IS : 5751 - 1984
(Reaffirmed 1997)

Indian Standard

SPECIFICATION FOR PRECAST CONCRETE COPING BLOCKS

(First Revision)

UDC 692·233·25 : 691·327-431

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

January 1985

Indian Standard

SPECIFICATION FOR PRECAST CONCRETE COPING BLOCKS

(First Revision)

Cement and Concrete Sectional Committee, BDC 2

Chairman	*Representing*
DR H. C. VISVESVARAYA	Cement Research Institute of India, New Delhi
Members	
ADDITIONAL DIRECTOR, STANDARDS (B&S)	Research, Designs & Standards Organization (Ministry of Railways), Lucknow
DEPUTY DIRECTOR, STANDARDS (B&S) (*Alternate*)	
SHRI K. P. BANERJEE	Larsen & Toubro Ltd, Bombay
SHRI HARISH N. MALANI (*Alternate*)	
SHRI S. K. BANERJEE	National Test House, Calcutta
DR N. S. BHAL	Structural Engineering Research Centre (CSIR), Roorkee
SHRI V. K. GHANEKAR (*Alternate*)	
SHRI S. P. CHAKRABORTI	Roads Wing, Ministry of Shipping and Transport
SHRI N. SHIVAGURU (*Alternate*)	
CHIEF ENGINEER (BD)	Beas Designs Organization, Nangal Township
SHRI J. C. BASUR (*Alternate*)	
CHIEF ENGINEER (DESIGNS)	Central Public Works Department, New Delhi
EXECUTIVE ENGINEER (DESIGNS III) (*Alternate*)	
CHIEF ENGINEER (RESEARCH)-CUM-DIRECTOR	Irrigation Department, Government of Punjab, Chandigarh
RESEARCH OFFICER (IPRI) (*Alternate*)	
DR S. K. CHOPRA	Cement Research Institute of India, New Delhi
DR A. K. MULLICK (*Alternate*)	
DIRECTOR	A. P. Engineering Research Laboratories, Hyderabad
DIRECTOR	Central Soil & Materials Research Station, New Delhi
DEPUTY DIRECTOR (*Alternate*)	
DIRECTOR (C&MDD-I)	Central Water Commission, New Delhi
DEPUTY DIRECTOR (C&MDD-I) (*Alternate*)	
SHRI T. A. E. D'SA	The Concrete Association of India, Bombay
SHRI N. C. DUGGAL (*Alternate*)	

(*Continued on page* 2)

(*Continued from page* 1)

Members	*Representing*
SHRI A. V. GOKAK	Cement Controller (Ministry of Industry), New Delhi
SHRI S. S. MIGLANI (*Alternate*)	
SHRI A. K. GUPTA	Hyderabad Asbestos Cement Product Ltd, Hyderabad
SHRI P. J. JAGUS	The Associated Cement Companies Ltd, Bombay
SHRI M. R. VINAYAKA (*Alternate*)	
SHRI N. G. JOSHI	Indian Hume Pipes Company Ltd, Bombay
SHRI S. R. KULKARNI	M. N. Dastur & Co Pvt Ltd, Bombay
SHRI S. K. LAHA	The Institution of Engineers (India), Calcutta
SHRI B. T. UNWALLA (*Alternate*)	
SHRI G. K. MAJUMDAR	Hindustan Prefab Ltd, New Delhi
SHRI H. S. PASRICHA (*Alternate*)	
SHRI K. K. NAMBIAR	In personal capacity (*'Ramanalaya' 11 First Crescent Park Road, Gandhinagar, Adyar, Madras*)
SHRI Y. R. PHULL	Indian Roads Congress, New Delhi
SHRI Y. R. PHULL	Central Road Research Institute (CSIR), New Delhi
SHRI M. R. CHATTERJEE (*Alternate* I)	
SHRI K. L. SETHI (*Alternate* II)	
DR MOHAN RAI	Central Building Research Institute (CSIR), Roorkee
DR S. S. REHSI (*Alternate*)	
SHRI A. V. RAMANA	Dalmia Cement (Bharat) Ltd, New Delhi
DR K. C. NARANG (*Alternate*)	
DR M. RAMAIAH	Structural Engineering Research Centre (CSIR), Madras
DR A. G. MADHAVA RAO (*Alternate*)	
SHRI G. RAMDAS	Directorate General of Supplies and Disposals, New Delhi
DR A. V. R. RAO	National Buildings Organization, New Delhi
SHRI J. SEN GUPTA (*Alternate*)	
SHRI R. V. CHALAPATHI RAO	Geological Survey of India, Calcutta
SHRI S. ROY (*Alternate*)	
SHRI T. N. S. RAO	Gammon India Ltd, Bombay
SHRI S. A. REDDI (*Alternate*)	
SHRI ARJUN RIJHSINGHANI	Cement Corporation of India Ltd, New Delhi
SHRI C. S. SHARMA (*Alternate*)	
SHRI H. S. SATYANARAYANA	Engineer-in-Chief's Branch, Army Headquarters, New Delhi
SHRI V. R. KOTNIS (*Alternate*)	
SECRETARY	Central Board of Irrigation and Power, New Delhi
SHRI K. R. SAXENA (*Alternate*)	
SHRI K. A. SUBRAMANIAM	The India Cement Ltd, Madras
SHRI P. S. RAMACHANDRAN (*Alternate*)	
SUPERINTENDING ENGINEER (DESIGNS)	Public Works Department, Government of Tamil Nadu, Madras
EXECUTIVE ENGINEER (SM&R DIVISION) (*Alternate*)	

(*Continued on page* 11)

Indian Standard

SPECIFICATION FOR PRECAST CONCRETE COPING BLOCKS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 April 1984, after the draft finalized by the Cement and Concrete Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Precast concrete coping blocks serve as the first line of defence against the entry of moisture into hollow concrete block walls. The effectiveness in keeping water out of walls depends entirely upon the way in which the coping blocks are designed and constructed.

0.3 The functional requirements to be met by a coping system are as follows:

a) It should prevent downward penetration of water through the coping system and damp-proof course should always be used;

b) It should direct water clear of the wall below;

c) It should resist lateral displacement by the forces likely to be applied to it in the situation in which it is used. This may be achieved either by its mass (*see* **5.1**) or mechanical means, for example, the form of the coping, the clip type (*see* **3.1**), or the use of cramps and dowels (*see* **2.5**);

d) It should allow for thermal and moisture movements (*see* **7.3**); and

e) It should be durable. This can be achieved by selection of materials for the coping system (*see* **2**).

0.3.1 While it may not always be possible to meet all these requirements fully, this specification gives criteria by which coping blocks may be judged.

0.4 This standard was first published in 1969. The present revision has been prepared with a view to incorporating the modifications found necessary in the light of experience gained during the use of this standard

and to align with the requirements of various related standards which have been revised consequent to the publication of the earlier version of this standard. In this revision the requirements in respect of aggregates have also been modified.

0.5 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 : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for precast concrete coping blocks, giving details of the materials for manufacture, workmanship, functional repuirements and the essential dimensions to meet them

2. MATERIALS

2.1 Cement — The cement used shall be ordinary and low heat Portland cement conforming IS : 269-1976† or rapid hardening Portland cement conforming to IS : 8041-1978‡ or Portland slag cement conforming to IS : 455-1976§ or Portland pozzolana cement conforming to IS : 1489-1976‖. Alternatively, if specified by the purchaser, white Portland cement conforming to IS : 8042-1978¶ or supersulphated cement conforming to IS : 6909-1973** or hydrophobic Portland cement conforming to IS : 8043-1978†† may be used.

2.2 Aggregates — All aggregates shall comply with IS : 383-1970‡‡. The aggregate crushing value, aggregate impact value and aggregate abrasion value shall not exceed the corresponding requirements laid down in IS : 383-1970‡‡ for concrete for non wearing surfaces. The aggregate impact test shall be done only as an alternative test to aggregate crushing test.

---

*Rules for rounding off numerical values (*revised*).
†Specification for ordinary and low heat Portland cement (*third revision*).
‡Specification for rapid hardening Portland cement (*first revision*).
§Specification for Portland slag cement (*third revision*).
‖Specification for Portland pozzolana cement (*second revision*).
¶Specification for white Portland cement (*first revision*).
**Specification fot supersulphated cement (*first revision*).
††Specification for Hydrophobic Portland cement.
‡‡Specification for coarse and fine aggregates from natural sources for concrete (*second revision*).

2.2.1 Alternatively, coarse aggregates, such as blastfurnace slag which may be found suitable having regard to strength, durability and freedom from harmful properties, may be used, but such aggregates shall not contain more than one percent of sulphate and shall not absorb more than 10 percent of its own mass of water.

2.2.2 The aggregates shall not exceed 12·5 mm maximum nominal size.

2.3 Additives — Additives used in the manufacture may be:

a) pigments to colour the finished product, and/or

b) admixtures to improve the workability and impermeability of concrete.

2.3.1 Where additivers are employed, they shall be used in such proportions as to have no harmful effects on the setting, hardening and durability of the concrete.

2.4 Concrete — The concrete shall be of a quality not lower than M 20 grade as specified in **5.1** of IS : 456-1978*.

2.5 Cramps and Dowels — Cramps and dowels shall be of copper, brass, bronze, corrosion resisting steel, or galvanized steel of the form and dimensions agreed to between the manufacturer and the purchaser.

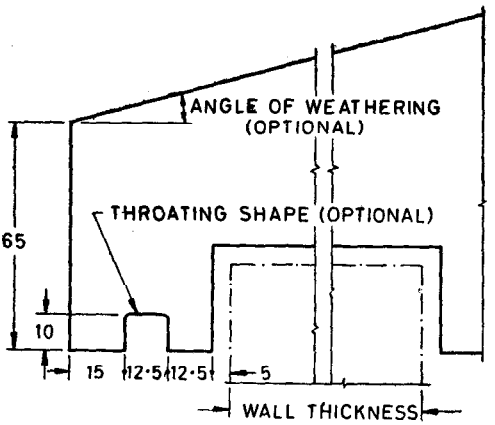
3. DIMENSIONS AND TOLERANCES

3.1 Dimensions of Cross Section — The form of the cross-section shall be as agreed to between the purchaser and the supplier. The overall width shall be determined by referring to the thickness of the wall to which the coping is to be applied. The minimum dimensions of the cross-section shall be those shown in Fig. 1 for clip type copings and in Fig. 2 for flat-bottomed copings (bed faces may be serrated or have bedding recesses), respectively.

3.2 Length — Unless otherwise specified, the length of coping blocks shall be one metre.

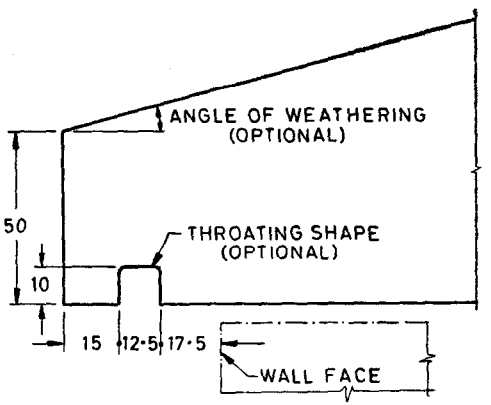
3.3 Tolerances — Tolerances of $\pm$ 3 mm are allowed on the dimensions of the cross-sectional profile, and the differences between cross-sectional dimensions of individual coping blocks of the same type shall be not greater than half the specified tolerances. A tolerance of $\pm$ 6 mm is allowed on the specified length of each coping block.

*Code of practice for plain and reinforced concrete (*third revision*).



All dimensions in millimetres.

FIG. 1 CLIP TYPE COPING



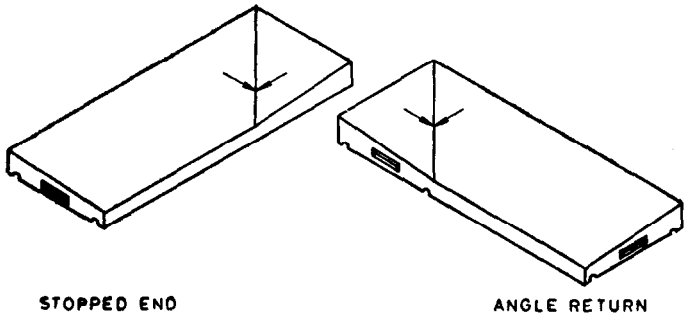
All dimensions in millimetres.

FIG. 2 FLAT-BOTTOM COPING

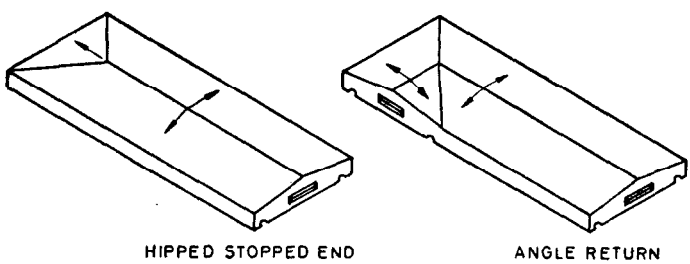
4. SHAPE

4.1 Different shapes of coping blocks are shown in Fig. 3.

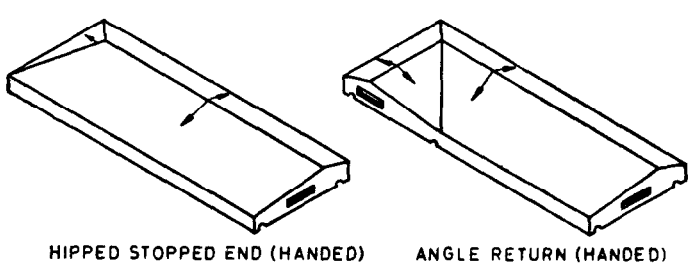
4.2 Coping blocks shall slope to the rear so as to reduce the wash of water and accumulated dirt over the face of the wall. The slope shall be as steep as possible for rapid shedding of water.



3A SPLAYED COPINGS



3B SADDLEBACK COPINGS, TYPE 1



3C SADDLEBACK COPINGS, TYPE 2

NOTE — The detailed dimensions to be in accordance with Fig. 1 or 2 and overall dimensions to be agreed between the manufacturer and the purchaser.

FIG. 3 EXAMPLES OF CONCRETE COPINGS

5. MASS OF COPING BLOCK

5.1 The mass of flat-bottomed copings not intended to be fixed by cramps shall be not less than 35 kg/m.

NOTE — This mass is intended to guard against displacement by impact or pressure of ladders or by normal wind conditions.

6. PROVISION FOR CRAMPS

6.1 Where copings are specified to be held down by means of cramps, holes suitable to receive them shall be provided, at positions specified by the purchaser, in those coping blocks which require to be fixed.

7. FIXING AND JOINTING

7.1 Provisions shall be made for jointing the ends of coping blocks by means of dowels, cramps or joggled mortar joints.

7.2 When the coping block is specified to be dowelled, dowels complying with **2.5** shall be provided at every joint.

7.3 Adequate provision for thermal and moisture movement shall be made in the coping blocks, by flexible joints at appropriate intervals. Where movement joints are provided in the structure below, they shall be continued through the coping blocks.

7.4 Leaks through coping blocks occur through open joints. Permanent water-tightness cannot be obtained in a straight-sided joint sealed with any rigid type of mortar. For this reason, a suitable design of flashing of non-corrodible material is sometimes adopted.

8. MANUFACTURE

8.1 Casting — The concrete shall be thoroughly compacted and this may be assisted by mechanical tamping, vibration or by hydraulic pressure.

8.2 Maturing — Unless otherwise specified in contract or order, no coping blocks shall be delivered until they have matured for 21 days after curing for 7 days.

NOTE — This requirement is based on normal temperature and weather conditions, and having regard to: (a) the desirability of the irreversible drying shrinkage having first occurred, and (b) strength.

9. FINISH

9.1 The finish shall be that obtained by casting the block in properly designed moulds. Where these are of wood, they shall be of closely jointed wrought timber and the faces of the block may be kept imprinted

with the slight grain of the wrought timber and the faces of their joints. In addition, irrespective of the material used for the moulds, small surface blemishes caused by entrapped air or water may be expected but the exposed surfaces shall be plane, true and free from honey-combing or other large blemishes.

10. WEATHERING

10.1 Top of the coping blocks shall be weathered. The angle of weathering shall be that agreed to between the purchaser and the manufacturer.

11. FITTINGS

11.1 Stopped ends, hipped stopped ends, stooled ends and right-angled returns, shall be available to match the coping blocks. Other fittings shall be provided by agreement between the purchaser and the supplier. Examples are shown in Fig. 3.

12. MARKING

12.1 Each precast coping block may be clearly and permanently marked with the following information:

a) Manufacturer's name and trade-mark, if any;

b) Year of manufacture, if required by the purchaser; and

c) The grade of concrete assessed in accordance with **5.1** of IS : 456-1978*.

12.1.1 Each coping block may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

13. SAMPLING AND CRITERIA FOR CONFORMITY

13.1 The method of selecting representative samples of materials and the criteria for conformity shall be as given in **13.2** to **13.5**.

*Code of practice for plain and reinforced concrete (*third revision*).

13.2 Lot — In any consignment all the blocks of the same size and from the same batch of manufacture shall be grouped together in groups of one thousand coping blocks or less.

13.3 From each lot a sample of 24 coping blocks shall be selected at random. All the 24 coping blocks shall be checked for dimensions as indicated in **3** and shall be inspected for visual defects.

13.4 The number of coping blocks with dimensions outside the tolerance limit add/or with visual defects among those inspected shall not be more than 2.

13.5 The grade of concrete shall be assessed by 28-day compressive strength test on cubes in accordance with **5.1** of IS : 456-1978*. The quality of the concrete may also be assessed by compressive strength tests on cube specimens cut out of precast concrete coping blocks when agreed to between the purchaser and the manufacturer The strength requirements shall be as given in Table 2 of IS : 456-1978* or a suitable minimum strength value for the particular size of the cube to be cut out of the precast concrete coping block may be agreed to between the purchaser and the manufacturer.

*Code of practice for plain and reinforced concrete (*third revision*).

(*Continued from page* 2)

Members	*Representing*
SHRI L. SWAROOP	Orissa Cement Ltd, New Delhi
SHRI D. S. BHANDARI (*Alternate*)	
SHRI G. RAMAN, Director (Civ Engg)	Director General, ISI (*Ex-Officio Member*)

Secretary

SHRI N. C. BANDYOPADHYAY
Deputy Director (Civ Engg), ISI

Precast Concrete Products Subcommittee, BDC 2 : 9

Convener

SHRI G. K. MAJUMDAR	Hindustan Prefab Ltd, New Delhi

Members

DEPUTY DIRECTOR, STANDARDS (B&S)	Research Designs & Standards Organization, Lucknow
ASSISTANT DIRECTOR, STANDARDS (B&S-II) (*Alternate* I)	
SHRI C. G. VITHAL RAO (*Alternate* II)	
DIRECTOR	Central Soil and Materials Research Station, New Delhi
DEPUTY DIRECTOR (*Alternate*)	
SHRI Z. GEORGE	Structural Engineering Research Centre (CSIR), Madras
DR A. G. MADHAVA RAO (*Alternate*)	
SHRI V. G. GOKHALE	Bombay Chemicals Pvt Ltd, Bombay
SHRI B. K. JINDAL	Central Building Research Institute (CSIR), Roorkee
DR S. S. REHSI (*Alternate*)	
SHRI L. C. LAI	In personal capacity (*B/17, West End, New Delhi*)
SHRI S. NAHAROY	Engineering Construction Corporation Ltd, Madras
SHRI A. RAMAKRISHNA (*Alternate*)	
SHRI D. B. NAIK	Engineer-in-Chief's Branch, Army Headquarters, New Delhi
SHRI SUCH SINGH (*Alternate*)	
SHRI K. K. NAMBIAR	In personal capacity (*'Ramanalya' 11 First Crescent Park Road, Gandhinagar, Adyar, Madras*)
SHRI B. V. B. PAI	The Concrete Association of India, Bombay
SHRI P. SRINIVASAN (*Alternate*)	
SHRI H. S. PASRICHA	Hindustan Prefab Ltd, New Delhi
DR N. RAGHAVENDRA	Cement Research Institute of India, New Delhi
SHRI V. RAMALINGAM	Neyveli Lignite Corporation Ltd, Neyveli
SHRI K. A. RAMABHADRAN (*Alternate*)	

(*Continued on page* 12)

(*Continued from page* 11)

Members	*Representing*
DR A. V. R. RAO	National Buildings Organization, New Delhi
SHRI J. SEN GUPTA (*Alternate*)	
SHRI B. G. SHIRKE	B. G. Shirke & Co Ltd, Pune
SHRI R. T. PAWAR (*Alternate*)	
SHRI C. N. SRINIVASAN	M/s C. R. Narayana Rao, Madras
SHRI C. N. RAGHAVENDRAN (*Alternate*)	
SUPERINTENDING ENGINEER (P&S)	Tamil Nadu Housing Board, Madras
PROJECT OFFICER (*Alternate*)	
SUPERINTENDING SURVEYOR OF WORKS (NZ)	Central Public Works Department, New Delhi
SURVEYOR OF WORKS (NZ) (*Alternate*)	