

CONFIDENTIAL REPORT

Project Title : Tensile and Shear Tests on Two Types of Block Supplied by Besblock Ltd

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Client : Besblock Limited

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**REPORT OF TENSILE AND SHEAR TESTS ON TWO TYPES OF BLOCK
SUPPLIED BY BESBLOCK LTD****1 INTRODUCTION**

The client requested shear and tensile tests to be carried out on two types of concrete block. Both block types were referred to as 'medium density paint grade': one block type being solid and the other having 15% voids.

Both types of blocks were subjected to tensile and shear tests based on BS 5080: Parts 1 and 2: Structural Fixings in Concrete and Masonry.

2 SAMPLES RECEIVED

Six solid units marked 'medium density paint grade' of nominal dimensions 440 x 215 x 140mm (length x height x thickness).

Six units having voids marked 'medium density paint grade' of nominal dimensions 440 x 215 x 140mm (length x height x thickness), with voids measuring approximately 160mm long x 32 mm wide, separated by a 40mm central bridge.

3 FIXING DETAILS

Following consultation with the client regarding the requirements from this test programme an M8 Anchor shield plug (incorporating a projection bolt) was used. This fixing would cover all medium load industrial installations on both walling types.

Plate 5 shows a fixing as used in the testing.

During the installation a hole approximately 53mm deep by 13-14mm diameter was pre-drilled and the fixing installed as prescribed instructions.

For the 'Cellular' block installation the hole depth was 53mm and subsequently the drill bit penetrated the 55mm thickness of the solid material. However the fixing did not penetrate the void.

Plate 3 shows a fixing installed in a test sample prior to a tensile test.

4 TEST METHODS

Prior to testing, ten samples approximately 215 x 215mm were prepared from the supplied six units, for each block type.

4.1 Tensile Tests

Loading was applied as instructed in BS 5080: Part 1: 1993: Structural fixings in concrete and masonry, clause 7.1.2.

4.2 Shear Tests

Loading was applied as instructed in BS 5080: Part 2: 1986: Structural fixings in concrete and masonry, clause 7.2.2.

5 RESULTS

Tensile test results are given in Table 1. Shear results are given in Table 2. Plate 4 shows the shear test set-up prior to testing and plate 6 shows failure of test specimen in shear.

6 SUMMARY

The tensile and shear loads shown in Tables 1 and 2 respectively show that both types of blocks having medium load fixings installed would be suitable for the commercial application the client requested.

Both types of blocks appeared to perform particularly well, with in most cases the actual fixing failing before the block.

NOTE: The results given in this report apply only to the samples that have been tested.

END OF REPORT

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Table 1
Tensile Strengths of Fixings Installed in Solid and Hollow Blocks

Sample No.	Block Type	Maximum Load (kN)	Maximum Load (Kg)	Mode of Failure
1	Solid	4.12	420.0	Failure of block
2		3.80	387.4	Failure of fixing
3		4.12	420.0	Failure of fixing
4		5.07	516.8	Failure of block
5		3.93	400.6	Failure of fixing
Mean		4.21	429.0	
1	Cellular	6.02	613.7	Failure of fixing
2		10.71	1091.7	Failure of fixing
3		10.50	1070.3	Failure of fixing
4		5.89	600.4	Failure of fixing
5		9.19	936.8	Failure of fixing
Mean		8.50	863.0	

Table 2
Shear Strengths of Fixings Installed in Solid and Hollow Blocks

Sample No.	Block Type	Maximum Load (kN)	Maximum Load (Kg)	Mode of Failure
1	Solid	7.60	774.7	Failure of fixing
2		5.76	587.2	Failure of fixing
3		5.57	567.8	Failure of fixing
4		5.76	587.2	Failure of fixing
5		5.51	561.7	Failure of fixing
Mean		6.04	615.7	
1	Cellular	8.24	835.5	Failure of fixing
2		7.60	774.7	Failure of fixing
3		4.94	503.7	Failure of concrete
4		6.65	677.8	Failure of fixing
5		6.90	703.4	Failure of fixing
Mean		6.87	699.0	

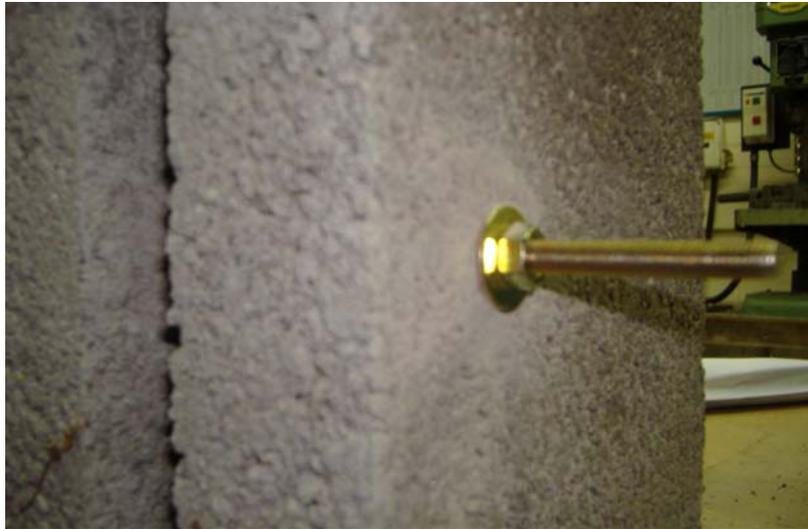


Plate 1 - Showing Installation of Fixing on Cellular Block



Plate 2 - Showing Rear of Cellular Block with Bottom of Fixing



Plate 3 - Showing Test Sample Prior to Tensile Test



Plate 4 - Shear Test on Test Specimen



Plate 5 - Fixing as Used in Tests



Plate 6 - Failure of Test Specimen in Shear