

PHIUS Certified Builders' Training at Yestermorrow Design Build School, Waitsfield, VT The Passive Building Concept with Materials, Details and Techniques for their Implementation

The first day will be an introduction to the most important theoretical basics of 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.

** Please note that the order of presentation is subject to change.

Morning Session Day 1 –

9:00 am – 9:30 am Introductions

9:30am-10:30am

- The Passive Building Standard: Why a measurable energy metric is needed
- A brief history of Passive Building
- Passive Building Metrics: the goals, the economics, the global context

10:30am-10:45 am Break

10:45am-12:00 pm

- Passive Building Enclosure Principles: exceptional thermal comfort in summer and winter

12:00pm-1:00pm Lunch

Afternoon Session Day 1 –

1:00pm-3:15pm

- Building Science Essentials
 - Energy Transfer
 - Air Movement
 - Moisture Transfer
- An Overview of the Tools utilized to design a Passive Building:
 - The Passive House Planning Package (PHPP)
 - Excel-based, static energy model for buildings
 - WUFI
 - Dynamic Hygrothermal Modeling
 - THERM
 - Two Dimensional Finite Element Heat Flow Modeling
 - WUFI-Passive
 - Dual-mode building energy modeling (static and dynamic) with hygrothermal modeling in dynamic mode

3:15pm-3:30 Break

3:30pm-4:00pm

- Passive Elements

4:00pm-5:00pm

- Built Passive Building Examples from North America and around the world

Day 2

Day Two begins the analysis of assembling a Passive Building and the super insulated envelope utilizing 'in the dirt' construction examples and details from North America.

Morning Session Day 2 –

8:30am-9:00am

- ▣ A new Paradigm for building: the super-efficient 100-year building
- ▣ The comfort principle

9:00am-12:00am (with break)

- ▣ The Super insulated, Airtight and Thermal Bridge Free Envelope
 - Envelope Materials Selection
 - Structural Materials
 - Thermal Envelope
 - Air Barriers
 - Vapor Control Layers

12:00pm-1:00pm Lunch

Afternoon Session Day 2 –

1:00pm-4:00pm (with break)

- ▣ Details and Techniques: Foundations
- ▣ Details and Techniques: Walls
- ▣ Details and Techniques: Roofs

4:00pm-5:00pm

- ▣ Moisture Management

Day 3

Day three continues the analysis of the Passive Building envelope including windows and their installation, Air Sealing and ventilation, mechanicals and an open forum on Details from the Field.

Morning Session Day 3–

8:30am-10:00am

- ▣ Windows: the numbers, the science, the details & installation

10:00am-10:15 Break

10:15am-12:00pm

- ▣ Balanced Ventilation with Energy/Heat Recovery

12:00pm-1:00pm Lunch

Afternoon Session Day 3–

1:00pm-2:00 PM

- Air Sealing

2:00pm – 3:15pm

- Efficient Mechanicals

3:15pm – 3:30pm Break

3:30pm – 5:00 pm

- Details from the field

Day 4

Day four begins with an investigation of Passive Building retrofits as well as the importance of potential inclusion of renewable energy systems and continues with Project Management and Passive Economics. The day concludes with PHIUS+ Certification procedures & Passive Building testing methodology.

Morning Session Day 4 –

8:30 am-10:00 am

- Retrofit

10:00am– 10:15am Break

10:15 am-10:45 am

- Renewable Ready and the world of zeros

10:45am-12:00pm

- Management of Passive Building Construction
 - Project Development
 - Working with Code Officials, Passive Building Consultants, Architects & Designers, and Structural & Mechanical Engineers
 - Builder as Educator
 - Trades Management
 - On-Site

12:00 pm-1:00 pm Lunch

Afternoon Session Day 4 –

1:00pm-1:45pm

- Economics and Marketing of Passive Building
 - Communicating to Clients and the world
 - Project Cost
 - Construction Strategies

1.45pm-2:15 pm

- Bigger Building Basics

2:15pm– 2:30pm Break

2:30pm-4:00 pm

- Passive Building Project Certification requirements and procedures
 - PHIUS+
- Post-Occupancy
 - Delivering
 - Maintaining
 - Monitoring
- The Passive Builder