

Project: 2015028

April 10, 2016

Quik-Therm Insulation Solutions
No. 7 – 1429 West Kelowna Road,
West Kelowna, BC
V1Z 3Z2

E-mail: ray@quiktherm.com

Attention: Ray Snitynsky

Re: Meyenburg Residence, 7640 Rockcliff Place, Lot 41, Kelowna, BC
• **Quik-Therm Sub-Grade Insulation**

Integrus Project Management and Engineering (Integrus) was retained by Quik-Therm Insulation Solutions (Quik-Therm) to review their Sub-Grade Insulation product (SGI) in relation to the requirements of the British Columbia Building Code 2012 (BCBC). The SGI product of 2-9/16" thickness is proposed to be used at the single family residence, being built at 7640 Rockcliff Place in Kelowna, in a below grade heated floor slab with a minimum 3-1/2" concrete topping.

Clause 9.25.2.2.1(c) of the BCBC requires expanded polystyrene (EPS) insulation boards to meet CAN/ULC-S701, "Thermal Insulation, Polystyrene, Boards and Pipe Covering". Quik-Therm SGI is an EPS rigid insulation board with a foil facing on both sides. It meets CAN/ULS-S701 as per CCMC reports #13393-L and #13457-L.

According to Table 9.36.2.8.A (without heat recovery) or Table 9.36.2.8.B (with heat recovery) the minimum effective thermal resistance of a heated floor below grade is to be 2.32 (m²·K)/W in climate zone 6. Using computer simulation, the listed effective insulating value of 2-9/16" SGI with 3-1/2" of concrete is 2.32 (m²·K)/W, the minimum required by code. The computer simulation was done by Architectural Testing Inc who are a NFRC accredited test laboratory. The simulation was completed using tested thermal values of two samples of varying thickness in a vertical orientation and simulated in a horizontal orientation. The simulation methodology as per Architectural Testing's report is sound.

Based on the test reports and technical information provided, it is our opinion that 2-9/16" SGI insulation with 3-1/2" of concrete meets the requirements of insulation for a heated floor per the 2012 BCBC in climate zone 6.

If you should have any questions or wish to discuss this letter in further detail, please contact the undersigned.

Sincerely,

Integris Project Management + Engineering

Per:



Cory Legge, ASCT, LEED® AP, CEA
Principal, Senior Project Manager



Reviewed on April 10, 2016 by:
Jasdeep Bains, P.Eng, M.Eng
Project Engineer

Encl: Testing reports



February 25, 2015

Mr. Ted Cullen
TBC Canada, Inc.
P.O. Box 577
Lasalle, Manitoba R0G1B0

RE: Calculated subgrade R-value (R_u)

Architectural Testing, Inc. (ATI) was contracted by TBC Canada to determine expected overall R-values for their Quik-Therm Subgrade Insulation when used in a horizontal application with a 3-1/2" concrete overlay. Due to the fact that horizontal specimens cannot be accurately tested in the ATI thermal test chamber, TBC Canada requested a computer simulation be conducted to determine the estimated R_u for this installation.

Results*

Quik-Therm Thickness	Concrete Thickness	Total Thickness	Overall R-value (R_u) (hr*ft ² *F/Btu)
11/16"	3-1/2"	4-3/16"	5.2
1-1/4"	3-1/2"	4-3/4"	7.6
1-7/8"	3-1/2"	5-3/8"	10.2
2-5/16"	3-1/2"	5-3/4"	12.1
2-7/16"	3-1/2"	5-15/16"	12.7
2-9/16"	3-1/2"	6-1/16"	13.2
3-0"	3-1/2"	6-1/2"	15.1

*Note: these are estimated overall R-values and may vary from actual system performance.

Simulation Procedure

Architectural Testing conducted two ASTM C1363 thermal tests to determine the overall R-value (R_u) for the 1/2" system and 1" system when combined with 3-1/2" of concrete. This test data was then imported to the Window5 computer program where the interior and exterior heat transfer coefficients and orientation were modified to reflect a subgrade application. The resulting overall R-values were then used to determine a linear equation that could be used to extrapolate the expected R_u for the listed thicknesses. These values were determined using computer simulation and should not be considered ASTM C1363 R-values.



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Software

Architectural Testing, Inc is an ISO 17025 and NFRC accredited test laboratory. To complete these simulations, ATI used the following approved software.

WINDOW 6.3 Program:

This software was developed by the Lawrence Berkeley National Laboratory. The program calculates U-factor and temperatures for the center-of-glazing by using two-dimensional heat flow analysis.

Sincerely,



Digitally Signed by: Andrew Walczak

Andrew C. Walczak
Architectural Testing, Inc.

ACW:acw