Certificate

Passive House Designer

Passive House Institute

Dr. Wolfgang Feist
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Germany
www.passivehouse.com

Valid until 4th March 2029

Norman Garcia

Date of birth: 24th May 1976

is entitled to use the seal below during the five year validity of the certificate and is listed during this period in the list of Certified Passive House Designers/Consultants at `www.passivehouse-designer.org`

The qualification was obtained according to the valid examination regulations

at: **Passive House Canada**

DESIGNER
CERTIFIED PASSIVE HOUSE DESIGNER

Construction Verifier
energy efficiency

Darmstadt, 16th June 2025

Prof. Dr. Wolfgang Feist

3.2 Documents to be submitted for Passive House Certification

Folder	Documents Required	Description	Status	Remarks
3.2.1 Passive House Planning Package (PHPP)				
	PHPP	version 10	Attached	
	designPH	version 2.0	Attached	
3.2.2 Design and planning documents				
	Site plan	Building's orientation, the position and height of relevant shading elements (neighbouring buildings, prominent trees, elevated terrain, etc.).	Attached	
	Construction drawings	Floor plans, sections, elevations with comprehensible dimensions for all area calculations (room dimensions, envelope areas, rough window opening size	Attached	
	Reference drawings of envelope areas	Easy and clear identification and allocation of the areas and U-values in the PHPP to the planning drawings. Alternatively, submit a DesignPH file which includes this information.	Attached	
	Treated Floor Area calculations	"Room_data" tool; "SFH-Aid" tool.	Attached	
3.2.3 Standard and connection details				
	Reference drawing of thermal bridges (if present)	Clear allocation of the entries in the PHPP.		
	Detail drawings	All building envelope connections, e.g. the exterior and interior walls at the basement ceiling or floor slab, exterior wall at the roof and ceiling, roof ridge, verge, attachment of balconies etc. The details must be given with dimensions and information about the materials used and their conductivities. The airtight layer must be indicated and its execution at connection points must be described.	Attached	
	Thermal-bridge coefficients	Documented values of comparable constructions; calculated thermal bridge details for all relevant connection points are available for certified Passive House wall and construction systems; thermal bridge calculation in accordance with EN ISO 10211.	Attached	
	Manufacturer, type and technical data sheets for insulation materials	Rated λ-values (thermal conductivity); PHI Component certificate.	Attached	
	Radiation properties of the building's exterior surface (hot and very hot climates)	For roof products: measured values for absorptivity or reflectance and emissivity determined in accordance with ANSI/CRRC-1 (or comparable methods). For wall products: on account of the lack of data available, no requirements currently apply for the source of the specific values. All values must be determined after a period of exposure to weathering of at least 3 years.	Attached	
	Verification of moisture protection for interior insulation (in climates requiring heating)	Hygrothermal simulation.	Attached	
3.2.4 Windows and doors				
	Reference drawings for windows and doors	Clear allocation of the entries in the PHPP.	Attached	
	Windows and door frames information	Manufacturer, type, Uf value, ΨInstallation, ΨGlazing Edge, exterior colour (for radiation balance), and graphical representations of all planned installation situations in the exterior wall. The calculated values must be computed in accordance with EN ISO 10077-2. PHI Component certificate.	Attached	
	Glazing information	Manufacturer, type, build-up, type of edge spacer, Ug value according to EN 673 (or NFRC100), g-value in accordance with EN 410, or Ug and g-value in accordance with ISO 15099, mathematically computed. PHI Component certificate.	Attached	
3.2.5 Shading				
	Movable shading elements	Product data sheet showing the type and geometry of the element. Evidence of the shading factor can be provided by means of the standard values in the PHPP User Manual, the manufacturer's data (Ug value in the manufacturer's calculation must not be significantly poorer than the Ug value of the installed glazing), or calculation in accordance with EN13363.	Attached	
	Fixed shading elements	Detail section which shows the relevant shading characteristics. Alternatively, evidence of the shading factor can also be provided by means of an existing designPH file (version 2.0 onwards).	Attached	
3.2.6 Ventilation				
	Ventilation plans: Ducts	Position; length; cross section dimensions; if necessary insulation material thickness, thermal conductivity, and vapour tightness (cold air carrying ducts only).	Attached	
	Ventilation plans: Outlets	Position and type of the supply and extract air outlets; position of the outdoor and exhaust air openings; air transfer openings: position and cross-section.	Attached	
	Ventilation specs: Built-in parts of ducts	Sound absorber: position and type; additional sound protection measures for the ventilation unit in the installation room; filter: position and filter class in outdoor air and extract air ducts; frost protection mechanisms; heating coils; other built-in parts of ducts (fire safety dampers etc.).	Attached	
	Ground-coupled heat exchanger	Length; installation depth and method; material of tubes and diameter.	Attached	
	Ventilation units (ERV/HRV)	Heat recovery efficiency; humidity recovery; specific electric input power; PHI Component certificate.	Attached	
	Exhaust air systems without heat recovery (also fume hoods and fume cabinets etc.)	Manufacturer, type, technical data sheets and verification of the electricity demand.	Attached	
	Pressure loss calculation	"PHI pressure loss calculation tool": for the duct network for non-residential buildings and for ventilation units with an air flow greater than 600 m³/h, in order to verify the electrical efficiency of the ventilation unit.	Attached	
	HRV Commissioning report	"Final Protocol Worksheet for Ventilation Systems".	Attached	
3.2.7 Space heating/cooling, DHW and waste water				
	Compact heat pump units	PHI Component certificate; Manufacturer's data sheet.	Attached	
	Space heating with heat pumps	PHI Component certificate; Manufacturer's data sheet.	Attached	

Hot water generation with heat pumps	"HP tool"; HPWH tool.	Attached	
Borehole heat exchangers and ground collectors	The design documents prepared by the engineer or the contracting company must be submitted. At least the length and number of borehole heat exchangers must be evident from this.	Attached	
Boiler	PHI Component certificate; Manufacturer's data sheet.	Attached	
District heating	The primary energy factor is calculated in the PHPP worksheet "District heating", as described in 2.5.12. If the detailed calculation is used, the documentation supporting the values in PHPP must be submitted.	Attached	
Solar thermal collectors	The characteristic values must be verified using the relevant product data sheet or test report. If no data is available it is permitted to use the standard characteristic values given in the PHPP for one of the three types: flat collector, improved flat collector or vacuum tube collector.	Attached	
Wood stoves	Monitoring of the differential pressure which switches off the ventilation system and/or the stove in case of negative pressure in the room where it is installed; carbon monoxide detectors.	Attached	
Pipes	Position; length; nominal width of pipe; thermal insulation: type, thickness and thermal conductivity.	Attached	
Pumps	Manufacturer's data sheet.	Attached	
Hot water storage tank	Manufacturer's data sheet.	Attached	
Cooling units	PHI Component certificate; Manufacturer's data sheet.	Attached	
Dehumidifier	PHI Component certificate; Manufacturer's data sheet.	Attached	
Cooling distribution	Position; length; nominal width of the pipe; thermal insulation: type, thickness and thermal conductivity; design forward flow temperature (i.e. distribution supply temperature).	Attached	
Shower waste water heat recovery	PHI Component certificate; Manufacturer's data sheet; efficiency calculated in accordance with NEN 7120 (the Dutch KIWA certificate), CAPE/RECADO-PQE (French) or CSA B55 (Canada).	Attached	
In buildings without active cooling	Written documentation of the strategy for thermal comfort in summer, signed by the building owner; evidence of instructions given to the future building user regarding the strategy for thermal comfort in summer, e.g. in a user handbook.	Attached	
3.2.8 Electrical devices and lighting			
Residential buildings	Planning or concept for efficient electricity use (only if the standard verification is not used, see 2.5.11); If applicable, electrical design for common areas including e.g. elevators, lighting etc.	Attached	
Non-residential buildings	Manufacturer, type, technical data sheets and evidence of the electricity demand for all significant electrical uses such as elevators, kitchen facilities, IT applications, telephone systems, security systems and all other electrical uses with a significant electricity demand that are specific to the building use, e.g. furnace. Datasheets must show the power consumption when the equipment is in use (ON mode) and not in use (standby / off mode).	Attached	
Lighting	Depiction and dimensioning of lighting (if applicable also concepts or simulations for the use of daylight).	Attached	
Use profile	Written confirmation by the building user (if known, otherwise building owner) that the use profile in the PHPP (worksheet "Use non-res") corresponds with the planned building use later on.	Attached	
3.2.9 Renewable energy			
Proof of ownership	Suitable proof of ownership for renewable energy generation systems (except for solar thermal systems) on the building plot, or off-site. Or if applicable, evidence relating to the percentage of ownership of the system as a whole. For systems which are off-site, this evidence must show that it is a newly constructed system, i.e. a system that was not put into operation before the start of construction of the building and belongs to the building owner or the (long-term) user (first time acquisition). If constructing or purchasing renewable energy generation systems is part of the business model of the building owner, only systems which are on-site may be	Attached	
Solar thermal systems	Data sheets related to the collectors and storage used, indicating the necessary input parameters.	Attached	
PV system (on-site)	Module data sheet with rated current, rated voltage and rated power; temperature coefficient of the short-circuit current and the open-circuit voltage; module dimensions; Efficiency of the inverter taken from the data sheet; Number of the modules, proof of this e.g. through purchase receipts; Alignment, inclination and shading from the corresponding planning.	Attached	
Other RE generation systems	Suitable evidence of the predicted annual power generation of the system (simulation).	Attached	
3.2.10 Airtightness of the building envelope			
BDT Report	in accordance with ISO 9972 (method 1) with deviations.	Attached	
Leak Detection Report	Only for EnerPHit and PHI Low Energy Buildings, for n50 values between 0.6 1/h and 1.0 1/h and for pre-certification: extensive leak detection must be carried out during the pressurisation test. Individual leakages which may cause structural damage or impair comfort must be identified and remedied. This must be confirmed in writing and signed by the person conducting the leak detection.	Attached	
Calculation of the air volume Vn50 for the airtightness test	The volume must be determined on a room-by-room basis. In doing so, the base area of the room must be multiplied by the average clear height of the room.	Attached	
3.2.11 Photographs			
Photograph checklists	Evidence of the progress of construction must be supported with photographs, but it is not necessary to provide complete photographic documentation of all measures.	Attached	
3.2.12 Exemptions (e.g. for EnerPHit by component method)			
Exemptions	Written confirmation by the historic building preservation authority, excerpts from laws and ordinances, drawings. Generally, in the event that a specific value that is required as standard is exceeded on the basis of an exemption, clear evidence must be provided that the prerequisites for the exemption exist by presenting the appropriate documents with the signature of the person in charge.	Attached	
3.2.13 Economic feasibility calculation (only for EnerPHit)			

Economic feasibility calculation	Calculation of economic feasibility compared to a renovation without improvement of the energy efficiency, using the PHPP worksheet "Comparison".	Attached	
3.2.14 Verification of general minimum requirements			
Ventilation: Excessively low relative indoor air humidity	Rough concept which shows how measures for increasing the monthly average relative humidity to more than 30 % (in all months) can be applied subsequently.	Attached	
Ventilation: Draughts	For supply air rooms with a 2-fold air change rate or more with normal operation (e.g. classroom, meeting room): plausible description of how draughts are to be avoided.	Attached	
Moisture protection: Excessively low interior surface temperatures	As a rule, no evidence for the temperature factor fRsi or input of this value in the PHPP are required for components with a typical Passive House quality. However, the Certifier may request such evidence in case of uncertainty.	Attached	
Moisture protection: Moisture accumulation in a component	If the Certifier has concerns regarding structural damage caused by moisture, evidence of moisture protection in accordance with accepted technical standards may be requested. For example, this can be the case for the following constructions: components with interior insulation in climates requiring heating; certain flat roof constructions (e.g. with roof greening) in climates requiring heating; insulated constructions in hot and humid climates.	Attached	
Thermal comfort	If the criteria for thermal comfort mentioned in Subsection 2.4.5 "Minimum thermal protection" are exceeded, then evidence of the comfort conditions in accordance with DIN EN ISO 7730 may be provided alternatively (not applicable for PHI Low Energy Buildings).	Attached	
User satisfaction	If use is made of any of the exemptions mentioned in Subsection 2.4.6, then evidence of the prerequisites for these must be provided.	Attached	
3.2.15 Construction manager's declaration			
Construction manager's declaration	In order to limit the costs for the certification, supervision of the construction work by the Certifier is not required for the building certification. Instead, with the construction manager's declaration the person appointed by the building owner for supervising the construction work assumes the legal responsibility for ensuring that the work has been carried out in accordance with the documents submitted for the certification.	Attached	
3.3 Pre-certification for staged retrofits			
EnerPHit Retrofit Plan (ERP)	If energy retrofits are carried out in several individual consecutive steps, then pre-certification of the building as an EnerPHit (or Passive House) project is possible. The preparation of a comprehensive EnerPHit Retrofit Plan (ERP) is a prerequisite for this. The pre-certificate provides building owners and planners with the security that the standard being aimed for will actually be achieved after the completion of all steps.	Attached	
		-	

List of photographs required for Passive House Certification

Folder	No.	Photographs Required	Description	Status	Remarks
1. Assemblies	1	Opaque envelope assembly (walls, slabs, roofs)	Component thickness indicated by measuring ruler	Attached	
1. Assemblies	2	Manufacturer cut-sheet or label for Insulation	Manufacturer cut-sheet or label showing the thermal conductivity in W/(mK)	Attached	
2. Shading	3	Site and surroundings	Site and surrounding neighbourhood in all directions. Important for shading calculation.	Attached	
3. Thermal Bridges	4	Thermal bridges	Thermal bridges and thermal breaks showing how the construction has been carried out	Attached	
4. WindowsDoors	5	Window assembly (glazing + frames)	Window installation: fixing, location in wall, over insulation of frame and finished window	Attached	
4. WindowsDoors	6	Door assembly (glazing/panel + frames)	Window installation: fixing, location in wall, over insulation of frame and finished door	Attached	
4. WindowsDoors	7	Windows and Door labels	Glazing, frame: manufacturer cut-sheet or label. Spacer, secondary sealing: manufacturer cut-sheets	Attached	
4. WindowsDoors	8	Window/Door shading	External or internal shading rollers or blind	Attached	
5. Ventilation	9	Ventilation units	Installation situation of the ventilation units, and their location	Attached	
5. Ventilation	10	Ventilation units labels	Label with all the specifications including average air flow rate, specific power input, heat & humidity recovery efficiency	Attached	
5. Ventilation	11	Ventilation units components	Silencers, Outdoor air-filter, Extract air-filter, Frost protection system, ODA/EHA ducts, SUP/EXA dutct, ODA/EHA valve	Attached	
5. Ventilation	12	Kitchen exhaust system and additional fans	Kitchen exhaust system showing its installation situation, location and label with all the specifications including electrical efficiency, air-flow, etc.	Attached	
6. Heating,Cooling,DHW	13	Heating system	Heat generation unit, storage, distribution and supply system, showing labels and insulation	Attached	
6. Heating,Cooling,DHW	14	Domestic Hot Water	DHW generation unit, storage, distribution and supply system, showing labels and insulation	Attached	
6. Heating,Cooling,DHW	15	Cooling	Cooling generation unit, distribution and supply system, showing labels and insulation	Attached	
6. Heating,Cooling,DHW	16	Dehumidification	Dehumidification unit, distribution and supply system, showing labels and insulation	Attached	
7. Renewable Energy	17	Renewable Energy	Renewable energy generation system installations, manufacturer cut-sheet or label with specifications including type of product, efficiency, inverter efficiency etc.	Attached	
8. Electricity	18	Electricity Devices	Lighting system, pumps specification and installation, elevator specifications and other devices.	Attached	
9. Construction Phase	19	Site during construction	General photographs of the building site showing how the insulation was installed, penetrations if any, installation of windows, doors, thermal bridges etc.	Attached	
9. Construction Phase	20	Any modification from the planning	Site area or assembly which has been modified from the initial planning.	Attached	
10. Airtightness	21	Airtightness layer	Installed air-tightness layer on external walls specifications of the materials and installation process.	Attached	
10. Airtightness	22	Blower Door test	Sealing sheet, air transfer device, detected leaks, measurements, windows, skylight and sealed components during the test execution.	Attached	

General Information

PHPP Name	
Version	

Checklist for illustrative photographs for the Passive House Certification

Project:					
Compiled by					
Name:	Norman Garcia, AllClimate Consulting				
Address:	1321 Manitoba Ave.				
City:	Winnipeg, MB Canada				
Telephone:	204-930-3737				
E-Mail	norm@allclimateconsulting.com				
Building Type:					
Building Utilization:					
If "Other", please specify					
Street					
Postcode/City					
Province/Country					
Climate Data					
Indoor temperature					
Winter:		° C	Summer:		° C
Internal heat gains					
Heating case:		W/m²	Cooling Case:		W/m²
Energy standard:					
If "Other", please specify					
Treated floor area:		m²			
Net air volume for press. test (V_{n50})		m³			

Specific building characteristics with reference to the treated floor area

					Criteria	Alternative criteria	Fullfilled?
	Treated floor area	m²					
Space heating	Heating demand	kWh/(m²a)		≤			
	Heating load	W/m²		≤			
Space cooling	Cooling & dehum. demand	kWh/(m²a)		≤			
	Cooling load	W/m²		≤			
	Frequency of overheating (> - °C)	%		≤			
	Frequency excessively high humidity (> g/kg)	%		≤			
Airtightness	Pressurization test result n_{50}	1/h		≤			
Non-renewable Primary Energy (PE)	PE demand	kWh/(m²a)		≤			
Primary Energy Renewable (PER)	PER demand	kWh/(m²a)		≤			
	Generation of renewable energy (in relation to projected building footprint area)	kWh/(m²a)		≥			

U-Values

No.	Photographs required	Description	Status	Remarks	Location of building assembly in floorplan/section or designPH model
1	Opaque envelope assembly: Assembly Type-1	Photographs (especially for insulation): - Component thickness indicated by measuring ruler - Manufacturer cut-sheet or label showing the thermal conductivity in W/(mK)	Attached		
	Manufacturer cut-sheet or label for Insulation Type-1				
2	Opaque envelope assembly: Assembly Type-2	Photographs (especially for insulation): - Component thickness indicated by measuring ruler - Manufacturer cut-sheet or label showing the thermal conductivity in W/(mK)	Attached		
	Manufacturer cut-sheet or label for Insulation Type-2				
3	Opaque envelope assembly: Assembly Type-3	Photographs (especially for insulation): - Component thickness indicated by measuring ruler - Manufacturer cut-sheet or label showing the thermal conductivity in W/(mK)	Attached		
	Manufacturer cut-sheet or label for Insulation Type-3				
4	Opaque envelope assembly: Assembly Type-4	Photographs (especially for insulation): - Component thickness indicated by measuring ruler - Manufacturer cut-sheet or label showing the thermal conductivity in W/(mK)	Attached		
	Manufacturer cut-sheet or label for Insulation Type-4				

Planning Documents for Architecture

	No.	Photographs Required	Description	Status	Remarks
Building, site surroundings	1	Site and surroundings.	Photographs of site and surrounding neighbourhood in all directions. Important for shading calculation.	Attached	

Thermal Bridges

	No.	Name of thermal bridge	Length (m)	Ψ W/(mK)	Photographs Required	Description	Status	Remarks
Thermal Bridges	1				Thermal bridge: Type-1	Photographs thermal bridge, thermal breaks: - Length and thickness of thermal bridge indicated by measuring ruler - Penetration material: manufacturer cut-sheet or label showing the thermal conductivity in W/(mK)	Attached	
	2				Thermal bridge: Type-2		Attached	
	3				Thermal bridge: Type-3		Attached	
	4				Thermal bridge: Type-4		Attached	
	5				Thermal bridge: Type-5		Attached	
	6				Thermal bridge: Type-6		Attached	
	7				Thermal bridge: Type-7		Attached	
	8				Thermal bridge: Type-8		Attached	
	9				Thermal bridge: Type-9		Attached	
	10				Thermal bridge: Type-10		Attached	

Windows or Doors

	No.	Frame type	U_f W/(m²K) Left	Right	Bottom	Above	χ_{oc} W/K	Photographs Required	Description	Status	Remarks
Window Frames, Curtain Wall & Doors	1							Window and manufacturer cut-sheet or label-Type-1	Photographs: - Window installation: fixing, location in wall, over insulation of frame - Window finished - Glazing, frame: manufacturer cut-sheet or label - Installation thermal bridges (side, bottom, top) inclusive external shading blind - Spacer, secondary sealing: manufacturer cut-sheets	Attached	
	2							Window and manufacturer cut-sheet or label-Type-2		Attached	
	3							Window and manufacturer cut-sheet or label-Type-3		Attached	
	4							Window and manufacturer cut-sheet or label-Type-4		Attached	
	5							Window and manufacturer cut-sheet or label-Type-5		Attached	
	6							Window and manufacturer cut-sheet or label-Type-6		Attached	
	7							Window and manufacturer cut-sheet or label-Type-7		Attached	
	8							Window and manufacturer cut-sheet or label-Type-8		Attached	
	9							Window and manufacturer cut-sheet or label-Type-9		Attached	
	10							Window and manufacturer cut-sheet or label-Type-10		Attached	

	No.	Glazing type	g-Value	U_g W/(m²K)	Photographs Required	Description	Status	Remarks
Glazing	1				Glazing and manufacturer cut-sheet or label-Type-1	Photographs: - Window installation: fixing, location in wall, over insulation of frame - Window finished - Glazing, frame: manufacturer cut-sheet or label - Installation thermal bridges (side, bottom, top) inclusive external shading blind - Spacer, secondary sealing: manufacturer cut-sheets	Attached	
	2				Glazing and manufacturer cut-sheet or label-Type-2		Attached	
	3				Glazing and manufacturer cut-sheet or label-Type-3		Attached	
	4				Glazing and manufacturer cut-sheet or label-Type-4		Attached	
	5				Glazing and manufacturer cut-sheet or label-Type-5		Attached	

Ventilation

	No.	Photographs Required	Description	Description of Unit	Effective Heat Recovery Efficiency %	Energy recovery value η_{ECR} %	Electric Efficiency Wh/m³	Status	Remarks
Ventilation Unit	1	Ventilation unit-1	Photographs ventilation unit: - Installation situation, location - Label with all the specifications including average air flow rate, specific power input, heat & humidity recovery efficiency					Attached	
	2	Ventilation unit-2							
	3	Ventilation unit-3							
	4	Ventilation unit-4							
	5	Ventilation unit-5							

	No.	Photographs Required	Description	Status	Remarks
Ventilation Unit Components	1	Silencers	Photographs of the all ventilation system silencers showing their installations and locations.	Attached	
	2	Outdoor air-filter	Photographs of the all filters showing its location, installation and label or manufacturer-cut sheet with specifications.	Attached	
	3	Extract Air-filter	Photographs of the all filter showing its location, installation and label or manufacturer-cut sheet with specifications.	Attached	
	4	Frost protection system	Photographs of the all frost protection units showing its location and installation.	Attached	
	5	ODA/EHA ducts	Photographs of location, insulation thickness indicated by scale, installation on ceiling, cross-sections, reflective coating etc.	Attached	
	6	SUP/EXA dutct	Photographs of location, insulation thickness indicated by scale, installation on ceiling, cross-sections, reflective coating etc.	Attached	
	7	ODA/EHA valve	Photographs of location and installation.	Attached	

Type of Kitchen Exhaust System	Recirculation

	No.	Photographs Required	Description	Status	Remarks
Kitchen Exhaust System	1	Kitchen exhaust system	Photographs of the kitchen exhaust system showing its installation situation, location and label with all the specifications including electrical efficiency, air-flow, etc.	Attached	

	No.	Photographs Required	Description	Status	Remarks
Fans	1	Any other fans if used		Attached	

	No.	Photographs Required	Description	Existing?	Air change rate 1/h	Air change rate 1/h	Status	Remarks
Natural Ventilation	1	Natural ventilation	Photographs of strategy adopted for	No		-	Attached	
	2	Manual night Ventilation	Photographs of strategy adopted for	No		Manual window opening	Attached	
	3	Mechanical night Ventilation	Photographs of strategy adopted for	No		-	Attached	

Heating or Cooling & DHW

Heating

No.	Photographs Required	Description	Status	Remarks
1	Heat generation system	Photographs of the heat generation unit showing its installation situation, location and label with all the specifications.	Attached	
2	Heat storage system	Photographs of the heat storage unit showing its installation situation, location, specifications and thickness of insulation using measuring ruler.	Attached	
3	Heat distribution system	Photographs of the heat distribution system showing its installation situation, control system and label with all the specifications. Also, provide photographs of valves showing their installation, and thickness of insulation using a measuring ruler.	Attached	
4	Heat supply system	Photographs of the heat supply system showing its installation situation and thickness of insulation using a measuring ruler.	Attached	

	Inside thermal envelope					Outside thermal envelope				
	1	2	3	4	5	1	2	3	4	5
Nominal width of pipe mm										
Insulation thickness of distribution pipes mm										
Insulation reflective coating?										
Thermal conductivity of insulation W/(mK)										

Domestic Hot Water

No.	Photographs Required	Description	Status	Remarks
1	DHW generation system	Photographs of the DHW generation unit showing its installation situation, location and label with all the specifications.	Attached	
2	DHW storage system	Photographs of the DHW storage unit showing its installation situation, location, specifications and thickness of insulation using measuring ruler.	Attached	
3	DHW distribution system for circulation	Photographs of the DHW distribution system for circulation showing its installation situation. Also, provide photographs of valves showing their installation, and thickness of insulation using a measuring ruler.	Attached	
4	DHW individual pipes	Photographs of the DHW distribution system for individual pipes showing its installation situation.	Attached	
5	DHW supply system	Photographs of the DHW supply system showing its installation situation and thickness of insulation using a measuring ruler.	Attached	

	Inside thermal envelope					Outside thermal envelope				
	1	2	3	4	5	1	2	3	4	5
Nominal width of pipe mm										
Insulation thickness of distribution pipes mm										
Insulation reflective coating?										
Thermal conductivity of insulation W/(mK)										

Cooling

No.	Photographs Required	Description	Status	Remarks
1	Cooling system	Photographs of the cooling unit or the chiller system showing its installation situation, location and label with all the specifications. Also provide the thickness of insulation for cooling distribution system, if any.	Attached	
2	Dehumidification system	In case dehumidification system has been provided, provide Photographs with installation situation and label with all the specifications.	Attached	
3	Cooling distribution system	Photographs of the cooling distribution system showing its installation situation, control system and label with all the specifications. Also, provide photographs of valves showing their installation, and thickness of insulation using a measuring ruler.	Attached	

	Inside thermal envelope					Outside thermal envelope				
	1	2	3	4	5	1	2	3	4	5
Nominal width of pipe mm										
Insulation thickness of distribution pipes mm										
Insulation reflective coating?										
Thermal conductivity of insulation W/(mK)										

Renewable Energy

Renewable Energy

No.	Photographs Required	Description	Status	Remarks
1	Renewable energy generation system	Photographs of the renewable energy generation system installations, manufacturer cut-sheet or label with all the specifications including type of product, efficiency, inverter efficiency etc.	Attached	

Electricity

Electrical Devices

No.	Photographs Required	Description	Status	Remarks
1	Lighting system	Photographs of the lighting systems showing its label with all the specifications.	Attached	
2	Pump system	Photographs of all the pump systems including HVAC, water supply water extract etc. showing their label with all the specifications.	Attached	
3	Any other electrical device being used	In case refrigeration system, washing machines etc. have been installed, provide their Photographs with label showing all the specifications.	Attached	
4	Elevator system	Photographs of the elevator system showing its installation situation, location and label of the motor with all the specifications.	Attached	

Construction Phase

	No.	Photographs Required	Description	Status	Remarks
Construction Phase	1	Site during construction.	Photographs of site showing how the insulation was installed, thickness using a measuring tape, penetrations if any, installation of windows, doors, thermal bridges etc.	Attached	
	2	Any modification from the planning	Photographs of the site area or assembly which has been modified from the initial planning.	Attached	

Airtightness

	No.	Photographs Required	Status	Remarks
Airtightness Layer	1	Airtightness layer: Type-1	Attached	
	2	Airtightness layer: Type-2	Attached	
	3	Airtightness layer: Type-3	Attached	
	4	Any other airtightness layer	Attached	

	No.	Photographs Required	Status	Remarks
Airtightness Test	1	Installed sealing sheet	Attached	
	2	Air transfer device	Attached	
	3	Detected leaks	Attached	
	4	Measurements	Attached	
	5	Windows and skylights during test	Attached	
	6	Floor drains and siphons	Attached	
	7	Outdoor air ducts and exhaust air ducts	Attached	
	8	Any other component which was temporarily or permanently sealed during the test	Attached	
	9	Any repairs which were done to cure any major leak	Attached	
	10	Blower Door Test Report	Attached	

Envelope Leakage Test

THE ENERGY CONSERVATORY

Testing Company:

Name: AllClimate Consulting
Address: Winnipeg, MB R2X 0K8
Phone: 204-9303737
www.allclimateconsulting.com

Technician:

Name: Norman Garcia
Credentials: CPHD, NRCan QAS (MURB)
Email: norm@allclimateconsulting.com

Building Information:

Project ID: Bahay Passivhaus
Address:
Geo-Tag Data: Latitude:
Longitude:
Timestamp:

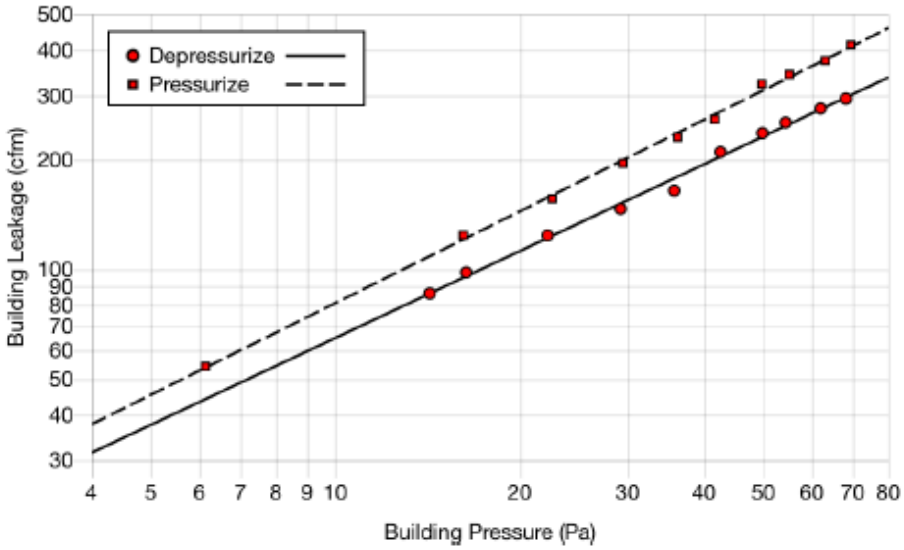
Customer Information:

Name:
Address:

Summary of Results:

	Average
Measured Leakage:	**n_{50} = 1.17 1/h**
Leakage Target:	**n_{50} = 0.60 1/h**
Compliance with Leakage Target:	**Fail**

Test Results at 50 Pascals:	Depressurization	Pressurization	Average
q_{50}: cfm (Airflow)	231.7 (+/- 3.1%)	310.0 (+/- 2.3%)	270.8
n_{50}: 1/h (Air Change Rate)	1.00	1.34	1.17
q_{F50}: cfm/ft² (Floor Area)	---	---	---
q_{E50}: cfm/ft² (Surface Area)	---	---	---



Test Equipment:

Flow Device: Model 3 110V Fan
Pressure Gauge: DG1000
Serial #: 12836
Calibration Date: 2022-11-18

Deviations from Standard:

Depressurization Test:

-

Pressurization Test:

-
-

Comments:

None

Building Leakage Curve:	Depressurization	Pressurization
Air Flow Coefficient (C_{env}):	10.3 (+/- 17.5%)	11.8 (+/- 9.9%)
Air Leakage Coefficient (C_L):	10.5 (+/- 17.5%)	11.8 (+/- 9.9%)
Exponent (n):	0.791 (+/- 0.049)	0.835 (+/- 0.028)
Coefficient of Det. (r^2):	0.99434	0.99831

Test Information:

Test ID:	001		
Purpose of Test:	Passive House		
Test Date and Time:	2025-02-26 20:17:07	Reporting Pressure:	50 Pa
Test Standard:	ISO 9972 Multi-Point	Time Average Period:	30 seconds
Test Mode:	Dual (Depress & Press)	Building Preparation:	Method 1
Net Floor Area:	0.0 ft² (Flr. Area)	Year Built:	
Envelope Area:	0.0 ft² (Env. Area)	Wind Class (Bft):	4
Internal Volume:	13,843.3 ft³		

Test Readings:

Depressurization Test:

Environmental Data: Indoor Temp: 22.0 °C Outdoor Temp: -2.0 °C Bar. Pressure: 101,325 Pa

Target (Pa)	Bldg (Pa)	Adj Bldg (Pa)	Fan (Pa)	Flow (cfm)	Config
Baseline	0.7 (+0.7,-0.0)				
-70.0	-68.0	-68.2	-27.6	313.6	Ring B
-63.0	-61.8	-61.9	-166.2	294.7	Ring C
-56.0	-54.2	-54.3	-139.9	269.7	Ring C
-50.0	-49.7	-49.8	-122.8	252.3	Ring C
-43.0	-42.4	-42.5	-97.3	223.8	Ring C
-36.0	-35.7	-35.8	-60.6	175.6	Ring C
-30.0	-29.1	-29.2	-48.4	156.4	Ring C
-23.0	-22.1	-22.2	-34.9	132.3	Ring C
-17.0	-16.3	-16.4	-22.1	104.7	Ring C
-10.0	-14.2	-14.3	-17.1	91.7	Ring C
Baseline	-0.5 (+0.1,-0.6)				

Pressurization Test:

Environmental Data: Indoor Temp: 22.0 °C Outdoor Temp: -2.0 °C Bar. Pressure: 101,325 Pa

Target (Pa)	Bldg (Pa)	Adj Bldg (Pa)	Fan (Pa)	Flow (cfm)	Config
Baseline	-0.4 (+0.0,-0.4)				
70.0	69.7	69.5	-43.8	394.4	Ring B
63.0	63.4	63.1	-36.0	357.6	Ring B
56.0	55.3	55.1	-30.0	327.2	Ring B
50.0	49.9	49.7	-26.6	308.2	Ring B
43.0	41.9	41.6	-117.4	246.6	Ring C
36.0	36.4	36.2	-94.3	220.3	Ring C
30.0	29.7	29.5	-68.4	186.8	Ring C
23.0	22.9	22.6	-44.2	149.4	Ring C
17.0	16.4	16.2	-28.2	118.6	Ring C
10.0	6.4	6.1	-54.1	51.8	Ring D
Baseline	0.9 (+0.9,-0.0)				