SPECIFICATION FOR PRECAST CONCRETE BLOCKS

PART 2: FILLER BLOCKS

REVISION HISTORY

Issue Date	Revision	Revision Description
14/08/2011	01	Clause 3 new sub clause 3.4, 3.5, and 3.6 are added Figure 1 has been removed Clause 5.2.4 has been revised Table B.3 of Annex B has been revised
28/06/2020	02	Some changes have been made in the standard and it has been highlight Annex B Has been removed

TABLE OF CONTENTS

FOREWORD

With a view to have a comprehensive set of unified Dubai Municipality Standards which would be consistent and appropriate to local conditions and yet be at par with International Standard, the Dubai Central Laboratory Department is formulating standards taking guidance as much as possible from International and Regional Norms.

The formulation of this Dubai Municipality Standards (DMS) Specification is in accordance with Local Order 44 issued in 1990 as amended by Local Order (1) 2012 on "Standard Specifications of Concrete Blocks Used in the Emirate of Dubai". This DMS Specifications takes into account the new developments in terms of materials, block types and manufacturing technology as well as the availability of test facilities and test methods.

In view of the above, this DM Standard Specification (DMS 1) is being formulated in five parts as follows and intended to meet the requirements of the Local Order 44: 1990 as amended by Local Order (1) 2012.

Part 1: Masonry blocks
Part 2: Filler blocks
Part 3: Autoclaved aerated concrete masonry blocks
Part 4: Paving blocks
Part 5: Concrete-polystyrene sandwich masonry blocks

1 SCOPE

This standard specifies minimum performance levels for precast concrete filler blocks used as non-structural fillers in the construction of reinforced concrete cast in situ ribbed slabs.

2 REFERENCES

This standard incorporates provisions from other references. These references are cited undated at the appropriate points in the text, but latest edition of these references applies (including amendments). In case any reference is shown as dated, then that specific edition shall be used. The titles of these references are listed on the last page.

3 DEFINITIONS

3.1 Filler Block

A filler block, solid or hollow, manufactured from cementitious binder, aggregates and water and which may contain admixtures and additions and colouring pigments and other materials incorporated or applied during or subsequent to filler block manufacture, and is used as fillers in the construction of ribbed slabs.

3.2 Normalweight Concrete

Concrete having an oven-dry density greater than 2000 kg/m^3 but not exceeding 2600 kg/m^3.

3.3 Lightweight Concrete

Concrete having an oven-dry net density not more than 2000 kg/m^3. It is produced using lightweight aggregate with full or partial replacement of the lightweight fines with normal weight sand.

3.4 Length

The largest dimension of the horizontal plane of installation.

3.5 Width

The smallest dimension of the horizontal plane of installation.

3.6 Height

The vertical dimension perpendicular to installation plane.

4 REQUIREMENTS FOR MATERIALS

4.1 General

Only materials with suitability established in terms of their properties and performance shall be used in the manufacture of concrete filler blocks.

The suitability requirements and acceptance criteria of the material used shall be given in the manufacturer's production control documentation.

The material used shall conform to applicable standard or shall be shown by test or experience that it is not detrimental to the durability of the concrete masonry units or any material customarily used in masonry manufacturing.

4.2 Asbestos

Asbestos, or materials containing asbestos, shall not be used.

5 REQUIREMENTS FOR FILLER BLOCKS

5.1 Shape

The blocks shall be so shaped that they can not slip out of the cast in situ concrete. Block surfaces shall be clean, plane and free from cracks and flaws.

5.2 Sizes

5.2.1 Work Size

The size of filler blocks shall be as specified by the purchaser. If the blocks are trapezoidal, the difference in length-top and length-bottom shall not be less than 20 mm nor more than 40 mm.

5.2.2 Dimensions

The dimensions of blocks shall be declared by the manufacturer.

5.2.3 Internal Webs

Hollow filler blocks shall be provided with at least one internal web, but when average length exceeds 400 mm there shall be two internal webs. The minimum thickness of external shell and web of filler blocks shall not be less than 25 mm.

5.2.4 Tolerances

When measured in the manner described in BS EN 772: Part 16, the length top, length bottom, height or width of each block from the sample shall not deviate by more than ±3 mm from the declared dimensions.

5.3 Net Density Of Blocks

Block manufacturers shall declare the net density of each type and configuration of their filler blocks. When tested in accordance with BS EN 772: Part 13, the net density of each type and configuration of the filler blocks shall not deviate by more than ±10%.from the declared value.

5.4 Chloride And Sulphate Content

When tested in accordance with BS 1881: Part 124, the acid soluble chloride (Cl) and sulphate content (SO_3) by mass of filler block concrete shall not exceed 0.05% and 0.5 % by mass of concrete respectively.

5.5 Compressive Strength

The compressive strength test shall be carried out on air-dry filler block specimens. The filler block specimen shall be tested in compression with both faces under compression reflecting

each others exact shape and size. Filler blocks may be sawn appropriate to suit machine platten dimensions. The method of testing shall be as specified in BS EN 772: Part 1 or by using the rapid compressive strength method as per "Annex A" of this DMS.The compressive strength of filler blocks based on gross area shall not be less than the values given in Table 1.

Table 1 - Minimum compressive strength of filler blocks based on gross area

Type of filler blocks	**Strength N/mm^2**	
	Average	Individual
Normalweight concrete / Lightweight concrete	3.2	2.6
NOTE 1: Designers may specify filler blocks of higher strengths than those given in thisTable if required.		

5.6 Drying Shrinkage

When tested in accordance with ASTM C 426, for a sample of four blocks, the average drying shrinkage shall not exceed 0.06%.

5.7 Thermal Conductivity

For blocks intended to be used in elements subject to thermal requirements, thermal conductivity of filler blocks shall be declared by the manufacturer according to BS EN ISO 10456 at 35ºC and 60% relative humidity (RH).

When tested in accordance with BS EN 12664 or BS EN 12667 or BS EN 1934 or BS EN ISO 8990 or ASTM C 1363, at 35ºC and 60% RH, block thermal conductivity shall not exceed the declared value.

As an alternative, thermal conductivity of the blocks shall be calculated according to BS EN ISO 6946 taking into consideration the block configuration and concrete thermal conductivity declared by the manufacturer at 35ºC & 60% RH.

6 DURABILITY ASPECT

Under normal exposure conditions of use in Arabian Gulf region environment, precast concrete blocks will continue to provide satisfactory strength, provided they conform to clause (5.5) above.

7 VISUAL ASPECTS

7.1 Appearance

Filler Blocks shall be sound and free of defects that would interfere with the proper placing on the units or impair the strength or performance of the construction and shall have uniform texture. The faces of the blocks shall not exhibit defects such as cracking.

7.2 Special Texture

In the case of blocks produced with special surface textures, the texture shall be described by the manufacturer.

8 SAMPLING FOR TESTS

8.1 For dimensions, compressive strength and density the minimum number of test specimens shall conform to BS EN 771 – 3

8.2 For other tests, the number of specimens shall be:

Chloride and Sulphate	1
Drying shrinkage	4
Block thermal conductivity, or Concrete thermal conductivity	As required by the testing laboratory

9 CONFORMITY ASSESSMENT AND CERTIFICATION

9.1 Conformity of the product with this standard shall be assessed in accordance with Dubai Municipality third party product certification schemes.

9.2 Product delivered to site shall demonstrate compliance with this standard through a Certificate of Conformity or Mark of Conformity issued by Dubai Municipality.

ANNEX A: COMPRESSIVE STRENGTH: RAPID TESTING

A.1 Method of Testing

Compressive strength test shall be carried in accordance with BS EN 772 – 1 with the following deviations:

A.1.1 Surface Preparation

Rub the bed faces of specimens with a carborundum stone to remove any fins or high spots. Wipe the bearing surfaces of all the platens clean and remove any loose grit or other material from the surfaces of the specimen which are to be in contact with the platens.

A.1.2 Conditioning

Specimens shall be stored in the normal laboratory temperature and humidity for at least 16 h before being used for tests.

A.1.3 Procedure

A.1.3.1 Grinding Method

Grind the specimen as per the requirement of BS EN 772 – 1

A1.3.2 Use of Fiber Board

As an alternative to grinding method and capping method as mentioned in BS EN 772 – 1, fiber boards can be used. Use fiber board (12 ± 1) mm thickness as in parallel contact with the platens. Place the specimen in the machine between two new pieces of 12 mm thick fiber board. Ensure that the board overhangs the specimen by a minimum of 5 mm along each edge and the centre of mass of the specimen coincides with the axis of the machine.

PUBLICATIONS REFERRED TO

ASTM C 426	STANDARD TEST METHOD FOR LINEAR DRYING SHRINKAGE OF CONCRETE MASONRY UNITS
ASTM C 1363	STANDARD TEST METHOD FOR THE THERMAL PERFORMANCE OF BUILDING ASSEMBLIES BY MEANS OF A HOT BOX APPARATUS
BS 1881: Part 124	METHOD FOR ANALYSIS OF HARDENED CONCRETE
BS 6073: Part 2	PRECAST CONCRETE MASONRY UNITS. GUIDE FOR SPECIFYING PRECAST CONCRETE MASONRY UNITS.
BS EN 771: Part 3	SPECIFICATION FOR MASONRY UNITS. AGGREGATE CONCRETE MASONRY UNITS (DENSE AND LIGHTWEIGHT AGGREGATES).
BS EN 772: Part 1	METHODS OF TEST FOR MASONRY UNITS. DETERMINATION OF COMPRESSIVE STRENGTH
BS EN 772: Part 2	METHODS OF TEST FOR MASONRY UNITS. DETERMINATION OF PERCENTAGE AREA OF VOIDS IN MASONRY UNITS (BY PAPER INDENTATION)
BS EN 772: Part 13	METHODS OF TEST FOR MASONRY UNITS. DETERMINATION OF NET AND GROSS DRY DENSITY OF MASONRY UNITS (EXCEPT FOR NATURAL STONE).
BS EN 772: Part 16	METHODS OF TEST FOR MASONRY UNITS. DETERMINATION OF DIMENSIONS
BS EN 1934	THERMAL PERFORMANCE OF BUILDINGS - DETERMINATION OF THERMAL RESISTANCE BY HOT BOX METHOD USING HEAT FLOW METER - MASONRY
BS EN 12664	THERMAL PERFORMANCE OF BUILDING MATERIALS AND PRODUCTS – DETERMINATION OF THERMAL RESISTANCE BY MEANS OF GUARDED HOT

	PLATE AND HEAT FLOW METER METHODS – DRY AND MOIST PRODUCTS OF MEDIUM AND LOW THERMAL RESISTANCE
BS EN 12667	THERMAL PERFORMANCE OF BUILDING MATERIALS AND PRODUCTS – DETERMINATION OF THERMAL RESISTANCE BY MEANS OF GUARDED HOT PLATE AND HEAT FLOW METER METHODS – PRODUCTS OF HIGH AND MEDIUM THERMAL RESISTANCE
BS EN 13055	LIGHTWEIGHT AGGREGATES
BS EN ISO 6946	BUILDING COMPONENTS AND BUILDING ELEMENTS – THERMAL RESISTANCE AND THERMAL TRANSMITTANCE – CALCULATION METHOD
BS EN ISO 8990	THERMAL INSULATION — DETERMINATION OF STEADY-STATE THERMAL TRANSMISSION PROPERTIES — CALIBRATED AND GUARDED HOT BOX
BS EN ISO 10456	BUILDING MATERIALS AND PRODUCTS. HYDROTHERMAL PROPERTIES. TABULATED DESIGN VALUES AND PROCEDURES FOR DETERMINING DECLARED AND DESIGN THERMAL VALUES