IS 3630 (1992): Construction of Non-load Bearing Gypsum Block Partitions - Code of Practice [CED 13: Building Construction Practices including Painting, Varnishing and Allied Finishing]

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IS 3630 : 1992
(Reaffirmed 2002)

भारतीय मानक

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(पहला पुनरीक्षण)

Indian Standard

CONSTRUCTION OF NON-LOAD BEARING GYPSUM BLOCK PARTITIONS — CODE OF PRACTICE

(First Revision)

UDC 666·91-431

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

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Price Group 3

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Building Construction Practices Sectional Committee had been approved by the Civil Engineering Division Council.

Gypsum block partitions are light in weight, fireproof and free from pest infestation. Production of gypsum building materials is developing in this country and there is scope for large scale adoption of gypsum partitions in multi-storeyed construction. This standard is intended to provide guidance with regard to selection of gypsum blocks and the methods of construction of gypsum partition.

This standard was first published in 1966. The present revision has been taken up to incorporate the improvements found necessary in light of the usage of this standard and the suggestions made by various bodies implementing it.

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.

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 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

CONSTRUCTION OF NON-LOAD BEARING GYPSUM BLOCK PARTITIONS — CODE OF PRACTICE

(First Revision)

1 SCOPE

This standard covers the design and construction of non-load bearing gypsum block partitions.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to the standard.

3 TERMINOLOGY

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

3.1 Gypsum Block

Building block manufactured essentially from gypsum plaster.

3.2 Half Bond

The arrangement of blocks in successive courses in which the amount of lap is half the length of blocks (*see* Fig. 3).

3.3 Isolation Strips

Strips of resilient material such as fibre, building board, building felt, etc, fixed on the edges of a partition for the purpose of mitigating or localising crack formation or for reducing the transmission of sound.

3.4 Nailing Blocks

Blocks of wood or other nail holding materials inserted in a partition to receive ground, trim or other attachments.

3.5 Scrim

Cotton, jute, metal or other fabric with a coarse open weave.

3.6 Trim

Accessories fixed to a wall or partition such as skirting, dados nails, picture rails and architraves.

4 NECESSARY INFORMATION

4.1 For the efficient planning, design and construction of gypsum block partitions, information with regard to the following shall be furnished to those responsible for the work:

a) Type of framing, covering, infilling and decorations to be adopted in the construction of partitions; and

b) Location and other details of openings, chases, embedment of services such as for electrical installations.

4.2 All information as in **4.1** shall be made available to those who are responsible for the gypsum partition work. Necessary drawings and instructions for planning shall be furnished.

4.3 Arrangements shall also be made for the proper exchange of information between those engaged in the gypsum partition work and those whose work will affect or will be affected.

5 MATERIAL

5.1 Gypsum Block

Gypsum blocks for use in partitions shall conform to IS 2849 : 1983.

5.1.1 *Form and Soundness*

The blocks shall have straight square edges and true surfaces and shall be free from cracks and any other imperfections that would render them unfit for use in the circumstances for which they are required. In cored blocks the core spaces shall be symmetrically spaced and the shell thicknesses shall be not less than those given in IS 2849 : 1983.

5.1.2 *Surface Texture*

The surfaces of the blocks may be either smooth or scored, as required. The scoring shall be not more than 5 mm deep.

5.2 Aggregates for Mortar

Sand or other fine aggregates used for preparation of gypsum mortar shall conform to IS 383 : 1970.

5.3 Mortar

Mortar shall consist of one part calcined gypsum with not more than three parts of fine aggregates or sand by weight as specified in **5.2**. Sodium citrate in proportion of 0·25 percent of the weight of gypsum may be added to the mortar to act as retarder.

For fine works that is work with fine mortar joints, the mortar may also consist of gypsum and lime in the ratio of one gypsum and three unslaked lime by weight and sodium citrate added in proportion of 0·25 percent of the weight of the gypsum.

5.4 Reinforcing Material

Mesh, expanded metal ties, light gauge expanded metal, steel strips, etc, used for reinforcing gypsum block partitions shall be free from rust and shall be suitably protected against rusting.

6 DESIGN CONSIDERATIONS

6.1 General

6.1.1 Gypsum blocks, gypsum plaster-board and gypsum plaster are not suitable for use in external walls, whether protected or unprotected.

6.1.2 Gypsum blocks or tiles may be used around steel members for fire protection. Gypsum blocks or tiles always require plastering or external faces.

6.1.3 Solid gypsum blocks may be used in ground floor and cored blocks may be used in upper floors for reducing weight of the partition walls, particularly when they come directly over beams and similar supports.

6.1.4 Where possible the length and height of partitions, the dimensions of door and other openings, etc, shall be such as to conform to dimensions of the block with an allowance for joints so that cutting or sawing of blocks will be reduced to the minimum. It is recommended that blocks of size 700 × 300 × 100 mm should be used wherever possible.

6.2 Strength and Stability

The height of gypsum block partition where lateral support is provided by means of wall piers or columns at horizontal intervals not exceeding 36 times its thickness shall conform to the data given in Table 1.

6.2.1 The following recommendations regarding gypsum partitions may generally be followed:

a) The height of gypsum block partitions between the horizontal lateral supports shall not exceed 36 times its thickness, except where lateral support is provided by means of wall piers or columns at horizontal intervals not exceeding 36 times its thickness in which case the height may extend to 72 times its thickness.

b) The height of partition that is not supported laterally at its top shall not exceed 18 times its least thickness except where lateral support is provided by means of walls, piers or columns at horizontal intervals not exceeding 36 times its least thickness in which case the height may be extended to 36 times its least thickness.

6.2.2 *Fixing of the Partition to the Main Structure*

Gypsum partitions shall have their base above the skirting level (*see* Fig. 1). The edges of partitions shall be firmly attached to the main structure or to permanent supports where these are used, in such a manner as to afford adequate lateral rigidity (*see* Fig. 2). They shall not be block-bonded into the main structure but shall be let into the chases, grooves or channels to ensure structural discontinuity. In case of partitions supported laterally at top, these partitions shall be securely wedged and pinned at the ceiling (*see* Fig. 1).

6.3 Avoidance of Cracks Formation

6.3.1 Changes in volume of gypsum blocks with normal variations in temperature or moisture content will not be generally sufficient to require special precautions, but the relative weakness of the material necessitates care in design and erection to prevent cracking arising from movements of the surrounding structure, or by vibration.

6.3.2 Where such movements are likely to be of sufficient magnitude to have any significant effect upon the partitions, edge-isolated walls, floors and ceilings may be provided by fibre-board building felt or other resilient strips, fixed in suitable chases where convenient or on a flush surface (*see* Fig. 2).

6.3.3 When the edge isolation is not required to reduce sound transmission, expanded metal ties may be used. These ties shall be fixed to the surrounding structure, passed through the resilient packing and be built into the joints in the partitions; they shall extend at least 300 mm into horizontal joints and at least 150 mm into vertical joints.

6.3.4 Longitudinal reinforcement, if required, may be provided by lightgauge expanded metal, or by steel strips of a width approximately equal to one quarter of the thickness of the blocks, embedded in every alternate horizontal joint.

6.3.5 For construction with cored blocks, reinforcement against diagonal cracking shall be provided as in **6.3.5.1** and Fig. 3.

6.3.5.1 Along a line from each upper corner of the partition to the nearer quarter point of the span at floor level, the vertical joints in each course shall be reinforced, using reinforcing bars of 12 mm diameter and 400 mm long. Where the line cuts a course at or near to a vertical joint, the core holes of one block shall be filled with gypsum and the bars inserted for half their length. The core holes of the block abutting at the joint shall then be filled with mortar and the block slide into position so that the projecting halves of the bars are embedded in its cores. When the line cuts at or near the centre of the block, reinforcing bars shall be used at both ends of the block.

Table 1 Height of Gypsum Block Partition

(*Clause* 6.2)

Sl No.	Thickness of Block (Solid or Cored)	Maximum Height for Lengths of Partitions not Exceeding 36 Times its Thickness, m		
	cm	With Edge Isolation	Built Solidity Against Floor and Ceiling	With Reinforcement Anchored to Floor and Ceiling
(1)	(2)	(3)	(4)	(5)
i)	7·5	2·7	3·5	
ii)	10	3·5	4·5	According to design
iii)	12·5	4·5	6	of reinforcement
iv)	15	5·3	6	

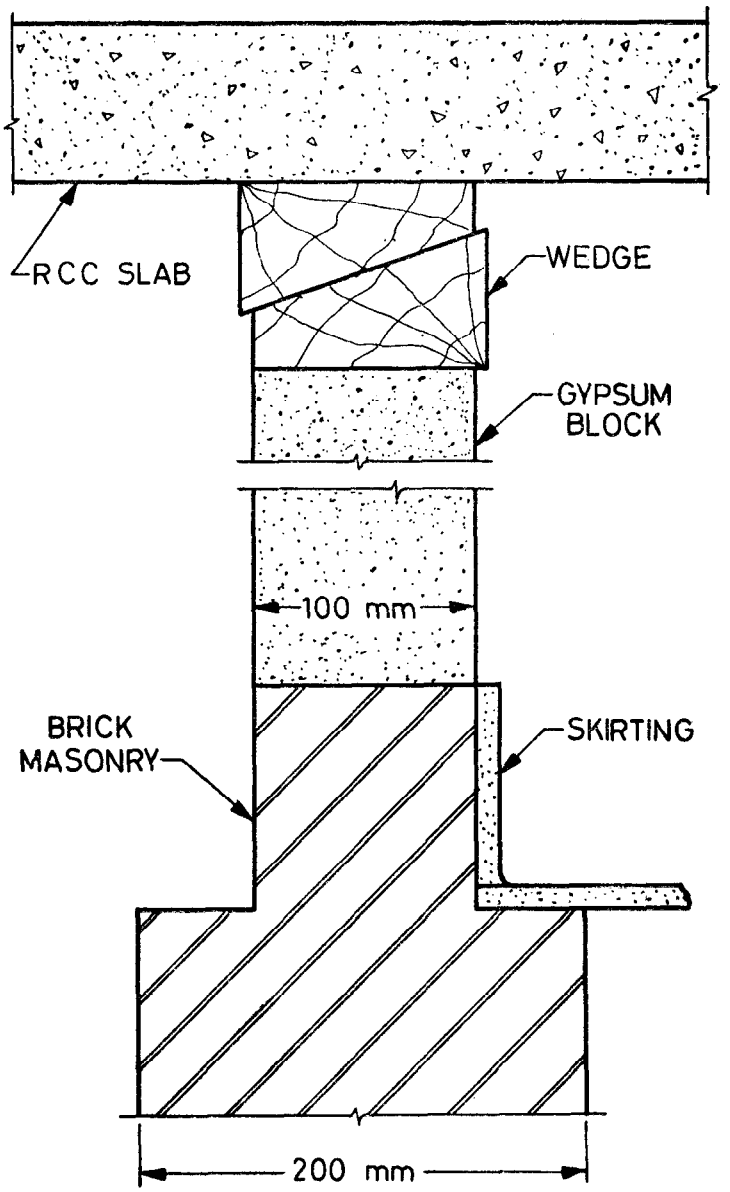


FIG. 1 POSITION OF WEDGE AND GYPSUM BLOCK PARTITION WALL ABOVE SKIRTING

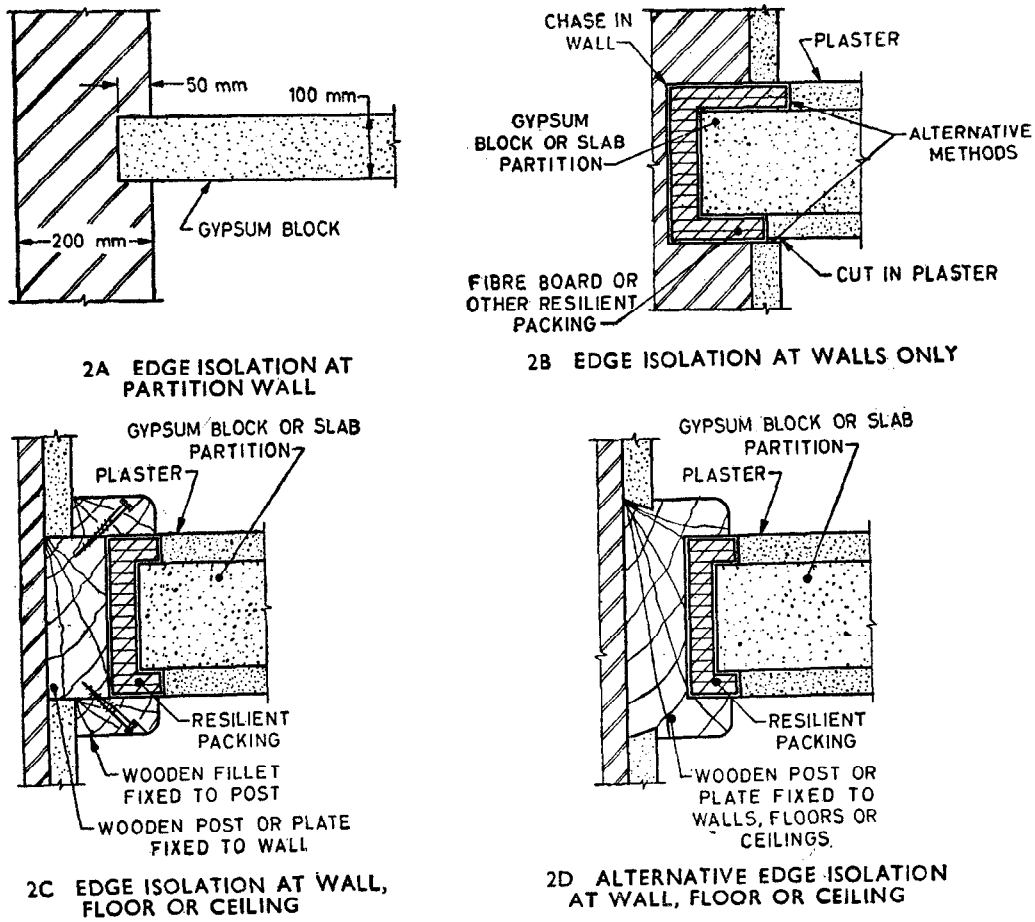
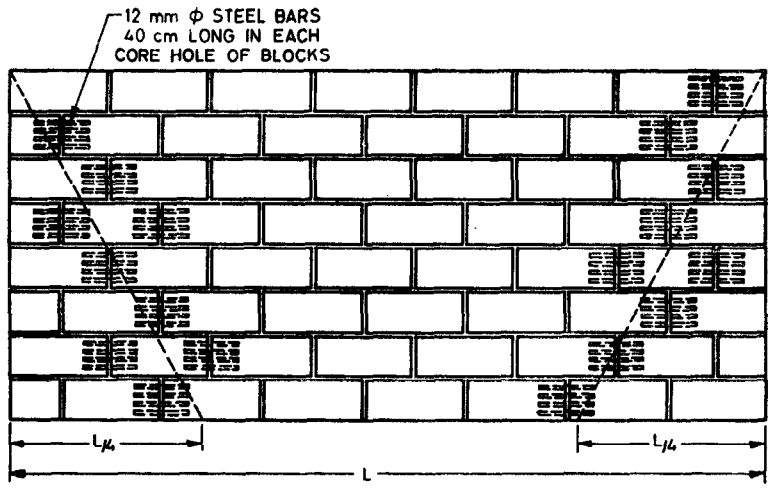


FIG. 2 METHODS OF EDGE ISOLATION FOR PARTITIONS



NOTE — Number of reinforcement bars will depend on number of holes in the block.

FIG. 3 REINFORCING OF VERTICAL JOINTS OF GYPSUM BLOCKS AS A SAFEGUARD AGAINST CRACKING

6.3.6 Block of wood or other nail-holding materials inserted in a partition to receive grounds, trim or other attachments shall have bonding material around it such as hessian, mesta fibre and wire gauge to avoid the appearance of cracks around the block.

6.3.7 When the partition is to be plastered, surface reinforcement shall be used in positions which would otherwise be sources of weakness, for example in narrow bays, at corners and above openings. Scrim of types suitable to the nature of the plaster, may be used for this purpose; it shall be fixed over the blocks on both sides of the partition before plastering extending at least 300 mm beyond the edge of a narrow bay, on each side of a corner of an opening as in Fig. 4.

6.4 Sound Insulation (Airborne Sound)

Partitions of gypsum blocks are relatively light in weight and the sound insulation is moderate. The insulation value may be reduced by the presence of cracks or open joints arising from faulty design or construction or by other openings giving air paths. Sound insulation may be increased by introducing discontinuities. Discontinuity may be obtained by isolating the edges of the wall or partition from the surrounding structures. They all consist, in principle, of strips of some resilient material between the edges of the walls or partition and the surrounding structure. Packing materials such as slag wool or glass silk may also be used, and will be advantageous where fire resistance is important (*see* IS 1950 : 1962).

7 PROGRAMME OF WORK

7.1 The following facilities are necessary and shall be provided to the person entrusted with the gypsum partition work for carrying out his work satisfactorily:

a) Completion of proceeding work in floors, walls, beams, etc, which form support for the partition all around;

b) Installation of frames for doors, windows and other openings; and

c) Completion of service fixtures such as for electrical work, which are to be buried or hidden in the partition.

7.2 A properly worked out time schedule shall be available.

8 STORAGE AND HANDLING OF MATERIALS

Gypsum block shall be carefully handled throughout to avoid damage particularly to the arrises. The core holes of the cored blocks shall not be used for lifting. The blocks shall be neatly stored in a dry place as near as possible to the place of work. They shall be effectively protected from rain.

9 LAYING THE BLOCKS

9.1 Gypsum blocks shall preferably not be wetted before laying. Where, however, the suction of the block surfaces in contact with the mortar is so great as to make wetting necessary, only these faces may be wetted using a suitable brush and with the minimum quantity of water.

9.2 Coursing and Bonding

Gypsum block partitions shall be built in half bond in true level and regular courses (*see* Fig. 3).

9.3 Mortar Joints

The joints shall be as thin as possible. Where the partition is to be plastered, the joint shall be left roughly flush or they may be slightly raked out. If the partition is not to be plastered, the joints shall be neatly finished flush with the face as the work proceeds and care shall be taken to keep the faces clean and free from mortar splashings and stains.

9.4 Frames for Doors and Other Openings

Where possible frames shall have their posts extending from floor to ceiling to secure a positive fixing to the surrounding structure at both ends and shall have a groove of channel at least 15 mm deep to receive the ends of the blocks.

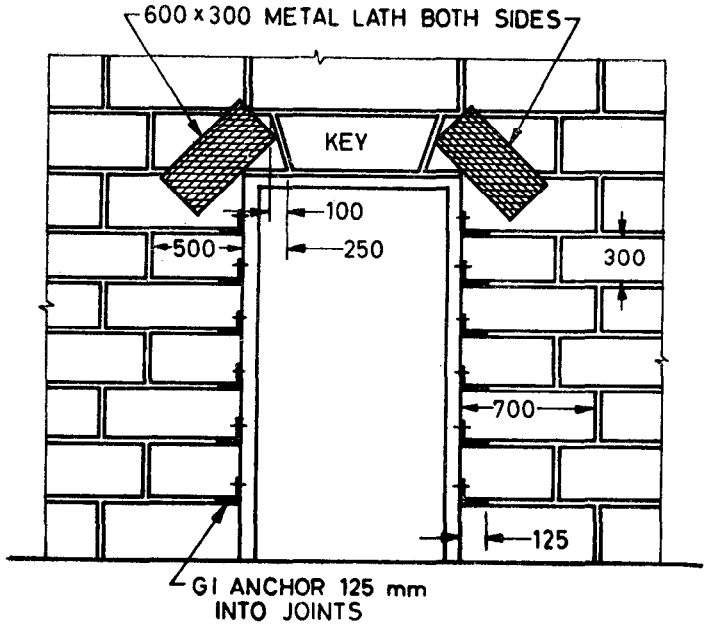
9.5 Lintels

9.5.1 The lintel over an opening not more than 0·5 m wide may consist of a single gypsum block having 100 mm bearing at each end.

9.5.2 Where no other support is provided, the lintel over an opening not more than 1·2 m wide may consist of three unreinforced gypsum blocks cut to form a jack-arch. The bearing at each end shall be not less than 350 mm and the bottom side of the key block shall be not more than 500 mm (*see* Fig. 4).

9.5.3 The lintel over an opening not more than 1·8 m wide shall consist of gypsum blocks having the upper and lower core holes filled with gypsum mortar and reinforced with 10 mm steel bars. The minimum bearing at each end shall be 100 mm.

9.5.4 Lintels over an opening more than 1·8 m wide shall be a separate lintel designed to support the superincumbent load and having a bearing of not less than 100 mm at each end.



All dimensions in millimetres.

FIG. 4 REINFORCEMENT AROUND OPENING IN GYPSUM BLOCK PARTITIONS

9.6 Treatment at Heads of Partitions

9.6.1 At the ceiling the partitions shall be securely wedged and pinned to the structure above unless special methods of edge isolation are adopted. If the cutting of a cored block exposes the core holes or leaves only a thin shell on top, the core shall be filled solid with mortar before the block is laid. It is essential that the joints in the partition are hardened before any wedging or pinning-up is down.

9.6.2 *Dwarf Partitions*

At the head of dwarf partitions lateral supports shall always be provided either by using a capping rail of sufficient rigidity or by staying it to the adjacent main structure.

10 FINISHING

Gypsum block partitions shall normally be finished with a rendering of gypsum plaster not less than 6 mm thick. Where the partition is not to be rendered, it shall be cleaned down and any defects made good with neat gypsum plaster or with mortar as specified in **5.3**.

ANNEX A
(*Clause* 2.1)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
383 : 1970	Specification for coarse and fine aggregates from natural sources for concrete (*revised*)
1950 : 1962	Code of practice for sound insulation of non-industrial buildings
2849 : 1983	Specification for non-load bearing gypsum partition blocks (solid and hollow types)

Standard Mark

The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The Standard Mark on products covered by an Indian Standard coveys 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 BIS and operated by the producer. Standard marked products are also continusly checked by BIS for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

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Revision of Indian Standards

Indian Standards are reviewed periodically and revised, when necessary and amendments, if any, are issued from time to time. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition. Comments on this Indian Standard may be sent to BIS giving the following reference :

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices:	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola, CALCUTTA 700054	37 84 99, 37 85 61, 37 86 26, 37 86 62
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