



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

व्यापक परिचालन मसौदा

हमारा संदर्भ : सीईडी 02:2/टी-30

11 जनवरी 2024

तकनीकी समिति : सीमेंट और कंक्रीट विषय समिति, सीईडी 02

प्राप्तकर्ता :

- 1 सिविल इंजीनियरिंग विभाग परिषद, सीईडीसी के सभी सदस्य
- 2 सीमेंट और कंक्रीट विषय समिति, सीईडी 02 के सभी सदस्य
- 3 सीईडी 02 उपसमिति एंव इसकी पैनल और कार्यदल के सभी सदस्य
- 4 रूचि रखने वाले अन्य निकाय।

महोदया/महोदय,

निम्नलिखित मसौदा संलग्न है:

प्रलेख संख्या	शीर्षक
सीईडी 02 (24630)WC	सीमेंट कंक्रीट से संबंधित शब्दों की शब्दावली: भाग 5 कंक्रीट के लिए फॉर्मवर्क (पहला पुनरीक्षण) का भारतीय मानक मसौदा (ICS: 01.040.91)

कृपया इस मसौदे का अवलोकन करें और अपनी सम्मतियाँ यह बताते हुए भेजे कि यह मसौदा प्रकाशित हो तो इस पर अमल करने में, आपको व्यवसाय अथवा कारोबार में क्या कठिनाइयाँ आ सकती हैं।

सम्मतियाँ भेजने की अंतिम तिथि: **12 फरवरी 2024**

सम्मति यदि कोई हो तो कृपया अधोहस्ताक्षरी को उपरिलिखित पते पर संलग्न फॉर्मेट में भेजें या ced2@bis.gov.in पर ईमेल कर दें या सम्मतियाँ बीआईएस ई-गवर्नेंसस पोर्टल, www.manakonline.in के माध्यम से ऑनलाइन भी भेजी जा सकती हैं।

यदि कोई सम्मति प्राप्त नहीं होती है अथवा सम्मति में केवल भाषा संबंधी त्रुटि हुई तो उपरोक्त प्रलेख को यथावत अंतिम रूप दे दिया जाएगा। यदि सम्मति तकनीकी प्रकृति की हुई तो विषय समिति के अध्यक्ष के परामर्श से अथवा उनकी इच्छा पर आगे की कार्यवाही के लिए विषय समिति को भेजे जाने के बाद प्रलेख को अंतिम रूप दे दिया जाएगा।

यह प्रलेख भारतीय मानक ब्यूरो की वेबसाइट www.bis.gov.in पर भी उपलब्ध हैं।

धन्यवाद।

भवदीय

ह/-

(अरुण कुमार एस.)

वै. 'ई' / निर्देशक और प्रमुख (सिविल इंजीनियरिंग)

संलग्न: उपरिलिखित



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG, NEW DELHI 110002

DRAFT IN
WIDE CIRCULATION

DOCUMENT DESPATCH ADVICE

TECHNICAL COMMITTEE:

Reference	Date
CED 02:2/T-30	11 January 2024

CEMENT AND CONCRETE SECTIONAL COMMITTEE, CED 02

ADDRESSED TO:

1. All Members of Civil Engineering Division Council, CEDC
2. All Members of Cement and Concrete Sectional Committee, CED 02
3. All Members of Subcommittees, Panels and Working Groups under CED 02
4. All other interested

Dear Madam/Sir,

Please find enclosed the following draft:

Doc. No.	Title
CED 02 (24630)WC	Draft Indian Standard Glossary of terms relating to Cement Concrete : Part 5 Formwork for Concrete (<i>First Revision</i>) (ICS 01.040.91)

Kindly examine the draft and forward your views stating any difficulties which you are likely to experience in your business or profession, if this is finally adopted as National Standard.

Last Date for comments: 12 February 2024

Comments if any, may please be made in the attached format and mailed to the undersigned at the above address or preferably through e-mail to ced2@bis.gov.in. The comments may preferably be shared in the prescribed template through the Manak Online portal at www.manakonline.in. Alternatively, the comments may be sent through the attached format for consideration by the BIS' Sectional Committee for necessary action.

In case no comments are received or comments received are of editorial nature, you will kindly permit us to presume your approval for the above document as finalized. However, in case comments, technical in nature are received, then it may be finalized either in consultation with the Chairman, Sectional Committee or referred to the Sectional Committee for further necessary action if so desired by the Chairman, Sectional Committee.

The document is also hosted on BIS website www.bis.gov.in.

Thanking you,

Yours faithfully,
Sd/-
(Arun Kumar S.)

Sc. 'E'/Director and Head (Civil Engg.)

Encl: As above

BUREAU OF INDIAN STANDARDS**DRAFT FOR COMMENTS ONLY**

(Not to be reproduced without the permission of BIS or used as a Standard)

Draft Indian Standard**GLOSSARY OF TERMS RELATING TO CEMENT CONCRETE****PART 5 FORMWORK FOR CONCRETE**

(First Revision)

Cement and Concrete
Sectional Committee, CED 02

Last date of Comments:
12 February 2024

FOREWORD

(Formal Clauses to be added later)

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 4	Types of 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

In addition to the above, two separate standards were brought out concerning terminology relating to hydraulic cement and pozzolanic materials. These standards are IS 4845: 1968 'Definitions and terminology relating to hydraulic cement' and IS 4305: 1967 'Glossary of terms relating to pozzolana'.

This standard (Part 5) 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.

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:

- a) BS 6100-9 (2007) Building and civil engineering – Vocabulary – Part 9 – Work with concrete and plaster, British Standards Institution
- b) ASTM C125 (2021) Standard terminology relating to concrete and concrete aggregates, American Society for Testing and Materials (revision 21A)
- c) ACI No. SP-19 (1967) Cement and concrete terminology, American Concrete Institute.
- d) ACI 617 (1968) Recommended practice for concrete formwork, American Concrete Institute.

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.

BUREAU OF INDIAN STANDARDS

DRAFT FOR COMMENTS ONLY

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Draft Indian Standard

**GLOSSARY OF TERMS RELATING TO CEMENT CONCRETE
PART 5 FORMWORK FOR CONCRETE**

(First Revision)

Cement and Concrete
Sectional Committee, CED 02

Last date of Comments:
12 February 2024

1 SCOPE

This standard (Part 5) covers definitions of terms relating to formwork for concrete.

2 TERMINOLOGY

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

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

2.2 Access Door (Access Trap or Inspection Door or Porthole or Trap Door) – A removable panel in the formwork for a high lift to give access for inspection or for placing or compacting concrete (*see also 2.67*).

2.3 Access Trap – *See 2.2.*

2.4 Activating Agent – *See 2.307.*

2.5 Adjustable Prop, Telescopic Prop – A prop whose length may be varied.

2.6 Adjuster – A mechanical device for bringing formwork to its correct line or level or both.

2.7 Anchor – A device for providing a fixing to a concrete surface (*see also 2.141*).

2.8 Anchor Bolt – A bolt passing through the member to be anchored and engaging with the anchor.

2.9 Anchor Plate – A plate on the embedded end of an anchor which increases its resistance to being pulled out of the concrete.

2.10 Anchor Slot – See **2.106**.

2.11 Angle Fillet (Corner Mould) – A strip used to form an internal or external intersection which is to be other than a sharp angle.

2.12 Arris – Sharp edge or protruding corner formed by meeting of two surfaces, whether plane or curved, applied especially to edges in mouldings and edges separating fluting.

2.13 Back Form (Top Form)

- a) A form for a concrete surface which will be unseen in the finished structure.
- b) Form required on the upper or outer surface of a sloping slab or thin shell.

2.14 Back Propping – Propping to cast concrete floors which allows them to support formwork for higher floors.

2.15 Ballies – Thin poles in the round usually without bark.

2.16 Barrier Paint – See **2.264**.

2.17 Bar Spacer – A device for maintaining reinforcement in its correct, position within the formwork (*see also 2.90*).

2.18 Batten (Batten Strip)

- a) A member of relatively small section.
- b) A narrow strip of wood placed over the vertical joint of sheathing or paneling, or used to hold several boards together.
- c) A piece of sawn timber whose cross-sectional dimensions do not exceed 50 mm in either direction.

2.19 Batter – A small inclination from the vertical.

2.20 Batter Boards – Pairs of horizontal boards nailed to wood stakes adjoining an excavation, used as a guide to elevations and to outline the building.

2.21 Bay – An area of concrete bounded by construction joints, expansion joints or free edges.

2.22 Beam Box (Beam Casing) – The assembled side and bottom formwork for a beam.

2.23 Beam Casing – See 2.22.

2.24 Beam Clamp (Beam Cramp or Clamp, or Cramp) – A yoke or other device, which holds a beam box tightly against the pressure of freshly placed concrete.

2.25 Beam Cramp – See 2.24.

2.26 Beam Hanger (Form Hanger or Beam Saddle)

- a) A support to the soffit form for the encasement to a steel joist where the form is hung from the joist itself.
- b) A wire, strap, or other hardware device that supports formwork from structural members.

2.27 Beam Side – Vertical side panels or parts of a beam form.

2.28 Bearing – A surface which transmits direct compressive load from one member to another.

2.29 Bearing Area – The area of the interface over which bearing stress exists.

2.30 Bearing Length – That length of beam which rests on a support.

2.31 Bearing Stress – The compressive stress which exists at the interface between two structural members where the forces exerted by one member on the other tend to crush the materials of which the members are made.

2.32 Bent – A two-dimensional frame used as a supporting structure, usually when a number of such frames are used as the supports of a long narrow structure, such as a jetty or pier.

2.33 Bevel – The intersection of one plane surface with another plane surface at an angle other than a right angle.

2.34 Bevel, To – To cut the edge of a panel or board at an angle other than a right angle.

NOTE — This is normally done so that the panels or boards may easily be struck or to form an intersection between two such panels w boards.

2.35 Binding – The adherence of forms to the concrete when the supports are removed and striking is attempted.

2.36 Bleb – See 2.39.

2.37 Block (Blocking Piece) – A piece of wood or other material used to pack out or separate, or; when glued, to stiffen other members (see *also* 2.204).

2.38 Blocking Piece – See 2.37.

2.39 Blowhole – A small hole, generally smaller than about 16 mm across in a concrete face, caused by an air pocket.

2.40 Blow Out, To – To use compressed air for cleaning out the inside of formwork before concreting.

2.41 Board

- a) A piece of square-sawn softwood/timber under 50 mm thick and 100 mm over wide.
- b) A piece of square-sawn or unedged hardwood timber 50 mm or less in thickness and of the required width.
- c) Manufactured rigid or semi-rigid sheets, such as laminated board, wood chipboard and other particle board or hard-board.

2.42 Bolt Sleeve – A cylindrical or other shaped form through which a bolt passes so as to separate the bolt from the surrounding concrete.

2.43 Box – Formwork for a beam or column (see *also* 2.22, 2.44 and 2.73).

2.44 Box-Out – The form for a pocket or aperture in concrete.

2.45 Brace (Back Stay)

- a) Any structural member used to support another, always designed for compression loads and sometimes for tension under special load conditions.
- b) A member in a bracing system.

2.46 Bracing – The system of members, usually diagonal, which acts in compression or tension and stiffens a frame against deformation.

2.47 Break Down, To – To dismantle made-up formwork after it has been struck.

2.48 Brick Seat – Ledge on wall or footing to support a course of masonry.

2.49 Building Board – A loose term applied to most boards.

2.50 Bulkhead – A vertical partition within the forms, blocking fresh concrete from a section of forms or closing the end of a form, such as at a construction joint.

2.51 Butt Joint – A plain square joint between two members.

2.52 Camber – The intentional curvature of a beam or formwork, either formed initially to compensate for subsequent deflection under load or produced as a permanent effect for aesthetic reasons.

2.53 Cantilever Formwork – Formwork which is supported solely by members fixed to, and projecting beyond, previously hardened concrete.

2.54 Carcassing Timber (Framing Timber) – Timber used for any structural purpose in the support of the forms, but not normally in contact with the concrete.

2.55 Cast-in-Socket – An anchor consisting of a female-threaded metal socket cast into concrete as a fixing for a bolt.

2.56 Centering (Centring)

- a) The temporary supporting structure to a soffit.
- b) Centring is the specialized formwork used in the construction of arches, shells, space structure or any continuous structure where the entire falsework is lowered (struck or decentred) as a unit to avoid introducing injurious stress in any part of structure.

2.57 Centre – See 2.136.

2.58 Chamfer

- a) The surface produced by the removal, usually symmetrically, of an external edge.
- b) Believed corner, which is formed in concrete work by placing a three-corner piece of wood (cannot strip or skew back) in the form corner.

2.59 Chase – A long groove or recess formed in the concrete surface.

2.60 Chase Form – A form for moulding a chase. It is often a wooden moulding planted on the face of the main form (*see also 2.62*).

2.61 Check – A small strip of timber fixed to the face of a form to indicate the top of a concrete lift and to form a clean line at the joint with the next lift (*see also 2.158*).

2.62 Check Out – A piece of wood or other material fixed to the face of a form to form a recess in concrete (*see also 2.60*).

2.63 Chipboard – *See 2.347*.

2.64 Gill – *See 2.274*.

2.65 Clamp – *See 2.24, 2.75 and 2.341*.

2.66 Cleanout Hole – *See 2.67*.

2.67 Cleanout Trap (Cleanout Hole) – A removable section at the base of the forms for a column or wall which allows rubbish to be removed before concreting (*see also 2.2*).

2.68 Cleat

- a) A block fixed to a main member to provide a bearing or to resist a thrust (*see also 2.190*).
- b) Small board used to connect formwork members or used as a brace.

2.69 Climbing Formwork (Moving Formwork) – Formwork for vertical or near vertical structures which are constructed in successive lifts and which is supported by the previously poured lift (*see also 2.189*).

2.70 Coffer Form – *See 2.337*.

2.71 Coffered Slab – *See 2.339*.

2.72 Collapsible Forms – Forms which are activated by mechanical means to reduce their volume or surface area to permit striking.

2.73 Column Box (Column Casing) – The assembled forms for a column.

2.74 Column Casing – See 2.73.

2.75 Column Clamp (Column Cramp) – A yoke or other device which holds a column box tightly closed against the pressure of freshly placed concrete.

2.76 Column Cramp – See 2.75.

2.77 Column Guard – A length of metal angle cast into a corner of a column to protect it against damage.

2.78 Column Side – One of the vertical panel components of a column form.

2.79 Cone – A cone-shaped piece of wood, rubber or other material which is placed over the end of a form tie to form a neat hole in the surface of the concrete.

2.80 Construction Joint – The interface between adjacent concrete pours which are designed to act monolithically in the completed structure (see also 2.94).

2.81 Continuously Sliding Form – See 2.276.

2.82 Contraction Joint – See 2.270.

2.83 Control Joint – Groove (formed, saw cut or tooled) in concrete structure to regulate the location of shrinkage cracks.

2.84 Corbel – A projection from the face of a wall or column, usually to provide a bearing for a beam.

2.85 Core

- a) A removable former used to produce a cavity of any shape in concrete.
- b) The inner layer or layers of a piece of board.

2.86 Corner Mould – See 2.11.

2.87 Counter-Waling – See 2.301.

2.88 Cove – An infill which produces a concave curve connecting the two surfaces forming an internal angle such as that between a wall and a ceiling or floor.

2.89 Cover (Reinforced Concrete) – The least distance between the surface of the reinforcement and the face of the concrete.

2.90 Cover Block – A device which is fixed between reinforcement and the face of a form to ensure correct cover to the reinforcement.

2.91 Cradling – Light timber framing in formwork.

2.92 Cross Brace – A pair of diagonal braces.

2.93 Crown Centre – In centering, a structure which supports ribs at the crown of a dome.

2.94 Day Joint – A construction joint formed at the end of a day's concreting.

2.95 Dead Load – The self-weight of the forms and the permanent structure supported by them (*see also 2.195*).

2.196 Dead Man – A heavy Mock or beam, sometimes buried, used to anchor a guy or form tie.

2.97 Dead Shore – A support to hardening concrete designed to be left in place when the soffit form is struck.

2.98 Deal – A piece of square-sawn softwood timber 50 to 100 mm thick and 230 to under 280 mm wide.

2.99 Deck or Decking

- a) The form upon which concrete for a slab is placed, also the floor or roof slab itself.
- b) The sheeting to a soffit form.

2.100 Deflection – The deformation of a member caused by bending stress.

2.101 Determination – The separation of the layers which make up plywood or laminated wood.

2.102 Deviation – The distance between the actual position of a reference joint and its specified position (*see also 2.323*).

2.103 Distance Piece (Spacer, Spreader) – A short piece of timber or other material used to hold parallel forms for walk or beams at the correct spacing.

2.104 Domed Pan – *See 2.337*.

2.105 Double-Headed Nail – A round-wire nail which has a second head brined in the shank, just below the head struck by the hammer.

Note — After being driven home this nail leaves a projecting head for easy withdrawal.

2.106 Dovetailed Anchor (Anchor Slot or Slot Anchor) – A device made from sheet steel or other metal, and cast into the concrete surface to produce a chase which is narrower at the surface than at its base into which shaped metal tongues are inserted to form an anchor.

2.107 Dowel – A cylindrical piece of wood used for positioning and fixing one member to another.

2.108 Dowel Bar (Dowel Pin) — A short metal rod or bar cast into concrete with part of its length left projecting as a fixing or (especially in road and other slabs) as a means of transferring forces acting in the plane of a joint from one member or slab to another.

NOTE — One end of a dowel is usually fixed in one member while the other end is free to slide in the other member. Forces may thus be transmitted across the axis of the dowel but not along it.

2.109 Dowel Pin – *See 2.108*.

2.110 Drawform (Separator Plate) – A loose vertical metal plate which separates an integral facing from the backing concrete and which is gradually withdrawn as the form is filled to allow the two mixes to bond together.

2.111 Dressed Timber – *See 2.216*.

2.112 Drip – A cut out in the underside of a projecting piece of wood, stone or concrete to prevent water from working its way back to the wall.

2.113 Dummy Joint – A groove in the surface of the concrete which gives the appearance of a joint.

2.114 Easing Wedges – See 2.139.

2.115 Edge Form – The formwork to the edge of a road or other slab.

2.116 End Lug (Lip End) – An end bearing plate on floor centres.

NOTE — An end lug is sometimes adjustable.

2.117 Expanded Metal – A metal network or mesh formed by suitably stamping or cutting slits in sheet metal and stretching it to form open meshes, usually of diamond shape.

NOTE — Expanded metal may be used as reinforcement in concrete and for forming box-outs and stop ends.

2.118 Expanded Polystyrene (Foamed Polystyrene) – A rigid plastics material, usually in the form of sheets or blocks, which is made by pressing together particles of polystyrene which have been expanded by steam to form non-porous, ultra-lightweight beads (see also 2.245).

NOTE - Expanded polystyrene is used to form box outs and other awkward shapes in concrete.

2.119 Exterior Plywood – Plywood normally bonded with a phenolic resin adhesive, which complies with the 'Weather and Boil Proof (WBP)' requirements.

2.120 External Vibrator – A vibrator which is attached or applied to the outside of the forms.

2.121 Face Mix – See 2.175.

2.122 Fair Face – A plain concrete finish better than that produced from rough formwork.

2.123 Falsework

- a) Falsework is the temporary structure erected, to support work in the process of construction. It is composed of shores, formwork for beams or slabs (or both), and lateral bracing.

- b) That part of formwork which supports the forms usually for a large structure, such as a bridge.

2.124 Fascia – A flat member or bend at the surface of a building or the edge beam on a bridge or exposed eave of a building, etc.

2.125 Feather Edge – The sharp edge produced when two surfaces meet at an acute angle.

2.126 Fibre Glass – A mat or cloth made from strands of glass.

NOTE — Glass fibre is used in glass fibre reinforced plastics in the construction of moulds and forms.

2.127 Fibre Glass Reinforced Plastic – A material made from plastics or resins reinforced by glass fibre, usually by building up successive layers of these component materials.

2.128 Filler – See 2.292.

2.129 Fillet – A piece of timber, of triangular cross-section, fixed at the intersection of two forms to produce a chamfer on the concrete.

2.130 Film Overlay Plywood (Overlay Plywood) – Plywood to the faces of which a layer of resin in the form of a sheet (or film) is permanently bonded during manufacture, usually by means of heat and pressure, so as to form a smooth non-absorbent surface (see also 2.219).

2.131 Fin – An undesirable projection from the face of the concrete caused by grout escaping into a gap along a joint in the form.

2.132 Fishplate – A plate used for connecting the webs of members where these are to be joined end to end.

2.133 Flat Jack – A jack, made of two dished steel sheets with one inverted onto the other and the two welded together round their rims, which is inflated by injection of oil or grout under pressure.

2.134 Flexible Foamed Polyurethane – Polyurethane which has been expanded during manufacture to form a flexible multi-cellular material.

NOTE — Flexible foamed polyurethane is mainly used in formwork by being compressed in the joints between boards and between forma and the concrete to prevent grout loss.

2.135 Flier – See 2.137.

2.136 Floor Centre – A beam of adjustable length, usually a metal-lattice or sheet-metal box beam, used to support decking for a floor slab.

2.137 Flying Shore (Flier) – A horizontal strut fixed above ground between two walls.

2.138 Foamed Polystyrene – See 2.118.

2.139 Folding Wedges (Easing Wedges) – Wedges, usually timber but occasionally metal, used in pairs for levelling and adjusting formwork during erection and/or to release loads on formwork prior to striking. They are also used to tighten or slacken connections between formwork members (*see also* 2.332).

2.140 Form (Shutter)

- a) That part of formwork which consists of the sheeting and its immediate supporting or stiffening members (*see also* 2.200 and 2.212).
- b) A temporary structure or mould for the support of concrete while it is setting and gaining sufficient strength to be self supporting.

2.141 Form Anchor – A device used in the securing of formwork to previously placed concrete of adequate strength. The device is normally embedded in the concrete during placement.

2.142 Form Coating – See 2.264.

2.143 Form Hanger – See 2.26 (b).

2.144 Form Lining (Lining) – Prepared timber, board or sheets of plastics, paper or other material, fixed to the inside face of the form to produce a special surface finish.

2.145 Form Plucking (Form Scabbing) – Removal of the surface of the form due to adhesion of the form to the concrete.

2.146 Form Scabbing – See 2.145.

2.147 Form Tie (Wall Tie or Tie)

- a) A device for holding the opposing faces of wall, beam or other forms at the correct distance apart against the pressure of fresh concrete.

- b) A tensile unit adapted to holding concrete forms against the active pressure of freshly placed plastic concrete.

2.148 Formwork (Shuttering) – Complete system of temporary structure built to contain fresh concrete to form it to the required shape and dimensions and to support it until it hardens sufficiently to become self supporting. Formwork includes the surface in contact with the concrete and all necessary supporting structure (*see also 2.200*).

2.149 Framing Timber – *See 2.54.*

2.150 Gang Mould – A series of moulds so arranged that many identical precast units can be formed on the same base.

2.151 Ganged Form – A number of panels fixed together and stiffened with walings, strongbacks or soldiers, or combinations of these.

2.152 Grain (of Wood) – The general direction or arrangement of the fibres, like spiral grain, straight grain, etc.

2.153 Grillage – An assemblage of timber or steel members placed parallel to each other under a sill to spread the load from the sill.

NOTE — Where the load is large a grillage may consist of two or more layers of parallel members placed across each other at right angles.

2.154 Grit Blasting – The abrasion of a surface by blowing grit on to it at high velocity (*see also 2.269*).

NOTE — Grit blasting is sometimes used to accentuate the grain of timber for greater effect in roughboard formwork.

2.155 Groundcill – A cill which is in direct contact with the ground.

2.156 Grout Loss – The loss of cement and water from fresh concrete by leakage through joints in the forms.

2.157 Grout Seal – Material or method used for sealing joints in forms to prevent grout loss. Normally, a strip of compressible material inserted in the joints.

2.158 Grout Strip – A batten fixed to a form to create a clean line at the top of a concrete lift.

NOTE — The clean line so produced allows even contact of the forms for the next lift and helps minimize grout loss.

2.159 Gusset – A plate made of steel, timber, plywood or other material which is nailed or bolted over main timbers to form or strengthen a joint between them.

2.160 Guy (Guy Rope) – A rope fixed at one end to a Structure, and at the other end to a stake, dead man or other secure point in order to provide resistance to lateral forces.

2.161 Guy Rope – See **2.160**.

2.162 Hanger – A vertical member giving support from above (*see also 2.26*).

2.163 Hanging Formwork – Formwork which is supported from above (*see also 2.26*).

2.164 Hardboard – Fibre building board having a nominal thickness of 3 to 12 mm, usually made from wood fibres.

2.165 Headtree

- a) A strutted bearer at the top of a post at right angles to the run of the beam box, which it supports.
- b) A bearer placed or fixed on top of a dead shore to spread the support from the dead shore.

2.166 Hollow Form – A form for producing weight-reducing recesses in the soffit of a suspended slab (*see also 2.333, 2.337 and 2.339*).

2.167 Hollow Mould – See **2.166**.

2.168 Hydrostatic Pressure – The pressure exerted on the formwork by the freshly placed concrete where this is effectively a fluid.

2.169 Immersion Vibrator (Internal Vibrator) – A vibrator which is inserted into the freshly placed concrete (*see also 2.223*).

2.170 Independent Prop – See **2.97**.

2.171 Inflatable Form – ii form which acquires the required shape by internal pressure and which is deflated for striking. It is usually long relative to its cross-sectional dimensions.

2.172 Insert – A piece of timber or other material cast into the concrete surface usually to provide a fixing.

2.173 Inspection Door – See 2.2.

2.174 Insulation (Lagging) – A cover of insulating material intended to reduce loss of heat. It is used on forms in cold water to reduce loss of heat from the concrete.

2.175 Integral Facing (Face Mix) – A special facing concrete or mortar, cast simultaneously with the backing concrete so as to be monolithic with it. It is often cast by using a drawform.

2.176 Internal Vibrator – See 2.169.

2.177 Jack – A mechanical device for raising heavy loads (*see also* 2.133).

2.178 Jack Rod – A steel rod upon which jacks act in order to raise slip forms.

2.179 Joist – A horizontal or sloping beam, in particular the horizontal timbers which carry decking for a suspended concrete slab.

2.180 Kerf – A saw cut which is not the full depth of the timber.

2.181 Kerfing – See 2.254.

2.182 Kerf-Sawing – See 2.254.

2.183 Key – The treatment of a concrete surface to ensure the bonding of fresh concrete to that already cast.

2.184 Lacing – Horizontal members which hold together and position props or other vertical supports.

2.185 Lagging – Narrow timbers fixed to a shaped frame for forming curved surfaces.

2.186 Laminated Wood – An assembled product made up of layers of wood and adhesives in which the grain of adjacent layers is parallel.

2.187 Lamination – One of the individual layers of wood used to make up laminated wood.

2.188 Lap – The part of the length or height of a form which covers the previously placed concrete when the form is fixed in place for the next lift.

2.189 Leapfrog Form – A form for a method of casting vertical surfaces in which two or more sets of forms are used so that the form for the last poured lift may be left fixed in place while that from a lower lift is struck and re-erected on top of it, the process being repeated, if necessary.

2.190 Ledge (Cleat) – A member nailed across a number of boards to hold them together.

2.191 Ledger (Runner)

- a) A horizontal timber supported on posts or hangers and, carrying joists.
- b) A timber fixed to the side of a beam box, or elsewhere to support the ends of joists carrying decking.
- c) A longitudinal member spanning across a number of support members to lace them together.
- d) One of a pair of supports running parallel to the axis of the centering for a deep arch or tunnel. One runner is above the other and they are separated by folding wedges.

2.192 Lift – That height of concrete which is poured in one continuous operation.

2.193 Lining – See 2.144.

2.194 Lip End – See 2.116.

2.195 Live Load – The temporary forces applied to formwork by the weights of men and construction equipment (see *also* 2.95).

2.196 Loose Tongue – A strip of wood which is inserted into grooves in the edges of adjacent boards where these are to be joined edge to edge (see *also* 2.324).

2.197 Make-Up Piece – A piece of material used to obtain dimensions greater than those obtainable by use of standard pans or panels.

2.198 Mobile Form – See 2.330.

2.199 Moisture Movement – The swelling and shrinkage of a material caused by varying moisture content.

2.200 Mould – A form for casting precast concrete units.

2.201 Mould Oil – Oil or emulsion applied to the face of forms, its primary purpose being to act as a release agent.

2.202 Moving Formwork – See 2.69, 2.276 and 2.330.

2.203 Nib – A small concrete upstand cast above floor level to position wall or column forms for the next lift and to assist the prevention of grout loss.

2.204 Nogging Piece – A short wooden strut fixed between and at right angles to cleats, joists, studs, walings, etc in order to stiffen them (*see also* 2.37).

2.205 Overlay Plywood - See 2.130.

2.206 Pallet – A flat timber or metal plate on which precast concrete units are cast and handled until they have hardened.

2.207 Pan – A form of stiffened steel sheet which is a component of a system of formwork. A number of pans may be fixed together to construct a larger area.

2.208 Panel – A prefabricated form of limited size, designed for repeated (re-use, a number of which may be fixed together to form a larger surface (*see also* 2.151).

2.209 Particle Board – Board made from particles of wood and/or other lignocellulosic material bonded with synthetic resin and/or other organic binder.

2.210 Parting Compound – See 2.239.

2.211 Pencil Round – The junction of two concrete surfaces which is finished with a small radius.

2.212 Permanent Form (Permanent Shutter) – Forms permanently left in place to provide a facing to the concrete.

2.213 Permanent Shore – See 2.97.

2.214 Permanent Shutter – See 2.212.

2.215 Placing Rate – The rate at which the free surface of the concrete rises in the forms during placing.

2.216 Planed Timber (Dressed Timber or Surfaced Timber or Wrought Timber) – Timber made smooth on one or more surfaces by planning (*see also 2.255*).

2.217 Plank

- a) of softwood. A piece of square-sawn timber 50 to 100 mm thick and 280 mm or over wide.
- b) of hardwood. A piece of square-sawn or unedged timber over 50 mm thick. The width varies according to the grade and country of origin.

2.218 Plaster Mould – A mould made from plaster.

2.219 Plastics Faced Plywood – Plywood, one or both faces of which have been coated with plastics material or resin which acts as a sealant (*see also 2.130*).

2.220 Plucking (Scabbing) - Spalling of the concrete face due to adhesion of concrete to the form (*see also 2.145*).

2.221 Plywood – A product of balanced construction made up of plies assembled by gluing, the chief characteristic being the crossing of alternate plies to improve the strength properties and minimize movement in the plane of the board (*see also 2.130 and 2.219*).

2.222 Pocket – A recess formed in a concrete surface.

2.223 Poker Vibrator – An immersion vibrator consisting of a vibrating tubular head connected to a source of energy.

2.224 Polystyrene – A transparent, hard plastics material.

2.225 Polyurethane – An organic plastics material (*see also 2.134, 2.226 and 2.245*).

2.226 Polyurethane Varnish – Polyurethane in liquid form which is applied to forms to act as a sealant.

2.227 Porthole – See 2.2.

2.228 Post – A vertical support.

2.229 Precast Concrete – Concrete which is cast in moulds before being placed in position.

2.230 Profile – See **2.316 (a)**.

2.231 Profiled Form (Profiled Shutter) – A form for casting a concrete surface which is curved or unusual in shape.

2.232 Profiled Shutter – See **2.231**.

2.233 Prop – A strut which is light enough to be man-handled.

NOTE — The term 'prop' is commonly used to describe a strut of proprietary manufacture which is adjustable in length.

2.234 Pun, To – To compact fresh concrete by ramming by hand with a timber or steel rod.

2.235 Raker – See **2.236**.

2.236 Raking Strut (Raker) – An inclined strut.

2.237 Random Board Forms – A form, the sheeting of which is made with softwood boards of random widths or lengths or both.

2.238 Rebate Check – A grout which also forms a rebate in the concrete.

2.239 Release Agent – A substance, usually applied to the form face, to prevent adhesion of the concrete to the form and thus facilitate stripping.

2.240 Re-Propping (Re-Shoring) – The application of posts or props to the soffit of a concrete slab or beam to enable it to carry an excess superimposed load, or to carry superimposed loads when the concrete is not fully mature (*see also 2.14*).

2.241 Re-Shoring – See **2.240**.

2.242 Resin Bonded Plywood – Plywood which has been manufactured using a phenolic or other resin as an adhesive (*see also 2.119*).

NOTE — Resin-bonded plywood is not necessarily of sufficient quality for use formwork.

2.243 Retractable Form – See **2.312**.

2.244 Ribbon – A runner connecting beam bottom support members to prevent spreading of the lower edges of the side of a beam box.

2.245 Rigid Roamed Polyurethane – Polyurethane which has been expanded during manufacture to form a rigid multi-cellular material.

NOTE — Rigid foamed polyurethane is used in formwork for the same purposes cu expanded polystyrene.

2.246 Rip, To – To cut a timber parallel with the grain.

2.247 Riser Board – The board which forms the vertical face of a step.

2.248 Road Form – An edge form used in the construction of a road or other ground slab.

NOTE — The term is normally used to describe specially designed proprietary steel products.

2.249 Rough Formwork - Formwork for concrete where no special surface finish is required.

2.250 Roughboard Formwork – Formwork, the face of which consists of softwood boards with a rough grain or sawn texture so that a similar texture is imparted to the concrete surface.

2.251 Runner – See 2.191.

2.252 Sand Box – See 2.253.

2.253 Sand Jack (Sand Box) – A box containing dry sand on which rests the lower end of a vertical strut. On removal of a plug in the side of the box, the sand ‘flows out and the strut is lowered.

2.254 Saw-Kerfing (Kerfing or Kerf-Sawing) – Parallel kerfs cut on one side of a piece of timber so that it may be more easily bent towards that side.

2.255 Sawn Timber – Timber which has not been planed on any surface (see *also* 2.216).

2.256 Sawnboard Formwork – See 2.250.

2.257 Scabbing – See 2.220.

2.258 Scaffold (Scaffolding) – A temporary structure for gaining access to higher levels of the permanent structure during construction.

2.259 Scaffold Board – A softwood board used with similar boards to form walkways and as toeboards on a scaffold.

2.260 Scaffolding – See 2.258.

2.261 Screed – See 2.262.

2.262 Screed Board (Screed) - A templet for the finishing of a concrete surface (see *also* 2.310).

2.263 Screed Rail – A guide fixed at the perimeter of a concrete pour to act as a datum and support for a screed board.

2.264 Sealant

- a) A paint, or other coating, intended to render impervious the surface of timber formwork or form linings (see *also* 2.142).
- b) A paint or other coating (usually in liquid form) applied to contact surfaces of formwork or form lining-either during manufacture or in the field to serve one or more of the following purposes:
 - 1) Alter the texture of the contact surface;
 - 2) Improve the durability of the contact surface;
 - 3) In addition to (2) above, to facilitate release from concrete during stripping; and
 - 4) Seal the contact surface from intrusion of moisture.

2.265 Separator Plate – See 2.110.

2.266 Sheathing – See 2.267.

2.267 Sheeting (Sheathing) – That part of the form which is in contact with the concrete.

2.268 Shore – See 2.97 and 2.137.

2.269 Shot Blasting – The abrasion of a surface by blowing metal shot on to it at high velocity (see *also* 2.154).

NOTE — Shot blasting is sometimes used to accentuate the grain of timber for greater effect in roughboard formwork.

2.270 Shrinkage Joint (Contraction Joint) – A break in the continuity of a concrete structure provided so that shrinkage of the concrete will open this rather than cause cracking of the structure.

2.271 Shutter – See 2.140.

2.272 Shuttering – See 2.148.

2.273 Side Form – A form for the side of a concrete member where the height of the member is not great in proportion to the width of its cross-section.

2.274 Sill (Gill or Sole Plate) – A horizontal timber under the foot of a jack or post used to spread the load from the member above.

2.275 Sliding Formwork – See 2.276.

2.276 Slip Form (Moving Formwork, or Sliding Formwork) – A form which moves, usually continuously, during placing of the concrete. Movement may be either horizontal or vertical.

2.277 Slip Form Paver – A travelling machine, for laying concrete paving, which carries its own edge forms between which the concrete is compacted.

2.278 Slot Anchor – See 2.106.

2.279 Snap Tie – A form tie designed to be broken off beneath the concrete surface after use.

2.280 Soffit – The under surface of concrete, for example, of a concrete arch, or suspended beam or slab.

2.261 Soffit Form – The form to a soffit.

2.282 Soldier – A vertical member, acting as a beam or cantilever, and used in conjunction with form ties or struts to support and prevent movement of forms.

2.283 Sole Plate – See 2.274.

2.264 Spacer – See 2.103.

2.285 Spanish Windlass – A device for drawing two members together against an outward force. It consists of a number of wires from one member to the other between which a bar is inserted and turned to create a tension in the wires by twisting them together.

2.286 Splay – A concrete mass of triangular cross-section across an internal angle.

2.297 Spreader – See **2.103**.

2.288 Square-Edged Boards – Boards of rectangular cross-section with plain edges suitable for butt jointing.

2.299 Starter Frame – Shallow formwork projecting above floor level for the construction of a nib, that is, the formwork for a nib.

2.290 Stave – One of a number of vertical members forming a surface which is curved on plan (see *also* **2.185**).

2.291 Stop End – The form for a construction joint in the vertical plane.

2.292 Stopping (Filler) – Materials used for filling screw holes, joints, etc, to form a smooth, even surface.

2.293 Strap – A timber collar or metal band fixed round a box, such as a column box to resist the pressure of freshly placed concrete [*see also* **2.350** (a)].

2.294 Strike, To (Strip, To) – To remove formwork after the concrete has hardened.

2.295 Striking Piece (Stripping Piece) – A narrow, often splayed, member intended to facilitate striking in a confined space.

2.296 Striking Time (Stripping Time) – The time specified for the earliest removal of forms and other support from the concrete.

2.297 Strip

- a) **Softwood Strip** – A piece of square-sawn timber under 50 mm thick and under 100 mm wide.
- b) **Hardwood Strip** – A piece of square-sawn timber usually 50 mm or under thick and 50 to 140 mm wide.

2.298 Strip, To – See 2.294.

2.299 Stripping Piece – See 2.295.

2.300 Stripping Time – See 2.296.

2.301 Strongback (Counter-Waling) – A soldier, often of framed construction, for heavy duty application.

2.302 Strut – A member in compression.

2.303 Stud – A vertical or horizontal stiffener to the back of the form sheeting.

2.304 Subsiding – See 2.204.

2.305 Surface-Active Agent – See 2.307.

2.306 Surface Timber – See 2.216.

2.307 Surfactant (Surface-Active Agent or Activating Agent) – A chemical which lowers the surface tension of water.

NOTE — Surfactants are used in mould oils to reduce the occurrence of blowholes in the concrete face.

2.308 Suspended Formwork – Formwork suspended on hangers.

2.309 Table Form – Formwork for suspended floors which is built up into the form of a table. It stands on the floor previously cast and is lowered and moved in one piece.

2.319 Tamper – A timber or metal beam spanning between edge forms or screed rails and used for compacting concrete.

NOTES

- 1) A tamper may be constructed so that it also acts as a screed board.
- 2) A tamper may also be equipped with one or more vibrators.

2.311 Telescopic Centre – See 2.136.

2.312 Telescopic Form (Retractable Form) – A form used for work, such as tunnelling, which when struck reduces to a size small enough to enable it to pass through similar forms already in position for concreting.

2.313 Telescopic Prop – See 2.5.

2.314 Telltale – Any device designed to indicate movement of formwork.

2.315 Template – See 2.316.

2.316 Template Profile or Template

- a) A shape made of timber or metal and used for building or testing the accuracy of surfaces which are curved or otherwise unusual in shape.
- b) A guide or pattern used for accurately locating bolts, etc.

2.317 Thickness, To – To plane timber on opposite faces, usually simultaneously, to produce a uniform thickness.

2.318 Through Tie – A form tie which passes through the concrete and is withdrawn when the forms are struck.

2.319 Tie – See 2.147.

2.320 Tilting Table – A table on which a vertical concrete component is cast horizontally, and which is tilted into a vertical or near vertical position to allow the component to be lifted in its natural position.

2.321 Tilt-Up Construction – The on-site casting of walls horizontally so that they have only to be tilted through 90° to gain their permanent position.

2.322 Tilt-Up Form – A wall form which is built on the ground beside the wall to be cast and then rotated into the vertical plane.

2.323 Tolerance – The difference between the limits between which a size dimension or position should lie (see also 2.102).

2.324 Tongue – A projection on the edge of a board formed by rebating the arris of both faces. It is most usually used for tongued and grooved boarding (see also 2.196).

2.325 Tongued and Grooved Boarding – Boarding laid edge to edge and jointed by a tongue on the edge of one board which fits into a corresponding groove in the edge of the adjacent board (see also 2.196).

2.326 Top Form – A form to the top surface of the concrete where this slopes too steeply to be cast without containment.

2.327 Trammel – An instrument for describing circles or ellipses.

2.328 Trap Door – See 2.2.

2.329 Trapped Form – A form which is lost when no opening is left in the permanent structure through which it can be removed (see 2.336), or which has to be destroyed in striking because of the configuration of the concrete.

2.330 Travelling Formwork (Mobile Form or Moving Formwork) – Formwork, such as that used for walls and tunnel linings carried on wheels or rollers so that it may be struck and moved for re-use without dismantling.

2.331 Trestle – A structure for temporary or permanent support which gains its stability by having its main members at an inclination to the vertical.

2.332 Triple Wedges – A system of folding wedges using three instead of two wedges.

2.333 Trough Form – A form which produces an inverted-trough shaped concrete soffit.

2.334 Veneer – A thin sheet of wood produced by rotary cutting or slicing.

2.335 Vibrator – A mechanical device for compacting concrete by imparting vibrations to it (see also 2.120, 2.169 and 2.223).

2.336 Void Box – A trapped form used to create a completely enclosed space within the concrete.

2.337 Waffle Form (Coffer Form or Waffle Pan) – A hollow form, usually square on plan and domed in elevation, used for forming the recesses or coffer in a waffle slab.

2.338 Waffle Pan – See 2.337.

2.339 Waffle Slab (Coffered Slab) – A concrete slab designed to span in two directions and containing recesses, which are square on plan, in its under side.

2.340 Waling – A long horizontal member acting as a beam and used in conjunction with form ties, struts or strongbacks to support and prevent movement of forms.

2.341 Wall Clamp (Wall Cramp or Clamp or Cramp) – Two vertical members connected together to form an adjustable yoke to support wall forms in such a way as to avoid the use of form ties through the concrete.

2.342 Wall Cramp – See 2.341.

2.343 Wall Hanger – A metal bracket suspended from a wall to support a ledger [2.191(a)] on which in turn is supported formwork for a suspended floor.

2.344 Wall Tie – See 2.147.

2.345 Wedge – A piece of wood or metal tapering to a thin edge, wed to adjust elevation, tighten formwork, etc.

2.346 Wedge Bolt – A bolt which is tightened by means of a wedge driven through a slot in its shank.

2.347 Wood Chipboard (Chipboard) – A particle board made from particles of wood bonded with synthetic resin and/or other organic binder.

2.348 Wrecking Strip – A striking piece which is intended to be destroyed in the course of striking.

2.349 Wrought Timber – See 2.216.

2.350 Yoke

- a) An assembly of members which restrains forms from movement by encircling, or nearly encircling, them.
- b) In a vertical slip form, a yoke in the form of an inverted 'U' which carries the wall forms and is itself carried and raised by a jack.
- c) A tie or clamping device around column forms or over the top of wall or footing forms to keep them from spreading because of the lateral pressure of concrete.

2.351 Apartment Formwork – Room formwork for casting a concrete slab and its supporting walls in one continuous operation.

2.352 Lost Formwork – Formwork that cannot be removed easily and is therefore left in place.

2.353 Vacuum Form Work – Formwork that incorporates a lining through which a vacuum is applied to a face of concrete to improve its compaction.
