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Dear Sir:

Project: Incablock - Concrete Masonry – Physical Testing

On March 22, 2007, ten Incablocks (concrete masonry), nominal 406 mm (16") x 152 mm (6") x 215 mm (8-1/2") were received in our Richmond, BC, Canada laboratory for physical qualification testing. The Incablocks, cast November 2006, were tested according to the requirements of CSA A165.1 (ASTM C140). Test results are presented in the following tables.

Construction Materials

Building Science

Geotechnical

Metallurgy and Corrosion

Environmental

Analytical Chemistry

Physical Testing

Table I

Block Sample ID	Compressive Strength			
	Gross Area		Net Area	
	MPa	Psi	MPa	Psi
A	12.8	1860	23.4	3390
B	13.0	1885	23.7	3440
C	15.9	2310	29.0	4210
D	14.7	2130	26.8	3890
E	13.2	1910	24.1	3490
Average	13.9	2020	25.4	3680

Table II

Sample ID	Absorption			Dry Density		Moisture Content	
	kg/m ³	pcf	%	kg/m ³	pcf	% Total Absorption	% as Received
1	172.8	10.8	8.8	1984	124	24.4	2.16
2	169.0	10.5	8.6	1971	123	20.2	1.74
3	163.8	10.2	8.3	1980	124	18.3	1.51
4	174.4	10.9	8.9	1950	122	17.3	1.55
5	161.2	10.1	8.1	2000	125	19.1	1.54
Average	168.2	10.5	8.5	1977	123	19.5	1.70



CERTIFIED LABORATORY FOR TESTING CONCRETE

AT65.1-04

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Table 1
Physical properties

(See Clauses 3.2, 5.1, 9.3, 10.3, 10.4, A.1.2, A.5.1, A.6.2, A.7.1, A.7.2, and C.1.)

Facet	Symbol	Property		
First		Solid content		
	H*	Hollow		
	SS*	Semi-solid (as defined)		
	SF*	Full solid (as defined)		
Second		Minimum specified compressive strength calculated on average net cross-sectional area of the unit, MPa†		
	10	10		
	15	15		
	20	20		
	30	30		
Third		Concrete type		
		Density, kg/m ³	Absorption (maximum), kg/m ³	
	A	Over 2000	175	
	B	1800–2000	200	
	C	1700–1800	225	
	D	Less than 1700	300	
N	No limits	No limits		
Fourth		Maximum moisture content, % of total absorption (average of 5 specimens)		
		Moisture content		
		Linear shrinkage, %	RH over 75% §	RH under 75% §
	M	Less than 0.03	45	40
		0.03–0.045	40	35
		Over 0.045	35	30
O‡	No limits	No limits		

*See Clause 3.2 (a).

†See Clause A.5 of Annex A, which discusses gross area, net area, and average net area.

‡Not tested where shrinkage is not of importance.

§Average annual climatic relative humidity, per cent, at point of manufacture.

Notes:

- (1) It is not intended that manufacturers make masonry units to fit all possible combinations of second, third, and fourth facets, but rather that purchasers be able to select a unit from the manufacturer's range of masonry units that will meet their requirements. Most commonly produced units in Canada have a minimum specified compressive strength of 15 MPa based on average net cross-sectional area.
- (2) When masonry units are used in a dry environment such as interior partitions, the maximum water absorption limits need not apply.
- (3) When masonry units are used under service humidity conditions considerably lower than climatic humidity, additional precautions against shrinkage can be required.
- (4) When a particular surface texture, finish, colour, uniformity of colour, or other special feature is desired, it should be specified separately by the purchaser. One method of establishing suitability is to build a sample wall before construction begins, using the specified or recommended materials.
- (5) This Standard does not provide requirements for fire resistance, thermal transmission, or acoustical properties. The purchaser should specify definite values for any such properties when required (see Annex A).

3 Classification

3.1

Block units are classified by their physical properties, and the classification in this Standard is made by a four-facet system. All facets shall be used to designate the properties of the unit.

3.2

The facets are defined as follows (see Table 1 for physical property values and symbols):

- (a) First facet — a hollow, semi-solid, or full solid block. Hollow blocks are designated by the letter H, semi-solid blocks by the letters SS, and full solid blocks by the letters SF.
- (b) Second facet (designated by a number) — the specified compressive strength of the unit.
- (c) Third facet (designated by a letter) — the density and maximum water absorption of the unit.
- (d) Fourth facet (designated by a letter) — the moisture content of the unit at the time of shipment in relation to the shrinkage characteristics of the unit and the climatic relative humidity at the point of manufacture and time of shipment.

Example: H/15/D/O is a hollow unit with a specified compressive strength of 15.0 MPa, a density less than 1700 kg/m³, a maximum water absorption of 300 kg/m³, and no limit on moisture content at the time and point of shipment.



We trust this meets your report requirements, thank you for this opportunity to be of service.

LEVELTON CONSULTANTS LTD.

[Original signed by W.J. Gerry, C.Tech]

Per: W.J. Gerry, C.Tech.
Laboratory Supervisor

Attachments: