

भारतीय मानक
Indian Standard

IS 5758 : 2020

पूर्वढलित कंक्रीट कर्ब, चैनल, एजिंग,
क्वार्टेन्ट्स व अन्य सम्बन्धित फिटिंग —
विशिष्टि

(दूसरा पुनरीक्षण)

**Precast Concrete Kerbs, Channels,
Edging, Quadrants and Other
Associated Fittings —
Specification**

(*Second Revision*)

Incorporating Amendment 1 (2023)

ICS 93.080.20

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Price Group 8

Cement Matrix Products Section Committee, CED 53

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Cement Matrix Products Sectional Committee had been approved by the Civil Engineering Division Council.

With the development of precast concrete industry, the precast concrete units, such as kerbs, channels, edgings, quadrants, etc, have gained popularity in this country due to their ease of manufacture, technology upgradation, consistent quality and architectural features and other considerations. The different sections of these products shown in this standard are, as far as possible, a fair representation of the types which are used in the field.

This standard was first published in 1970 under the title 'Specification for precast concrete kerbs'. The first revision was published in 1984 under the modified title 'Specification for precast concrete kerbs, channels, edgings, quadrants and gutter aprons' so as to reflect the contents of the standard in the title.

This second revision of the standard incorporates modifications found necessary as a result of the experience gained with the use of the standard and to bring the standard in line with present good practices being followed in the country and abroad. The principal modifications in this revision are as follows:

- a) New types and sizes of products have been included as per the current practice;
- b) Interlocking end treatment of units has been introduced;
- c) Additional details of the sections/profiles have been added; and
- d) Requirement of testing for compressive strength has been included for products, where bending moment testing may be difficult due to shape constraint.

In the formulation of this standard, assistance has been also derived from the EN 1340 : 2003 'Concrete kerb units — Requirements and test methods'.

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

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

PRECAST CONCRETE KERBS, CHANNELS, EDGING, QUADRANTS AND OTHER ASSOCIATED FITTINGS — SPECIFICATION

(Second Revision)

1 SCOPE

This standard covers requirements of precast concrete units for kerbs, channels, edgings, quadrants, angles, off lets and other associated fittings for the use in the construction of carriage ways and footpaths.

2 REFERENCES

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

3 DEFINITIONS

For the purposes of this standard, the following terms and their definitions shall apply.

3.1 Actual Dimension — Dimension of a unit or any other element as measured.

3.2 Bed Face — Lower surface in contact with the ground after laying.

3.3 Channel — Precast concrete unit structure typically located at the edge of a road, used to move water from the pavement to a gutter to prevent excess water build upon roads as shown in Fig. 4.

3.4 Draw — Intended angle of the side face from the vertical plane over the full height of a unit.

3.5 Edging — Precast concrete unit forming an edge or border of a paved area, surfacing of carriage way or footpath as shown in Fig. 5.

3.6 Face — Surface intended by the manufacturer to be seen when laid and in use.

3.7 Facing Layer — Layer of concrete on the face, or part of a face, of different materials and/or properties to the main body or backing layer.

NOTE — It is distinguished from wipe, being a fine cement mortar or slurry applied to the surface of the unit or any other element.

3.8 Height (*H*) — Distance between the bed face and the top of the unit, as shown in Fig. 1

3.9 Overall Length (*L*) — Length of a unit, or any other element excluding any interlocking features or spacers, as shown in Fig. 1

3.10 Profile — Part of a unit where two faces meet. It can be square, bull nosed, splayed and half batter, as shown in Fig. 1 and Fig. 2.

3.11 Quadrant — Any of the four portions into which a precast unit is divided by the horizontal and vertical axes.

3.12 Radiussed Kerbs — Radiussed kerbs shall be described as convex or concave. The description shall refer to the reference line. The radius of a kerb and its overall length shall be measured to and along its reference line, (*see* Fig. 8).

3.13 Reference Line — Line to which the unit is intended to be laid.

3.14 Traffic Face — Face of a unit intended by the manufacturer to be above a road surface and which provides containment of traffic.

3.15 Unit — precast concrete unit such as kerb, channel, edging, quadrant, angle, offset and complementary fittings, etc, individual or in combination with other units, intended to separate surfaces of the same or of different levels to provide physical or visual delineation or containment and separation between areas submitted to different kinds of traffic.

3.16 Work Dimension — Dimension of a unit or any other element specified for its manufacture to which the actual dimension should conform within specified permissible deviations.

4 SHAPE AND DIMENSIONS

4.1 The units shall be made in shape and dimensions to fit different construction needs. They include kerb, channel, edging, quadrant, angles, offlets and radiussed kerb.

4.2 The shape and dimensions of unit shall be as per Table 1.

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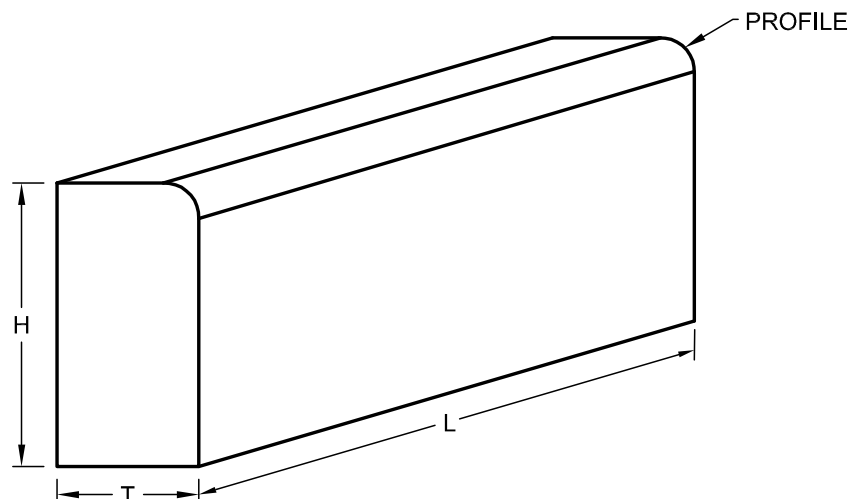


FIG. 1 TYPICAL DETAIL OF KERB

Table 1 Shape and Dimensions of Precast Concrete Unit
(Clause 4.2)

Sl No.	Classification	Ref to Fig.	Dimension and Profile			
			Length(L) mm	Height(H) mm	Thickness(T) mm	Profile / Section (see Fig. 2)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	Kerbs:					
	a) Straight kerb	Fig. 3A	300,500,600,1 000	200,300,375,450,600	100,125,150,165	Any profile
	b) Transition Kerb	Fig. 3B	300,500,600,1 000	200,300,375,450,600	100,125,150,165	Any profile or combination of two profile
	c) Dropper kerb	Fig. 3C	300,500,600,1 000	150,250,300,325,375,450	100,125,150,165	Any profile or combination of two profile
ii)	Channels:		300,500,600,1 000			
	a) Channel square	Fig. 4A	300,500,600,1 000	200,300,450	100,125,150	Square
	b) Channel dished	Fig. 4B	300,500,600,1 000	200,300,450	100,125,150	Dished
iii)	Edgings:					
	a) Profile edging	Fig. 5A	300,500,600,1 000	150,200,250,300	50,75,100,125	Any profile
	b) Round top edging	Fig.5B	300,500,600,1 000	150,200,250,300	50,75,100,125	Round
	c) Flat top edging	Fig. 5C	300,500,600,1 000	150,200,250,300	50,75,100,125	flat
iv)	Quadrants	Fig. 6	NA	150,200,250,300	300,450	Any profile
v)	Angles:					
	a) Internal angle	Fig. 7A	300	150,200,250	125,150	Any profile
	b) External angle	Fig. 7B	300	150,200,250	125,150	Any profile
vi)	Offlets	Fig. 9	500,600,1 000	250,300	125,150	Any profile
vii)	Radiussed kerbs:			Radius (R)		
	a) Convex	Fig. 8	780	0.5,1,2,3,4,5,6,8,10 and 15 m		Any profile
	b) Concave		780	0.5,1,2,3,4,5,6,8,10 and 15 m		Any profile

NOTES

1 It is recommended that the Splayed kerb should not be used where the footway is immediately adjacent to the carriageway. Their use should be confined to cases where a strip of substantial width, but in no case less than I 500 mm, separates the footway from the carriageway.

2 The recommended length of a straight kerb including joint is 1 m.

3 Units of sizes other than those specified in Table 2 may also be used by mutual agreement between the purchaser and the supplier. In the case of special units, the specified sizes may not necessarily apply.

4.3 All references to dimensions are work dimensions. The work dimensions shall be stated by the manufacturer.

4.4 For the manufacturing of units the profile given in Table 2 and Fig. 2 shall be used.

Table 2 Profile of the Manufacturing Units
(Clause 4.4)

Sl No.	Profiles	Ref to Fig.
(1)	(2)	(3)
i)	Square	Fig. 2A
ii)	Bullnosed	Fig. 2B
iii)	Splayed	Fig. 2C
iv)	Half Batter	Fig. 2D

4.5 Units with Special Faces

4.5.1 The units with special facing and backing layers shall be manufactured and supplied as agreed upon between the supplier and the purchaser. When units are produced with a facing or backing layer this layer shall have a minimum thickness of 4 mm over that area claimed by the manufacturer.

4.5.2 The units may be produced with functional and/or decorative profiles, which shall not be included in the work dimensions of a units. The surface of units may be textured, secondary processed or treated chemically.

These finishes or treatments shall be described and declared by the manufacturer.

4.6 End Treatment

Units may be manufactured with plain ends or with end features to facilitate interlocking or laying. These features shall be declared by the manufacturer. Typical detail are given in Figs. 10, 11 and 12.

5 DESIGNATION OF SIZES

For the designation of unit, dimensions of the face which will be horizontal after laying shall be given first, and the dimensions of the face which will be vertical, second. Thickness shall be specified separately.

6 TOLERANCES

6.1 The values for the permissible deviations on the manufacturer's declared work dimensions are as given below:

- a) Length: ± 1 percent or ± 10 mm, whichever is smaller.
- b) Other dimensions, except radius:
 - 1) For faces: ± 3 percent or ± 5 mm, whichever is smaller.
 - 2) For other parts: ± 5 percent or ± 10 mm, whichever is smaller.

The difference between any two measurements of a single dimension of a single unit shall be ≤ 5 mm.

- c) The radius in the profiles shall be given in Fig. 2.

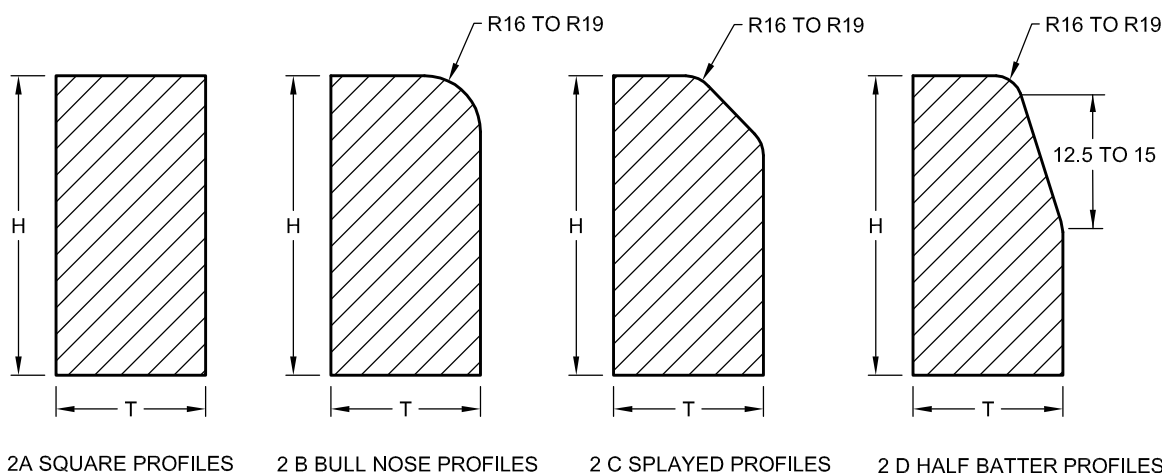


FIG. 2 TYPICAL DETAIL OF PROFILES

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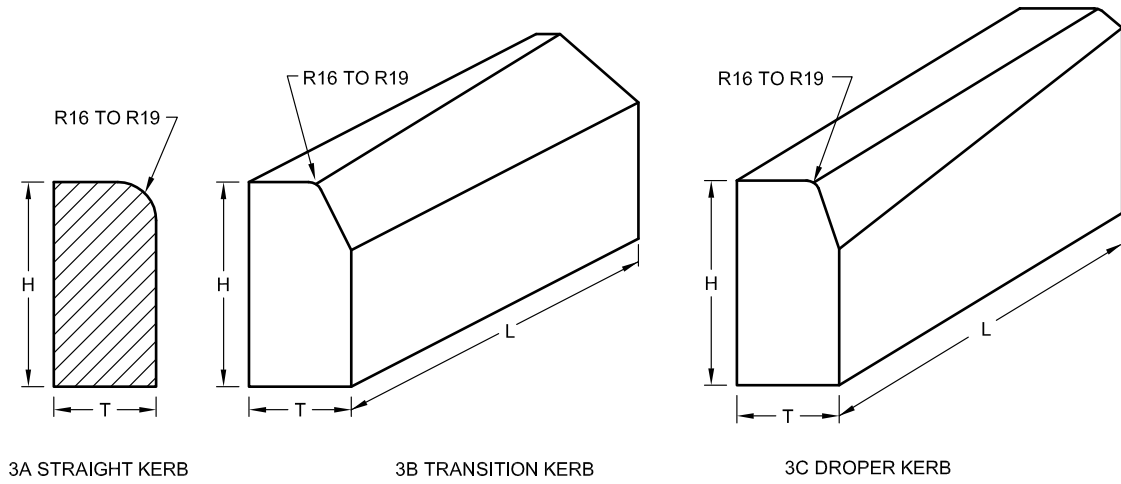


FIG. 3 TYPICAL DETAIL OF KERB

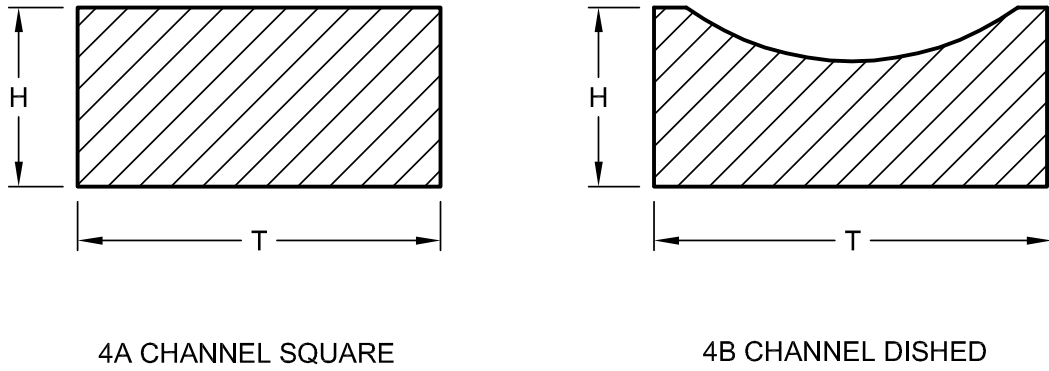


FIG. 4 TYPICAL DETAIL OF CHANNEL

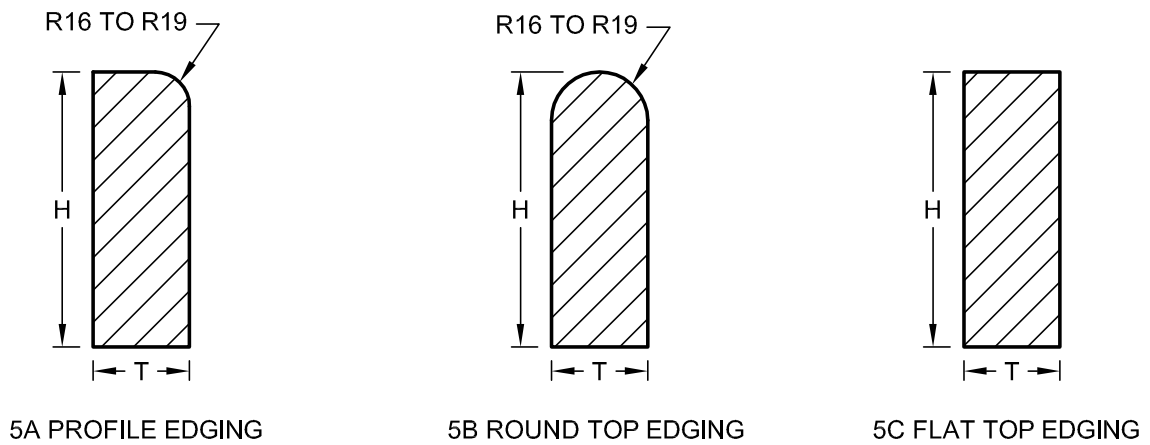


FIG. 5 TYPICAL DETAIL OF EDGING

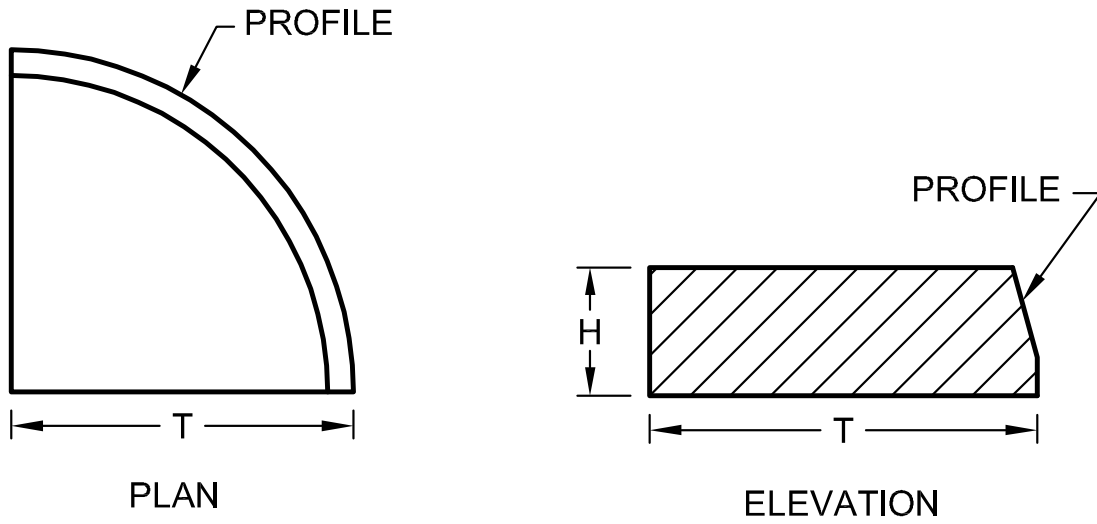


FIG. 6 TYPICAL DETAIL OF QUADRANT

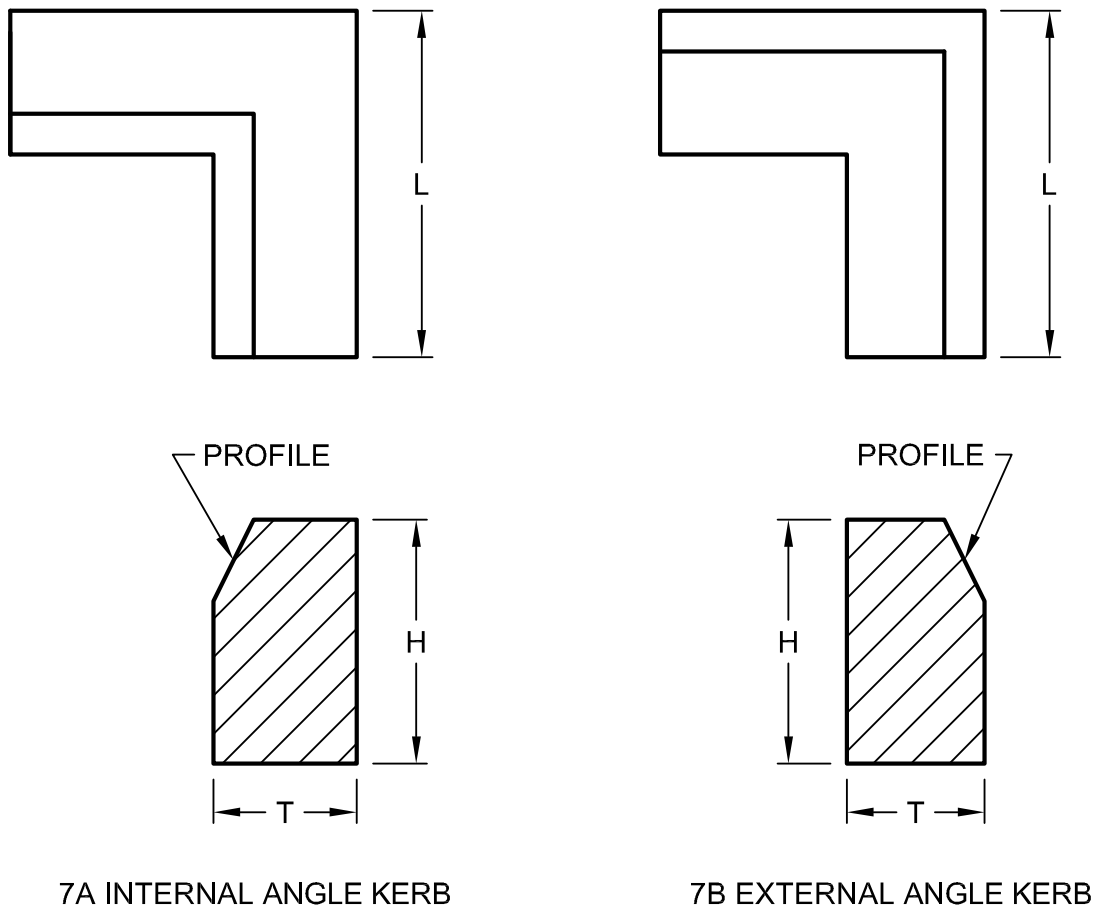
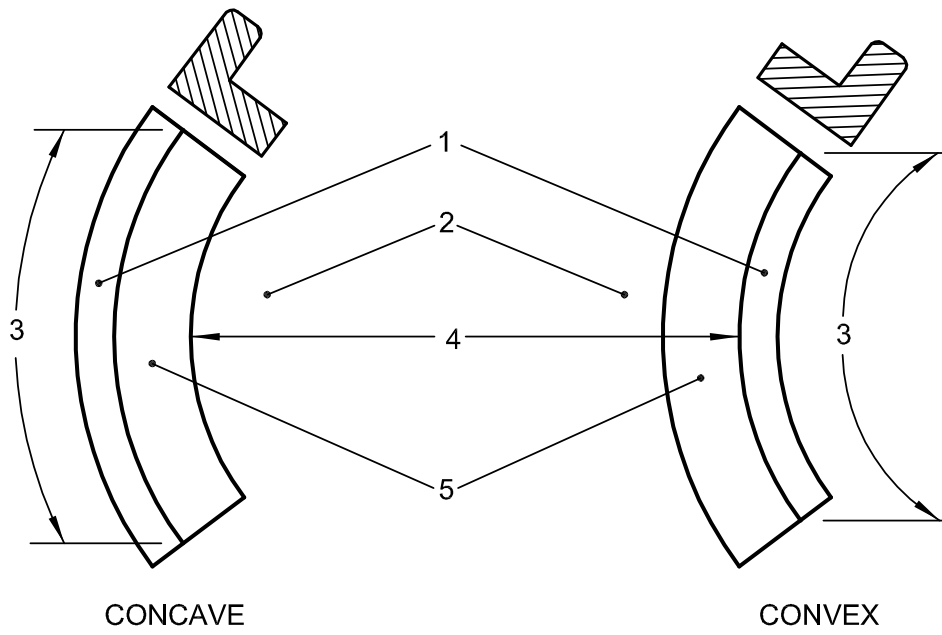


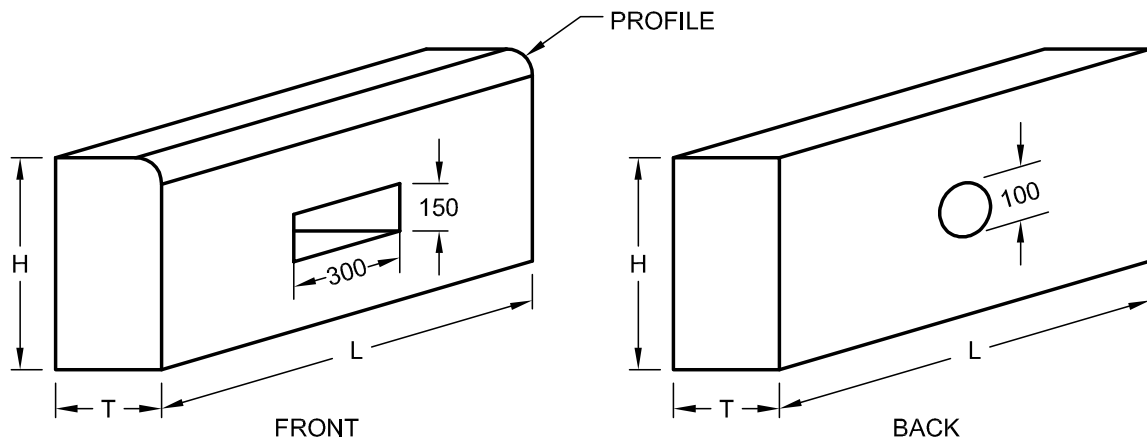
FIG. 7 TYPICAL DETAIL OF ANGLE

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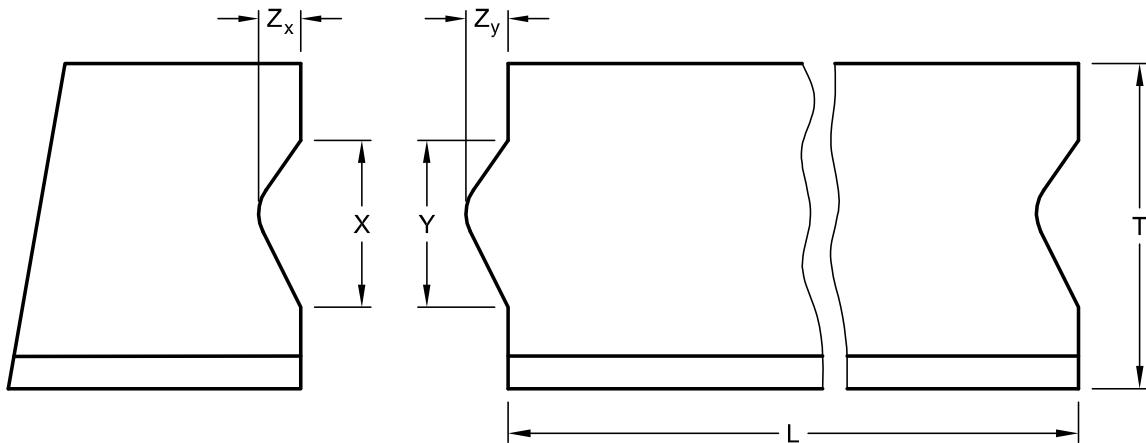
- Key
1 Kerb
2 Carriageway
3 Length
4 Radius
5 Channel

FIG. 8 TYPICAL DETAIL OF RADIUSSED KERB



All dimension in millimetres.

FIG. 9 TYPICAL DETAIL OF OFFLET



Key

$Y \leq X - 3 \text{ mm}$ and $Z_y \leq Z_x - 3 \text{ mm}$,

X minimum: $\geq 1/5 T$ and $\geq 20 \text{ mm}$,

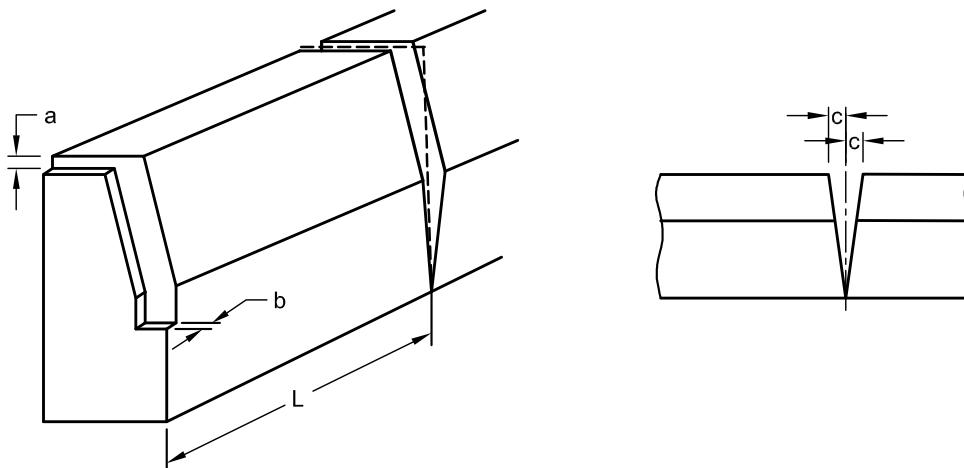
X maximum: $\leq 1/3 T$ and $\leq 70 \text{ mm}$,

Z_y maximum: $Y/2$

Tolerance on X and Z_x : $-1, +2 \text{ mm}$,

Tolerance on Y and Z_y : $-2, +1 \text{ mm}$

FIG. 10 TYPICAL DETAIL OF SIDE INTERLOCKING



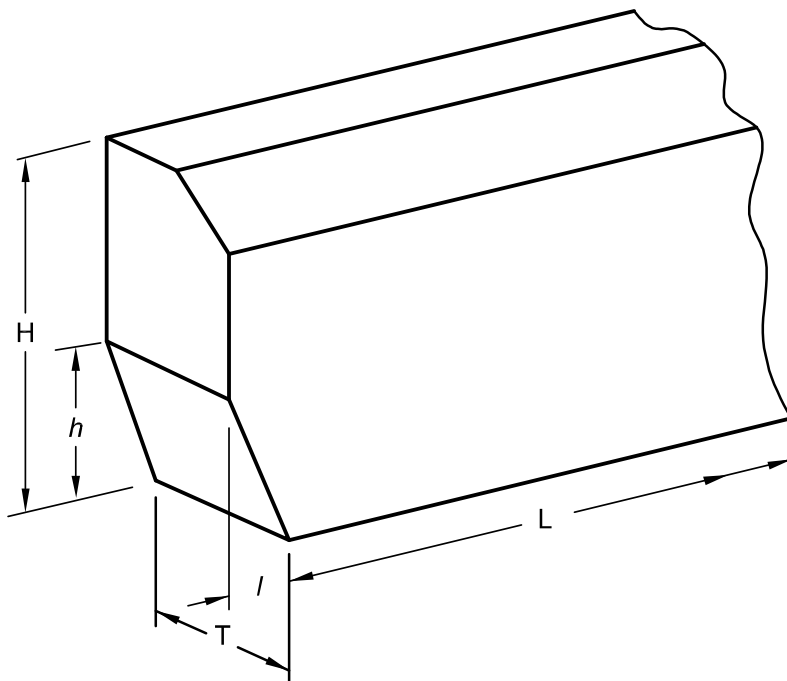
Key

a & b – Dimensions of chase

c – Dimension of draw

FIG. 11 TYPICAL DETAIL OF CHASE AND DRAW INTERLOCKING

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Key
h – Height of the cut-out
l – Length of recess or cut-out

FIG. 12 TYPICAL DETAIL OF BOTTOM END CUT-OUT INTERLOCKING

6.2 For faces described as flat and edges described as straight, the permissible deviations on flatness and straightness are given in Table 3.

Table 3 Permissible Deviations on Flatness and Straightness
 (Clause 6.2)

Sl No.	Length of Gauge	Permissible Deviations on Flatness and Straightness
	mm	mm
(1)	(2)	(3)
i)	300	± 1.5
ii)	400	± 2.0
iii)	500	± 2.5
iv)	800	± 4.0

7 MATERIALS

7.1 Cement

Cement complying with any of the following Indian Standards may be used:

- a) Ordinary Portland cement conforming to IS 269,
- b) Portland slag cement conforming to IS 455,

- c) Sulphate resisting Portland cement conforming to IS 12330,
- d) Portland pozzolana cement conforming to IS 1489 (Part 1),
- e) Portland pozzolana cement, calcined clay based conforming to IS 1489 (Part 2),
- f) Super sulphated cement conforming to IS 6909,
- g) Rapid hardening Portland cement conforming to IS 8041,
- h) White Portland cement conforming to IS 8042,
- j) Hydrophobic Portland cement conforming to IS 8043, and
- k) Composite cement conforming to IS 16415.

7.2 Aggregates

7.2.1 Fine and coarse aggregates used in the manufacture shall conform to IS 383.

7.2.2 The maximum size of coarse aggregates shall be 20 mm graded or one-fourth of the minimum thickness of the section, whichever is less.

7.3 Pulverized Fuel Ash

Pulverized fuel ash, if used shall conform to IS 3812 (Part 1) or IS 3812 (Part 2).

7.4 Ground Granulated Blast Furnace Slag

Ground granulated blast furnace slag, if used shall conform to IS 16714.

7.5 Additives or Admixtures

Additives or admixtures may be added either as additives to the cement during manufacture, or as admixtures to the concrete mix.

Chemical admixture used shall conform to IS 9103.

7.6 Pigments

7.6.1 Synthetic or natural pigments may be used in concrete mix to obtain units with desired shades of colours. The pigment used should result in durable colours of units. It shall not contain matters detrimental to concrete. Pigments, either singly or in combination, conforming to the following Indian Standards may preferably be used:

<i>Pigments</i>	<i>Relevant Indian Standard</i>
(1)	(2)
Black or Red or Brown pigment	IS 44
Yellow pigment	IS 50
Green pigment	IS 54
Blue pigment	IS 55 or IS 56
White pigment	IS 411

Pigment quantity to be restricted to a maximum of 9 percent by mass of cement content. The pigment should be finer than the cement.

7.6.2 The pigments shall not contain zinc compounds or organic dyes.

7.6.3 Lead pigments shall not be used.

8 MANUFACTURE

~~8.1 The units in accordance with this standard shall be of cement concrete.~~ Batching of the ingredients should be done accurately and concrete mixing shall be done in a mixer to achieve homogeneous mix. Mixing shall be continued until there is a uniform distribution of the materials, and the mass is uniform in colour and consistency.

8.2 The units may be compacted by vibrator compaction or pressing machine and finished to proper size, without broken edges. After demoulding, the units shall be handled carefully to avoid damage. The units shall be protected until they are sufficiently hardened before starting curing.

8.3 The hardened units shall then be cured as per IS 456 so as to deliver the specified strength of units.

7.7 As per the agreement between manufacturer and purchaser, precast concrete kerbs, channels, edging, quadrants and other associated fittings may also be manufactured by using alkali activated concrete as per IS 17452.'

9 PHYSICAL REQUIREMENTS

9.1 General

All units shall be sound and free of cracks or other defects which interfere with the proper placing of the unit or impair the strength or performance of the construction. Minor chipping resulting from the customary methods of handling during delivery, shall not be deemed grounds for rejection. All angles of the units with the exception of the angles resulting from the splayed or chamfered faces shall be true right angles.

9.2 Dimensions

The overall dimensions of the units when measured as given in Annex B shall in accordance with Table 2 subject to the tolerances mentioned in 6.

9.3 Bending Strength

The minimum average bending strength of five units, and the minimum bending strength of individual units, when tested in the manner described in Annex C shall not be less than 5.0 MPa and 4.0 MPa, respectively. Products, such as quadrants, angles, offlets and radiussed kerbs, which cannot be tested for bending strength, will be tested for compressive strength by extracting a core. In such cases, the minimum average compressive strength of the concrete core shall not be less than 30 MPa.

9.3.1 The above test for bending strength shall be carried out after 14 days of producing the unit.

9.4 Water Absorption

The water absorption, being the average of three units, when determined in the manner prescribed in Annex D shall not be more than 6 percent by mass.

10 SAMPLING

10.1 The units required for carrying out the tests laid down in this standard shall be taken by one of the methods given in 10.2 and 10.3. In either case, a sample of 8 units shall be taken from every lot/consignment of 2 000 units or part thereof from the same shape, size and same batch/lot of manufacture.

10.2 The required number of units shall be taken at regular intervals during the loading of the vehicle or the unloading of the vehicle depending on whether sample is to be taken before delivery or after delivery. When this is not practicable, the sample shall be taken from the stack in which case the required number of units shall be taken at random (*see* IS 4905) from across the top of the stacks, the sides accessible and from the interior of the stacks by opening trenches from the top.

10.3 The sample of blocks shall be marked for future identification of the consignment it represents. The units shall be kept under cover and protected from

The units in accordance with this standard shall be of cement concrete as per IS 456 or alkali activated concrete as per IS 17452. Where alkali activated concrete is used for manufacture, the constituent materials, mix design procedure and curing requirements shall be as per IS 17452. [Inplace of 1st sentence of clause 8.1]

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extreme conditions of temperature, relative humidity and wind until they are required for test. The tests shall be undertaken as soon as practicable after the sample has been taken.

10.4 Number of Tests

10.4.1 All the 8 units shall be checked for dimensions and inspected for visual defects.

10.4.2 Out of the 8 units, 3 units shall be subjected to the test for water absorption and 5 units bending strength and later to the test for facing or backing layer, if applicable.

11 CRITERIA FOR CONFORMITY

11.1 The lot shall be considered as conforming to the requirements of the specification, if the conditions mentioned in **9.1**, **9.3** and **9.4** are satisfied.

11.2 The number of units with dimensions outside the tolerance limit and/or with visual defects, among those inspected shall be not more than two.

12 RETESTS

12.1 Any test sample which fails to comply with the requirements of either of the tests specified in **9.1**, **9.3** and **9.4**, one set of test samples from the batch/lot comprising the same order shall be tested further.

12.2 If these further test samples fail to comply with the requirements of the tests, the whole of the batch/lot represented by the samples shall be rejected.

13 FACILITIES FOR SAMPLING AND TESTING

The purchaser or his representative shall, at all reasonable times, have access to the place where the units are manufactured or stored, for the purpose of examining and sampling the materials and the finished units, inspecting the process of manufacture, and testing

and marking the units. The supplier/manufacturer shall, free of cost provide or make arrangements for the provision of every facility and all labour required for such examination, sampling, inspecting, testing and marking before delivery, and shall provide and maintain or make arrangements of providing and maintaining in good working order suitable, convenient and accurate apparatus for testing samples as hereinafter shall be provided.

14 MANUFACTURER'S CERTIFICATE

The manufacturer shall satisfy himself that the units, comply with the requirements of this Indian Standard and, if requested, shall forward a certificate to this effect to the purchaser or his representative. The manufacturer shall, if requested to do so, supply a certificate stating the date of manufacture of the units. If the purchaser or his representative requires independent tests, the samples shall be taken before or immediately after delivery at the option of the purchaser or his representative. The tests shall be carried out in accordance with the standard on the written instructions of the purchaser or his representative in a testing laboratory mutually agreed upon by the purchaser and manufacturer.

15 MARKING

15.1 The following particulars relating to the units shall be made available on the invoice or on the manufacturer's certificate:

- a) Source of identification of the manufacturer;
- b) Designation of the unit; and
- c) Date of production and batch number.

15.2 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

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ANNEX B

(Clauses 6 and 9.2)

MEASUREMENT OF DIMENSIONS OF A SINGLE UNIT

B-0 Fifteen full size units shall be measured for dimension. Alternative test methods, for example go and no-go gauges, may be used provided at least the same accuracy is achieved as in the following test method.

B-1 PREPARATION

Remove all flashings and burrs from the unit to be measured.

B-2 OVERALL DIMENSIONS

B-2.1 Apparatus

Measuring equipment capable of measuring with an accuracy of 0.5 mm.

B-2.2 Procedure

B-2.2.1 Length

Measure the overall length of a unit at the front and back at 10 mm above the bottom in whole millimetres. Record the measurements and the calculated difference. The chase and draw shall not be taken into account.

B-2.2.2 Width

Measure the width on both ends of a unit at the top (only if the width at the top is intended to be equal to the width at the bottom) and at 10 mm from the bottom. Record the measurements in whole millimetres and the calculated difference.

B-2.2.3 Height

Measure the height at the back of the units at 10 mm from both ends. Record the measurements in whole millimetres and the calculated difference.

B-3 DRAW

B-3.1 Apparatus

Measuring equipment capable of measuring with an accuracy of 0.5 mm.

B-3.2 Procedure

Place two units together (or the two halves of one unit after the bending test) and measure the opening at the top between the two units. Record the mean opening in whole millimetres. When the specification is in angular terms, use appropriate tables and record the angle.

B-4 CHASE

B-4.1 Apparatus

Measuring equipment capable of measuring with an accuracy of 0.5 mm.

B-4.2 Procedure

Put the units on a side and measure the chase at both ends of the unit. Record the appropriate dimensions of the chase, in whole millimetres.

B-5 FLATNESS AND STRAIGHTNESS

B-5.1 Apparatus

Measuring equipment capable of measuring with an accuracy of 0.1 mm.

B-5.2 Procedure

The maximum convex and concave deviation shall be measured along the trafficked face.

B-6 THICKNESS OF FACING LAYER

B-6.1 Apparatus

Measuring equipment capable of measuring with an accuracy of 0.5 mm.

B-6.2 Procedure

Take a unit which has been broken during bending moment test. Measure the thickness of the facing layer on the broken face at the point where, by visual inspection, the value will be a minimum. Record the measurement to the nearest millimetre. Isolated particles of aggregate protruding into the facing layer shall be ignored.

ANNEX C

(Clauses 9.3)

MEASUREMENT OF BENDING STRENGTH

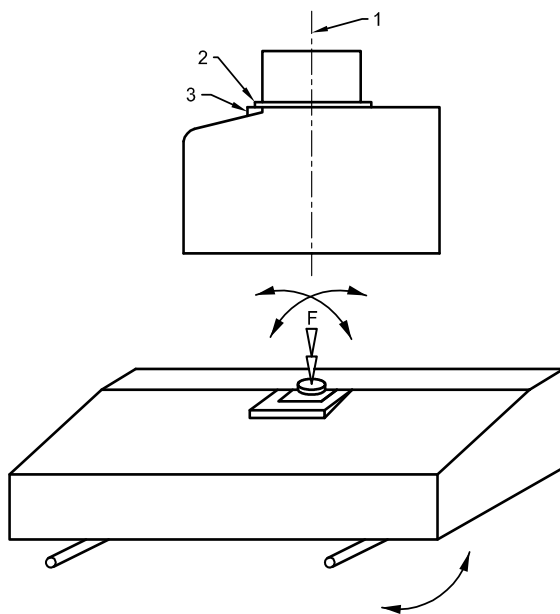
C-1 APPARATUS

The transverse testing machine shall have a scale with an accuracy of ± 3 percent over the range of anticipated test loads and shall be capable of increasing the load at specified rates.

It shall be constructed in such a way that it can induce three point bending into the sample without torsion (see Fig. 13).

The length of the supports shall be at least equal to the width of the sample as tested and the load shall be applied through a swivel joint on a 40 ± 1 mm diameter pad of steel with a minimum thickness of 20 mm.

The lower bearers shall be rigid and round or rounded to a radius of 20 ± 1 mm.



Key:

1 Centre of gravity line

2 Packing piece

3 Hardwood wedge or mortar pack

FIG. 13 PRINCIPAL OF BENDING STRENGTH TESTING

C-2 PREPARATION

Use whole units and remove any burrs and high spots, if necessary. Immerse the units in water at 27 ± 2 °C for 24 ± 3 h. Remove, wipe dry and test immediately. Other methods of preparation may be used for routine testing providing there is a correlation between the results of the two methods.

C-3 PROCEDURE

The distance between the bearers and the ends of the unit shall be 100 mm, but if the span is less than four times the vertical dimension of the unit as placed in the testing machine, the distance between the bearers and the end of the unit shall be reduced to half the vertical dimension of the unit in the test position. If, after this reduction, the span is still less than four times this vertical dimension, this test cannot be performed. The actual span between the bearers shall be within 0,5 percent of the specified span rounded to the nearest millimetre and recorded. Apply the load ± 5 mm from the centre of gravity line of the unit. The unit shall always be tested with the biggest dimension of the cross section horizontally. Place the specimen symmetrically on the bearers of the testing machine with its greater cross-sectional dimension horizontal and place a plywood packing of 4 ± 1 mm thick under the steel pad. When units having profiles are to be tested, insert a suitable hardwood wedge or mortar pack between the unit and the pad. Apply the load without shock and increase the stress at a rate of 0.06 ± 0.02 MPa/s until the specimen fails. Record the failure load P to 100 N.

C-4 CALCULATION OF TEST RESULTS

Using the work dimensions of the failure plane calculate the second moment of area I about a horizontal axis through the centre of the area of the failure plane.

Calculate the strength, T , in megapascals of the unit tested from the equation:

$$T = \frac{P \times L \times y}{4 \times I}$$

where

T = strength, in megapascals;

P = failure load, in newtons;

L = distance apart of the supports, in millimetres;

I = second moment of area, determined from the work dimensions; and

Y = distance from the centroid to the extreme tensile fibre.

Record the individual result, in megapascals.

C-5 TEST REPORT

The test report shall include the strength, T , of the unit.

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ANNEX D

(Clauses 9.4)

DETERMINATION OF TOTAL WATER ABSORPTION

D-1 PRINCIPLE

After conditioning the specimen to 27 ± 2 °C it is soaked to constant mass and then oven dried to constant mass. The loss in mass is expressed as a percentage of the mass of the dry specimen.

D-2 SPECIMEN

Cut two specimens, one from each end of the unit. The specimens may be sawn or cored and shall have a mass greater than 2.5 kg but not more than 5.0 kg. If the unit is composed of two mixes the specimens shall contain the mixes in similar proportions to those of the unit.

D-3 MATERIALS

Potable water.

D-4 APPARATUS

D-4.1 Ventilated Drying Oven, with a capacity in litres over an area of ventilation channels in square millimetres less than 0.2 in which the temperature may be controlled to 105 ± 5 °C. It shall have a volume at least 2.5 times greater than the volume of specimens to be dried at any one time.

D-4.2 Flat Based Vessel, having a capacity at least 2.5 times the volume of samples to be soaked and a depth at least 50 mm greater than the height of the specimens in the attitude that they will be soaked.

D4.3 Balance, reading, in grams and accurate to 0.1 percent of the reading.

D-4.4 Stiff Brush

D-4.5 Cloth

D-5 PREPARATION OF THE TEST SPECIMENS

Remove all dust, flashing, etc. with a brush and ensure that each specimen is at a temperature of 27 ± 2 °C.

D-6 PROCEDURE

Immerse the specimens in potable water at a temperature of 27 ± 5 °C using the vessel until constant mass M_1 is reached. Separate the specimens from each other by at least 15 mm and ensure a minimum of 20 mm water above them. The minimum period of immersion shall be 3 days and constant mass shall be deemed to have been reached when two weighings performed at an interval of 24 h show a difference in mass of the specimen of less than 0.1 percent. Before each weighing wipe the specimen with the cloth which has been moistened and squeezed to remove any excess of water. The drying is correct when the surface of the concrete is dull.

Place each specimen inside the oven in such a way that the distance between each specimen is at least 15 mm. Dry the specimen at a temperature of 105 ± 5 °C until it reaches constant mass M_2 . The minimum period of drying shall be 3 days and constant mass shall be deemed to have been reached when two weighings performed at an interval of 24 h show a difference in mass of the specimen of less than 0.1 percent. Allow the specimens to cool to room temperature before they are weighed.

D-7 CALCULATION OF TEST RESULTS

Calculate the water absorption W_a of each specimen as a percentage of its mass from the equation:

$$W_a = \frac{M_1 - M_2}{M_2} \times 100 \text{ percent}$$

where

M_1 = initial mass of the specimen, in g; and

M_2 = final mass of the specimen, in g.

Calculate the mean value as a test result for the unit.

D-8 TEST REPORT

The test report shall give the values of water absorption for each of the specimens.