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Indian Standard

सीमेंट कंक्रीट — पारिभाषिक शब्दावली

भाग 4 कंक्रीट के प्रकार

(पहला पुनरीक्षण)

Cement Concrete — Glossary of Terms

Part 4 Types of Concrete

(First Revision)

ICS 01.040.91

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Cement and Concrete Sectional Committee, CED 02

FOREWORD

This Indian Standard (Part 4) (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

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. Based on this necessity and to standardize the various terms and definitions used in cement and concrete technology, this standard was published in 12 parts.

The other parts in the series are:

Part 1 Concrete aggregates

Part 2 Materials (other than cement and aggregate)

Part 3 Concrete reinforcement

Part 5 Formwork for concrete

Part 6 Equipment, tools and plant

Part 7 Mixing, laying, compaction, curing and other construction aspects

Part 8 Properties of concrete

Part 9 Structural aspects

Part 10 Tests and testing apparatus

Part 11 Prestressed concrete

Part 12 Miscellaneous terms

In addition to the above, the terminology relating to hydraulic cement and pozzolanic materials are separately covered in IS 4845 and IS 4305.

This standard was first published in 1972. In this revision the necessary changes required have been incorporated in the light of experience gained in its use and also to bring it in line with the latest development on the subject. Definitions of high performance concrete and self compacting concrete have been added, and other terms have been rationalized.

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 6100-9 : 2007 ‘Building and civil engineering — Vocabulary — Part 9: Work with concrete and plaster’, British Standards Institution

ASTM C125 : 2021 ‘Standard terminology relating to concrete and concrete aggregates’, American Society for Testing and Materials (Revision 21A)

ACI CT-23 : 2023 ‘Concrete terminology’, American Concrete Institute

ACI 617 : 1968 ‘Recommended practice for concrete formwork’, American Concrete Institute

(*Continued on third cover*)

Indian Standard

CEMENT CONCRETE — GLOSSARY OF TERMS

PART 4 TYPES OF CONCRETE

(First Revision)

1 SCOPE

This standard (Part 4) covers definitions of terms relating to different types of cement concrete.

2 REFERENCES

The standards given below contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent edition of these standards:

IS No.	*Title*
IS 4305 : 1967	Glossary of terms relating to pozzolana
IS 4845 : 1968	Definitions and terminology relating to hydraulic cement

3 TERMINOLOGY

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

3.1 Aerated Concrete — A lightweight product consisting of Portland cement, cement-silica, cement-pozzolana, lime-pozzolana, or lime-silica pastes containing blends of these ingredients and having a homogeneous void or cell structure, attained with gas-forming chemical agents (for cellular concretes containing binder ingredients other than addition to Portland cement, autoclave curing is usually employed).

3.2 Air Blown Mortar — Mortar or concrete conveyed through a host and projected at high velocity on to a surface; also pneumatically applied mortar or concrete, sprayed mortar and gunned concrete (*see also* dry-mix shotcrete; gunite; and wet-mix shotcrete, pneumatically applied mortars).

3.3 Air Entrained Concrete — Concrete in which an admixture is used to incorporate a quantity of small uniformly distributed air bubbles during mixing, and these remain after hardening.

3.4 Autoclaved — Steam curing of concrete products, sand lime brick, asbestos cement products, hydrous calcium silicate insulation products, or cement in an autoclave at maximum ambient temperatures generally between 170 °C and 215 °C.

3.5 Block, Concrete — A concrete masonry unit, usually containing hollow cores.

3.6 Boron Loaded Concrete — High-density concrete including a boron-containing admixture or aggregate, such as mineral colemanite, boron frits, or boron metal alloys to act as a neutron attenuator.

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

3.8 Cast-in-Place — Mortar or concrete which is deposited in the place where it is required to harden as part of the structure, as opposed to precast concrete.

3.9 Cast-In-Situ — *See* 3.8.

3.10 Castable Refractory — A packaged, dry mixture of hydraulic cement, generally calcium-aluminate cement, and specially selected and proportioned refractory aggregates which, when mixed with water, will produce refractory concrete or mortar (*see also* 3.93).

3.11 Cast Stone — Concrete or mortar cast into blocks or small slabs in special moulds so as to resemble natural building stone.

3.12 Cell Gas Concrete — Low density cementitious mixture having a homogeneous void or cell structure attained using gas forming chemicals or foaming agents.

3.13 Cellular Concrete — *See* 3.1.

3.14 Cellular Construction — *See* 3.15.

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

3.16 Centrifugally Cast — Concrete compacted by centrifugal action, for example, in the manufacture of pipe and poles.

3.17 Chemical 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.

3.18 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.

3.19 Colloidal Concrete — Concrete of which the aggregate is bound by colloidal grout.

3.20 Colloidal Grout — A grout which has artificially induced cohesiveness or ability to retain the dispersed solid particles in suspension.

3.21 Concrete, Dense — Concrete containing a minimum number of voids.

3.22 Concrete, Dry-Mix — Concrete of very low water content used in the dry-cast process concrete (mortar or grout) and expansive cement concrete (mortar or grout) made with expansive cement.

3.23 Concrete, Dry-Packed — A concrete mixture sufficiently dry to be consolidated only by heavy ramming.

3.24 Concrete, Exposed — Concrete surface formed so as to yield an acceptable texture and finish for permanent exposure to view.

3.25 Concrete, Fair-Face — A concrete surface that, on completion of the forming process, requires no further (concrete) treatment other than curing.

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

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

3.28 Concrete, Flowing — Concrete that is characterized by a slump greater than 190 mm while remaining cohesive.

3.29 Concrete, Foamed — *See* 3.1.

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

3.31 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.

3.32 Concrete, Hardened — Concrete that has developed sufficient strength to serve some defined purpose or resist a stipulated loading without failure.

3.33 Concrete, Heavy — Concrete of exceptionally high unit weight, usually obtained by use of heavyweight aggregates, used especially for radiation shielding.

3.34 Concrete, High-Density — Concrete of exceptionally high unit weight usually obtained by use of heavyweight aggregates, used especially for radiation shielding (*see* 3.33).

3.35 Concrete, Lightweight — Concrete of substantially lower unit weight than that made from gravel or crushed stone.

3.36 Concrete, Mass — Any volume of concrete cast-in-place (generally as a monolithic structure usually incorporating a high proportion of large coarse aggregate and low cement content) and intended to resist applied loads by virtue of its mass; it is distinct from other types of concrete because its dimensions are of such magnitude as to require that measures be taken cope with the generation of heat and attendant volume changes.

3.37 Concrete, No-Fines — A concrete mixture containing little or no fine aggregate.

3.38 Concrete, No-Slump — Concrete with a slump of 25 mm or less.

3.39 Concrete, Normal Weight — Concrete having a unit weight of approximately 2 400 kg/m^3 made with aggregates of normal weight.

3.40 Concrete, Pervious — Hydraulic cement concrete proportioned with sufficient distributed interconnected macroscopic voids that allow water to flow through the material under the action of gravity alone.

3.41 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.

3.42 Concrete, Precast — Concrete cast elsewhere than its final position in the structure. Also known as grouted concrete (*see* 3.73).

3.43 Concrete, Prepacked — Concrete produced by placing coarse aggregate in a form and later injecting a Portland cement-sand grout, usually with admixtures, to fill the voids.

3.44 Concrete, Preplaced-Aggregate — *See* 3.43.

3.45 Concrete, Ready-Mixed — Concrete delivered at site or into the purchaser's vehicle in a plastic condition and requiring no further treatment before being placed in the position in which it is to set and harden.

3.46 Concrete, Refractory — Concrete having refractory properties, usually made with calcium-aluminate cement and refractory aggregate and suitable for use even at temperature above 1 000 °C.

3.47 Concrete, Reinforced — Concrete containing reinforcement and designed on the assumption that the two materials act together in resisting forces.

3.48 Concrete, Roller Compacted — Concrete compacted while fresh by a roller often a vibratory.

3.49 Concrete, Siliceous-Aggregate — Concrete made with normal-density aggregates having constituents composed mainly of silica or silicates.

3.50 Concrete, Spun — Concrete compacted by centrifugal action, for example, in the manufacture of pipes.

3.51 Concrete, Structural — Concrete used to carry structural load or to form an integral part of a structure; concrete of a quality specified for structural use; concrete used solely for protective cover, fill, or insulation is not considered structural concrete.

3.52 Concrete, Structural Lightweight — Structural concrete made with lightweight aggregate; the unit weight usually is in the range of 1 440 kg/m^3 to 1 850 kg/m^3.

3.53 Concrete, Terrazzo — Marble-aggregate concrete that is cast-in-place or precast and ground smooth for decorative surfacing purposes on floors and walls.

3.54 Concrete, Transit-Mixed — Concrete, the mixing of which is wholly or principally accomplished in a truck mixer.

3.55 Concrete, Translucent — A combination of glass and concrete used together in precast or prestressed panels.

3.56 Concrete, Vacuum — Concrete from which water is extracted by a vacuum process before hardening occurs.

3.57 Concrete, Vibrated — Concrete compacted by vibration during and after placing.

3.58 Containment 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.

3.59 Contraction-Joint Grouting — Injection of grout into contraction joints.

3.60 Control-Joint Grouting — *See* 3.59.

3.61 Cyclopean Concrete — Mass concrete in which large stones, each of 50 kg or more, are placed and embedded in the concrete as it is deposited; the stones are called ‘pudding stones’ or ‘plums’, preferably not less than 15 cm apart and not closer than 20 cm to any exposed surface (*see also* 3.112).

3.62 Dry-Mix Shotcrete — Pneumatically conveyed shotcrete in which most of the mixing water is added at the nozzle (*see also* 3.100).

3.63 Dry Pack — To forcibly ram a moist Portland-cement-aggregate mixture into a confined area; also the mixture so placed.

3.64 Dry-Tamp Process — The placing of concrete or mortar by hammering or ramming a relatively dry mix into place.

3.65 Expansive-Cement Concrete (Mortar or Grout) — A concrete (mortar or grout) made with expansive cement.

3.66 Extruded Concrete — Concrete that a finished cross section formed by extrusion.

3.67 Fibre Reinforced Concrete — Concrete strengthened with fibres.

3.68 Flash Coat — A light coat of shotcrete used to cover minor blemished on a concrete surface.

3.69 Gap Graded Concrete — Concrete made with gap graded aggregate.

3.70 Gas Concrete — Lightweight concrete produced by developing voids with gas generated within the unhardened mix (usually from the action of cement alkalies on aluminium powder used as an admixture).

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

3.72 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 of similar consistency or a cementitious mixture with or without aggregate or admixtures that is used primarily to fill voids.

3.73 Grouted-Aggregate Concrete — Concrete which is formed by injecting grout into previously placed coarse aggregate (*see* **3.43**).

3.74 Gun Finish — Undisturbed final layer of shotcrete as applied from nozzle, without hand finishing.

3.75 Gunite (Trade Name) — Method of applying dry-mix shotcrete.

3.76 Gunning Pattern — Conical outline of material discharge steam in shotcrete operation.

3.77 Heat-Resistant Concrete — Any concrete which will not disintegrate when exposed to constant or cyclic heating at any temperature below which a ceramic bond is formed, that is, below about 1 000 °C.

3.77 High Consistence Concrete — Fresh concrete that can be placed with little compactive effort.

3.79 High-Early-Strength Concrete — Concrete which, through the use of high-early-strength cement or admixtures, is capable of attaining specified strength at an earlier age than normal concrete.

3.80 High Performance Concrete — Concrete whose ingredients, proportions and production methods are specifically chosen to meet special performance and uniformity requirements.

3.81 High-Strength Concrete — Concrete that has a specified compressive strength for design of 65 MPa or greater.

3.82 Ilmenite — A mineral, iron titanate ($FeTiO_3$) which in pure or impure form is commonly used as aggregate in high density concrete.

3.83 Impending Slough — The consistency obtained with shotcrete containing the maximum amount of water that can be used without flow or sag after placement.

3.84 Insulating Concrete — Concrete having low thermal conductivity; used for thermal insulation.

3.85 Lean Concrete — Concrete of low cement content.

3.86 Liquid-Volume Measurement — Measurement of grout on the basis of the total volume of solid and liquid constituents.

3.87 Monolithic Concrete — Concrete cast with no joints other than construction joints.

3.88 Reinforcement Displacement — Movement of reinforcing steel from its specified position in the forms.

3.89 Nailable Concrete — Concrete, usually made with a suitable lightweight aggregate, with or without the addition of sawdust, into which nails can be driven.

3.90 Non-Air-Entrained Concrete — Concrete in which neither an air-entraining admixture nor air-entraining cement has been used.

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

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

3.93 Packaged Concrete, Mortar, Grout — Mixtures of dry ingredient in packages, requiring only the addition of water to produce concrete, mortar, or grout.

3.94 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.

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

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

3.97 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 (*see* 3.58).

3.98 Plain Concrete — Concrete without any reinforcement.

3.99 Plasticized Concrete — Fresh concrete that contains an admixture that increase consistence for a given water/binder ratio or maintains consistence at a lower water/binder ratio.

3.100 Pneumatically Applied Mortar — Mortar or concrete conveyed through a hose and projected at high velocity on to a surface; also known as air-blown mortar; also pneumatically applied mortar or concrete, sprayed mortar and gunned concrete (*see also* 3.62, 3.75, 3.118 and 3.135).

3.101 Polymer Impregnated Concrete — Hardened concrete that is impregnated with underwater concrete polymer.

3.102 Pozzolanic Cement Concrete — Concrete having pozzolana partly substituted for its cement, the pozzolana content being not less than 16 percent of the combined weight of cement plus pozzolana.

3.103 Pressed Concrete — Precast concrete that is pressed before it hardens expelling some of the mixing water.

3.104 Preshrunk Concrete

a) Concrete which has been mixed for a short period in a stationary mixer before being transferred to a transit mixed; and

b) Grout, mortar, or concrete that has been mixed 1 h to 3 h before placing to reduce shrinkage during hardening.

3.105 Puddling

a) Process of inducing compaction in mortar or concrete by use of a tamping rod; and

b) Undesirable placement of shotcrete wherein air pressure is decreased and water content is increased.

3.106 Pumped Concrete — Concrete which is transported through hose or pipe by means of a pump.

3.107 Rebound — Sand and cement or wet shotcrete which bounces away from a surface against which shotcrete is being projected.

3.108 Refractory Insulating Concrete — Refractory concrete having low thermal conductivity.

3.109 Retarded Concrete — Fresh concrete that changes to a hardened state more slowly as a result of the use of a set retarding admixture.

3.110 Rich Concrete — Concrete of high cement content.

3.111 Rolled Concrete — Concrete that is compacted by roller.

3.112 Rubble Concrete

a) Concrete similar to cyclopean concrete except that small stones (such as one man can handle) are used; and

b) Concrete made with rubble from demolished structures (*see also* 3.61).

3.113 Rustic or Washed Finish — A type of terrazzo toping in which the matrix is recessed by washing 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.

3.114 Sagging — Subsidence of material from the gunned surface of a sloping or vertical concrete structural member or from the gunned surface of an over head horizontal shotcrete structural member (*see also* 3.120).

3.115 Sawdust Concrete — Concrete in which the aggregate consists mainly of sawdust from wood.

3.116 Self Compacting Concrete — Highly flowable, non-segregating concrete that fills uniformly and completely every corner of formwork by its own weight without the need for any compaction and encapsulates reinforcement or any other embedment.

3.117 Shooting — Placing of shotcrete.

3.118 Shotcrete — Mortar or concrete pneumatically projected at high velocity onto a surface; also known as air-blown mortar,

pneumatically applied mortar or concrete sprayed mortar, and gunned concrete.

3.119 Shrink-Mixed Concrete — Ready-mixed concrete mixed partially in a stationary mixer and then mixed in a truck mixer (*see also* 3.104).

3.120 Sloughing — Subsidence of material from a vertical surface of newly gunned shotcrete generally due to the use of an excessive amount of mixing water (*see also* 3.114).

3.121 Slugging — Pulsating and intermittent flow of shotcrete material due to improper use of delivery equipment and materials.

3.122 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.

3.123 Sprayed Mortar — Mortar or concrete conveyed through a hose and projected at high velocity onto a surface; also known as air-blown mortar; also pneumatically applied mortar or concrete, sprayed mortar an gunned concrete (*see also* 3.62, 3.75 and 3.136).

3.124 Steam Cured Concrete — Concrete that is cure more quickly to increase its early strength using steam at atmospheric pressure.

3.125 Stiffened Concrete — Concrete that has lost its consistence to the extent that it is no longer readily mouldable.

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

3.127 Time of Haul — In production of ready-mixed concrete, the period from first contact between mixing water and cement until completion of discharge of, the freshly mixed concrete.

3.128 Tremie Concrete — Concrete placed by means of a tremie.

3.129 Tremie Seal — Concrete placed under water by means of a tremie in a cofferdam or caisson so that it can be dewatered after the concrete hardens.

3.130 Truck-Mixed Concrete — *See* 3.54.

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

3.132 Unreinforced Concrete — *See* 3.98.

3.133 Venetian — A type of terrazzo topping in which large chips are incorporated.

3.134 Vermiculite Concrete — Concrete in which the aggregate consists of exfoliated vermiculite.

3.135 Vibrated Concrete — Concrete compacted by vibration during and/or after placing.

3.136 Wet-Mix Shotcrete — Shotcrete wherein all ingredients, including mixing water, are mixed in the equipment before introduction into the delivery hose; it may be pneumatically conveyed or moved by displacement.

3.137 Water Resisting Concrete — Concrete that has high resistant to water penetration.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Cement and Concrete Sectional Committee, CED 02

Organization	*Representative(s)*
In Personal Capacity (*Grace Villa, Kadamankulam PO, Thiruvalla - 689583*)	SHRI JOSE KURIAN **(*Chairperson*)**
ACC Ltd, Mumbai	SHRI MANOJ JINDAL DR MANISH V. KARANDIKAR (*Alternate*)
Ambuja Cements Limited, Ahmedabad	SHRI UMESH P. SONI SHRI SUKURU RAMARAO (*Alternate*)
Cement Manufacturers Association, Noida	DR V. RAMACHANDRA SHRI PRAKHAR SRIVASTAVA (*Alternate* I) SHRI SHUBHO CHAKRAVARTY (*Alternate* II)
Central Public Works Department, New Delhi	SHRI DINESH KUMAR UJJAINIA
Central Soil and Materials Research Station, New Delhi	SHRI U. S. VIDYARTHI SHRI B. K. MUNZNI (*Alternate*)
CSIR - Central Building Research Institute, Roorkee	DR S. K. SINGH SHRI SUBHASH CHAND BOSE GURRAM (*Alternate*)
CSIR - Structural Engineering Research Centre, Chennai	DR K. RAMANJANEYULU DR P. SRINIVASAN (*Alternate*)
Engineers India Limited, New Delhi	DR SUDIP PAUL SHRI VIKRAM K. GUPTA (*Alternate* I) SHRI RAKESH KUMAR (*Alternate* II) SHRI RAVI GERA (*Alternate* III)
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Hindustan Consulting Associates Pvt Ltd, New Delhi	SHRI SATISH KUMAR SHARMA
Housing and Urban Development Corporation Limited, New Delhi	SHRI DEEPAK BANSAL
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Indian Institute of Technology Madras, Chennai	DR MANU SANTHANAM
Indian Institute of Technology Roorkee, Roorkee	DR UMESH KUMAR SHARMA SHRI PRAMOD KUMAR GUPTA (*Alternate* I) PROF ANJANEYA DIXIT (*Alternate* II)
National Council for Cement and Building Materials, Ballabhgarh	SHRI P. N. OJHA DR S. K. CHATURVEDI (*Alternate* I) SHRI BRIJESH SINGH (*Alternate* II)
National Test House, Kolkata	SHRI D. V. S. PRASAD DR SOMIT NEOGI (*Alternate*)

Organization	*Representative(s)*
Nuvoco Vistas Corporation Ltd, Mumbai	DR PRANAV DESAI SHRI JAI SINGH (*Alternate*)
The India Cements Limited, Chennai	SHRI S. DAKSHINAMOORTHY SHRI P. MUNI REDDY (*Alternate*)
The Indian Hume Pipe Company Limited, Mumbai	SHRI P. R. BHAT SHRI S. J. SHAH (*Alternate*)
The Institution of Engineers (India), Kolkata	DR H. C. VISVESVARAYA SHRI S. H. JAIN (*Alternate*)
The Ramco Cements Limited, Chennai	SHRI BALAJI K. MOORTHY SHRI ANIL KUMAR PILLAI (*Alternate*)
Ultra Tech Cement Ltd, Mumbai	SHRI RAJU GOYAL SHRI K. JAYASANKAR (*Alternate*)
Voluntary Organization in Interest of Consumer Education, New Delhi	SHRI M. A. U. KHAN DR RAJIV JHA (*Alternate*)
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BIS Directorate General	SHRI DWAIPAYAN BHADRA, SCIENTIST 'E'/DIRECTOR AND HEAD (CIVIL ENGINEERING) [REPRESENTING DIRECTOR GENERAL (*Ex-officio*)]

Member Secretaries
SHRIMATI DIVYA S.
SCIENTIST 'D'/JOINT DIRECTOR

AND

SHRI JITENDRA KUMAR CHAUDHARY
SCIENTIST 'B'/ASSISTANT DIRECTOR
(CIVIL ENGINEERING), BIS

Composition of Concrete Sub-Committee, CED 2 : 2

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ACC Limited, Mumbai	SHRI SANJAY ROY SHRI RAKESH GUPTA (*Alternate*)
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Association of Consulting Civil Engineers India, Bengaluru	SHRI AVINASH D. SHIRODE SHRI K. K. MEGHASHYAM (*Alternate*)
Cement Manufacturers Association, Noida	SHRI K. JAYASANKAR SHRI UTTAM KUMAR SINGH (*Alternate* I) SHRI SHUBHO CHAKRAVARTY (*Alternate* II)
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Central Soil and Materials Research Station, New Delhi	SHRI U. S. VIDYARTHI SHRI M. RAJA (*Alternate*)
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Ready Mixed Concrete Manufacturers' Association, Mumbai	SHRI RAMESH JOSHI
Tandon Consultants Private Limited, New Delhi	PROF MAHESH TANDON SHRI VINAY GUPTA (*Alternate*)
Tata Consulting Engineers Limited, Navi Mumbai	SHRI S. N. DIWAKAR SHRI MANOS KUMAR DE (*Alternate*)
UltraTech Cement Limited, Mumbai	DR V. RAMACHANDRA DR AWADHESH K. SINGH (*Alternate*)
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(*Continued from second cover*)

The composition of the Committee responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be periodically removed to create more space for the future falling blocks.

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