

IS : 10359 - 1982

Indian Standard

CODE OF
PRACTICE FOR MANUFACTURE AND
USE OF LIME-POZZOLANA CONCRETE
BLOCKS FOR PAVING

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

Indian Standard

CODE OF PRACTICE FOR MANUFACTURE AND USE OF LIME-POZZOLANA CONCRETE BLOCKS FOR PAVING

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Cement Research Institute of India, New Delhi

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Ministry of Railways

Builder's Association of India, Bombay

Central Building Research Institute (CSIR),
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Deptt of Science and Technology, New Delhi

Dyer's Stone Co Pvt Ltd, Delhi

Khadi and Village Industries Commission, Bombay

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Indian Standard

CODE OF PRACTICE FOR MANUFACTURE AND USE OF LIME-POZZOLANA CONCRETE BLOCKS FOR PAVING

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 25 October 1982, after the draft finalized by the Limes Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Lime-pozzolana concrete blocks in addition to precast cement concrete blocks, stone tiles and burnt clay bricks can also be used in the construction of footpaths, pavements, passenger waiting sheds at bus stops and other places. These blocks are normally manufactured by using lime and pozzolana or lime-pozzolana mixture as binder. The Indian Standard specification laying down the dimensions and strength requirements for lime-pozzolana concrete blocks for paving has been covered separately. This code, which is an essential adjunct to the above specification, is intended to provide guidance with respect to the manufacture and use of such blocks.

0.3 In the preparation of this standard, considerable assistance has been rendered by the Central Road Research Institute, New Delhi.

0.4 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 code covers the method of manufacture and curing of lime-pozzolana concrete blocks for use in paving.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 3115-1978* and IS : 6508-1972† shall apply.

3. MATERIAL

3.1 **Lime** — Shall conform to class C (hydrated) of IS : 712-1973‡.

3.2 **Fly Ash** — Shall conform to grade I of IS : 3812-1981§.

3.3 **Burnt Clay Pozzolana** — Shall conform to IS : 1344-1968||.

3.4 **Lime-Pozzolana Mixture** — Shall conform to IS : 4098-1982¶.

3.5 **Coarse and Fine Aggregate** — Shall be either natural or crushed stone conforming to IS : 383-1970**.

3.6 **Water** — Water used for manufacture of blocks shall be clean and free from harmful amount of deleterious material. Potable water is generally considered satisfactory. For further requirements regarding limits of deleterious materials permitted, reference may be made to IS : 456-1978††.

3.7 **Storage of Materials** — Storage of the materials shall be in accordance with IS : 4082-1977‡‡.

4. MIX PROPORTIONS

4.1 The suggested proportions of lime-pozzolana concrete for making lime-pozzolana concrete blocks are given in Table 1.

5. MIXING

5.1 Mixing shall be done preferably in a mechanical concrete mixer.

5.1.1 Part of total water shall be added first and then coarse aggregate lime and pozzolana or lime-pozzolana mixture shall be fed in the drum of the mixer and the contents mixed. The remaining quantity of water shall then be finally added and the contents shall be mixed thoroughly. The total time of mixing shall be not less than 2 minutes and shall be

*Specification for lime based blocks (*first revision*).

†Glossary of terms relating to building lime.

‡Specification for building limes (*second revision*).

§Specification for fly ash for use as pozzolana and admixture (*first revision*).

||Specification for burnt clay pozzolana (*first revision*).

¶Specification for lime-pozzolana mixture (*first revision*).

**Coarse and fine aggregates from natural sources for concrete (*second revision*).

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

‡‡Recommendations on stacking and storage of construction materials at site (*first revision*).

sufficient to ensure uniform mixing. Due allowance for water absorption by coarse and fine aggregate shall be given and the workability of the mix shall be adjusted depending upon the method of compaction adopted [(see 6.1.2 and 6.1.3 of IS : 2185 (Part I)-1979*].

6. MANUFACTURE

6.1 The lime-pozzolana concrete blocks for paving shall be of standard size 300 × 300 × 100 mm. The total thickness of 100 mm shall consist of 90 mm thick lower layer of lime-pozzolana concrete, topped with 10 mm mm thick wearing coarse layer of cement and sand.

**TABLE 1 RECOMMENDED MIX PROPORTIONS FOR LIME
POZZOLANA CONCRETE BLOCKS**
(Clause 4.1)

Sl. No.	DESCRIPTION	MIX PROPORTION (BY MASS)					
		Lime Pozzo-lana Mixture	Lime	Pozzo-lana	Fine Aggre-gate	Coarse Aggre-gate of Size 20 mm Graded	Water Re-quirement by Mass of Total Material (Percent)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Using lime-pozzo-lana mixture of grade						
	LP 20	1	—	—	1	2	11
	LP 40	1	—	—	2	4	10
2	Using lime and pozzolana separately.						
	Lime reactivity (40 kgf/cm ²)	—	1	2	3	6	11
	Lime reactivity (80 kgf/cm ²)	—	1	2	6	12	10

NOTE — The above mix proportions are for information only and may be modified as required during manufacture to give the desired performance.

*Specification for masonry units : Part I Hollow and solid concrete blocks (second revision).

6.2 Lime-Pozzolana Concrete

6.2.1 The lime-pozzolana concrete layer shall be compacted in moulds (wooden or steel) either with pan tape surface vibrator or table vibrator or by hand tamping up to a height of 90 mm, out of the total height of 100 mm of the mould; when hand tamping is adopted, the compaction of lime-pozzolana shall be done in two layers.

6.3 Wearing Coarse

6.3.1 The wearing coarse layer of the remaining 10 mm height of the mould shall be provided with cement-sand mortar 1:3 (by mass), having water cement ratio of about 0.5 to 0.55 (by mass) and compacted either with pan type vibrator or table vibrator or by hand tamping.

6.3.2 In order to have a good bond between the top wearing coarse layer and the bottom lime pozzolana concrete layer, the wearing coarse layer shall be laid immediately after the compaction of lime-pozzolana concrete.

7. INITIAL CURING

7.1 Immediately after the block is prepared as per **6**, it shall be released from the mould and removed along with the base plate to a covered shed. The shed shall be such as to provide protection against sun, strong wind and rain. The blocks shall be stored in the shed covered with polyethylene sheets until these are sufficiently hardened to permit handling without damage. But in no case shall the period be less than 72 hours.

8. FINAL CURING

8.1 The blocks after initial curing for 72 hours shall be stacked, suitably covered and shall be kept moist by spraying with water at regular intervals. The final curing period shall be not less than 28 days.

AMENDMENT NO. 1 DECEMBER 1994
TO
IS 10359 : 1982 CODE OF PRACTICE FOR
MANUFACTURE AND USE OF LIME-POZZOLANA
CONCRETE BLOCKS FOR PAVING

(*First cover page, pages 1 and 3, title*) — Substitute the following for the existing title:

‘CODE OF PRACTICE FOR MANUFACTURE OF
LIME-POZZOLANA CONCRETE BLOCKS FOR
PAVING’

(*Page 4, clause 2.1*) — Substitute ‘IS 3115 : 1992*’ for ‘IS : 3115 - 1978*’ and ‘IS 6508 : 1988†’ for ‘IS : 6508 - 1972†’.

(*Page 4, clause 3.1*) — Substitute ‘IS 712 : 1984‡’ for ‘IS : 712 -1973‡’.

(*Page 4, clause 3.3*) — Substitute ‘IS 1344 : 1981||’ for ‘IS : 1344 - 1968 ||’.

(*Page 4, clause 3.4*) — Substitute ‘IS 4098 : 1983¶’ for ‘IS : 4098 - 1982¶’.

(*Page 4, new clause*) — Insert the following new clause after 3.4 and renumber the subsequent clauses:

‘3.5 Cement — shall conform to IS 269 : 1989 |||| or IS 1489 (Part 1) : 1991¶¶ or IS 1489 (Part 2) : 1991 ¶¶.’

(*Page 4, foot-notes with ‘*’, ‘†’, ‘‡’, ‘||’, ‘¶’, ‘||||’ and ‘¶¶’ marks*) — Substitute the following for the existing foot-notes:

*Specification for lime based blocks (*second revision*).

†Glossary of terms relating to building lime (*first revision*).

‡Specification for building limes (*third revision*).

||Specification for calcined clay pozzolana (*second revision*).

¶Specification for lime-pozzolana mixture (*first revision*).

|||| Specification for 33 grade ordinary portland cement (*fourth revision*).

¶¶Specification for portland pozzolana cement:

Part 1 Fly ash based (*third revision*).

Part 2 Calcined clay based (*third revision*).

(Page 5, clause 6.1) — Insert the following sub-clause after 6.1:

'6.1.1 Sizes other than those mentioned in 6.1 may be manufactured with the agreement between the supplier and the purchaser.'

AMENDMENT NO. 2 DECEMBER 1999
TO
IS 10359 : 1982 CODE OF PRACTICE FOR
MANUFACTURE AND USE OF LIME-POZZOLANA
CONCRETE BLOCKS FOR PAVING

(*Page 4, clause 3.7 and also see Amendment No. 1*) — Substitute the following for the existing clause :

'3.7 Storage of Materials — Storage of the materials shall be in accordance with IS 4082 :1996††'.

(*Page 4, footnote with '††' mark*) — Substitute the following for the existing:

'††Recommendations on stacking and storage of construction materials and component at site (second revision).'

(CED 04)

Reprography Unit, BIS, New Delhi, India