TEST REPORT

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EVALUATION CENTER

INTERTEK TESTING SERVICES NA LTD.
1500 BRIGANTINE DRIVE
COQUITLAM, BC V3K 7C1

RENDERED TO

POLYCRETE INTERNATIONAL INC.
480 RUE DU PARK INDUSTRIAL
LONGUEUIL, QUEBEC J4H 3V6

PRODUCT EVALUATED:
Polycrete Big Block 1600 Insulated Concrete Form (ICF)

EVALUATION PROPERTY:
Forming Capacity

Report of Polycrete Big Block 1600 Insulated Concrete Form (ICF) for the selected requirements of CCMC Technical Guide, *Modular, Expanded Polystyrene Concrete Forms,* Appendix B – *Forming Capacity Test Methods*

1 Table of Contents

2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted Forming Capacity tests on an insulated concrete form (ICF) product for Polycrete International Inc. The testing was carried out in accordance with CCMC Technical Guide, *Modular, Expanded Polystyrene Concrete Forms,* Appendix B – *Forming Capacity Test Methods.* This evaluation was completed during the month of December 2010.

3 Test Samples

3.1. SAMPLE SELECTION

Intertek representative, Jean-Philippe Plourde, sampled and witnessed the manufacture of the Polycrete Big Block 1600 Insulated Concrete Form (ICF) product on October 27, 2009. The sample selection process and witnessing was conducted at 2450 rue Jules Vachon, Parc Industriel #2, Trois-Rivières, Quebec, Canada, G9A 5E1. Products were selected in accordance with recognized independent sampling procedures, and were received at the Evaluation Center on November 24, 2009.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The product was identified as Polycrete Big Block 1600, an insulated concrete form (ICF) product consisting of two parallel EPS panels with a reinforcing steel mesh embedded within the Type II expanded polystyrene (EPS). Big Block 1600 can be manufactured with a 5-5/8 in. (143 mm), 7-5/8 in. (194 mm), 9-5/8 in. (245 mm), and 11-5/8 in. (295 mm) concrete thickness with an EPS thickness of either 2-1/2 (64 mm) or 1-3/4 in. (44 mm). Big Block 1600 ICF blocks are also manufactured in either a 24 in. (610 mm) or 12 in. (305 mm) height. For testing purposes, ICF blocks with a height of 24 in. (610 mm) and a concrete core of 9-5/8 in. (245 mm) were used. Details of the tested samples are as follows:

Table 1. ICF Specifications

Length:	96 in. (2438 mm)
Height:	24 in. (610 mm)
Width:	14-5/8 in. (371 mm)
Core:	9-5/8 in. (245 mm)
Foam Thickness:	2-1/2 in. (64 mm)
Spacing of Ties:	8-1/2 in. (216 mm) wide and 6 in. (152 mm) high

4 Testing and Evaluation Methods

4.1. CONDITIONING

Unless otherwise stated, the sample materials were maintained in standard laboratory conditions for a minimum of 48 hours at a temperature of 73 ± 4°F (23 ± 2°C) and relative humidity of 50 ± 5%.

4.2. CALIBRATION

Prior to testing, the pressure transducers were calibrated using a Tinius Olsen universal testing apparatus and Revere 5k lbf capacity load cell in accordance with Section B.4 *Calibration Procedure* of CCMC Technical Guide.

4.3. FORMING CAPACITY TEST

Forming Capacity was conducted in accordance with Section B.9, *Test Method B: Pour-in-Place Forming Capacity Test Procedure* of the CCMC Technical Guide. One test sample, measuring not less than 3.5 m long and 2.44 m high, was assembled by the client. The assembly was constructed on a flat, level, and rigid concrete floor and was fixed in the same manner and by the same fixings that were intended to attach the system on site. The end of the sample was also blocked with end caps, made by the client, as to have a closed form system. The assembled wall was then measured for length and height, straightness and skewness, and thickness tolerances.

A set of deflection gauges were used to measure the displacements at 1) the top, middle, and bottom of the wall specimen at one-third of the distance from each frame support, 2) the top, middle and bottom of the wall specimen at the middle of the wall specimen, and 3) the end and middle of the forming unit that would be subjected to the greatest deflection.

Fresh concrete, consisting of 14 mm aggregate and with a strength of 25 MPa, was pumped from the top, using a 100 mm (4 in.) flexible hose with an “S” shape or double angle. The concrete was pumped in two lifts and was consolidated internally for every lift for a minimum of 20 seconds every second cell. The second lift was poured within 15 minutes after consolidating the first lift.

One pressure transducer was placed on the test wall (refer to Appendix A for pressure transducer location). The pressure exerted by the concrete on the inner face of the EPS was measured continuously for a period of two hours after placing and consolidating the concrete. The test assembly was then measured again for length and height, straightness and skewness, and thickness tolerances.

5 Testing and Evaluation Results

The test results for the Polycrete International Inc. ICF product together with the applicable requirements of the CCMC Technical Guide are shown in Tables 2-4 below. A copy of the data sheets can be found in the Appendices.

Table 2. Pressure Test Results

Description	Location	Minimum Load (kPa)	Maximum Load (kPa)	Requirement	Pass/Fail
Consolidation	Front	0	34	≥ 25 kPa	Pass
Placement	Front	17	34	≥ 25 kPa	Pass

Table 3. Deflection Test Results

Description	Location	Minimum Deflection (mm)	Maximum Deflection (mm)
Deflection	Center – Top	1.6	10.7
	Center	0.7	12.1
	Center – Bottom	1.1	19.5

Table 4. Deformation Test Results

Test	Requirement	Test Result	Pass/Fail
Length and Height, mm	-10 - 0	0	Pass
Straightness and Skewness, mm	± 10	3	Pass
Thickness Tolerance (mm)	± 5	0	Pass

6 Conclusion

The Polycrete Big Block 1600 product identified and evaluated in this report has met the requirements of CCMC Technical Guide, *Modular, Expanded Polystyrene Concrete Forms,* Appendix B – *Forming Capacity Test Methods.* The product test results are presented in Section 5 of this report.

INTERTEK TESTING SERVICES NA LTD.

Reported by: _____

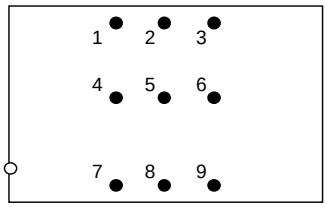
Chris Chang, EIT
Test Engineer / Project Leader – Construction Products

Reviewed by: _____

Riccardo DeSantis
Lab Supervisor / Project Coordinator – Building Products Group

APPENDIX A: Test Data (1 page)

Test:	**Forming Capacity**			Project No:	G100292480
Date:	21-Dec-10			Eng/Tech:	Baldeep Sandhu
Time:	10:30AM			Reviewer:	Riccardo DeSantis
Temperature:	8.6°C	Relative Humidity:	68.5%		
Client:	Polycrete International Inc.				
Product:	**Polycrete Big Block 1600 ICF**				
Method:	CCMC Technical Guide, *Modular, Expanded Polystyrene Concrete Forms* Appendix B - Forming Capacity Test Methods				
Conditioning:	Minimum 48 hours at a temperature of 23 ± 2° C and relative humidity of 50 ± 5%				
Equipment:	Mitutoyo Digital Gauge (Intertek ID# 02702, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 02763, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 60016, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 60014, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 60018, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 60020, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 02780, cal due November 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 02762, cal due September 2011)				
	Mitutoyo Digital Gauge (Intertek ID# 02681, cal due September 2011)				
	Pressure Transducers (Calibrated before use)				



Locations (not to scale)
● Deflection Gauge
○ Pressure Transducer (on the side)

Test Specimen:

Overall Dimensions:	3377 mm x 2438 mm x 373 mm
Concrete:	Rempel Brothers Concrete, Eco Mix - 14 mm aggregate, 25MPa strength, design slump of 6 in. 4 in. pump hose diameter Vibrator with 1 in. head
Other:	Specimen was assembled by the client.

		Pressure Loads	
Description	**Transducer Location**	**Minimum (kPa)**	**Maximum (kPa)**
Consolidation	Front	0	34
Placement	Front	17	34

		Deflections	
Description	**Gauge Location**	**Minimum (mm)**	**Maximum (mm)**
Deflection	2	1.6	10.7
	5	0.7	12.1
	8	1.1	19.5

	Tolerances	
Test#1	**Prior to Pouring Concrete (mm)**	**After Pouring Concrete (mm)**
Length	3377	3377
Height	2438	2438
Straightness	0	3
Thickness	373	373