

222 Cavalcade Street, 77009-3213  
P.O. Box 8768, Houston, Texas 77249-8768  
Tel: (713) 692-9151 Fax: (713) 696-6205

Attention: JG

**VOBB - VEROT OAKS BLDG. BLOCKS**

P.O. BOX 62806

Lafayette, LA 70596-2806

P: 337-781-0705 / F: 248/282-5175

W/O. No.: VOB001-11-26-37166-1

P.O. No.:

Report Date: 11/27/2007

**LATERAL COMPRESSION TESTING  
BONDING STRENGTH OF CONCRETE TO MORTAR JOINTS**

Project: Stork SWL performed a series of lateral compression tests to determine the force required to break the bond of mortar filled concrete blocks. Samples were tested with three different sizes of rebar (3/8", 1/2", and 5/8"); with one set being a series of three 2-cavity mortar filled blocks and three 3-cavity mortar filled blocks. Additionally, to establish a base line strength value, three stacks were tested with no rebar nor filler material within the cavities, bonded by a mortar seal only on the block contacting surface.

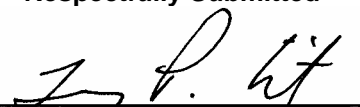
Method: Two blocks of the three stack assembly were secured into the loading frame, and a hydraulic ram was used to apply a lateral compression against the free, or unsecured, third block of the stack. This method applies a shear force against one row of blocks to determine the block, mortar, and rebar load bearing capacity to lateral forces.

Results: As expected, the three tier stacks (8" x 8" x 16" regular CMU) with only a mortar seal around the block perimeter exhibited the poorest bonding strength. The load values, based on a square inch area of mortar surface for those VOBB stacks having two or three cavities filled were very similar in strength, meaning filling a third cavity does not offer a significant rise on lateral bonding strength as opposed to a two cavity filled system.

It is also of note that the industry standard suggests a 60 psf force equals a lateral wind load of 150 MPH. The mortar filled blocks tested produced shear loads averaging 11,000 – 20,000 lbs, *which will far exceed the 150 MPH industry rating.* The estimation of wind force that would be needed to cause a shear load as applied in the testing could not be accurately detailed per individual block at this time. The psf vs wind force value is based on a flat surface, such as a wall, and the psi rating values in the following tables are based on the surface area of the mortar cavities.

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**Respectfully Submitted**

  
Terry Wilt  
Manager, Product Evaluation

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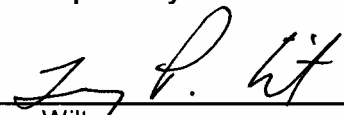
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**LATERAL COMPRESSION/LOADING TEST RESULTS**

**3/8" Rebar, with 2 cavities filled with mortar**

**Cured time: two months**

ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	25.5	12,250	480
2	25.5	11,690	460
3	25.5	17,750	700
AVG.	---	13,900	550

**3/8" Rebar, with 3 cavities filled with mortar**

**Cured time: two months**

ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	38.25	17,750	460
2	38.25	18,820	490
3	38.25	24,240	630
AVG.	---	20,270	530

**1/2" Rebar, with 2 cavities filled with mortar**

**Cured time: three weeks**

ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	25.5	12,250	480
2	25.5	11,140	440
3	25.5	10,040	390
AVG.	---	11,140	440

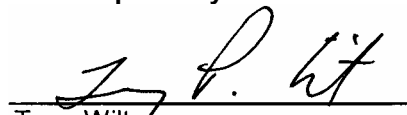
**1/2" Rebar, with 3 cavities filled with mortar**

**Cured time: three weeks**

ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	38.25	17,750	460
2	38.25	15,570	410
3	38.25	11,140	290
AVG.	---	14,820	390

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**5/8" Rebar, with 2 cavities filled with mortar**  
**Cured time: two months**

ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	25.5	13,360	520
2	25.5	12,250	480
3	25.5	14,460	570
AVG.	---	13,360	520

**5/8" Rebar, with 3 cavities filled with mortar**  
**Cured time: two months**

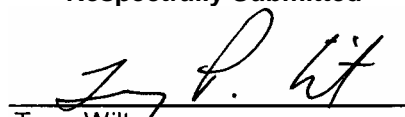
ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	38.25	22,020	580
2	38.25	20,950	550
3	38.25	24,240	630
AVG.	---	22,400	590

**No Rebar, mortar seal of contact surfaces only**  
**Cured time: two weeks**

ID	Area (in <sup>2</sup> )	Maximum Load (lbs.)	Maximum Load (psi)
1	54.51	1,120	20
2	54.51	1,690	30
3	54.51	560	10
AVG.	---	1,120	20

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3/8" 2-cavity. Representative pre load



3/8" 2-cavity. Representative failure



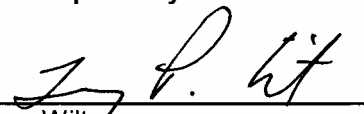
3/8" 3-cavity. Representative pre load



3/8" 3-cavity. Representative failure

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1/2" 2-cavity. Representative pre load



1/2" 2-cavity. Representative failure



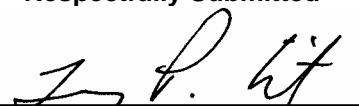
1/2" 3-cavity. Representative pre load



1/2" 3-cavity. Representative failure

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5/8" 2-cavity. Representative pre load



5/8" 2-cavity. Representative failure



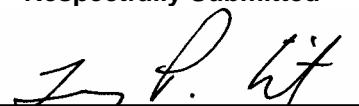
5/8" 3-cavity. Representative pre load



5/8" 3-cavity. Representative failure

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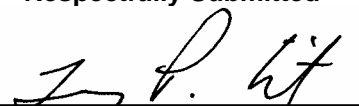
2-cavity mortar joint. Representative pre load



2-cavity mortar joint. Representative failure

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