



Passive House Academy

# Passive House Pre-Certification

Guidance Document



## Why work with Passive House Academy?

- **Internationally accredited by the Passivhaus Institut** to certify Passive House projects Internationally
- **Leading experts** in the Passive House standard, working on projects since 2002
- Currently working on over **60 Certification projects** in the US
- Dedicated Certification team of **8 experienced Consultants**
- Staff are very **experienced in PHPP software** – the essential passive house design tool as well as with **Therm calculations** for thermal bridges
- PHA is a leading training provider for both designers and tradespersons in the US and has extensive experience in dealing with a **broad range of construction types and climates**
- **Proactive and solutions-focused** approach with the aim of providing a timely and efficient service to our Clients
- **Certifiers of numerous award winning Passive House projects** including Julie Torres Moskovitz's 'Tighthouse' in Brooklyn and Onion Flats' 'Belfield Homes' project in Philadelphia
- Certifiers of several **'EnerPHit' projects** (the Passive House deep retrofit standard)



## Why Apply for Passive House Pre-Certification?

In order to be confident that a building's thermal design will achieve the Passive House Standard, the Passive House Academy provides a Pre-Certification Service. This service is generally provided to Passive House Consultants but is also often provided to clients that have no experience in Passive House.

A complete review of your project at design stage can iron out any issues before construction commences and assures the Client and Architect that the building will achieve the Passive House Standard if implemented properly on site.

Some authorities such as the Pennsylvania Housing Finance Agency (PHFA) encourage Passive House Pre-Certification as part of their application and approval process. PHA's Pre-Certification service meets these requirements.



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Brooklyn,  
New York,  
NY 11231,  
United States of America [www.passivehouseacademy.com](http://www.passivehouseacademy.com)

Client: Mr. Happy  
Architect: Mr. Designer  
Location: Nowville  
Job Ref: X.Y.Z.

### Design Stage Assurance

On assessing your design and specifications detailed in the report and calculations attached to this document we assure that the building will perform as a

#### Quality Approved Passive House

Provided that:

##### An airtightness of 0.6 ach/h at 50 pascal is achieved on site

Airtightness testing must be tested in accordance with ISO 9972. The building must be tested under pressurisation and de-pressurisation.

##### The detailing of all junctions are thermal bridge free

The heat loss coefficient must equal to less than 0.006 BTU/hr.ft.F / 0.01 W/m<sup>2</sup>.K for all linear thermal bridge junction connections. Point/Planiform connections must equal to less than 0.002 BTU/hr.ft.F / 0.01 W/m<sup>2</sup>.K.

Thermal Bridging is typically not assessed at design stage and if deemed substantial at construction will invalidate this Certificate. Care must be taken when detailing to ensure that the all junctions and connections are thermal bridge free.

##### Highly energy efficient appliances are selected

Standard values for electrical appliances have been used for the basis of this analysis. On selection of appliances at construction stage highly efficient appliances must be used and details of such submitted. The primary energy target of 38 MBTU/yr.ft<sup>2</sup> / 120 kWh/m<sup>2</sup> must be met in order to achieve certification. We can consult on their energy usage as the project progresses.

##### Heating System and Cooling

The heating and cooling system selected at construction stage must equal or exceed the specifications given in the attached PHPP calculations. We can, if needed, consult on system efficiencies and details of the system. Technical brochures should be submitted before selection of any system to ensure that primary energy targets are met. Variations to the attached calculations will invalidate this assurance.

##### Ventilation System

To ensure that adequate air changes occur in the building the ventilation flow rates should be as per the attached calculations. We can consult on ventilation flow rates and assist in ensuring that adequate ventilation is achieved throughout the building.

Signed 00/00/2000

  
Tomás O'Leary

This assurance letter is to be used only in combination with the associated report and documents which describe the exact characteristics of the building.

## The Process for Passive House Pre-Certification

To commence Pre-Certification we need slightly less information than that needed for full Passive House Certification. ***To start the process the minimum amount of information we need is the list of items listed in Section 1 below and substantial completion of sections 2 and 3.*** Failure to provide this information will delay the start date of the process. Once we commence working on your project, we will request further information as the assessment progresses.

### **Please note:**

To submit an information package or indeed an enquiry about Pre-Certification please email Alan at [alan@passivehouseacademy.com](mailto:alan@passivehouseacademy.com). We will only accept information on your project by digital download link. We do not accept hard copy or CD packages or live shared folders.

### **1) Minimum Documentation for Commencement of Pre-certification**

- 1.1)** Current PHPP. If you have a Passive House Planning Package (PHPP) you can send this to us for review. If you do not have a PHPP for your project, we can model it for you. We will provide a full set of calculations with a corresponding labelled drawing when the analysis is complete. The PHPP file will help you in continuing with the Pre-Certification phase but please be aware that any deviation will invalidate the assessment.
- 1.2)** A site plan or sketch showing the heights of immediately surrounding buildings and trees. The sketch or drawing should display the measured distance from the facade of the building to each shading object and also an approximate height from floor level to the shading object.
- 1.3)** An auto-CAD Dxf/Dwg of plans, elevations & sections for the proposed design. The edge of frame dimensions should be clearly shown for all windows (in dashed under overlap of insulation if any). If there are multiple assemblies intended for different areas of the elevations this should be clearly shown in coloured hatch or highlighting.
- 1.4)** Photographs facing every direction, with the orientation clearly labelled and depicting all shading objects surrounding the project.



**1.5)** A Google Map link with the exact project location

**1.6) Proposed Construction Details**

A detail of every junction in the thermal envelope should be submitted. If the construction build-ups of all opaque elements (walls, roofs and floors) are not clearly shown on these then a sketch/drawing should be submitted of all assemblies (PHPP calculations alone will not suffice). Both construction details and assembly sketches must show:

- The thickness of all layers;
- The insulation type, including conductivities or R per inch of all materials in the assembly/detail (products technical specifications must be submitted in accordance with item 2.2);
- The centers and thicknesses of any repeating elements (ie, timber studs or steel studs); **and**
- The gauge of steel studs (if used).

**2) Additional Documentation for Advancing Pre-certification**

**2.1) Technical Information for Insulation Products**

- Technical Brochures for all insulation products must be provided stating thermal conductivities (R per inch) in accordance with local government standards;
- This can be any local government testing. The Construction Supervisor is liable for the performance of the materials so if materials are rated with dubious values caution must be taken.
- Be sure to highlight the specific insulation values that pertain to the product you have chosen.

**2.2) Glass Technical Information**

**2.2.1)  $U_g$  or  $R_g$  according to ISO EN 673**



**2.2.2)** Solar heat gain coefficient (SHGC) or 'g-value' according to ISO EN 410

**2.2.3)** Psi glass edge according to ISO EN 10077-2

### **2.3) Window Frame Glazed Door or Solid Door Technical Information**

**2.3.1)**  $U_f$  or  $R_f$  according to ISO EN 10077-2

**2.3.2)** Widths of frames for top, bottom and sides

### **2.4) Technical Information for the Ventilation Unit**

- We highly recommend the use of a Passivhaus Institut (PHI) certified ERV (energy recovery ventilator) or HRV (heat recovery ventilator) as, leaks and thermal bridges in non-certified units can drastically affect their efficiency. The type (ERV or HRV?) and certification for the proposed ventilation unit is needed. If you choose not to use a PHI certified unit, we are required to reduce the manufacturers stated efficiency by 12%.
- The designed air flow rate has a significant effect on the energy balance of Passive House buildings. Air flow rates must be designed so that a minimum of 0.3 air changes per hour is achieved. In climates with cold winters, it is important not to greatly exceed the 0.3 air changes per hour in order to avoid low internal air humidity.

**2.4.1)** For certification we need a simple sketch (if drawings are already created, please send them) of the proposed supply and extract points, the position of the ERV / HRV and the intended flow rates at all registers.

**2.4.2)** Passive House certificate/technical Information stating both heat recovery and electrical efficiency.

**2.4.2)** Length of ambient air ducts (those that connect to the outside world) as well as proposed insulation type, thickness and R per inch thereon .

### **2.5) Subsoil Heat Exchanger**



In extremely cold climates a subsoil heat exchanger is a viable source of frost protection and pre-tempering.

Subsoil heat exchangers can be extremely problematic if not constructed properly or if the condensate drain dries out. It is imperative that if such a system is used that a specialist contractor is used.

A liquid source solution such as brine/glycol is much less problematic and can work very well with common systems.

For either system a layout showing the underground piping is needed. Although useful for frost protection and some tempering of the air it will only improve the ERV / HRV efficiency by approximately 4%. With liquid systems this energy saving may be outweighed by the electrical consumption of the circulation pumps.

## **2.6) Primary Energy – Heating, Cooling and Hot Water Production Description**

We require a brief description of the proposed heating, cooling and hot water systems. The use of efficient heating, cooling and hot water systems is crucial and contributes to a large proportion of the energy use in a Passive House building. If solar thermal collectors are used in combination with an efficient heating, cooling and hot water system then the primary energy target can usually be easily met. The use of direct electricity is not recommended and will cause the primary energy target to be exceeded in most cases (heat pumps, mini-splits are typically acceptable).

For the Pre-Certification we need an outline description of how you intend to produce hot water and deal with the heating and cooling demands.

## **2.7) Technical Brochures stating Efficiencies of Mechanical Equipment (heating, cooling and domestic hot water)**

For heating furnaces/boilers we simply need a technical document stating the efficiency. For Heat Pumps we need the co efficiency of performance (COP)



and season energy efficiency ratio (SEER), the capacity and the flow rates of each indoor cassette and wall unit for both heating and cooling modes.

If you are using a heat pump hot water heater we need the COP or SEER and for the storage tank the losses in W/K or BTU/hr.F.

### **2.8) Hot Water and Heating Supply Pipelines Layout**

For all hot water pipes we will need a dimensioned layout or sketch showing dimensions, diameter and thickness and type of insulation and details of the circulation loop (if used). The location of the tank and heat generator should also be shown.

## **3) Additional Documentation for Certification of Schools and Offices**

- 3.1)** A usage profile indicating the occupancy times and frequencies of absenteeism for all spaces within the building.
- 3.2)** A lighting layout with a legend indicating the wattage of each fixture.
- 3.3)** An equipment and appliance schedule with the power consumption of all electronic devices.

### **Additional Documentation**

Additional documentation will be requested depending on special circumstances and building types. Items such as external sliding doors, elevators, extract exhausts for dryers and other special items like thermal bridging of details may be sought. At the end of the review all such special information will be listed.

## **4) Time Frame and Deliverables**

We currently have a three to four week processing phase from the time of receipt of all the above mentioned material to complete the first review. Outstanding items will then be listed in full and recommendations for improvement will be given if needed. Upon receipt of a fully complete response with all requested information we will generally require 5-8 working days to process your project information and issue the Passive House Pre-Certification.

At the end of the review period we will provide the following deliverables:

- A fully verified PHPP file for use in continuing with the project;
- A labeled sketchup model corresponding with the PHPP inputs;
- A PDF set of the key calculations;
- A signed Passive House Pre-Certification letter; and
- A breakdown of information required should you wish to proceed to full certification.



## 5) Fee Proposal

Please apply for a quote for your Project Pre-Certification. A general arrangement drawing is required to prepare a custom fee proposal based on size and complexity.

If you decide to go ahead, we will require the following:

- Written instruction to proceed;
- A copy of project drawings in digital vector based format and a copy (if any) of the PHPP calculations;
- 25% deposit payable in advance; and
- 75% due on issue of the report & calculations.

### *General Terms & Conditions*

*Advice on general queries on this or other projects outside the fixed fee proposal noted above would be charged on a time basis and agreed in advance.*

*All comments / details provided will only concern the thermal performance of the building in relation to the PHPP report. Your Architect will remain responsible for the performance of the details in terms of all Building Codes, water penetration, weathering, structural performance, aesthetics, durability, retention of guarantees and so forth.*

*Passive House Academy will act as consultants to your Architect. Passive House Academy will require your Architect and other consultants involved in the project to carry Professional Indemnity Insurance at the appropriate level for the value of the particular project.*

*A condition of contract is that Passive House Academy is mentioned as the Certifier in the event of any kind of publication of the building for which its service is provided.*



## Contact Us:

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Website: [www.passivehouseacademy.com](http://www.passivehouseacademy.com)





## Passive House Pre-Certification

### Information Checklist

<b>1) Minimum Documentation Required for Commencement</b>	required	incomplete	complete
1.1) Completed PHPP file	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2) Site Plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3) Plans, Elevations & Sections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4) Photographs of Surroundings (labelled as to orientation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.5) Google Map Link of Exact Location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6) Proposed Construction Details showing:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1) Thickness of each material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) Lambda or R per Inch of each material	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) Center and thickness of steel or wood studs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*Note: Both printed pdf set and dwg files are needed for all Design Drawings*

<b>2) Additionally Required Documentation</b>	required	incomplete	complete
<b>2.1) Technical Brochures for all insulation products</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(don't forget to highlight your product if there are multiple values)



<b>2) Additionally Required Documentation</b>	<b>required</b>	<b>incomplete</b>	<b>complete</b>
<b>2.2) Technical specification for windows</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1) Psi Glass Edge according to ISO EN 10077-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) $U_f$ according to ISO EN 10077-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) $U_g$ according to ISO EN 673	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4) G-Value/SHGC according to ISO EN 410	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5) Psi Install according to ISO EN 10211	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) Widths of frames for top, bottom and sides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.3) Technical specification for glazed doors</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1) Psi Glass Edge according to ISO EN 10077-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) $U_f$ according to ISO EN 10077-2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) $U_g$ according to ISO EN 673	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4) G-Value/SHGC according to ISO EN 410	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5) Psi Install according to ISO EN 10211	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6) Widths of frames for top, bottom and sides	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.4) Technical Information for ventilation unit</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5.1) Ventilation Layout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5.2) Efficiency and Electrical Consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.5.3) Ambient air duct; Insulation, thickness, length and diameter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



<b>2) Additionally Required Documentation</b>	<b>required</b>	<b>incomplete</b>	<b>complete</b>
<b>2.5)</b> Information about the sub-soil heat exchanger (only if used)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.6)</b> Primary Energy – Heating, Cooling and Hot Water Production Description	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.7)</b> Technical brochures stating efficiencies of mechanical equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1) Heating Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2) Cooling Efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3) Hot Water Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4) Hot Water Storage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2.8)</b> Hot water and heating supply pipelines (lengths, dimensions, thickness and level of insulation if any, circulation loop)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3) Additional Documentation for Schools and Offices</b>	<b>required</b>	<b>incomplete</b>	<b>complete</b>
<b>3.1)</b> A usage profile indicating the occupancy times and frequencies of absenteeism for all spaces within the building	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.2)</b> A lighting layout with a legend indicating the wattage of each fixture in the building	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.3)</b> An equipment and appliance schedule with the power consumption of all electronic devices.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>