

## PHIUS Passive House Certified Builder Program

The Passive House Institute US (PHIUS) Builder Training program prepares construction professionals to meet the challenges of Passive House implementation. Super-insulation, air-tight envelopes, high-performance window installation, site management, component sourcing and other elements that present unique building challenges to Passive House will be covered in this course. This four- day course addresses both practical and business concerns specific to Passive House by providing instruction and solutions founded in real-world experience.

### Location

The Endeavour Centre  
910 High st unit 14  
Peterborough, ON

### Date and Ti

Day 1: April 21<sup>st</sup>, 8:30am – 4:30pm  
Day 2: April 22<sup>nd</sup>, 8:30am – 4:30pm  
Day 3: April 23<sup>rd</sup>, 8:30am – 4:30pm  
Day 4: April 24<sup>th</sup>, 8:30am – 4:30pm

### Day 1

The course begins with an introduction to the most important theoretical basics of an energy efficient and high performance building. The essential elements to planning and designing a passive building are presented to develop the foundations of durable, super-efficient construction.

9:00 am – 9:30 am	Introductions
9:30 am – 10:00 am	A new paradigm for building: the super-efficient 100-year building
10:00 am – 11:00 am	<ul style="list-style-type: none"> <li>● Passive building standard: Why a measurable energy metric is needed</li> <li>● Passive building history</li> <li>● Passive building metrics: goals, economics, global context</li> </ul>
11:00 am – 12:15 pm	Passive building enclosure principles: Exceptional thermal comfort year round
<b>12:15 am – 1:00 pm</b>	<b>Lunch</b>
1:00 pm – 3:15 pm	<ul style="list-style-type: none"> <li>● Building science essentials:             <ul style="list-style-type: none"> <li>○ Energy transfer</li> <li>○ Air movement</li> <li>○ Moisture transfer</li> </ul> </li> <li>● Passive building tool overview:             <ul style="list-style-type: none"> <li>○ Passive House Planning Package (PHPP) Excel-based, static energy model for buildings</li> <li>○ WUFI: Dynamic hydrothermal modeling</li> <li>○ THERM: Two dimensional finite element heat flow modeling</li> <li>○ WUFI – Passive: Dual-mode building energy modeling (static and dynamic) with hydrothermal modeling in dynamic mode</li> </ul> </li> </ul>
<b>3:15 pm – 3:30 pm</b>	<b>Break</b>
3:30 pm – 4:00 pm	Passive elements
4:00 pm – 5:00 pm	Passive building examples: <ul style="list-style-type: none"> <li>○ Canada</li> <li>○ North America</li> <li>○ International</li> </ul>

### Day 2

Day two covers the analysis of assembling a passive building and the importance of an insulated envelope

utilizing ‘in the dirt’ construction examples from North America.

8:30 am – 12:00 am (with break)	High Performance Building Envelope: <ul style="list-style-type: none"> <li>● Envelope materials selection</li> <li>● Structural materials</li> <li>● Thermal envelope</li> <li>● Air barriers</li> <li>● Vapor control layers</li> </ul>
<b>12:00 pm-12:30 pm</b>	<b>Lunch</b>
12:30 pm – 4:00 pm (with break)	Details and techniques: <ul style="list-style-type: none"> <li>● Foundations</li> <li>● Walls</li> <li>● Roofs</li> </ul>
4:00 pm – 4:30 pm	Moisture management

### Day 3

Day three continues with the passive building envelope analysis, including window installation, air sealing and ventilation, mechanicals, and a passive house field visit.

8:30 am – 10:00 am	Air sealing
<b>10:00 am – 10:15 am</b>	<b>Break</b>
10:15 am – 11:45 am	Windows: numbers, science, details and installation
<b>11:45 pm – 12:30 pm</b>	<b>Lunch</b>
12:30 pm – 2:00 pm	A balanced ventilation with energy/heat recovery
2:00 pm – 3:00 pm	Efficient mechanicals
3:00 pm – 5:00 pm	Details from the field (Passive House site visit)

### Day 4

On day four, we investigate passive building retrofits and the importance of potential inclusion of renewable energy systems. We then continue with project management and passive economics, concluding the day with PHIUS+ certification procedures and passive building testing methodology.

8:30 am – 9:15 am	Review
9:15 am – 10:30 am	Retrofit
<b>10:30 am – 10:45 am</b>	<b>Break</b>
10:45 am – 11:15 am	Renewable ready and the world of zeros
11:15 am – 12:15 am	Bigger building basics
<b>12:15 pm – 1:00 pm</b>	<b>Lunch</b>
1:00 pm – 1:30 pm	PHIUS+ passive building project certification requirements and procedures
1:30 pm – 2:30 pm	Passive building construction management <ul style="list-style-type: none"> <li>● Project development</li> <li>● Working with the industry: <ul style="list-style-type: none"> <li>○ Code officials</li> <li>○ Passive building consultants</li> <li>○ Architects and designers</li> </ul> </li> </ul>

	<ul style="list-style-type: none"> <li>o Structural and mechanical engineers</li> <li>• Builder as the educator</li> <li>• Trade management</li> </ul>
<b>2:30 pm – 2:45 pm</b>	<b>Break</b>
2:45 pm – 3:30 pm	Economics and marketing of passive building <ul style="list-style-type: none"> <li>• Communication</li> <li>• Project cost</li> <li>• Construction strategies</li> </ul>
3:30 pm – 4:30 pm	<ul style="list-style-type: none"> <li>• Post-Occupancy             <ul style="list-style-type: none"> <li>o Delivering</li> <li>o Maintaining</li> <li>o Monitoring</li> </ul> </li> <li>• The passive builder</li> </ul>

### Exam Information

<http://www.phius.org/get-professional-training/phius-certified-builders-training/overview-and-registration>

The optional certification exam is a take home test that you may register for directly online with PHIUS after completion of the training. The cost is US \$95.00. Expect to spend a minimum of 20 hours on completing the exam, as it is a self-study program/test designed to further your knowledge and understanding of building a Passive House. The passing grade for the PHIUS exam is 70%. Once you have passed your exam, you will receive your certificate, be listed on the PHIUS website and be licensed to utilize the designation for your marketing materials and communications.

### Program Lead Instructor: Natalie Leonard, P.Eng.



As the first Certified Passive House Consultant and Builder in Canada, Natalie is a recognized leader in the Passive House movement in Canada. Natalie founded Passive Design in 2009; a design, build and consulting firm that is dedicated to creating cost effective, elegant, practical, super-efficient buildings for the future.

Natalie brings her engineering background, hands on design and construction experience, and a practical, efficient approach to building. Passive Design Solutions has worked on over 45 passive house projects in Canada. Projects range from small single family to large scale apartment buildings, renovations and new construction.

Natalie’s passion for the natural environment and world travel has greatly influenced her perspective on residential construction and the footprint our buildings have on the planet. She has found the Passive House Concept to be a perfect fit. The simplicity and affordability of the Passive House aligns with Natalie’s values of creating practical and efficient homes for the mainstream market.

Website: <http://passivedesign.ca/>