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Structural Engineering Department

اتحاد ماسترلاب للاستشارات الهندسية
المهندس الاستشاري
دكتور / احمد فتحي عبد العزيز وشركاه
الاستاذ المتفرغ بكلية الهندسة جامعة عين شمس
قسم الهندسة الانشائية

Date: 18 / 8 /2020

Report (3) on :

Determination of Water Absorption of Autoclaved Aerated Concrete Blocks Masonry Units.

Project:
بلوم فيلد

Main-Contractor: شركة انشاء
Owner: تطوير مصر

Consultant: مركز التصميمات والاستشارات الهندسية
الأستاذ الدكتور/ اشرف الزناتي

Submitted to: Delta Block

Augost 18, 2020
Authored by: Masterlab (Dr. Ahmed Fathy Abdel-Aziz)

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Report on Determination of Water Absorption of Autoclaved Aerated Concrete Blocks Masonry Units.

Client : Delta Block

Project :Blume Field

Consultant : مركز التصميمات والاستشارات الهندسية
الأستاذ الدكتور/ اشرف الزناتي

This report was prepared upon the request of Delta Block to determine the water absorption of the delivered specimens –Autoclaved Aerated Concrete Blocks AAC masonry units- used for wall construction at the Mansoura 6 residential buildings Code 410 project. Tests were conducted to measure the water absorption of delivered blocks according to ESS for brick units Tests is used for quality control to determine specimen conformance/to compare with the manufacturer specification.

1. Delivered Specimens:

Eight specimens 25 & 12 cms thicknesses were delivered to Masterlab, by client on his sole reponsibility on 22/6/2020. Blocks are classified as regular shaped masonry units, autoclaved aerated concrete light weight blocks for use in masonry wall constructions in accordance with: BS EN 771-4-2003, Specification for masonry units Part 4: Autoclaved aerated concrete masonry units. For material details, refer to attached technical data sheets for tested blocks. Table -1- presents a description of delivered blocks data and dimensions as per client's letter on 15/8/2020.

Table 1- Description of Delivered Specimens

No.	Item	Type	Qty	Nominal Dimensions (cms)		
				Thickness	Height	Length
1	A	Delta Block	4	25	20	60
2	B	Delta Block	4	12	20	60

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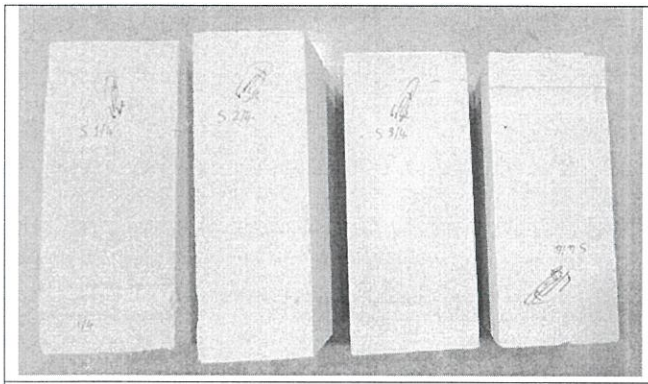
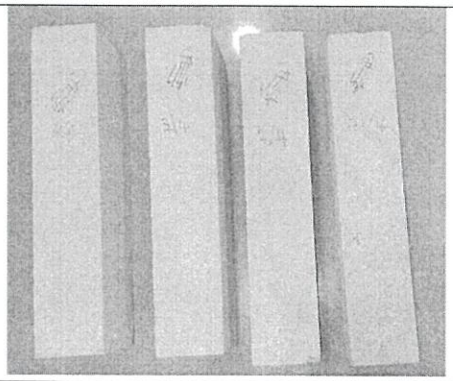


AAC blocks 25 cm thick



AAC blocks 12 cm thick

Photo 1- Delivered Specimens

2. Performed Tests

Tests were performed in accordance to ESS for masonry units. Cubes 5x5x5 cms were cut from delivered samples. Then, test specimens were dried to constant mass $m_{dry,s}$ in a ventilated oven at a temperature of 70 °C ± 5 °C. Sampling for testing was performed by client in such a way to be representative of the entire tested material*.

Specimens were immersed in water for a specific period of time and the increase in mass is determined. The measuring period was 30 min.

A calibrated balance capable of weighing to 15000g, with an accuracy of 1 g, used to determine sample weight. Specimens were completely immersed in water for the duration of the test. Timing device has been activated while maintaining water level constant throughout the test.

After the immersion time (t_{so}), remove the specimens, wipe off surface water and weigh them ($m_{so,s}$). Samples were tested in normal atmospheric condition

Percentage water absorption for AAC masonry units:

Calculation of the percentage of water absorption of cut samples of masonry units for each specimen using the following formula:

$$\%\text{Water Absorption} = \frac{m_{so,s} - m_{dry,s}}{m_{dry,s}} \; x\, 10^2$$

$m_{dry,s}$ is the mass of the specimen after drying, (g);

$m_{so,s}$ is the mass of the specimen in grams after soaking for time t, (g);

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3. Test Results

Tables -2 & 3, present test results i.e. Water absorption values for test units.

Table 2- Results of Percentage Water Absorption for 25 cms block units

Block	Sample	Nominal Dimensions	t_{so}	$m_{dry,\ s}$	$m_{so,\ s}$	Absorption Percentage
		cms	min.	g	g	%
Delta Block 25 cms	1	5 x 5 x 5	30	78	105	34.6
	2			82	108	31.7
	3			86	115	33.7
	4			81	107	32.1
	5			84	110	31.0
	6			82	109	32.9
	7			82	107	30.5
	8			84	112	33.3
Mean Value of water absorption percentage						32.5

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Table 3- Results of Percentage Water Absorption for 12 cms block units

Block	Sample	Nominal Dimensions	t_{so}	$m_{dry,\ s}$	$m_{so,\ s}$	Absorption Percentage
		cms	min.	g	g	%
Delta Block 12 cms	1	5 x 5 x 5	30	66	86	30.3
	2			62	82	32.3
	3			60	79	31.7
	4			71	93	31.0
	5			68	90	32.4
	6			66	86	30.3
	7			64	86	34.4
	8			63	84	33.3
Mean Value of water absorption percentage						31.9

Tested by Ahmed Hassan.

Revised by Eng. Khaled Ahmed

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