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IS 6461-7 (1973): Glossary of Terms Relating to Cement Concrete, Part 7: Mixing, Laying, Compaction, Curing and Other Construction Aspects [CED 2: Cement and Concrete]



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Indian Standard

**GLOSSARY OF TERMS RELATING TO
CEMENT CONCRETE**

**PART VII MIXING, LAYING, COMPACTION, CURING
AND OTHER CONSTRUCTION ASPECTS**

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

*Indian Standard*GLOSSARY OF TERMS RELATING TO
CEMENT CONCRETEPART VII MIXING, LAYING, COMPACTION, CURING
AND OTHER CONSTRUCTION ASPECTS

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*Indian Standard***GLOSSARY OF TERMS RELATING TO
CEMENT CONCRETE****PART VII MIXING, LAYING, COMPACTION, CURING
AND OTHER CONSTRUCTION ASPECTS****0. FOREWORD**

0.1 This Indian Standard (Part VII) was adopted by the Indian Standards Institution on 16 February 1973, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Cement concrete is one of the most versatile and extensively used building materials in all civil engineering constructions. There are a number of technical terms connected with the basic materials for concrete as well as the production and use of concrete which quite often require clarification to give precise meaning to the stipulations in the standard specifications, codes of practices and other technical documents. It has, therefore, become necessary to standardize the various terms and definitions used in cement and concrete technology and thus avoid ambiguity in their interpretations. The Sectional Committee has, therefore decided to bring out a series of glossaries of terms relating to concrete and concrete materials.

0.3 For convenience of reference, this glossary of terms relating to cement concrete has been grouped into the following twelve parts:

- Part I Concrete aggregates
- Part II Materials (other than cement and aggregates)
- Part III Concrete reinforcement
- Part IV Types of concrete
- Part V Formwork for concrete
- Part VI Equipment, tools and plant
- Part VII Mixing, laying, compaction, curing and other construction aspects
- Part VIII Properties of concrete
- Part IX Structural aspects
- Part X Tests and testing apparatus
- Part XI Prestressed concrete
- Part XII Miscellaneous

0.3.1 In addition to the above, two separate standards have been brought out concerning terminology relating to hydraulic cement and pozzolanic materials. These standards are IS : 4845-1968* and IS : 4305-1967†.

0.4 In the formulation of this standard due weightage has been given to international co-ordination among the standards and practices prevailing in different countries in addition to relating it to the practices in the field in this country. This has been met by deriving assistance from the following publications:

BS 2787:1956 Glossary of terms for concrete and reinforced concrete. British Standards Institution.

BS 4340:1968 Glossary of formwork of terms. British Standards Institution.

ASTM Designation : C 125 Definitions of terms relating to concrete aggregate. American Society for Testing and Materials.

ACI No. SP-19 Cement and concrete terminology. American Concrete Institute.

ACI 617-1968 Recommended practice for concrete formwork. American Concrete Institute.

1. SCOPE

1.1 This standard (Part VII) covers definitions of terms relating to mixing, laying, compaction, curing and other construction aspects.

2. DEFINITIONS

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Accessories — Those items other than frames, braces, or post shores used to facilitate the construction of scaffold and shoring.

2.2 Adiabatic Curing — The maintenance of adiabatic conditions in concrete or mortar during the curing period.

2.3 Advancing Slope Grouting — A method of grouting by which the front of a mass of grout is caused to move horizontally through preplaced aggregate by use of a suitable grout injection sequence.

2.4 Advancing Slope Method — A method of placing concrete as in tunnel linings in which the face of the fresh concrete is not vertical and moves forward as concrete is placed.

*Definitions and terminology relating to hydraulic cement.

†Glossary of terms relating to pozzolana.

2.5 Agglomeration — Gathering into a ball or mass.

2.6 Aggregate Interlock — The projection of aggregate particles or portions of aggregate particles from one side of a joint or crack in concrete into recesses in the other side of such joint or crack so as to effect load transfer in compression and shear, and maintain mutual alignment.

2.7 Agitating Speed — The rate of rotation of the drum or blades of a truck mixer or other device when used for agitation of mixed concrete.

2.8 Agitation

- a) The process of providing gentle motion in mixed concrete just sufficient to prevent segregation or loss of plasticity.
- b) The mixing and homogenization of slurries or finely ground powders by air or mechanical means.

2.9 Air-Water Jet — A high-velocity jet of air and water mixed at the nozzle, used in clean-up of surfaces of rock or concrete such as horizontal construction joints.

2.10 Alignment Wire — Small-gage high-strength steel wire used to establish line and grade as in shotcrete work; also called alignment wire or screed wire.

2.11 Alternate Lane Construction — A method of constructing concrete roads, runways, or other paved areas, in which alternate lanes are placed and allowed to harden before the remaining intermediate lanes are placed.

2.12 Amount of Mixing — The designation of extent of mixer action employed in combining the ingredients for concrete or mortar; in the case of stationary mixers, the mixing time; in the case of truck mixers, the number of revolutions of the drum or blades at mixing speed after the intermingling of the cement with water and aggregates.

2.13 Amplitude of Vibration — The maximum displacement from the mean position in connection with vibration.

2.14 Anchor Bolt — A bolt with the threaded portion projecting from a structure, generally used to hold the frame of a building secure against wind load or a machine against the forces of vibration; known also as hold-down bolt and foundation bolt (*see also* foundation bolt).

2.15 Atmospheric Steam Curing — Steam curing of concrete products or cement at atmospheric pressure, usually at maximum ambient temperature between 40 to 95°C.

2.16 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 for soundness.

2.17 Autoclave Curing — Steam curing of concrete products, sandlime brick, asbestos cement products, hydrous calcium silicate insulation products, or cement in an autoclave at maximum ambient temperatures generally between 170 and 215°C.

2.18 Autoclave Cycle — 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.

2.19 Autoclaved — *See* 2.17.

2.20 Autoclaving — *See* 2.17.

2.21 Autogenous Healing — A natural process of closing and filling of cracks in concrete or mortar when the concrete or mortar is kept damp.

2.22 Autogenous Volume Change — Change in volume produced by continued hydration of cement exclusive of effects of external forces or change of the water content or temperature.

2.23 Back Plastering — Plaster applied to one face of a lath system following application and subsequent hardening of plaster applied to the opposite face.

2.24 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, such as a pavement is placed.

2.25 Base Bead — A preformed metal screed with perforated or expanded flanges to provide a ground for plaster and to separate areas of dissimilar materials.

2.26 Base Coat — Any plaster coat or coats applied prior to application of the finish coat.

2.27 Base Plate — A plate of metal or other approved 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 device used to distribute vertical loads as for building columns or machinery.

2.28 Base Screed — A preformed metal screed with perforated or expanded flanges to provide a ground for plaster and to separate areas of dissimilar materials.

2.29 Batch — Quantity of concrete or mortar mixed at one time.

2.30 Batch Box — Container of known volume used to measure constituents of a batch of concrete or mortar in proper proportions.

2.31 Batched Water — The mixing water added by a batcher to a concrete or mortar mixture before or during the initial stages of mixing.

2.32 Batching — Weighing or volumetrically measuring and introducing into the mixer the ingredients for a batch of concrete or mortar.

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

2.34 Barliner (Crazy) — A type of terrazzo topping using small and large pieces of marble paving, usually with a standard terrazzo matrix between pieces.

2.35 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 or drainage of mixing water; also called water gain.

2.36 Blinding — The application of a layer of weak 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.

2.37 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.

2.38 Blockout — A space within a concrete structure under construction in which fresh concrete is not to be placed (also called core).

2.39 Blowdown Period — Time taken to reduce pressure in an autoclave from maximum to atmospheric.

2.40 Board Butt Joint — Shotcrete construction joint formed by sloping gunned surface to a 25-mm thick board laid flat.

2.41 Bolt Sleeve — A tube surrounding a bolt in a concrete wall to prevent concrete from sticking to the bolt and acting as a spreader for the formwork.

2.42 Bond Breaker — A material used to prevent adhesion of newly placed concrete and the substrate.

2.43 Bond Plaster — A specially formulated gypsum plaster designed as first coat application over monolithic concrete.

2.44 Bonding Agent — A substance applied to a suitable substrate to create a bond between it and a succeeding layer as between a subsurface and a terrazzo topping or a succeeding plaster application.

2.45 Bonding Layer — A layer of mortar, usually 3 to 12 cm thick, which is spread on a moist and prepared, hardened concrete surface prior to placing fresh concrete.

2.46 Broom Finish — The surface texture obtained by stroking a broom over freshly placed concrete.

2.47 Brown Coat — The second coat in three-coat plaster application.

2.48 Brown Cut — To complete application of basecoat plaster.

2.49 Build-Up — Gunning of shotcrete in successive layers to form a thicker mass.

2.50 Bull Float — A tool comprising a large, flat, rectangular piece of wood, aluminium, or magnesium usually 20 cm wide and 100 to 150 cm long, and a handle 1 to 5 m in length used to smooth unformed surfaces of freshly placed concrete.

2.51 Burlap — A coarse fabric of jute, hemp, or less commonly, flax, for use as a water-retaining covering in curing concrete surfaces.

2.52 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.

2.53 Bush-Hammer Finish — A finish on concrete obtained by means of a bush-hammer.

2.54 Butt Joint — A plain square joint between two members.

2.55 Buttress — A projecting structure to support a wall or building.

2.56 Catalyst (or Curing Agent or Promoter) — A substance that accelerates or causes a chemical reaction without itself being transformed by the reaction.

2.57 Catface — Belmish or rough depression in the finish plaster coat caused by variations in the base coat thickness.

2.58 Cellular Construction — A method of constructing concrete elements in which part of the interior concrete is replaced by voids.

2.59 Cellular Raft — A raft in which the intersecting beams form a number of cells.

2.60 Cemet Bacillus — See 2.160.

2.61 Cement Content — Quantity of cement contained in a unit volume of concrete or mortar, preferably expressed as weight.

2.62 Cement Factor — See 2.61.

2.63 Cement Gel — The colloidal material that makes up the major portion of the porous mass of which mature hydrated cement paste is composed.

2.64 Cementation Process — The process of injecting cement grout under pressure into certain types of ground (for example, gravel, fractured rock to solidify it).

2.65 Central-Mixed Concrete — Concrete which is completely mixed in a stationary mixer from which it is transported to the delivery point.

2.66 Chalking — Disintegration of coatings, such as a cement paint, manifested by the presence of a loose powder evolved from the paint at, or just beneath, the surface.

2.67 Chamfer — A beveled corner which is formed in concrete work by placing a chamfer strip in the corner of the form.

2.68 Chamfer Strip — Triangular or curved insert placed in an inside form corner to produce a rounded or flat chamfer; also called fillet, cant strip, skew back.

2.69 Charging — Introducing, feeding, or loading materials into a concrete or mortar mixer, furnace, or other container or receptacle where they will be further treated or processed.

2.70 Checking — Development of shallow cracks at closely spaced but irregular intervals on the surface of mortar or concrete.

2.71 Chipping — Treatment of a hardened concrete surface by chiseling.

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

2.73 Cleanup — Treatment of horizontal construction joints to remove all surface material and contamination to a condition of cleanliness corresponding to that of a freshly broken surface of concrete.

2.74 Closed-Circuit Grouting — Injection of grout into a hole intersecting fissures or voids which are to be filled at such volume and pressure that grout input to the hole is greater than the grout take of the surrounding formation, excess grout being returned to the pumping plant for recirculation.

2.75 Coat — A film or layer as of paint or plaster applied in a single operation.

2.76 Coating — Material applied to a surface by brushing, dipping, mopping, spraying, trowelling, etc, such as to preserve, protect, decorate, seal, or smooth the substrate.

2.77 Cold Joint — A joint or discontinuity formed when a concrete surface hardens before the next batch is placed against it, characterized by poor bond unless necessary procedures are observed.

2.78 Compaction — The process of inducing a closer packing of the solid particles in freshly mixed concrete or mortar during placement by the reduction of the volume of voids, usually by vibration, centrifugation, tamping, or some combination of these actions; also applicable to similar manipulation of other cementitious mixtures, soils, aggregate, or the like (*see also* 2.96).

2.79 Composite Concrete Flexural Construction — A precast concrete member and cast-in-place reinforced concrete so interconnected that the component elements act together as a flexural unit.

2.80 Composite Construction — A type of construction made up of different materials, for example, concrete and structural steel, or of members produced by different methods, for example, *in situ* concrete and precast concrete.

2.81 Concrete Dense — Concrete containing a minimum of voids.

2.82 Concrete Fat — A concrete containing a large proportion of mortar.

2.83 Concrete, Field — Concrete delivered or mixed, placed, and cured on the job site.

2.84 Concrete Green — Concrete which has set but not appreciably hardened.

2.85 Concrete, in situ (also Cast-in-Place) — Concrete which is deposited in the place where it is required to harden as part of the structure, as opposed to precast concrete.

2.86 Concrete, Lean — *See* lean concrete, IS : 6461 (Part IV)-1972*.

2.87 Concrete, Mass — *See* mass concrete, IS : 6461 (Part IV)-1972*.

2.88 Concrete, Monolithic — *See* monolithic concrete, IS : 6461 (Part IV)-1972*.

2.89 Concrete, No-Slump — *See* no-slump concrete, IS : 6461 (Part IV)-1972*.

2.90 Concrete, Normal-Weight — Concrete having a unit weight of approximately 2 400 kg/m³ made with aggregates of normal weight.

2.91 Concrete, Ready-Mixed — *See* ready-mixed concrete, IS : 6461 (Part IV)-1972*.

*Glossary of terms relating to cement concrete: Part IV Types of concrete.

2.92 Concrete, Reinforced — See reinforced concrete, IS : 6461 (Part IV)-1972*.

2.93 Concrete, Transit-Mixed — See transit-mixed concrete, IS : 6461 (Part IV)-1972*.

2.94 Concrete, Vibrated — See vibrated concrete, IS : 6461 (Part IV)-1972*.

2.95 Confined Concrete — Concrete containing closely spaced special transverse reinforcement which is provided to restrain the concrete in directions perpendicular to the applied stresses.

2.96 Consolidation — Compaction of freshly placed concrete or mortar to minimum practical volume, usually by vibration, centrifugation, tamping, or some combination of these, to mold it within forms or molds and around embedded parts and reinforcement, and to eliminate voids other than entrained air (*see also* 2.78).

2.97 Construction, Composite — Construction consisting of cast-in-place reinforced concrete and members made of some other material so interconnected that the component elements act together as a unit.

2.98 Construction Joint — The surface where two successive placements of concrete meet (*see also* 2.207).

2.99 Construction Loads — The loads to which a permanent or temporary structure is subjected during construction.

2.100 Contact Ceiling — A ceiling which is secured in direct contact with the construction above without use of furring.

2.101 Contact Pressure — Pressure acting at and perpendicular to the contact area between footing and soil, produced by the weight of the footing and all forces acting on it.

2.102 Containment Grouting — *See* 2.241.

2.103 Contraction Joint — A plane, usually vertical, separating concrete in a structure or pavement, at a designed location such as to interfere least with performance of the structure, yet such as to prevent formation of objectionable shrinkage cracks elsewhere in the concrete.

2.104 Contraction Joint Grouting — Injection of grout into contraction joints.

2.105 Control Factor — The ratio of the minimum compressive strength to the average compressive strength.

*Glossary of terms relating to cement concrete: Part IV Types of concrete.

2.106 Control Joint — Formed, sawed, or tooled groove in a concrete structure to regulate the location and amount of cracking and separation resulting from the dimensional change of different parts of a structure so as to avoid the development of high stresses.

2.107 Control Joint Grouting — *See 2.104.*

2.108 Core — The soil material enclosed within a tubular pile after driving (it may be replaced with concrete). The mandrel used for driving casings for cast-in-place piles. Portion of a reinforced concrete column inside the centre line of the principal reinforcement. A cylindrical sample of hardened concrete or rock obtained by means of a core drill. The moulded open space in a concrete masonry units (*see 2.38*).

2.109 Cored Beam — A beam whose cross-section is partially hollow, or a beam from which cored samples of concrete have been taken.

2.110 Coring — The act of obtaining cores from concrete structures or rock foundations.

2.111 Cotton Mats — Cotton-filled quilts fabricated for use as a water retaining covering in curing concrete surfaces.

2.112 Course — A horizontal layer of concrete usually one of several making up a lift (*see 2.206*).

2.113 Cover — In reinforced concrete, the least distance between the surface of the reinforcement and the outer surface of the concrete.

2.114 Craze Cracks — Fine, random cracks or fissures caused by shrinkage which may appear in a surface of plaster, cement paste, mortar, or concrete.

2.115 Cracking — The development of craze cracks; the pattern of craze cracks existing in a surface.

2.116 C/S Ratio — The molar or weight ratio, whichever is specified, of calcium oxide to silicon dioxide; usually of binder materials cured in an autoclave.

2.117 Cumulative Batching — 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.

2.118 Curing — Maintenance of humidity and temperature of freshly placed concrete during some definite period following placing, casting, or finishing to assure satisfactory hydration of the cementitious materials and proper hardening of the concrete.

2.119 Curing Blanket — A built-up covering of sacks, matting, hessian, straw, waterproof paper, or other suitable material placed over freshly finished concrete.

2.120 Curing Cycle — *See 2.18 and 2.314.*

2.121 Curing Delay — In steam curing of concrete products, the period between the completion of placement of concrete in molds and forms or forming of masonry units by machine and the application of steam.

2.122 Curing Kiln — *See 2.312.*

2.123 Curing Membrane — *See 2.216.*

2.124 Curling — The distortion of an originally essentially linear or planer member into a curved shape such as the warping of a slab due to creep or to differences in temperature or moisture content in the zones adjacent to its opposite faces.

2.125 Curtain Grouting — Injection of grout into a subsurface formation in such a way as to create a zone of grouted material transverse to the direction of anticipated water flow.

2.126 Damp Proofing — Treatment of concrete or mortar to retard the passage or absorption of water, or water vapour, either by application of a suitable coating to exposed surfaces, or by use of a suitable admixture or treated cement.

2.127 Dash-Bond Coat — A thick slurry of Portland cement, sand, and water dashed on surfaces with a paddle or brush to provide a base for subsequent Portland cement plaster coats.

2.128 D-cracking — The progressive formation of a series of fine cracks at rather close intervals on a concrete surface often of random patterns, in highway slabs paralleling edges, joints, and cracks and curving across slab corners (also termed D-cracks and D-line cracks).

2.129 Decenter — To lower or remove centering or shoring.

2.130 Deformed Metal Plate — A metal plate with horizontal deformations or corrugations used in construction to form a vertical joint and provide a mechanical interlock between adjacent sections.

2.131 Delay — *See 2.121 and 2.256.*

2.132 Dense Concrete — *See 2.81.*

2.133 Deterioration — *See 2.137.*

2.134 Diagonal Crack — An inclined crack, usually at about 45 deg to the center line beginning at the tension surface of a concrete member.

2.135 Diagonal Cracking — Development of diagonal cracks.

2.136 Direct Dumping — Discharge of concrete directly into place from crane bucket or mixer.

2.137 Disintegration — Deterioration into small fragments or particles due to any cause.

2.138 Distribution — The movement of freshly mixed concrete toward the point of placement either by hand or motorized tools.

2.139 Divider Strips — In terrazzo work, non-ferrous metal or plastic strips of different thicknesses usually 10 or 40 mm deep used to form panels in the topping.

2.140 D-line Cracks — See 2.128.

2.141 Double-Up — A method of plastering characterized by application in successive operations with no setting or drying time between coats.

2.142 Doughnut — A large washer of any shape to increase bearing area of bolts and ties; also a round concrete spacer with hole in the centre to hold bars at the desired distance from the forms.

2.143 Dowel — A steel bar, commonly a plain round steel bar, which extends into two adjoining portions of a concrete construction, as at a joint in a pavement slab, so as to connect the portions and transfer shear loads.

2.144 Dowel Deflection — Deflection caused by the transverse load imposed on a dowel.

2.145 Dowel Lubricant — Lubricating material applied to bars in expansion joints to reduce bond with the concrete and promote unrestrained longitudinal movement.

2.146 Drip — A cut-out in the underside of a projecting piece of stone or concrete to prevent water from working back to a wall.

2.147 Dropchute — A device used to confine or to direct the flow of a falling stream of concrete.

a) *Articulated Dropchute* — A dropchute consisting of a vertical succession of tapered metal cylinders which are so designed that the lower end of each cylinder fits into the upper end of the one below.

b) *Flexible Dropchute* — A dropchute consisting of a heavy, rubberized canvas tube.

2.148 Dry-Batch Weight — The weight of the materials, excluding water used to make a batch of concrete.

- 2.149 Dry Mix** — A mixture containing little water in relation to its other components.
- 2.150 Dry Mixing** — Blending of the solid materials for mortar or concrete prior to adding the mixing water.
- 2.151 Dry Pack** — To forcibly ram a moist portland-cement-aggregate mixture into a confined area; also the mixture so placed.
- 2.152 Dry-Packed Concrete** — A concrete mixture sufficiently dry to be consolidated only by heavy ramming.
- 2.153 Dry Shake** — *See 2.225.*
- 2.154 Dry-Tamp Process** — The placing of concrete or mortar by hammering or ramming a relatively dry mix into place.
- 2.155 Dry Topping** — *See 2.225.*
- 2.156 Dry-Volume Measurement** — Measurement of the ingredients of grout, mortar, or concrete by their bulk volume.
- 2.157 Duct** — A hole formed in a concrete member to accommodate a tendon for post-tensioning; a pipe or runway for electric, telephone, or other utilities.
- 2.158 Dummy Joint** — *See 2.179.*
- 2.159 Dusting** — The development of a powdered material at the surface of hardened concrete.
- 2.160 Ettringite** — A mineral, high sulphate calcium sulphotoaluminate ($3\text{CaO} \cdot \text{Al}_2\text{O}_3 \cdot 3\text{CaSO}_4 \cdot 30\text{--}32\text{H}_2\text{O}$); occurring naturally or formed by sulphate attack on mortar and concrete; designated as 'Cement bacillus' in older literature.
- 2.161 Exfoliation** -- Disintegration occurring by peeling off in successive layers; swelling up and opening into leaves or plates like a partly opened book.
- 2.162 Expansion Joint** — A separation between adjoining parts of a concrete structure which is provided to allow small relative movements, such as those caused by thermal changes to occur independently.
- 2.163 Exposed-Aggregate Finish** — A decorative finish for concrete work achieved by removing, generally before the concrete has fully hardened, the outer skin of mortar and exposing the coarse aggregate.
- 2.164 Faulting** — Differential vertical displacement of a slab or other member adjacement to a joint or crack.
- 2.165 Field Concrete** — *See 2.83.*

2.166 Fillet — *See* 2.68.

2.167 Fin — A narrow linear projection on a formed concrete surface, resulting from mortar flowing out between spaces in the formwork.

2.168 Finish — The texture and smoothness of a surface after compacting and finishing operations have been performed.

2.169 Finish Coat — Final thin coat of shotcrete preparatory to hand finishing; also exposed coat of plaster and stucco.

2.170 Finish Grinding — The final grinding of clinker into cement, with calcium sulphate in the form of gypsum or anhydrite generally being added; the final grinding operation required for a finished concrete surface for example, bump cutting of pavement, fin removal from structural concrete and terrazzo floor grinding.

2.171 Finishing — Leveling, smoothing, compacting, and otherwise treating surfaces of fresh or recently placed concrete or mortar to produce desired appearance and service.

2.172 Float Finish — A rather rough concrete surface texture obtained by finishing with a float.

2.173 Flouting — The operation of finishing a fresh concrete or mortar surface by use of a float.

2.174 Fog Curing — Storage in a moist room in which the desired high humidity is achieved by the atomization of fresh water (*see also* 2.223).

2.175 Foundation Bolt — *See* 2.14.

2.176 Free Fall — Descent of freshly mixed concrete into forms without dropchutes or other means of confinement; also the distance through which such descent occurs; also uncontrolled fall of aggregate.

2.177 Granolithic Finish — A surface layer of granolithic concrete which may be laid on a base of either fresh or hardened concrete.

2.178 Green Concrete — *See* 2.84.

2.179 Groove Joint — A construction joint created by forming a groove in the surface of a pavement, floor slab, or wall to control random cracking.

2.180 Grout — Mixture of cementitious material and aggregate to which sufficient water is added to produce pouring consistency without segregation of the constituents, or mixtures of other compositions, such as containing PVC or epoxy resin or sodium silicate, but similar consistency (*see also* 2.230).

2.181 Grouting — The process of filling with grout (*see also* 2.180).

- 2.182 Grout Slope**—The natural slope of fluid grout injected into preplaced-aggregate concrete.
- 2.183 Gunning** — Act of applying shotcrete; ejection of material from nozzle and impingement on surface to be gunned.
- 2.184 Hacking** — The roughening of a surface by striking with a tool.
- 2.185 Hair Cracks** — Cracks which are just visible to the naked eye.
- 2.186 Hairline Cracking** — Small cracks of random pattern in an exposed concrete surface.
- 2.187 Hardener** — A chemical (including certain fluosilicates or sodium silicate) applied to concrete floors to reduce wear and dusting. In a two-component adhesive or coating, the chemical component which causes the resin component to cure.
- 2.188 Harsh Mixture** — A concrete mixture which lacks desired workability and consistency due to a deficiency of mortar or aggregate fines.
- 2.189 Heating Rate** — The rate expressed in degrees per hour at which the temperature of the kiln or autoclave is raised to the desired maximum temperature.
- 2.190 Hessian** — *See 2.51.*
- 2.191 High Pressure Steam Curing** — *See 2.17.*
- 2.192 High Temperature Steam Curing** — *See 2.15 and 2.17.*
- 2.193 Holding-Down Bolt** — *See 2.14.*
- 2.194 Honeycomb** — Voids left in concrete due to failure of the mortar to effectively fill the spaces among coarse aggregate particles.
- 2.195 Hydration** — Formation of a compound by the combining of water with some other substance; in concrete, the chemical reaction between cement and water.
- 2.196 Interval Vibration** — *See 2.341.*
- 2.197 Joint Construction** — *See 2.98.*
- 2.198 Joint Filler** — Material used to fill a joint to prevent the infiltration of debris.
- 2.199 Joint Sealant** — Material used to exclude water and solid foreign materials from joints.
- 2.200 Key** — *See 2.202.*
- 2.201 Keyed or Keying** — Fastened or fixed in position in a notch or other recess.

2.202 Keyway — A recess or groove in one lift or placement of concrete which is filled with concrete of the next lift, giving shear strength to the joint.

2.203 Laitance — A layer of weak and nondurable material containing cement and fines from aggregates, brought by bleeding water to the top of overwet concrete, the amount of which is generally increased by overworking or overmanipulating concrete at the surface by improper finishing or by job traffic.

2.204 Layer — *See 2.112.*

2.205 Lean Concrete — Concrete of low cement content.

2.206 Lift — The concrete placed between two consecutive horizontal construction joints; usually contains several layers, or courses.

2.207 Lift Joint — Surface at which two successive lifts meet.

2.208 Longitudinal Joint — A joint parallel to the long dimension of a structure or pavement.

2.209 Low-Pressure Steam Curing — *See 2.15.*

2.210 Map Cracking — *See 2.115.*

2.211 Masonry Mortar — Mortar used in masonry structures (*see also 2.227*).

2.212 Mass Curing — Adiabatic curing in sealed containers.

2.213 Matrix — In the case of mortar, the cement paste in which the fine aggregate particles are embedded; in the case of concrete, the mortar in which the coarse aggregate particles are embedded.

2.214 Maximum-Temperature Period — A time interval over which the maximum temperature is held constant in an autoclave or steam-curing room.

2.215 Mechanical Bond — The physical keying of one plaster coat to another or to the plaster base by plaster keys to metal lath, or by interlock between adjacent plaster coats by scratching or cross raking; also between concrete and reinforcing bars, the bond attributed to keying of interlocking action other than adhesion.

2.216 Membrane Curing — A process that involves either liquid sealing compound (for example, bituminous and paraffinic emulsions, coal tar cutbacks, pigmented and nonpigmented resin suspensions, or suspensions of wax and drying oil) or nonliquid protective coating (for example, sheet plastics or waterproof paper), both of which types function as films to restrict evaporation of mixing water from the fresh concrete surface.

2.217 Mix — A colloquial term designating a particular type of concrete mixture (for example, 5-bag mix, lean mix and paving mix) the preferable term is 'mixture'.

2.218 Mix Design — *See 2.257.*

2.219 Mixing Cycle — The time taken for a complete cycle in a batch mixer, that is, the time elapsing between successive repetitions of the same operation (for example, successive discharges of the mixer).

2.220 Mixing Time — The period during which the constituents of a batch of concrete are mixed by a mixer, for a stationary mixer, time is given in minutes from the completion of mixer charging until the beginning of discharge for a truck mixer, time is given in total minutes at a specified mixing speed or expressed in terms of total revolutions at a specified mixing speed.

2.221 Mixing Water — The water in freshly mixed sand-cement grout, mortar, or concrete, exclusive any previously absorbed by the aggregate (for example, water considered in the computation of the net water-cement ratio) (*see also 2.31*).

2.222 Mixture — The assembled, blended, intermingled ingredients of mortar, concrete, or the proportions for their assembly.

2.223 Moist Room — A room in which the atmosphere is maintained at a selected temperature and a relative humidity of at least 98 percent, for the purpose of curing and storing cementitious test specimens; the facilities will be sufficient to maintain free moisture continuously on the exterior of test specimens.

2.224 Monolith — A body of plain or reinforced concrete cast or erected as a single integral mass or structure.

2.225 Monolithic Surface Treatment — A dry mixture, usually one part cement to two parts sand, which is sprinkled evenly on an unformed surface after water has largely disappeared following the strike-off, and then worked off, and then worked in by floating; also called 'dry shake'.

2.226 Monolithic Terrazzo — The application of a 15 mm terrazzo topping directly to a specially prepared concrete substrata eliminating an underbed.

2.227 Mortar — A mixture of cement paste and sand; when used in masonry construction, the mixture may contain masonry cement, or ordinary hydraulic cement with lime (and possibly other admixtures) to afford greater plasticity and durability than are attainable with ordinary hydraulic-cement paste (*see also 2.211*).

2.228 Mud Slab — A 5 to 15 cm layer of concrete below structural concrete floor or footing over soft, wet soil.

2.229 Nailer — A strip of wood or other fitting attached to or set in concrete, or attached to steel to facilitate making nailed connections.

2.230 Neat Cement Grout — A fluid mixture of hydraulic cement and water, with or without admixture; also the hardened equivalent of such mixture.

2.231 Net Mixing Water — *See 2.221.*

2.232 Nominal Mix — The proportions of the constituents of a proposed concrete mixture.

2.233 Open-Circuit Grouting — A grouting system with no provision for recirculation of grout to the pump.

2.234 Oversanded — Containing more sand than would be necessary to produce adequate workability and a satisfactory condition for finishing.

2.235 Overvibration — Excessive use of vibrators during placement of freshly mixed concrete, causing segregation and excessive bleeding.

2.236 Packer — A device inserted into a hole in which grout is to be injected which acts to prevent return of the grout around the injection pipe usually an expandable device actuated mechanically, hydraulically, or pneumatically.

2.237 Pass — Layer of shotcrete placed in one movement over the field of operation.

2.238 Pattern Cracking — Fine openings on concrete surfaces in the form of a pattern; resulting from a decrease in volume of the material near the surface, or increase in volume of the material below the surface, or both.

2.239 Pavement (Concrete) — A layer of concrete over such areas as roads, sidewalks, airfields, canals, playgrounds, and those used for storage or parking.

2.240 Peeling — A process in which thin flakes of mortar are broken away from a concrete surface, such as by deterioration or by adherence of surface mortar to forms as forms are removed (*see also 2.283 and 2.307*).

2.241 Perimeter Grouting — Injection of grout, usually at relatively low pressure, around the periphery of an area which is subsequently to be grouted at greater pressure; intended to confine subsequent grout injection within the perimeter.

2.242 Pitting — Development of relatively small cavities in a surface, due to phenomena, such as corrosion or cavitation, or in concrete, localized disintegration (*see also 2.251*).

2.243 Placeability — *See 2.354.*

2.244 Placing

- a) The deposition and compaction of freshly mixed mortar or concrete in the place where it is to harden.
- b) The process of applying plastic terrazzo mix to the prepared surface.

2.245 Plain Concrete — Concrete without reinforcement; or concrete that does not conform to the definition of reinforced concrete.

2.246 Plaster — A cementitious material or combination of cementitious material and aggregate that, when mixed with a suitable amount of water, forms a plastic mass or paste which when applied to a surface adheres to it and subsequently hardens, preserving in a rigid state the form or texture imposed during the period of plasticity; also the placed and hardened mixture.

2.247 Plaster Consistency — Condition of freshly mixed cement paste, mortar, or concrete such that deformation will be sustained continuously in any direction without rupture.

2.248 Plastic Cracking — Cracking that occurs in the surface of fresh concrete soon after it is placed and while it is still plastic.

2.249 Plastic Shrinkage Cracks — *See 2.186.*

2.250 Plum — A large random-shaped stone dropped into freshly placed mass concrete to economize on the volume of the concrete [*see also* cyclopean concrete in IS : 6461 (Part IV)-1972*].

2.251 Popout — The breaking away of small portions of a concrete surface due to internal pressure which leaves a shallow, typical conical, depression.

2.252 Pozzolan Cement Concrete — Concrete having pozzolana partly substituted for its cement, the pozzolana content being not less than 10 percent of the combined weight of cement plus pozzolana.

2.253 Precast — A concrete member that is cast and cured in other than its final position.

2.254 Precured Period — *See 2.256.*

2.255 Preset Period — *See 2.256.*

2.256 Presteamming Period — In the manufacture of concrete products, the time between moulding of a concrete product and start of the temperature rise period.

*Glossary of terms relating to cement concrete: Part IV Types of concrete.

2.257 Proportioning — Selection of proportioning of ingredients for mortar or concrete to make the most economical use of available materials to produce mortar or concrete of the required properties.

2.258 Puddling

- a) Process of inducing compaction in mortar or concrete by use of a tamping rod (also called roding, tampering).
- b) Undesirable placement of shotcrete wherein air pressure is decreased and water content is increased.

2.259 Punning — A form of light ramming.

2.260 Rendering — The application, by means of trowel or float, of a coat of mortar.

2.261 Reposting — The construction operation in which the original shoring or posting is removed and replaced in such a manner as to avoid damage to the partially cured concrete; also known as reshoring.

2.262 Retempering — The addition of water and remixing of concrete or mortar which has started to stiffen.

2.263 Revibration — One or more applications of vibration to concrete after completion of placing and initial compaction but preceding initial setting of the concrete.

2.264 Ribbon Loading — Method of batching concrete in which the solid ingredients, and sometimes also the water, enter the mixer simultaneously.

2.265 Rich Concrete — Concrete of high cement content.

2.266 Rich Mixture — A concrete mixture containing a high proportion of cement.

2.267 Rock Pocket — A porous, mortar-deficient portion of hardened concrete consisting primarily of coarse aggregate and open voids, caused by leakage of mortar from formwork separation (segregation) during placement, or insufficient consolidation (*see also 2.194*).

2.268 Rolling — The use of heavy metal or stone rollers on terrazzo topping to excess matrix.

2.269 Rod Tamping (also called Roding) — A round, straight steel rod, having one end rounded to a hemispherical tip (*see also 2.258 and 2.325*).

2.270 Rough Grind — The initial operation in which coarse abrasives are used to cut the projecting chips in hardened terrazzo down to a level surface.

2.271 Rub Brick — A silicon-carbide brick used to smooth and remove irregularities from hardened concrete surfaces.

2.272 Rubbed Finish — A finish obtained by using an abrasive to remove surface irregularities from concrete (*see also* 2.276).

2.273 Runway — Decking over area of concrete placement, usually of movable panels and supports, on which buggies of concrete travel to points of placement.

2.274 Rustic or Washed Finish — A type of terrazzo topping in which the matrix is recessed by washing prior to setting so as to expose the chips without destroying the bond between chip and matrix; a retarder is sometimes applied to the surface to facilitate this operation (*see also* 2.163).

2.275 Rustication — A groove in a concrete or masonry surface.

2.276 Sack Rub — A finish for formed concrete surfaces, designed to produce even texture and fill all pits and air holes; after dampening the surface, mortar is rubbed over surface; then, before it dries, a mixture of dry cement and sand is rubbed over it with a wad of burlap or a sponge-rubber float to remove surplus mortar and fill voids.

2.277 Sagging — Subsidence of material from the gunned surface of a sloping or vertical concrete structural member or from the gunned surface of an overhead horizontal shotcrete structural member (*see also* 2.299).

2.278 Sand Blast — A system of cutting or abrading a surface, such as concrete by a stream of sand ejected from a nozzle at high spread by compressed air; often used for cleanup of horizontal construction joints or for architectural exposure of aggregate.

2.279 Sand-Coarse Aggregate Ratio — Ratio of fine to coarse aggregate in a batch of concrete, by weight or volume.

2.280 Sand Grout — Any portland cement grout in which fine aggregate is incorporated into the mixture (also termed sanded grout).

2.281 Sand Streak — Streak in surface of formed concrete caused by bleeding.

2.282 Sawed Joint — A joint cut in hardened concrete generally not to the full depth of the member by means of special equipment, utilizing diamond or silicon-carbide blades or discs.

2.283 Scaling — Local flaking or peeling away of the near-surface portion of concrete or mortar (*see also* 2.240 and 2.307).

2.284 Scour — Erosion of a concrete surface, exposing the aggregate.

2.285 Scratch Coat — 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.

2.286 Screed

- a) Firmly established grade strips or side forms for unformed concrete which will guide the strike-off in producing the desired plane or shape.
- b) To strike off concrete laying above the desired plane or shape.
- c) A tool for striking off the concrete surface, preferably referred to as a strike-off.

2.287 Screeding — The operation of forming a surface by the use of screeds and a strike-off (*see also 2.318*).

2.288 Segregation — The differential concentration of the components of mixed concrete, resulting in nonuniform proportions in the mass.

2.289 Self-Desiccation — The removal of free water by chemical reaction so as to leave insufficient water to cover the solid surfaces and to cause a decrease in the relative humidity of the system; applied to an effect occurring in sealed concretes, mortars, and pastes.

2.290 Self-Furring — Metal lath or welded wire fabric formed in the manufacturing process to include means by which the material is held away from the supporting surface, thus creating a space for 'keying' of the insulating concrete, plaster, or stucco.

2.291 Separation — The tendency, as concrete is caused to pass from the unconfined ends of chutes or conveyor belts, or similar arrangements, for coarse aggregate to separate from the concrete and accumulate at one side; the tendency, as processed aggregate leaves the ends of conveyor belts, chutes, or similar devices with confining sides, for the larger aggregate to separate from the mass and accumulate at one side; or the tendency for the solids to separate from the water by gravitational settlement (*see also 2.35 and 2.288*).

2.292 Setting Bed — The mortar subsurface to which a terrazzo topping is applied; usually refers to terrazzo on vertical surfaces.

2.293 Settlement (of Aggregate) — Sinking of the solid particles in fresh concrete or mortar after placement and before initial set.

2.294 Shoulder — An unintentional offset in a formed concrete surface usually caused by bulging of or movement of formwork.

2.295 Shrinkage Crack — Crack due to restraint of shrinkage.

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

2.297 Single Stage Curing — Autoclave curing process in which precast concrete products remain on metal pallets until stacked for delivery or yard storage.

2.298 Slick Line — End section of a pipe line used in placing concrete by pump which is immersed in the placed concrete and moved as the work progresses.

2.299 Sloughing — *See* 2.277.

2.300 Slurry — A mixture of water and any finely divided insoluble material, such as Portland cement, slag, or soil in suspension.

2.301 Slush Grouting — Distribution of a Portland cement slurry with or without fine aggregate as required over a rock or concrete surface which is subsequently to be covered with concrete, usually by brooming it into place to fill surface voids and fissures.

2.302 Snap Tie — A proprietary concrete wall-form tie, the end of which can be twisted or snapped off after the forms have been removed.

2.303 Soaking Period — In high-pressure steam curing, the time during which the live steam supply to the kiln or autoclave is shut off and the concrete products are left to soak in the residual heat or moisture; in low-pressure steam curing, the period after the concrete product has reached maximum temperature and during which the steam is shut off and the products are allowed to soak in the residual heat and moisture of the curing kiln.

2.304 Sounding Well — A vertical conduit in the mass of coarse aggregate for preplaced aggregate concrete, provided with continuous or closely spaced openings to permit entrance of grout; the grout level is determined by means of a float on a measured line.

2.305 Spading — Consolidation of mortar or concrete by repeated insertions and withdrawal of a flat, spadelike tool.

2.306 Spall — A fragment, usually in the shape of a flake, detached from a larger mass by a blow, by the action of weather, by pressure, or by expansion within the larger mass (*see also* 2.240 and 2.283).

2.307 Spalling — The development of spalls.

2.308 Spatterdash — A rich mixture of Portland cement and coarse sand which is thrown onto a background by a trowel, scoop or other appliance, so as to form a thin, coarse-textured, continuous coating; as a preliminary treatment before rendering, it assists bond of the undercoat to the background, improves resistance to rain penetration, and evens out the suction of variable backgrounds (*see also* 2.127).

2.309 Split Batch Charging — Method of charging a mixer in which the solid ingredients do not all enter the mixer together; cement, and sometimes different sizes of aggregate, may be added separately.

2.310 Sprinkle — The distribution of additional chips on a terrazzo topping prior to rolling.

2.311 Stage Grouting — Sequential grouting of a hole in separate steps or stages in lieu of grouting the entire length at once.

2.312 Steam Box — Enclosure for steam curing concrete products.

2.313 Steam Curing — Curing of concrete or mortar in water vapour at atmospheric or high pressures and at temperatures between 30 and 215°C (*see also* 2.15, 2.17, 2.297 and 2.335).

2.314 Steam-Curing Cycle — The time interval between the start of the temperature-rise period and the end of the soaking period or the cooling-off period; also a schedule of the time and temperature of periods which make up the cycle.

2.315 Steam-Curing Room — A chamber for steam curing of concrete products at atmospheric pressure.

2.316 Steam Kiln — *See* 2.315.

2.317 Stratification — The separation of overwet or overvibrated concrete into horizontal layers with increasingly lighter material toward the top; water, laitance, mortar, and coarse aggregate will tend to occupy successively lower positions in that order; a layered structure in concrete resulting from placing of successive batches that differ in appearance.

2.318 Strike-off — To remove concrete in excess of that which is required to fill the form evenly or bring the surface to grade; performed with a straightedged piece of wood or metal by means of a forward sawing movement or by a power operated tool appropriate for this purpose; also the name applied to the tool (*see also* 2.286 and 2.287).

2.319 Stub Wall — Low wall, usually 10 to 20 cm high, placed monolithically with concrete floor or other members to provide for control and attachment of wall forms.

2.320 Stucco — A plaster used for coating exterior walls and other exterior surfaces of buildings (*see also* 2.246):

2.321 Sub-purlin — A light structural section used as a secondary structural member; in lightweight concrete roof construction used to support the formboards over which the lightweight concrete is placed.

2.322 Sulphate Attack — Harmful or deleterious chemical or physical reaction or both between sulphates in soil or ground water and concrete or mortar, primarily the cement-paste matrix.

2.323 Sulphate Resistance — Ability of concrete or mortar to withstand sulphate attack (*see also* 2.322).

2.324 Swirl Finish — A nonskid texture imparted to a concrete surface during final trowelling by keeping the trowel flat and using a rotary motion.

2.325 Tampering — *See* 2.258.

2.326 Tamping — The operation of compacting freshly placed concrete by repeated blows.

2.327 Tesserae — Small pieces of marble tile or glass used in mosaics.

2.328 Thin-Shell, Precast — Precast concrete characterized by thin slabs and web sections.

2.329 Tieback — A steel rod fastened to a deadman* or a rigid foundation to prevent the lateral movement of formwork sheet pile walls, retaining walls, etc.

2.330 Tie-Bar — A deformed bar or plain round bar embedded in a concrete construction at a joint and designed to hold abutting edges together, but not designed for direct load transfer as a dowel.

2.331 Tilt-Up — A method of concrete construction in which members are cast horizontally at a location adjacent to their eventual position, and tilted into place after removal of moulds.

2.332 Topping

a) A layer of high quality concrete or mortar placed to form a floor surface on a concrete base.

b) The mixture of marble chips and matrix which, when properly processed, produces a terrazzo surface.

2.333 Transverse Joint — A joint parallel to the intermediate dimension of a structure.

2.334 Trial Batch — A batch of concrete prepared to establish or check proportions of the constituents.

2.335 Two-Stage Curing — A process in which concrete products are cured in low-pressure steam, stacked, and then autoclaved.

2.336 Underbed — The base mortar, usually horizontal, into which strips are embedded and on which terrazzo topping is applied.

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

2.337 Undersanded — With respect to concrete, containing an insufficient proportion of the fine aggregate to produce optimum properties in the fresh mixture, especially workability and finishing characteristics.

2.338 Unit Water Content — The quantity of water per unit volume of freshly mixed concrete, often expressed as litres/m³ of concrete; the quantity of water on which the water-cement ratio is based, not including water absorbed by the aggregate.

2.339 Vent Pipe — A small-diameter pipe used in concrete construction to permit escape of air in a structure being concreted or grouted.

2.340 Vibrated Concrete — Concrete compacted by vibration during and after placing.

2.341 Vibration — Energetic agitation of freshly mixed concrete during placement by mechanical oscillating devices at moderately high frequency to assist in its consolidation. (a) External vibration employs a vibrating device attached at strategic positions on the forms and is particularly applicable to manufacture of precast items and for vibration of tunnel-lining forms. (b) Internal vibration employs a vibrating element which can be inserted into the concrete at selected locations, and is more generally applicable to in-place construction. (c) Surface vibration employs a portable horizontal platform on which a vibrating element is mounted.

2.342 Vibration Limit — That time at which fresh concrete has hardened sufficiently to prevent its becoming mobile when subjected to vibration.

2.343 Volume Batching — The measuring of the constituent materials for mortar or concrete by volume.

2.344 Warping — A deviation of a slab or wall surface from its original shape, usually caused by temperature or moisture differentials or both within the slab or wall (*see also* 2.124).

2.345 Warping Joint — A joint with the sole function of permitting warping of pavement slabs when moisture and temperature differentials occur in the pavement, that is, longitudinal or transverse joints with bonded steel or tie bars passing through them.

2.346 Wash (or Flush) Water — Water carried on a truck mixer in a special tank for flushing the interior of the mixer after discharge of the concrete.

2.347 Water Gain — *See* 2.35.

2.348 Water-Cement Ratio — The ratio of the amount of water, exclusive only of that absorbed by the aggregates, to the amount of cement in a concrete or mortar mixture; preferably stated as a decimal by weight.

2.349 Waterstop — A thin sheet of metal, rubber, plastic, or other material inserted in a construction joint to obstruct the seeping of water through the joint.

2.350 Weakened-Plane Joint — See 2.179.

2.351 Weathering — Changes in colour, texture, strength, chemical composition of other properties of a natural or artificial material due to the action of the weather.

2.352 Weight Batching — Measuring the constituent materials for mortar or concrete by weight.

2.353 Wettest Stable Consistency — The condition of maximum water content at which cement grout or mortar will adhere to a vertical surface without sloughing.

2.354 Workability — That property of freshly mixed concrete or mortar which determines the ease and homogeneity with which it can be mixed, placed, compacted, and finished. It is the amount of energy to overcome friction and cause full consolidation.

2.355 Yield — The volume of freshly mixed concrete produced from a known quantity of ingredients, the total weight of ingredients divided by the unit weight of the freshly mixed concrete; also, the number of product units, such as block, produced per bag of cement or per batch of concrete.

(Continued from page 2)

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*Eastern : 1/14 CIT Scheme VII M, V.I.P. Road, Manikola, CALCUTTA 700054 337 86 62

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022 60 38 43

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 235 23 15

†Western : Manakalaya, E9, Behind Marol Telephone Exchange, Andheri (East), MUMBAI 400093 832 92 95

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur, AHMEDABAD 380001 550 13 48

‡Peenya Industrial Area, 1st Stage, Bangalore-Tumkur Road, BANGALORE 560058 839 49 55

Gangotri Complex, 5th Floor, Bhadbhada Road, T.T. Nagar, BHOPAL 462003 55 40 21

Plot No. 62-63, Unit VI, Ganga Nagar, BHUBANESHWAR 751001 40 36 27

Kalaikathir Buildings, 670 Avinashi Road, COIMBATORE 641037 21 01 41

Plot No. 43, Sector 16 A, Mathura Road, FARIDABAD 121001 8-28 88 01

Savitri Complex, 116 G.T. Road, GHAZIABAD 201001 8-71 19 96

53/5 Ward No.29, R.G. Barua Road, 5th By-lane, GUWAHATI 781003 54 11 37

5-8-56C, L.N. Gupta Marg, Nampally Station Road, HYDERABAD 500001 20 10 83

E-52, Chitaranjan Marg, C-Scheme, JAIPUR 302001 37 29 25

117/418 B, Sarvodaya Nagar, KANPUR 208005 21 68 76

Seth Bhawan, 2nd Floor, Behind Leela Cinema, Naval Kishore Road, LUCKNOW 226001 23 89 23

NIT Building, Second Floor, Gokulpat Market, NAGPUR 440010 52 51 71

Patliputra Industrial Estate, PATNA 800013 26 23 05

Institution of Engineers (India) Building 1332 Shivaji Nagar, PUNE 411005 32 36 35

T.C. No. 14/1421, University P. O. Palayam, THIRUVANANTHAPURAM 695034 6 21 17

*Sales Office is at 5 Chowringhee Approach, P.O. Princep Street, CALCUTTA 700072 27 10 85

†Sales Office is at Novelty Chambers, Grant Road, MUMBAI 400007 309 65 28

‡Sales Office is at 'F' Block, Unity Building, Narashimaraja Square, BANGALORE 560002 222 39 71