siliceous material, the kind of cement and curing conditions governing the characteristics of the product formed; also materials such as asphalt, resins, and other materials forming the matrix of concretes, mortars, and sanded grouts.

biological shielding—shielding provided to attenuate or absorb nuclear radiation, such as neutron, proton, alpha and beta particles, and gamma radiation; the shielding is provided mainly by the density of the concrete, except that in the case of neutrons the attenuation is achieved by compounds of some of the lighter elements (for example, hydrogen and boron). (See also **concrete**, **shielding**.)

bituminous cement—see **cement**, **bituminous**.

Blaine apparatus—air-permeability apparatus for measuring the surface area of a finely ground cement, raw material, or other product. (See ASTM C 204.)

Blaine fineness—the fineness of powdered materials such as cement and pozzolans, expressed as surface area per unit mass usually in square meters per kilogram, determined by the Blaine apparatus. (See also **surface**, **specific**.)

Blaine test—see **test**, **Blaine**.

blanket, curing—a covering of sacks, matting, burlap, straw, waterproof paper, or other suitable material placed over freshly finished concrete. (See also **burlap**.)

blast-furnace slag—the nonmetallic product consisting essentially of silicates and aluminosilicates of calcium and other bases that is developed in a molten condition simultaneously with iron in a blast furnace.

1. air-cooled blast-furnace slag is the material resulting from solidification of molten blast-furnace slag under atmospheric conditions; subsequent cooling may be

bleed

accelerated by application of water to the solidified surface;

2. expanded blast-furnace slag is the low density, cellular material obtained by controlled processing of molten blast-furnace slag with water, or water and other agents, such as steam, compressed air, or both;
3. granulated blast-furnace slag is the glassy, granular material formed when molten blast-furnace slag is rapidly chilled, as by immersion in water; and
4. ground granulated blast-furnace slag is granulated blast-furnace slag that has been finely ground and is a hydraulic cement.

bleed—to undergo bleeding. (See **bleeding**.)

bleeding—the autogenous flow of mixing water within, or its emergence from, newly placed concrete or mortar; caused by the settlement of the solid materials within the mass; also called water gain.

bleeding capacity—the ratio of volume of water released by bleeding to the volume of paste or mortar.

bleeding rate—the rate at which water is released from a paste or mortar by bleeding.

blemish—any superficial defect that causes visible variation from a consistently smooth and uniformly colored surface of hardened concrete. (See also **bug holes**; **efflorescence**; **honeycomb**; **joint**; **lift**; **laitance**; **popout**; **rock pocket**; and **sand streak**.)

blended cement—see **cement, blended**.

blinding—the application of a layer of lean concrete or other suitable material to reduce surface voids or to provide a clean, dry working surface; also the filling or plugging of the openings in a screen or sieve by the material being separated. (See **concrete, lean**.)

blistering—the irregular raising of a thin layer at the surface of placed mortar or concrete during or soon after completion of the finishing operation, or in the case of pipe after spinning; also bulging of the finish plaster coat as it separates and draws away from the base coat.

bloated—swollen, as in certain lightweight aggregates as a result of processing.

block, concrete—a concrete masonry unit, usually containing hollow cores.

block, end—an enlarged end section of a member intended to reduce anchorage stresses to allowable values and provide space needed for post-tensioning anchorages.

block, wood—a solid piece of wood used in concrete formwork to fill space or prevent movement of the formwork.

block beam—a flexural member composed of individual blocks that are joined together by prestressing. (See also **member, segmental**.)

blockout—a space within a concrete structure under construction in which fresh concrete is not to be placed, called core in the UK.

blowdown period—time taken to reduce pressure in an autoclave from maximum to atmospheric.

blowholes—see **surface air voids** (preferred term).

blowup—the raising of two concrete slabs off the subgrade where they meet as a result of greater expansion than the

joint between them will accommodate; typically occurs only in unusually hot weather where joints have become filled with incompressible material; often results in cracks on both sides of the joint and parallel to it.

board butt joint—construction joint in shotcrete formed by sloping the sprayed surface to a 1 in. (25 mm) board laid flat.

bolster, slab—continuous wire bar support used to support bars in the bottom of slabs; top wire is corrugated at 1 in. centers to hold bars in position. (See also **bar support**.)

bolt, anchor—a metal bolt or stud, headed or threaded, either cast in place, grouted in place, or drilled into finished concrete, used to hold various structural members or embedments in the concrete, and to resist shear, tension, and vibration loadings from various sources, such as wind and machine vibration; also known as a hold-down bolt or a foundation bolt.

bolt, foundation—see **bolt, anchor**.

bolt, hold-down—anchor bolt provided near the ends of shear walls for transferring boundary-member loads from the shear wall to the foundation. (See also **bolt, anchor**.)

bolt, she—a type of form tie and spreader bolt in which the end fastenings are threaded into the end of the bolt, thus eliminating cones and reducing the size of holes left in the concrete surface.

bolt sleeve—a tube surrounding a bolt in a concrete wall to prevent concrete from adhering to the bolt and acting as a spreader for the formwork.

bond—

1. adhesion of concrete or mortar to reinforcement or other surfaces against which it is placed, including friction due to shrinkage and longitudinal shear in the concrete engaged by the bar deformations;
2. adhesion of cement paste to aggregate;
3. adhesion or cohesion between plaster coats or between plaster and a substrate produced by adhesive or cohesive properties of plaster or supplemental materials; and
4. patterns formed by the exposed faces of masonry units, for example, running bond or flemish bond.

bond, ceramic—the development of fired strength as a result of thermochemical reactions between materials exposed to temperatures approaching the fusion point of the mixture such as that which may occur, under these conditions, between calcium-aluminate cement and a refractory aggregate.

bond, chemical—bond between materials that is the result of cohesion and adhesion developed by chemical reaction.

bond, flexural stress—in structural-concrete members, the stress between the concrete and the reinforcing element that results from the application of external load.

bond, mechanical—

1. in general concrete construction, the physical interlock between cement paste and aggregate, or between concrete and reinforcement.

sliding resistance, not the adhesive resistance, of an embedded bar); and

2. in plastering, the physical keying of a plaster coat to: a) another; b) to the plaster base by means of plaster keys to the lath; or c) through interlock with adjacent plaster casts created by means of scratching or cross raking.

bond, transfer—in pretensioning, the bond stress resulting from the transfer of stress from the tendon to the concrete.

bond area—the nominal area of interface between two elements across which adhesion develops or may develop, as between cement paste and aggregate.

bond breaker—a material used to prevent adhesion of newly placed concrete to the substrate. (See also **oil, form** and **agent, release**.)

bond length—see **length, development** (preferred term).

bond plaster—a specially formulated gypsum plaster designed as first-coat application over monolithic concrete.

bond prevention—measures taken to prevent adhesion of concrete or mortar to surfaces against which it is placed.

bond strength—see **strength, bond**.

bond stress—see **stress, bond**.

bond stress, average—the force in a bar divided by the product of the perimeter and the development length of the bar.

bond stress, development—see **stress, anchorage bond** (preferred term).

bonded hollow-wall masonry—see **masonry, bonded hollow-wall**.

bonded member—a prestressed-concrete member in which the tendons are bonded to the concrete either directly or through grouting.

bonded post-tensioning—see **post-tensioning, bonded**.

bonded tendon—see **tendon, bonded**.

bonder—a masonry unit that ties two or more wythes (leaves) of a wall together by overlapping. (See also **header** and **wythe [leaf]**.)

bonding agent—see **agent, bonding**.

bonding layer—see **layer, bonding**.

bored pile—see **pier, drilled**.

boring—the removal by drilling of rock; a sample of soil or concrete for tests.

boron frits—clear, colorless, synthetic glass produced by fusion and quenching, containing boron. (See also **concrete, boron-loaded**.)

boron-loaded concrete—see **concrete, boron-loaded**.

box out—to form an opening in concrete by a box-like form.

brace—a structural member used to provide lateral support for another member, generally for the purpose of ensuring stability or resisting lateral loads.

bracing—see **brace** (preferred term).

bracket—an overhanging member projecting from a wall or other body to support weight acting outside the wall, or a similar piece to strengthen an angle. (See also **corbel**.)

breccia—rock composed of angular fragments of older rock cemented together.

breidigite—a mineral, alpha prime dicalcium silicate ($2\text{CaO}\cdot\text{SiO}_2$), occurring naturally at Scawt Hill, Northern Ireland, and at the Isle of Muck, Scotland and is also present in slags and portland cement.

breeze—usually clinker; also fine, divided material from coke production.

brick, calcium-silicate—a concrete product made principally from sand and lime that is hardened by autoclave curing.

brick, concrete—solid concrete masonry units of relatively small prescribed dimensions.

brick, rubbing—a silicon-carbide brick used to smooth and remove irregularities from surfaces of hardened concrete.

brick, sand-lime—see **brick, calcium-silicate** (preferred term).

brick seat—ledge on wall or footing to support a course of masonry.

bridge deck—see **deck, bridge**.

brique (also **briquet**)—a molded specimen of mortar with enlarged extremities and reduced center having a cross section of definite area, used for measurement of tensile strength.

broadcast—to toss granular material, such as sand, over a horizontal surface so that a thin, uniform layer is obtained.

broom finish—see **finish, broom**.

brown coat—see **coat, brown**.

brown out—to complete application of base coat plaster.

brown oxide—see **oxide, brown**.

brownmillerite—a ternary compound originally regarded as $4\text{CaO}\cdot\text{Al}_2\text{O}_3\cdot\text{Fe}_2\text{O}_3$ (C_4AF) occurring in portland and calcium-aluminate cement; now used to refer to a series of solid solutions between $2\text{CaO}\cdot\text{Fe}_2\text{O}_3$ (C_2F) and $2\text{CaO}\cdot\text{Al}_2\text{O}_3$ (C_2A).

brucite—a mineral having the composition magnesium hydroxide, $\text{Mg}(\text{OH})_2$, and a specific crystal structure.

brushed surface—see **surface, brushed**.

buck—framing around an opening in a wall; a door buck encloses the opening in which a door is placed.

buckling—failure by lateral or torsional instability of a structural member, occurring with stresses below the yield or ultimate values.

bug holes—see **surface air voids** (preferred term).

buggy—a two-wheeled hand or motor-driven cart, usually rubber-tired, for transporting small quantities of concrete from hoppers or mixers to forms; sometimes called a concrete cart.

building official—the official charged with administration and enforcement of the applicable building code, the duly authorized representative of the official.

build-up—spraying of shotcrete in successive layers to form a thicker mass; also the accumulation of residual hardened concrete in a mixer.

bulk cement—see **cement, bulk**.

bulk density—see **density, bulk**.

bulk loading—see **loading, bulk**.

bulk modulus—see **modulus, bulk**.

bulk specific gravity—see **specific gravity, absolute or density, bulk**.

bulk

bulk specific gravity (saturated-surface dry)—see **specific gravity, absolute**.

bulkhead—a partition in formwork blocking fresh concrete from a section of the form, or a partition closing a section of the form, such as at a construction joint; a partition in a storage tank or bin, as for cement or aggregate.

bulking—increase in the volume occupied by a quantity of sand in a moist condition over the volume of the same quantity dry or completely inundated.

bulking curve—graph of change in volume of a quantity of sand due to change in moisture content.

bulking factor—see **factor, bulking**.

bull float—see **float, bull**.

bundled bars—see **bars, bundled**.

burlap—a coarse fabric of jute, hemp, or less commonly, flax, for use as a water-retaining covering in curing concrete surfaces; also called Hessian.

bush-hammer—a hammer having a serrated face, as rows of pyramidal points, used to roughen or dress a surface; to finish a concrete surface by application of a bush-hammer.

bush-hammer finish—see **finish, bush-hammer**.

butt joint—see **joint, butt**.

butter—to spread mortar on a masonry unit with a trowel; also the process by which the interior of a concrete mixer, transportation unit, or other item coming in contact with fresh concrete is provided with a mortar coating so that fresh concrete coming in contact with it will not be depleted of mortar.

buttress—a projecting structure to support either a wall or a building.

butyl stearate—a colorless, oily, and practically odorless material ($C_{17}H_{35}COOC_4H_9$) used as an admixture for concrete to provide dampproofing.

C

cabinet, moist—an upright and compartmented case having doors and shelves of moderate dimensions for storing and curing small test specimens of cement paste, mortar, and concrete in an atmosphere of approximately 73 F (23 C) and at least 95% relative humidity. (See also **moist room**.)

cable—see **tendon** (preferred term).

cage—a rigid assembly of reinforcement ready for placing in position.

caisson—part of a foundation, a watertight chamber used in construction underwater, or a hollow floating box used as a floodgate for a dock or basin.

caisson pile—see **pile, caisson**.

calcareous—containing calcium carbonate or, less generally, containing the element calcium.

calcine—to alter composition or physical state by heating below the temperature of fusion.

calcite—a mineral having the composition calcium carbonate ($CaCO_3$) and a specific crystal structure; the principal constituent of limestone, chalk, and marble; a major constituent in the manufacture of portland cement.

calcium—a silver-white metallic element of the alkaline-earth group occurring naturally only in combination with other elements.

calcium-aluminate cement—see **cement, calcium-aluminate**.

calcium chloride—a crystalline solid, $CaCl_2$; in various technical grades, used as a drying agent, as an accelerator of concrete, as a deicing chemical, and for other purposes. (See also **admixture, accelerating**.)

calcium chloride, anhydrous ($CaCl_2$)—a solid, usually 94% calcium chloride, typically in pellet form.

calcium chloride, hydrous ($CaCl_2 \cdot 2H_2O$)—a solid, usually 77% calcium chloride, in flake form.

calcium chloride solution—an aqueous solution of calcium chloride (usually at a specified concentration so that a given amount can be gauged to provide a specific concentration) usually expressed as a percent calcium chloride by mass of portland cement.

calcium hydroxide—see **lime, hydrated**.

calcium stearate— $Ca(C_{18}H_{35}O_2)_2$, commonly marketed in powder form, insoluble in water, used as a water repellent admixture in concrete.

calcium-silicate brick—see **brick, calcium-silicate**.

calcium-silicate hydrate—see **hydrate, calcium-silicate**.

caliche—gravel, sand, and desert debris cemented by calcium carbonate or other salts.

California bearing ratio (CBR)—the ratio of the force per unit area required to penetrate a soil mass with a 3 in.² (1940 mm²) circular piston at the rate of 0.05 in. (1.3 mm) per min to the force required for corresponding penetration of a standard material; the ratio is usually determined at 0.1 in. (2.5 mm) penetration.

calorimeter—an instrument for measuring heat exchange during a chemical reaction, such as the quantity of heat liberated by the combustion of a fuel or hydration of a cement.

camber—a deflection that is intentionally built into a structural element or form to improve appearance or to nullify the deflection of the element under the effects of loads, shrinkage, and creep.

cant strip—see **strip, chamfer** (preferred term).

cap—a smooth plane surface of suitable material bonded to the bearing surfaces of test specimens to distribute the load during strength testing.

cap cables—short cables (tendons) introduced to prestress the zone of negative moment only.

capacity—a measure of the rated volume of a particular concrete mixer or agitator, usually limited by specifications to a maximum percentage of total gross volume; also the output of concrete, aggregate, or other product per unit of time (as plant capacity or screen capacity); also load-carrying limit of a structure.

capacity-reduction factor—see **strength-reduction factor** (preferred term).

capillarity—the movement of a liquid in the interstices of concrete, soil, or other finely porous material due to surface tension. (See also **flow, capillary**.)

capillary flow—see **flow, capillary**.

capillary space—see **space, capillary**.

cap, pile—

1. a structural member that is placed on top of a group of piles and used to transmit loads from the structure through the pile group into the soil; the piles may be connected to the cap with reinforcement to resist uplift or with reinforcement to resist moment so as to form a bent; also known as a rider cap or girder; also a masonry, timber, or concrete footing resting on a group of piles; and
2. a metal cap or helmet temporarily fitted over the head of a precast pile to protect it during driving; some form of shock-absorbing material is often incorporated.

cap, rider—see **cap, pile** (preferred term).

carbon black—a finely divided form of carbon produced by the combustion or partial decomposition of hydrocarbon, used as an admixture to color concrete.

carbonation—reaction between carbon dioxide and a hydroxide or oxide to form a carbonate, especially in cement paste, mortar, or concrete; the reaction with calcium compounds to produce calcium carbonate.

carbonation shrinkage—see **shrinkage, carbonation**.

carriageway—in the UK, a term used in the same meaning as the word “road” in the U.S.

cast-in-place—referring to a cementitious mixture that is deposited in the place where it is required to harden as part of the structure, as opposed to precast concrete.

cast-in-place concrete—see **concrete, cast-in-place**.

cast-in-place pile—see **pile, cast-in-place**.

cast-in-situ—see **cast-in-place** (preferred term).

cast stone—see **stone, cast**.

castable refractory—see **refractory, castable**.

catalyst—a substance that accelerates a chemical reaction and enables it to proceed under conditions more mild than otherwise required and which is not, itself, permanently changed by the reaction. (See also **catalyst, negative**.)

catalyst, negative—a substance that slows a chemical reaction and which, itself, does not enter into the reaction; inhibitor.

catface—blemish or rough depression in the finish plaster coat caused by variations in the base coat thickness.

cathead—a notched wedge placed between two formwork members meeting at an oblique angle; a spindle on a hoist; the large, round retention nut used on she bolts.

cathodic protection—the form of corrosion protection wherein one metal is caused to corrode in preference to another, thereby protecting the latter from corrosion.

catwalk—a narrow elevated walkway.

caulk—to place a material in a crack or joint with the intent of retarding entry of dirt or water. (See also **joint filler** or **sealant, joint**.)

cavitation damage—see **damage, cavitation**.

celite—a name used to identify the calcium aluminoferrite constituent of portland cement. (See also **alite**; **belite**; **fe-lite**; and **brownmillerite**.)

cellular concrete—see **concrete, cellular**.

cellular construction—see **construction, cellular**.

cement—see **cement, hydraulic**.

cement, air-entraining hydraulic—hydraulic cement containing an air-entraining agent in sufficient amount to entrain air in mortar within specified limits.

cement, aluminous—see **cement, calcium-aluminate** (preferred term).

cement, asphalt—asphalt that is refined to meet specifications for use in the manufacture of bituminous pavements.

cement, bituminous—a black solid, semisolid, or liquid substance at natural air temperatures and appreciably soluble only in carbon disulfide or some volatile liquid hydrocarbon, being composed of mixed indeterminate hydrocarbons mined from natural deposits, produced as a residue in the distillation of petroleum, or obtained by the destructive distillation of coal or wood.

cement, blended—a hydraulic cement consisting essentially of an intimate and uniform blend of granulated blast-furnace slag and hydrated lime; or an intimate and uniform blend of portland cement and granulated blast-furnace slag, portland cement and pozzolan, or portland blast-furnace slag cement and pozzolan, produced by intergrinding portland cement clinker with the other materials or by blending portland cement with the other materials, or a combination of intergrinding and blending.

cement, bulk—cement that is transported and delivered in bulk (usually in specially constructed vehicles) instead of in bags.

cement, calcium-aluminate—the product obtained by pulverizing clinker consisting essentially of hydraulic calcium aluminates resulting from fusing or sintering a suitably proportioned mixture of aluminous and calcareous materials; called high-alumina cement in the UK.

cement, chemically prestressing—a type of expansive cement containing a higher percentage of expansive component than a shrinkage-compensating cement, when used in concretes with adequate internal or external restraint, that will expand sufficiently due to chemical reactions within the matrix, to develop the stresses necessary for prestressing the concrete. (See also **cement, expansive**.)

cement, expanding—see **cement, expansive** (preferred term).

cement, expansive—a cement that, when mixed with water, produces a paste that, after setting, increases in volume to a significantly greater degree than does portland-cement paste; used to compensate for volume decrease due to shrinkage or to induce tensile stress in reinforcement (post-tensioning).

1. *cement, expansive, Type K*—a mixture of portland cement, anhydrous tetracalcium trialuminate sulfate ($C_4A_3\bar{S}$), calcium sulfate ($CaSO_4$), and lime (CaO); the $C_4A_3\bar{S}$ is a constituent of a separately burned clinker that is interground with portland cement or alternately, it may be formed simultaneously with the portland-cement clinker compound during the manufacturing process;

cement

2. *cement, expansive, Type M*—interground or blended mixtures of portland cement, calcium-aluminate cement, and calcium sulfate suitably proportioned; and
 3. *cement, expansive, Type S*—a portland cement containing a high computed tricalcium aluminate (C_3A) content and an amount of calcium sulfate above the usual amount found in portland cement
- cement, high-alumina**—see **cement, calcium-aluminate** (preferred term).
- cement, high-early-strength**—portland cement characterized by attaining a given level of strength in mortar or concrete earlier than does normal portland cement; referred to in the U.S. as Type III.
- cement, high-fineness**—a hydraulic cement of substantially higher specific surface and substantially smaller mean particle diameter than typical for products of similar composition, produced by additional grinding or by separation by particle size.
- cement, hot**—newly manufactured cement that has not had an opportunity to cool after burning and grinding of the component materials.
- cement, hydraulic**—a cement that sets and hardens by chemical interaction with water and is capable of doing so underwater, for example, portland cement and ground granulated blast-furnace slag are hydraulic cements.
- cement, hydrophobic**—unhydrated cement treated so as to have reduced tendency to take up moisture.
- cement, Keene's**—a cement composed of finely ground, anhydrous, calcined gypsum, the set of which is accelerated by the addition of other materials.
- cement, low-alkali**—a portland cement that contains a relatively small amount of sodium or potassium or both; in the U.S., a portland cement containing not more than 0.60% Na_2O equivalent, that is, percent $Na_2O + 0.658 \times$ percent K_2O .
- cement, low-heat**—a portland cement for use when a low heat of hydration is desired, referred to in U.S. as Type IV.
- cement, masonry**—a hydraulic cement for use in mortars for masonry construction; contains one or more of the following materials: portland cement, portland blast-furnace slag cement, portland-pozzolan cement, natural cement, slag cement or hydraulic lime; and in addition usually contains one or more materials, such as hydrated lime, limestone, chalk, calcareous shell, talc, slag, or clay in finely ground condition.
- cement, moderate sulfate-resisting**—a portland cement for use when either moderate sulfate resistance or moderate heat of hydration or both is desired, now referred to as Type II.
- cement, modified**—a portland cement for use when either moderate heat of hydration, moderate sulfate resistance, or both, is desired, now referred to as Type II (an obsolete term).
- cement, natural**—a hydraulic cement produced by calcining an argillaceous limestone at a temperature below the sintering point and then grinding to a fine powder.
- cement, nonstaining**—a masonry cement that contains not more than a stipulated amount of water-soluble alkali as measured by a stipulated test method.
- cement, normal**—general purpose portland cement, referred to in the U.S. as Type I.
- cement, oil-well**—hydraulic cement suitable for use under high pressure and temperature in sealing water and gas pockets, and setting casing during the drilling and repair of wells; often contains retarders to meet the requirements of use.
- cement, ordinary portland**—the term used in the UK and elsewhere to designate the equivalent of American normal portland cement or Type I cement; commonly abbreviated OPC.
- cement, plastic**—a special product manufactured for plaster and stucco application.
- cement, portland**—a hydraulic cement produced by pulverizing portland-cement clinker, usually in combination with calcium sulfate.
- cement, portland blast-furnace slag**—a hydraulic cement consisting of an intimately interground mixture of portland-cement clinker and granulated blast-furnace slag or an intimate and uniform blend of portland cement and fine granulated blast-furnace slag in which the amount of the slag constituent is within specified limits.
- cement, portland-pozzolan**—a hydraulic cement consisting of an intimate and uniform blend of portland cement or portland blast-furnace slag cement and fine pozzolan produced by intergrinding portland-cement clinker and pozzolan, by blending portland cement or portland blast-furnace slag cement and finely divided pozzolan, or a combination of intergrinding and blending, in which the pozzolan constituent is within specified limits.
- cement, regulated-set**—a hydraulic cement containing fluorine-substituted calcium aluminate, capable of very rapid setting.
- cement, Roman**—a misnomer for a hydraulic cement made by calcining a natural mixture of calcium carbonate and clay, such as argillaceous limestone, to a temperature below that required to sinter the material but high enough to decompose the calcium carbonate, followed by grinding; so named because its brownish color resembles ancient Roman cements produced by use of lime-pozzolan mixtures.
- cement, self-stressing**—see **cement, expansive**.
- cement, shrinkage-compensating**—see **cement, expansive**.
- cement, slag**—hydraulic cement consisting mostly of an intimate and uniform blend of granulated blast-furnace slag and portland cement, hydrated lime, or both, in which the slag constituent is at least 10% by mass of the finished product.

cement, sticky—finished cement that develops low or zero flowability during or after storage in silos, or after transportation in bulk containers, hopper-bottom cars, etc.; may be caused by: a) interlocking of particles; b) mechanical compaction; c) electrostatic attraction between particles. (See also **set, warehouse**.)

cement, sulfate-resistant—portland cement, low in tricalcium aluminate, that reduces susceptibility of concrete to attack by dissolved sulfates in water or soils, designated Type V in the U.S.

cement, sulfoaluminate—see **cement, expansive, Type K**.

cement, supersulfated—a hydraulic cement made by intimately intergrinding a mixture of granulated blast-furnace slag, calcium sulfate, and a small amount of lime, portland cement, or portland cement clinker; so named because the equivalent content of sulfate exceeds that for portland blast-furnace slag cement.

cement, white—portland cement that hydrates to a white paste; made from raw materials of low iron content, the clinker for which is fired by a reducing flame.

cement-aggregate ratio—see **ratio, aggregate-cement**.

cement bacillus—see **ettringite** (preferred term).

cement-bound macadam—see **macadam, cement-bound**.

cement content—quantity of cement contained in a concrete, mortar, or grout, preferably expressed as mass per unit volume of concrete, mortar, or grout.

cement factor—see **cement content** (preferred term).

cement gel—see **gel, cement**.

cement gun—see **gun, cement**.

cement kiln—see **kiln, cement**.

cement paint—see **paint, cement**.

cement paste—binder of concrete and mortar consisting essentially of cement, water, hydration products, and any admixtures together with very finely divided materials included in the aggregates. (See also **cement paste, neat**.)

cement paste, neat—a plastic mixture of hydraulic cement and water both before and after setting and hardening.

cement plaster—see **plaster** and **stucco**.

cement rock—natural impure limestone that contains the ingredients for production of portland cement in approximately the required proportions.

cementation process—the process of injecting cement grout under pressure into certain types of ground (for example, gravel, or fractured rock) to solidify it.

cementitious—having cementing properties.

cementitious materials—see **materials, cementitious**.

cementitious mixture—a mixture (mortar, concrete, or grout) containing hydraulic cement.

center matched—tongue-and-groove lumber with the tongue and groove at the center of the piece rather than offset as in standard matched. (See also **standard matched**.)

centering—falsework used in the construction of arches, shells, space structures, or any continuous structure where the entire falsework is lowered (struck or dented) as a unit. (See also **falsework** and **formwork**.)

central-mixed concrete—see **concrete, central-mixed**.

central mixer—see **mixer, central**.

centrifugally cast concrete—see **concrete, centrifugally cast**.

centrifugal process—see **process, centrifugal**.

ceramic bond—see **bond, ceramic**.

chair—see **bar support** (preferred term), and **bat**.

chalk—a soft limestone composed chiefly of the calcareous remains of marine organisms.

chalking—formation of a loose powder resulting from the disintegration of the surface of concrete or of applied coating, such as cement paint.

chamfer—either a beveled edge or corner formed in concrete work by means of a chamfer strip.

chamfer strip—see **strip, chamfer**.

charge—to introduce, feed, or load materials into a concrete or mortar mixer, furnace, or other container or receptacle where they will be further treated or processed.

checking—development of shallow cracks at closely spaced but irregular intervals on the surface of plaster, cement paste, mortar, or concrete. (See also **cracks** and **crazing**.)

chemical bond—see **bond, chemical**.

chemically prestressing cement—see **cement, chemically prestressing**.

chemically prestressing concrete—see **concrete, chemically prestressing**.

chert—a very fine-grained siliceous rock characterized by a variety of colors, by hardness and conchoidal fracture in dense varieties, and the fracture becoming splintery and the hardness decreasing in porous varieties; it is composed of silica in the form of chalcedony, cryptocrystalline or microcrystalline quartz, opal, or combinations of any of these minerals.

chipping—treatment of a hardened concrete surface by chiseling.

chips—broken fragments of marble or other mineral aggregate screened to specified sizes.

chord modulus—see **modulus of elasticity**.

chute—a sloping trough or tube for conducting concrete, cement, aggregate, or other free flowing materials from a higher to a lower point.

clamp—see **coupler** (preferred term).

class (of concrete)—an arbitrary characterization of concrete of various qualities or usages, usually by compressive strength.

clay—natural mineral material having plastic properties and composed of very fine particles; the clay mineral fraction of a soil is usually considered to be the portion consisting of particles finer than 2 μm ; clay minerals are essentially hydrous aluminum silicates or occasionally hydrous magnesium silicates.

clay, fire—an earthy or stony mineral aggregate that has as the essential constituent hydrous silicates of aluminum with or without free silica, and that is plastic when sufficiently pulverized and wetted, rigid when subsequently dried, and of suitable refractoriness for use in ceramic refractory products.

clay

clay content—mass fraction of clay of a heterogeneous material, such as a soil or a natural concrete aggregate or crushed stone.

cleanout—an opening in the forms for removal of refuse, to be closed before the concrete is placed; a port in tanks, bins, or other receptacles for inspection and cleaning.

cleanup—treatment of horizontal construction joints to remove surface material and contamination down to a condition of soundness corresponding to that of a freshly broken surface of hardened concrete.

cleat—small board used to connect formwork members or used as a brace. (See also **batten**.)

climbing form—see **form, climbing**.

clinker—a partially fused product of a kiln, which is ground to make cement; also other vitrified or burnt material. (See also **clinker, portland-cement**.)

clinker, portland-cement—a partially fused ceramic material consisting primarily of hydraulic calcium silicates and calcium aluminates. (See also **clinker**.)

clip—wire or sheet-metal device used to attach various types of lath to supports or to secure adjacent lath sheets.

closed-circuit grouting—see **grouting, closed-circuit**.

coarse aggregate—see **aggregate, coarse**.

coarse-aggregate factor—see **factor, coarse-aggregate**.

coarse-grained soil—see **soil, coarse-grained**.

coat—a film or layer as of paint or plaster applied in a single operation.

coat, brown—the second coat in three-coat plaster application.

coat, dash-bond—a thick slurry of portland cement, sand, and water flicked on surfaces with a paddle or brush to provide a base for subsequent portland cement plaster coats; sometimes used as a final finish on plaster.

coat, finish—final thin coat of shotcrete preparatory to hand finishing; also exposed coat of plaster and stucco.

coat, flash—a light coat of shotcrete used to cover minor blemishes on a concrete surface.

coat, scratch—the first coat of plaster or stucco applied to a surface in three-coat work; usually cross-raked or scratched to form a mechanical key with the brown coat.

coated bar—see **bar, coated**.

coating—

1. *on concrete*—material applied to a surface by brushing, dipping, mopping, spraying, troweling, etc., to preserve, protect, decorate, seal, or smooth the substrate;
2. *on aggregate particles*—foreign or deleterious substances found adhering to the aggregate particles; or
3. *on architectural concrete*—material used to protect a concrete surface from atmospheric contaminants and those that penetrate slightly and leave a visible clear or pigmented film on the surface. (See also **sealer**.)

coating, polysulfide—a protective-coating system prepared by polymerizing a chlorinated alkyl polyether with an inorganic polysulfide.

coating, form—a liquid applied to formwork surfaces for a specific purpose, such as to promote easy release from the concrete, to preserve the form material, or to retard setting of the near-surface matrix for preparation of exposed-aggregate finishes.

cobble—in geology, a rock fragment between 2-1/2 and 10 in. (64 and 256 mm) in diameter; as applied to coarse aggregate for concrete, the material in the nominal size range (3 to 6 in. [75 to 150 mm]).

cobblestone—a rock fragment, usually rounded or semirounded, with an average dimension between 3 and 12 in. (75 and 300 mm).

coefficient of subgrade friction—the coefficient of friction between a slab and its subgrade, commonly used in design of slabs-on-grade to estimate the force induced in the slab due to volume changes and elastic shortening if prestressed.

coefficient of subgrade reaction—ratio of: a) load per unit area of horizontal surface of a mass of soil; to b) corresponding settlement of the surface; determined as the slope of the secant, drawn between the point corresponding to zero settlement and the point of 0.05 in. (1.3 mm) settlement, of a load-settlement curve obtained from a plate load test on a soil using a 30 in. (762 mm) or greater diameter loading plate; used in the design of concrete pavements by the Westergaard method; also called modulus of subgrade reaction or subgrade modulus.

coefficient of thermal expansion—change in linear dimension per unit length or change in volume per unit volume per degree of temperature change.

coefficient of variation (V)—the standard deviation expressed as a percentage of the average. (See also **standard deviation**.)

cold-drawn wire reinforcement—see **reinforcement, cold-drawn wire**.

cold face—the surface of a refractory section not exposed to the source of heat; surface of concrete or masonry exposed to low ambient temperatures.

cold joint—see **joint, cold**.

cold-joint lines—visible lines on the surfaces of formed concrete indicating the presence of discontinuities where one layer of concrete had hardened before subsequent concrete was placed. (See also **joint, cold**.)

cold strength—see **strength, cold**.

cold-water paint—see **paint, cold-water**.

cold weather—a period in which for more than three successive days the average daily outdoor temperature drops below 40 F (5 C). Note: The average daily temperature is the average of the highest and lowest temperature during the period from midnight to midnight. When temperatures above 50 F (10 C) occur during more than half of any 24-h duration, the period shall no longer be regarded as cold weather.

cold-worked steel reinforcement—see **reinforcement, cold-worked steel**.

colemanite—a mineral, hydrated calcium borate ($\text{Ca}_2\text{B}_6\text{O}_{11} \cdot 5\text{H}_2\text{O}$). (See also **concrete, colemanite**.)

colloid—a substance that is in a state of division preventing passage through a semipermeable membrane, consisting of particles ranging from 0.1 to 0.001 mm in diameter.

colloidal concrete—see **concrete, colloidal**.

colloidal mixer—see **mixer, colloidal**.

colloidal grout—see **grout, colloidal**.

colloidal particle—see **particle, colloidal**.

colorimetric value—an indication of the amount of organic impurities present in fine aggregate.

column—a member used primarily to support axial compression loads and with a height of at least three times its least lateral dimension.

column, composite—a concrete compression member reinforced longitudinally with structural steel shapes, pipe, or tubing with or without longitudinal reinforcing bars.

column, long—a column whose load capacity is limited by buckling rather than strength. (See also **column, slender**.)

column, pipe—a column made of steel pipe; often filled with concrete.

column, short—a column whose load capacity is limited by strength rather than buckling; a column that is customarily so stocky and sufficiently restrained that at least 95% of the cross-sectional strength can be developed.

column, slender—a column whose load capacity is reduced by the increased eccentricity caused by secondary deflection moments.

column, spirally reinforced—a column in which the vertical bars are enveloped by spiral reinforcement, that is, closely spaced continuous hooping.

column, tied—a column laterally reinforced with ties.

column capital—an enlargement of a column below a slab intended to increase the shearing resistance.

column clamp—any of various types of tying or fastening units to hold column form sides together.

column side—one of the vertical panel components of a column form.

column strip—the portion of a flat slab over the columns and consisting of the two adjacent quarter panels on each side of the column center line.

combined-aggregate grading—see **grading, combined-aggregate**.

combined footing—see **footing, combined**.

come-along —

1. a hoe-like tool with a blade approximately 4 in. (100 mm) high and 20 in. (500 mm) wide and curved from top to bottom, used for spreading concrete; or
2. a colloquial name for a device (load binder) used to tighten chains holding loads in place on a truck bed.

compacting factor—the ratio obtained by dividing the observed mass of concrete that fills a container of standard size and shape when allowed to fall into it under standard conditions of test, by the mass of fully compacted concrete which fills the same container.

compaction—see **consolidation** (preferred term).

component, expansive—the portion of an expansive cement that is responsible for the expansion, generally one of several anhydrous calcium aluminate or sulfoaluminate compounds and a source of sulfate, with or without free lime, (CaO); the expansive component may be produced separately and later ground or blended with a normal portland-cement clinker; in other instances, produced by firing in a kiln with the constituents of portland cement.

composite column—see **column, composite**.

composite concrete flexural members—concrete flexural members consisting of concrete elements constructed in separate placements but so interconnected that the elements respond to loads as a unit.

composite construction—see **construction, composite**.

composite pile—see **pile, composite**.

composite sample—see **sample, composite**.

compound, curing—a liquid that can be applied as a coating to the surface of newly placed concrete to retard the loss of water or, in the case of pigmented compounds, and also to reflect heat so as to provide an opportunity for the concrete to develop its properties in a favorable temperature and moisture environment. (See also **curing** and **curing, membrane**.)

compound, joint-sealing—an impervious material used to fill joints in pavements or structures.

compound, sealing—see **sealer**.

compound, waterproofing—material used to impart water repellency to a structure or a constructional unit.

compression flange—see **flange, compression**.

compression member—see **member, compression**.

compression reinforcement—see **reinforcement, compression**.

compression test—see **test, compression**.

compressive strength—see **strength, compressive**.

compressive-strength, average—the average compressive strength of a given class or strength level of concrete; in ACI 214, defined as average compressive strength required to statistically meet a designated specific strength.

compressive stress—see **stress**.

concentric tendons—see **tendons, concentric**.

concordant tendons—see **tendons, concordant**.

concrete—a composite material that consists essentially of a binding medium within which are embedded particles or fragments of aggregate, usually a combination of fine aggregate and coarse aggregate; in portland-cement concrete, the binder is a mixture of portland cement and water, with or without admixtures.

concrete, aerated—see **concrete, foamed** and **concrete, cellular**.

concrete, aluminate—concrete made with calcium-aluminate cement; used primarily where high-early-strength and refractory or acid-resistant concrete is required.

concrete, architectural—concrete that will be permanently exposed to view and therefore requires special care in selection of the concrete materials, forming, placing, and finishing to obtain the desired architectural appearance.

concrete

concrete, asphaltic—a mixture of asphalt cement and aggregate.

concrete, backfill—nonstructural concrete used to correct over-excavation, fill excavated pockets in rock, or prepare a surface to receive structural concrete.

concrete, boron-loaded—high density concrete including a boron-containing admixture or aggregate, such as the mineral colemanite, boron frits, or boron metal alloys, to act as a neutron attenuator. (See also **biological shielding** and **concrete, shielding**.)

concrete, cast-in-place—concrete that is deposited and allowed to harden in the place where it is required to be in the completed structure, as opposed to precast concrete.

concrete, cellular—a low-density product consisting of portland cement, cement-silica, cement-pozzolan, lime-pozzolan, lime-silica pastes, or pastes containing blends of these ingredients and having a homogeneous void or cell structure, attained with gas-forming chemicals or foaming agents (for cellular concretes containing binder ingredients other than, or in addition to, portland cement, autoclave curing is usually employed).

concrete, central-mixed—concrete that is completely mixed in a stationary mixer from which it is transported to the delivery point.

concrete, centrifugally cast—concrete compacted by centrifugal action, for example, in the manufacture of pipe and poles. (See also **centrifugal process**.)

concrete, chemically prestressing—concrete made with expansive cement and reinforcement under conditions such that the expansion of the cement induces tensile stress in the reinforcement so as to produce prestressed concrete.

concrete, colloidal—concrete in which the aggregate is bound by colloidal grout.

concrete, confined—concrete containing closely spaced special transverse reinforcement that is provided to restrain the concrete in directions perpendicular to the applied stress.

concrete, cyclopean—mass concrete in which large stones, each of 100 lb (50 kg) or more, are placed and embedded in the concrete as it is deposited. (See also **concrete, rubble**.)

concrete, dense—concrete containing a minimum of voids.

concrete, dry-mix—concrete of very low water content used in the dry-cast process. (See also **process, dry-cast**.)

concrete, dry-packed—concrete placed by dry packing.

concrete, epoxy—a mixture of epoxy resin and catalyst (binder), fine aggregate, and coarse aggregate. (See also **concrete, polymer, mortar, epoxy**; and **resins, epoxy**.)

concrete (mortar or grout), expansive-cement—concrete (mortar or grout) made with expansive cement.

concrete, exposed—concrete surfaces formed so as to yield an acceptable texture and finish for permanent exposure to view. (See also **concrete, architectural**.)

concrete, fair-face—a concrete surface that, on completion of the forming process, requires no further (concrete) treatment other than curing. (See also **concrete, architectural**.)

concrete, fat—concrete containing a relatively large amount of plastic and cohesive mortar.

concrete, fiber-reinforced—concrete containing dispersed, randomly oriented fibers.

concrete, fibrous—see **concrete, fiber-reinforced**.

concrete, field—concrete delivered or mixed, placed, and cured on the job site.

concrete, flowing—concrete that is characterized by a slump greater than 7-1/2 in. (190 mm) while remaining cohesive.

concrete, foamed—low-density concrete made by the addition of a prepared foam or by generation of gas within the unhardened mixture.

concrete, fresh—concrete that possesses enough of its original workability so that it can be placed and consolidated by the intended methods.

concrete, gap-graded—concrete containing a gap-graded aggregate.

concrete, gas—lightweight concrete produced by developing voids with gas generated within the fresh mixture (usually from the action of cement alkalies on aluminum powder used as an admixture). (See also **concrete, foamed**.)

concrete, granolithic—concrete suitable for use as a wearing surface finish to floors, made with specially selected aggregate of suitable hardness, surface texture, and particle shape.

concrete, green—concrete that has set but not hardened appreciably.

concrete, grouted-aggregate—see **concrete, preplaced-aggregate**.

concrete, gypsum—concrete in which the cementitious constituent is partially dehydrated calcium sulfate (plaster).

concrete, hardened—concrete that has developed sufficient strength to serve some purpose or resist breaking under stipulated loading.

concrete, heat-resistant—any concrete that will not disintegrate when exposed to constant or cyclic heating at any temperature below that at which a ceramic bond is formed.

concrete, heavy—see **concrete, high-density** (preferred term).

concrete, heavyweight—see **concrete, high-density** (preferred term).

concrete, high-density—concrete of substantially higher density than that made using normal-density aggregates, usually obtained by use of high-density aggregates and used especially for radiation shielding.

concrete, high-early-strength—concrete which, through the use of high-early-strength cement or admixtures, attains a given level of strength earlier than normal concrete does.

concrete, high-strength—concrete that has a specified compressive strength for design of 6000 psi (41 MPa) or greater.

concrete, high-performance—concrete meeting special combinations of performance and uniformity requirements that cannot always be achieved routinely using conventional constituents and normal mixing, placing, and curing practices.

concrete, in-situ—see **concrete, cast-in-place** (preferred term).

concrete, insulating—concrete having low thermal conductivity; used as thermal insulation. (See also **concrete, lightweight** and **concrete, low-density**.)

concrete, lean—concrete of low cementitious material content.

concrete, lightweight—concrete of substantially lower density than that made using aggregates of normal density. (See also **concrete, insulating** and **concrete, low-density**.)

concrete, low-density—concrete having an oven-dry density of less than 50 lb/ft³ (800 kg/m³). (See also **concrete, insulating** and **concrete, lightweight**.)

concrete, mass—any volume of concrete with dimensions large enough to require that measures be taken to cope with generation of heat from hydration of the cement and attendant volume change, to minimize cracking.

concrete, monolithic—concrete cast with no joints other than construction joints.

concrete, nailable—concrete, usually made with a suitable low-density aggregate, with or without the addition of sawdust, into which nails can be driven.

concrete, negative-slump—concrete of a consistency such that it not only has zero slump but still has zero slump after adding additional water. (See also **concrete, zero-slump** and **concrete, no-slump**.)

concrete, no-fines—a concrete mixture containing little or no fine aggregate.

concrete, nonair-entrained—concrete in which neither an air-entraining admixture nor air-entraining cement has been used.

concrete, nonslip—

1. a floor, pavement, or walkway of concrete the surface of which has been roughened, before final set, either by sprinkling fine particles of abrasive material thereon and then troweling or by swirling with either a coarse-bristled brush or a trowel; or
2. a concrete surfaced roughened after final set by acid etching, mechanically abrading, or grooving.

concrete, normalweight—concrete having a density of approximately 150 lb/ft³ (2400 kg/m³) made with normal-density aggregates.

concrete, normalweight refractory—refractory concrete having a bulk density greater than 100 lb/ft³ (1600 kg/m³).

concrete, no-slump—freshly mixed concrete exhibiting a slump of less than 1/4 in. (6 mm). (See also **concrete, zero-slump** and **concrete, negative-slump**.)

concrete, plain—structural concrete with no reinforcement or with less reinforcement than the minimum amount specified in ACI 318 for reinforced concrete; also used loosely to designate concrete containing no admixture and prepared with no special treatment.

concrete, polymer—concrete in which an organic polymer serves as the binder; also known as resin concrete; sometimes erroneously employed to designate hydraulic cement mortars or concretes in which part or all of the mixing water is replaced by an aqueous dispersion of a thermoplastic copolymer. (See also **concrete**.)

concrete, polymer-cement—a mixture of water, hydraulic cement, aggregate, and a monomer or polymer; polymerized in place when a monomer is used.

concrete, popcorn—no-fines concrete containing insufficient cement paste to fill voids among the coarse aggregate so that the particles are bound only at points of contact. (See also **concrete, no-fines**.)

concrete, precast—concrete cast elsewhere than its final position.

concrete, prepacked—see **concrete, preplaced-aggregate**.

concrete, preplaced-aggregate—concrete produced by placing coarse aggregate in a form and later injecting a portland cement-sand grout, usually with admixtures, to fill the voids.

concrete (mortar, grout), preshrunk—

1. concrete that has been mixed for a short period in a stationary mixer before being transferred to a transit mixer, or
2. grout, mortar, or concrete that has been mixed one to three hours before placing to reduce shrinkage during hardening.

concrete, prestressed—concrete in which internal stresses of such magnitude and distribution are introduced that the tensile stresses resulting from the service loads are counteracted to a desired degree; in reinforced concrete the prestress is commonly introduced by tensioning the tendons.

concrete, pumped—concrete which is transported through hose or pipe by means of a pump.

concrete, ready-mixed—concrete manufactured for delivery to a purchaser in a fresh state. (See also **concrete, central-mixed**; **concrete, shrink-mixed**; and **concrete, transit-mixed**.)

concrete, recycled—hardened concrete that has been processed for reuse, usually as aggregate.

concrete, refractory—hardened hydraulic-cement concrete that has refractory properties and that is suitable for use at temperatures between 600 and 2400 F (315 to 1315 C).

concrete, refractory-insulating—refractory concrete having low thermal conductivity.

concrete, reinforced—structural concrete reinforced with no less than the minimum amount of prestressing tendons or nonprestressed reinforcement specified by ACI 318.

concrete

concrete, resin—see **concrete, polymer** (preferred term).

concrete, rich—concrete of high cement content. (See also **concrete, lean**.)

concrete, roller-compacted—concrete compacted by roller compaction; concrete that, in its unhardened state, will support a roller while being compacted.

concrete, rubble—

1. concrete similar to cyclopean concrete except that small stones (such that one person can handle them) are used.
2. concrete made with rubble from demolished structures. (See also **concrete, cyclopean**.)

concrete, sand-lightweight—concrete made with a combination of expanded clay, shale, slag, or slate or sintered fly ash and natural sand; its density is generally between 105 and 120 lb/ft³ (1680 and 1920 kg/m³).

concrete, sawdust—concrete in which the aggregate consists mainly of sawdust from wood.

concrete (mortar or grout), self-stressing—expansive-cement concrete (mortar or grout) in which expansion, if restrained, induces persistent compressive stresses in the concrete (mortar or grout); also known as chemically prestressed concrete.

concrete, shielding—concrete, employed as a biological shield to attenuate or absorb nuclear radiation, usually characterized by high density or high hydrogen (water) content or boron content, having specific radiation attenuation effects. (See also **biological shielding**.)

concrete, shrink-mixed—ready-mixed concrete mixed partially in a stationary mixer and then mixed in a truck mixer. (See also **concrete, preshrunk**.)

concrete, shrinkage-compensating—concrete containing expansive components usually based on the formation of calcium sulfoaluminate (ettringite) in a mixture of calcium aluminate and gypsum. (See also **cement, expansive**.)

concrete, siliceous-aggregate—concrete made with normal-density aggregates having constituents composed mainly of silica or silicates.

concrete, sprayed—see **shotcrete** (preferred term).

concrete, spun—see **concrete, centrifugally cast** (preferred term).

concrete, structural—concrete used to carry load.

concrete, structural lightweight—structural concrete made with low-density aggregate; having an air-dry density of not more than 115 lb/ft³ (1850 kg/m³) and a 28-day compressive strength of more than 2500 psi (17.2 MPa).

concrete, subaqueous—see **concrete, underwater**.

concrete, terrazzo—marble-aggregate concrete that is cast-in-place or precast and ground smooth for decorative surfacing purposes on floors and walls.

concrete, transit-mixed—concrete, the mixing of which is wholly or principally accomplished in a truck mixer.

concrete, translucent—a combination of glass and concrete used together in precast and prestressed panels.

concrete, truck-mixed—see **concrete, transit-mixed**.

concrete, underwater—concrete placed underwater by tremie or other means.

concrete, unhardened—see **concrete, fresh** (preferred term).

concrete, unreinforced—see **concrete, plain**.

concrete, vacuum—concrete from which excess water and entrapped air are extracted by a vacuum process before hardening occurs.

concrete, vermiculite—concrete in which the aggregate consists of exfoliated vermiculite.

concrete, vibrated—concrete consolidated by vibration during and after placing.

concrete, visual—see **concrete, exposed** and **concrete, architectural**.

concrete, zero-slump—concrete of stiff or extremely dry consistency showing no measurable slump after removal of the slump cone. (See also **slump**; **concrete, no-slump**; and **concrete, negative-slump**.)

concrete block—see **block, concrete**.

concrete breaker—a compressed-air tool specially designed and constructed to break up concrete.

concrete brick—see **brick, concrete**.

concrete cart—see **buggy**.

concrete containment structure—a composite concrete and steel assembly that is designed as an integral part of a pressure retaining barrier, which in an emergency prevents the release of radioactive or hazardous effluents from nuclear power plant equipment enclosed therein.

concrete finishing machine—a machine mounted on flanged wheels that ride on the forms or on specially set tracks, used to finish surfaces such as those of pavements; or a portable power-driven machine for floating and finishing of floors and other slabs.

concrete flatwork—see **flatwork, concrete**.

concrete masonry unit—see **masonry unit, concrete**.

concrete paver—see **paver, concrete**.

concrete pile—see **pile, cast-in-place** and **pile, precast**.

concrete pump—see **pump, concrete**.

concrete reactor vessel—a composite concrete and steel assembly that functions as a component of the principal pressure-containing barrier for the nuclear fuel's primary heat extraction fluid (primary coolant).

concrete spreader—see **spreader, concrete**.

concrete strength—see **strength, compressive**; **strength, fatigue**; **strength, flexural**; **strength, shear**; **strength, splitting tensile**; **strength, tensile**; and **strength, ultimate**.

concrete vibrating machine—a machine that consolidates a layer of freshly mixed concrete by vibration.

condensed silica fume—see **silica fume** (preferred term).

conductance, thermal—time rate of heat flow through a unit area of body induced by a unit temperature difference between the body surfaces; the thermal conductance is the reciprocal of the thermal resistance.

conductivity, thermal—the property (of a homogeneous body) measured by the ratio of the steady-state heat flux (time-rate of heat flow per unit area) to the temperature difference.

cone—

cone, flow—a device for measurement of grout consistency in which a predetermined volume of grout is permitted to escape through a precisely sized orifice, the time of efflux (flow factor) being used as the indication of consistency; also the mold used to prepare a specimen for the flow test.

cone, pyrometric—a small, slender, three-sided oblique pyramid made of ceramic or refractory material for use in determining the time-temperature effect of heating and in obtaining the pyrometric cone equivalent (PCE) of refractory material.

cone, slump—a mold in the form of the lateral surface of the frustum of a cone with a base diameter of 8 in. (203 mm), top diameter of 4 in. (102 mm), and height of 12 in. (305 mm), used to fabricate a specimen of freshly mixed concrete for the slump test; a cone 6 in. (152 mm) high is used for tests of freshly mixed mortar and stucco.

cone bolt—a type of tie rod for wall forms with cones at each end inside the forms so that a bolt can act as a spreader as well as a tie.

confined concrete—see **concrete, confined**.

confined region—region with transverse reinforcement within beam-column joints.

connection, scarf—a connection made by precasting, bevelling, halving, or notching two pieces to fit together; after overlapping, the pieces are secured by bolts or other means.

consistency—the relative mobility or ability of freshly mixed concrete or mortar to flow; the usual measurements are *slump* for concrete, *flow* for mortar or grout, and *penetration resistance* for neat cement paste.

consistency, flowable—the consistency at which a grout will form a nearly level surface when lightly rodded; the consistency of a grout with at least 125% at five drops on the ASTM C 230 flow table and an efflux time through the ASTM C 939 flow cone of more than 30 s.

consistency, fluid—the consistency at which a grout will form a nearly level surface without vibration or rodding; the consistency of a grout that has an efflux time of less than 30 s from the ASTM C 939 flow cone.

consistency, normal—

1. the degree of wetness exhibited by a freshly mixed concrete, mortar, or neat cement grout when the workability of the mixture is considered acceptable for the purpose at hand; or
2. the physical condition of neat cement paste as determined with the Vicat apparatus in accordance with a standard method test (for example, ASTM C 187).

consistency, plastic—

1. condition of freshly mixed cement paste, mortar, or concrete such that deformation when a stress is applied will be sustained continuously in any direction without rupture; or
2. the consistency at which a grout will form a nearly level surface only when rodded or vibrated with a vibrator, the consistency of a grout with a flow between

100 to 125% at five drops on the ASTM C 230 flow table.

consistency, wettest stable—the condition of maximum water content at which cement grout and mortar will adhere to a vertical surface without sloughing.

consistency factor—a measure of grout fluidity, roughly analogous to viscosity, which describes the ease with which grout may be pumped into voids or fissures; usually a laboratory measurement in which consistency is reported in degrees of rotation of a torque viscosimeter in a specimen of grout.

consistometer—an apparatus for measuring the consistency of cement pastes, mortars, grouts, or concretes.

consolidation—the process of inducing a closer arrangement of the solid particles in freshly mixed concrete or mortar during placement by the reduction of voids, usually by vibration, centrifugation, rodding, tamping, or some combination of these actions; also applicable to similar manipulation of other cementitious mixtures, soils, aggregates, or the like. (See also **rodding** and **tamping**.)

construction—

construction, alternate-lane—a method of constructing soil-supported concrete roads, runways, building floors, or other paved areas, in which alternate lanes are placed and allowed to harden before the remaining intermediate lanes are placed.

construction, cellular—a method of constructing concrete elements in which part of the interior concrete is replaced by voids.

construction, composite—a type of construction using members produced by combining different materials (for example, concrete and structural steel); members produced by combining cast-in-place and precast concrete, or cast-in-place concrete elements constructed in separate placements but so interconnected that the combined components act together as a single member and respond to loads as a unit.

construction, shell—construction using thin curved slabs.

construction, structural sandwich—a laminar construction comprising a combination of alternating dissimilar simple or composite materials assembled and intimately fixed in relation to each other so as to use the properties of each to attain specific structural and thermal advantages for the whole assembly.

construction joint—see **joint, construction**.

construction loads—the loads to which a permanent or temporary structure is subjected during construction.

contact ceiling—a ceiling that is secured in direct contact with the construction above without use of furring.

contact pressure—pressure acting at and perpendicular to the contact area between soil and a concrete element.

contact splice—see **splice, contact**.

containment grouting—see **grouting, perimeter**.

continuous beam—see **continuous slab or beam**.

continuous footing—see **footing, continuous**.

continuous grading—see **grading, continuous**.

continuous mixer—see **mixer, continuous**.

continuous

continuous sampling—see **sampling, continuous**.

continuous slab or beam—a slab or beam that extends as a unit over three or more supports in a given direction.

continuously reinforced pavement—a pavement with uninterrupted longitudinal steel reinforcement and no intermediate transverse expansion or contraction joints.

contract documents—see **documents, contract**.

contraction—decrease in either length or volume. (See also **expansion**; **shrinkage**; **swelling**; **volume change**; and **volume change, autogenous**.)

contraction, thermal—see **thermal contraction**.

contraction joint—see **joint, contraction**.

contraction-joint grouting—see **grouting, contraction-joint**.

contractor—the person, firm, or corporation with whom the owner enters into an agreement for construction of the work.

control factor—the ratio of the minimum compressive strength to the average compressive strength.

control joint—see **joint, contraction** (preferred term).

control-joint grouting—see **grouting, contraction-joint**.

controlled low-strength cementitious material—material that is intended to result in a compressive strength of 1200 psi (8.3 MPa) or less.

conventional design—design procedure using moments or stresses determined by widely accepted methods.

conveying hose—see **hose, delivery** (preferred term).

conveyor—a device for moving materials; usually a continuous belt, an articulated system of buckets, a confined screw, or a pipe through which material is moved by air or water.

coping—the material or units used to form a cap or finish on top of a wall, pier, pilaster, or chimney.

coquina—a type of limestone formed of sea shells in loose or weakly cemented condition, found along present or former shorelines; used as a calcareous raw material in cement manufacture and other industrial operations.

corbel—a projection from the face of a beam, girder, column, or wall used as a beam seat or a decoration.

core (n.)—

1. the soil material enclosed within a tubular pile after driving (it may be replaced with concrete);
2. the mandrel used for driving casings for cast-in-place piles;
3. a structural shape used to internally reinforce a drilled-in-caisson;
4. a cylindrical sample of hardened concrete or rock obtained by means of a core drill;
5. the molded open space in a concrete masonry unit or precast concrete unit (see also **blockout**); or
6. the area enclosed by ties or spiral reinforcement in a concrete column.

core (v.)—the act of obtaining cores from concrete structures, rock foundations, or soils.

core test—compression test on a concrete sample cut from hardened concrete by means of a core drill.

cored beam—a beam whose cross section is partially hollow or a beam from which cored samples of concrete have been taken.

coring—the act of obtaining cores from hardened concrete or masonry structures, rock, or soil.

corner reinforcement—see **reinforcement, corner**.

corrosion—destruction of metal by a chemical, electrochemical, or electrolytic reaction within its environment.

corrosion, bacterial—destruction of a material by bacterial processes brought about by the activity of certain bacteria that consume the material and produce substances, such as hydrogen sulfide, ammonia, and sulfuric acid.

corrosion inhibitor—a chemical compound, either liquid or powder, usually intermixed in concrete and sometimes applied to concrete, and that effectively decreases corrosion of steel reinforcement.

cotton mats—see **mats, cotton**.

coupler—

1. a device for connecting reinforcing bars or prestressing tendons end to end;
2. a device for locking together the component parts of a tubular metal scaffold (also known as a clamp); or
3. internal threaded device for joining reinforcing bars with matching threaded ends for the purpose of providing transfer of either axial compression or axial tension or both from one bar to the other. (See also **coupling sleeve**, **end-bearing sleeve**, **mechanical connection**.)

coupling agent—a substance used between the transducer and test surface to permit or improve transmission of ultrasonic energy.

coupling pin—an insert device used to connect lifts or tiers or formwork scaffolding vertically.

coupling sleeve—device fitting over the ends of two reinforcing bars for the eventual purpose of providing transfer of either axial compression or axial tension or both from one bar to the other. (See also **coupler**, **end-bearing sleeve**, **mechanical connection**.)

course—in concrete construction, a horizontal layer of concrete, usually one of several making up a lift; in masonry construction, a horizontal layer of block or brick. (See also **lift**.)

cover—in reinforced concrete, the least distance between the surface of embedded reinforcement and the outer surface of the concrete.

cover block—see **spacer** and **spreader** (preferred terms).

crack—a complete or incomplete separation, of either concrete or masonry, into two or more parts produced by breaking or fracturing. (See also **fracture**.)

crack, diagonal—in a flexural member, an inclined crack caused by shear stress, usually at approximately 45 degrees to the axis; or a crack in a slab, not parallel to either the lateral or longitudinal directions.

crack, longitudinal—a crack that develops parallel to the length of a member.

crack, shrinkage—crack due to restraint of shrinkage.

crack-control reinforcement—see **reinforcement, crack-control**.

cracked section—a section designed or analyzed on the assumption that concrete has no resistance to tensile stress.

cracking—

cracking, diagonal—development of diagonal cracks. (See also **tension, diagonal**.)

cracking, map—

1. intersecting cracks that extend below the surface of hardened concrete; caused by shrinkage of the drying surface concrete that is restrained by concrete at greater depths where either little or no shrinkage occurs; vary in width from fine and barely visible to open and well-defined; or
2. the chief symptom of a chemical reaction between alkalis in cement and mineral constituents in aggregate within hardened concrete; due to differential rate of volume change in different portions of the concrete; cracking is usually random and on a fairly large scale, and in severe instances the cracks may reach a width of 0.50 in. (12.7 mm). (See also **checking** and **crazing**; also known as pattern cracking.)

cracking, pattern—see **cracks** and **cracking, map**.

cracking, plastic—cracking that occurs in the surface of fresh concrete soon after it is placed and while it is still plastic.

cracking, shrinkage—cracking of a structure or member due to failure in tension caused by external or internal restraints as reduction in moisture content develops, carbonation occurs, or both.

cracking, stress-corrosion—a cracking process that requires the simultaneous action of a corrodent and sustained tensile stress. (This excludes corrosion-reduced sections that fail by fast fracture; also excludes intercrystalline or transcrystalline corrosion that can disintegrate an alloy without either applied or residual stress).

cracking, temperature—cracking due to tensile failure, caused by a temperature drop in members subjected to external restraints or by a temperature differential in members subjected to internal restraints.

cracking load—see **load, cracking**.

cracks—

cracks, craze—fine random cracks or fissures in a surface of plaster, cement paste, mortar, or concrete.

cracks, D-line—see **D-cracks** (preferred term.)

cracks, hairline—cracks in an exposed concrete surface having widths so small as to be barely perceptible.

cracks, pattern—see **cracks** and **cracking, map**.

cracks, plastic shrinkage—see **cracking, plastic**.

cracks, transverse—cracks that develop across the long dimension of the member.

craze cracks—see **cracks, craze**.

crazing—the development of craze cracks; the pattern of craze cracks existing in a surface. (See also **checking** and **cracks**.)

creep—time-dependent deformation due to sustained load. (See also **deformation, inelastic**.)

creep, basic—creep that occurs without migration of moisture to or from the concrete. (See also **creep**; and **creep, drying**.)

creep, drying—creep caused by drying. (See **creep**; and **creep, basic**.)

creep, nonrecoverable—the residual or nonreversible deformation remaining in hardened concrete after removal of sustained load.

crimped wire—see **wire, crimped**.

critical saturation—see **saturation, critical**.

cross bracing—crossing members usually designed to act only in tension, often used in scaffolding systems. (See also **sway brace** and **X-brace**.)

cross joint—see **joint, cross**.

cross section—a plane through a body perpendicular to a given axis of the body; a drawing showing such a plane.

cross-tee—a light-gage metal member resembling an upside-down “tee” used to support the abutting ends of formboards in insulating concrete roof constructions.

crush plate—an expendable strip of wood attached to the edge of a form or intersection of fitted forms, to protect the form from damage during prying, pulling, or other stripping operations. (See also **strip, wrecking**.)

crushed gravel—see **gravel, crushed**.

crushed stone—see **stone, crushed**.

crusher—

crusher, primary—a heavy crusher suitable for the first stage in a process of size reduction of rock, slag, or the like.

crusher, secondary—a crusher used for the second stage in a process of size reduction of aggregate and the like. (See also **crusher, primary**.)

crusher-run aggregate—see **aggregate, crusher-run**.

C/S—the molar or mass ratio, whichever is specified, of calcium oxide (CaO) to silicon dioxide (SiO₂), usually of binder materials cured in an autoclave.

cube strength—see **strength, cube**.

cubical piece (of aggregate)—one in which length, breadth, and thickness are approximately equal.

cumulative batching—see **batching, cumulative**.

curb form—a retainer or mold used in conjunction with a curb tool to give the necessary shape and finish to a concrete curb.

curb tool—a tool used to give the desired finish and shape to the exposed surfaces of a concrete curb.

curing—action taken to maintain moisture and temperature conditions in a freshly placed cementitious mixture to allow hydraulic cement hydration and (if applicable) pozzolanic reactions to occur so that the potential properties of the mixture may develop. (See ACI 308.)

curing, adiabatic—the maintenance of adiabatic conditions in concrete or mortar during the curing period.

curing, atmospheric-pressure steam—steam curing of concrete products or cement at atmospheric pressure, usually at maximum ambient temperature between 100 to 200 F (40 to 95 C).

curing, autoclave—curing of concrete products in an autoclave at maximum ambient temperature between 340 to 420 F (170 to 215 C).

curing

curing, electrical—a system in which a favorable temperature is maintained in freshly placed concrete by supplying heat generated by electrical resistance.

curing, fog—

1. storage of concrete in a moist room in which the desired high humidity is achieved by the atomization of water (see also **moist room**); and
2. application of atomized water to concrete, stucco, mortar, or plaster.

curing, high-pressure steam—see **curing, autoclave** (preferred term).

curing, low-pressure steam—see **curing, atmospheric-pressure steam**.

curing, mass—adiabatic curing in sealed containers.

curing, membrane—a process that involves either liquid sealing compound (for example, bituminous and paraffinic emulsions, coal tar cut-backs, pigmented and non pigmented resin suspensions, or suspension of wax and drying oil) or nonliquid protective coating (for example sheet plastics or “waterproof” paper), both of which types function as a film to restrict evaporation of mixing water from concrete surfaces.

curing, moist-air—curing in air of not less than 95% relative humidity at atmospheric pressure and normally at a temperature approximating 73 F (23 C).

curing, single-stage—autoclave curing process in which precast concrete products are put on metal pallets for autoclaving and remain there until stacked for delivery or yard storage.

curing, standard—exposure of test specimens to specified conditions of moisture and temperature. (See also **fog curing**.)

curing, steam—curing of concrete, mortar, grout, or neat-cement paste in water vapor at atmospheric or higher pressures and at temperatures between about 100 and 420 F (40 and 215 C). (See also **atmospheric-pressure steam curing**, **autoclave curing**, **single-stage curing**, and **two-stage curing**.)

curing, two-stage—a process in which concrete products are cured in low-pressure steam, stacked, and then autoclaved.

curing agent—see **catalyst** and **hardener**.

curing blanket—see **blanket, curing**.

curing compound—see **compound, curing**.

curing cycle—see **cycle, autoclave** and **steam-curing cycle**.

curing delay—see **period, prestreaming** (preferred term).

curing kiln—see **curing, autoclave**.

curing membrane—see **membrane curing** and **curing compound**.

curling—the distortion of an originally essentially linear or planar member into a curved shape, such as the warping of a slab to differences in temperature or moisture content in the zones adjacent to its opposite faces. (See also **warping**.)

curtain grouting—see **grouting, curtain**.

curtain reinforcement—see **reinforcement, curtain**.

curvature friction—friction resulting from bends or curves in the specified prestressing cable profile.

curve, grading—a graphical representation of the proportions of different particle sizes in a granular material; obtained by plotting the cumulative or individual percentages of the material passing through sieves in which the aperture sizes form a given series.

cutting screed—see **screed, cutting**.

cycle, autoclave—the time interval between the start of the temperature-rise period and the end of the blowdown period; also, a schedule of the time and temperature-pressure conditions of periods which make up the cycle.

cyclopean concrete—see **concrete, cyclopean**.

cylinder strength—see **strength, compressive** and **strength, splitting tensile**.

cylinders, field-cured—test cylinders that are left at the job-site for curing as nearly as practicable in the same manner as the concrete in the structure to indicate when supporting forms may be removed, additional construction loads may be imposed, or the structure may be placed in service.

D

damage, abrasion—wearing away of a surface by rubbing and friction. (See also **damage, cavitation** and **erosion**.)

damage, cavitation—pitting of concrete caused by implosion, that is, the collapse of vapor bubbles in flowing water which form in areas of low pressure and collapse as they enter areas of higher pressure. (See also **damage, abrasion**, and **erosion**.)

damp—either partial saturation or moderate covering of moisture; implies less wetness than that connoted by “wet” and slightly wetter than that connoted by “moist.” (See also **moist** and **wet**.)

dampproofing—treatment of concrete or mortar to retard the passage or absorption of water, or water vapor, either by application of a suitable coating to exposed surfaces, by use of a suitable admixture or treated cement, or by use of a preformed film such as polyethylene sheets placed on grade before placing a slab. (See also **vapor barrier**.)

darby—a hand-manipulated straightedge, usually 3 to 8 ft (1 to 2.5 m) long, used in the early stage leveling operations of concrete or plaster, preceding supplemental floating and finishing.

dash-bond coat—see **coat, dash-bond**.

day—for concrete, a time period of 24 consecutive hours.

D-cracks—a series of cracks in concrete near and roughly parallel to joints, edges, and structural cracks.

dead end—in the stressing of a tendon from one end only, the end opposite that to which the load is applied.

dead-end anchorage—see **anchorage, dead-end**.

dead load—see **load, dead**.

deadman—an anchor for a guy line, usually a beam, block, or other heavy item buried in the ground, to which a line is attached.

debonding—procedures whereby specific tendons in pre-tensioned construction are prevented from becoming bonded to the concrete for a predetermined distance from the ends of flexural members.